2001

2001-2003 Undergraduate Catalog

University of Alabama in Huntsville

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Undergraduate Catalog 2001-2003

The University of Alabama in HUNTSVILLE

Opportunities unlimited
The University of Alabama in Huntsville is committed to equal opportunity in employment and education. The University does not discriminate in any program or activity on the basis of race, color, religion, sex, age, or national origin, or against any qualified individual with a disability, and it maintains an affirmative action program for protected minorities and women.

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The University of Alabama in Huntsville also reserves the right in its sole discretion and at any time to modify any policy, procedure, or benefit set forth in this catalog and to make any other changes it deems necessary and appropriate. Students enrolling in the University are subject to current policies and practices as contained herein and as subsequently stated or modified by official institutional action.
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## Fall Semester 2001

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<thead>
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<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 20</td>
<td>Late Registration</td>
</tr>
<tr>
<td>August 21</td>
<td>Faculty Convocation/New Faculty Orientation</td>
</tr>
<tr>
<td>August 22</td>
<td>Classes Begin</td>
</tr>
<tr>
<td>August 25</td>
<td>First Saturday class</td>
</tr>
<tr>
<td>September 3</td>
<td>Labor Day Holiday</td>
</tr>
<tr>
<td>October 4-6</td>
<td>Fall Break</td>
</tr>
<tr>
<td>November 21-24</td>
<td>Thanksgiving holidays - No Classes</td>
</tr>
<tr>
<td>December 3</td>
<td>Last MWF class</td>
</tr>
<tr>
<td>December 3</td>
<td>Last MW class</td>
</tr>
<tr>
<td>December 4</td>
<td>Last TR class</td>
</tr>
<tr>
<td>December 4</td>
<td>Last Tuesday Evening only class/final exam</td>
</tr>
<tr>
<td>December 5</td>
<td>Last Wednesday Evening only class/final exam</td>
</tr>
<tr>
<td>December 5</td>
<td>Study Day/Weather Day</td>
</tr>
<tr>
<td>December 6-13</td>
<td>Final Examinations</td>
</tr>
<tr>
<td>December 8</td>
<td>Last Saturday class/final exam</td>
</tr>
<tr>
<td>December 10</td>
<td>Last Monday Evening only class/final exam</td>
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<tr>
<td>December 13</td>
<td>Last Thursday Evening only class/final exam</td>
</tr>
<tr>
<td>December 24-31</td>
<td>Winter break - No Classes</td>
</tr>
</tbody>
</table>

*One day a week classes meet 15 times with the last class being the final examination.

## Spring Semester 2002

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>January 3</td>
<td>Late Registration</td>
</tr>
<tr>
<td>January 7</td>
<td>Classes Begin</td>
</tr>
<tr>
<td>January 12</td>
<td>First Saturday class</td>
</tr>
<tr>
<td>January 21</td>
<td>Martin Luther King Jr. Holiday</td>
</tr>
<tr>
<td>March 25-30</td>
<td>Spring Break</td>
</tr>
<tr>
<td>April 16</td>
<td>Honors Day</td>
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<tr>
<td>April 19</td>
<td>Last MWF class</td>
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<tr>
<td>April 22</td>
<td>Last MW class</td>
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<tr>
<td>April 23</td>
<td>Last TR class</td>
</tr>
<tr>
<td>April 24</td>
<td>Study Day/Weather Day</td>
</tr>
<tr>
<td>April 24</td>
<td>Last Wednesday Evening only class/final exam</td>
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<tr>
<td>April 25-51</td>
<td>Final Examinations</td>
</tr>
<tr>
<td>April 25</td>
<td>Last Thursday Evening only class/final exam</td>
</tr>
<tr>
<td>April 27</td>
<td>Last Saturday class/final exam</td>
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<tr>
<td>April 29</td>
<td>Last Monday Evening only class/final exam</td>
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<tr>
<td>April 30</td>
<td>Last Tuesday Evening only class/final exam</td>
</tr>
<tr>
<td>May 12</td>
<td>Commencement</td>
</tr>
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</table>

*One day a week classes meet 15 times with the last class being the final examination.

## Summer 2002

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>May 9-10</td>
<td>Registration</td>
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<tr>
<td>May 13</td>
<td>Classes begin - 12 week</td>
</tr>
<tr>
<td>May 13</td>
<td>Classes begin - 1st 6 week</td>
</tr>
<tr>
<td>May 27</td>
<td>Memorial Day Holiday</td>
</tr>
<tr>
<td>June 21</td>
<td>Last class - 1st 6 week</td>
</tr>
<tr>
<td>June 24-25</td>
<td>Final Examinations - 1st 6 week</td>
</tr>
<tr>
<td>June 26</td>
<td>Classes begin - 2nd 6 week</td>
</tr>
</tbody>
</table>
PROPOSED ACADEMIC CALENDAR 2002-2003
(Prepared January 2000 - All dates tentative and subject to change without prior notice.)

Fall Semester 2002

August 19
Faculty Convocation/New Faculty Orientation
August 20
Late Registration
August 21
Classes Begin
August 24
First Saturday class
September 2
Labor Day Holiday
October 3 - 5
Fall Break
November 27 - 30
Thanksgiving Holidays - No Classes
December 2
Last MWF class
December 2
Last MW class
December 3
Last TR class
December 3
Last Tuesday Evening only class/final exam
December 4
Last Wednesday Evening only class/final exam
December 4
Study Day/Weather Day
December 5 - 12
Final Examinations
December 7
Last Saturday class/final exam
December 9
Last Monday Evening only class/final exam
December 12
Last Thursday Evening only class/final exam
December 23 - 31
Winter break - No Classes

*One day a week classes meet 15 times with the last class being the final examination.

Spring Semester 2003

January 3
Late Registration
January 6
Classes Begin
January 11
First Saturday class
January 20
Martin Luther King Jr. Holiday
March 24 - 29 (Tentative)
Spring Break
April 15
Honors Day
April 18
Last MWF class
April 21
Last MW class
April 22
Last TR class
April 23
Study Day/Weather Day
April 23
Last Wednesday Evening only class/final exam
April 24
Final Examinations
April 24 - 30
Last Thursday Evening only class/final exam
April 26
Last Saturday only class/final exam
April 28
Last Monday Evening only class/final exam
April 29
Last Tuesday Evening only class/ final exam
May 11
Commencement

*One day a week classes meet 15 times with the last class being the final examination.
Summer 2003

May 9
May 12
May 12
May 12
June 20
June 23 - 24
June 25
July 4
July 31
August 4
August 5
August 6
August 5 - 8
August 7 - 8

Registration
Classes Begin - 12-week
Classes begin - 1st 6-week
Memorial Day Holiday
Last class - 1st 6 week
Final examinations - 1st 6-week
Classes begin - 2nd 6-week
Independence Day Holiday
Last TH class - 12-week
Last MW class - 12 week
Last class - 2nd 6 week
Study Day - 2nd 6 week
Final Examinations - 12 week
Final Examinations - 2nd 6 week
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<th>Major</th>
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<td>B.S.B.A.</td>
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<tr>
<td>Art</td>
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<td>Biological Sciences</td>
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<td>Communication Arts</td>
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<td>Computer-Mediated Communication</td>
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<tr>
<td>Computer Science</td>
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<td>Education, Elementary</td>
<td>B.A., K-6 Certificate</td>
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<tr>
<td>Education, Secondary</td>
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<tr>
<td>Education, Special (Collaborative Teacher)</td>
<td>K-6 Certificate</td>
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<tr>
<td>Education, Special (Collaborative Teacher)</td>
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<tr>
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<td>Industrial and Systems Engineering</td>
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<td>Mechanical Engineering</td>
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<td>Environmental Science</td>
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<td>Foreign Language, General</td>
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<td>French</td>
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<td>German</td>
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<td>Russian</td>
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<td>Spanish</td>
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<td>Concentration in Foreign Languages and International Trade</td>
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<tr>
<td>General Science</td>
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<td>Management - Business Administration</td>
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<td>Management - Human Resources Management</td>
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<td>Nursing</td>
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<td>Optical Science</td>
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<td>Political Science</td>
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<td>Sociology</td>
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<tr>
<td>Teaching English to Speakers of Other Languages</td>
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<td>Technical Communications</td>
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General Information

Mission of the University of Alabama in Huntsville

The University of Alabama in Huntsville (UAH) is an autonomous campus of The University of Alabama System dedicated to excellence in teaching, research, and service. UAH is a key participant in one of the nation's major international centers for advanced technological research and utilizes its position in this environment to provide unique opportunities and creative programs for students, faculty, and the community. UAH is committed to maintaining a diverse academic community of the highest quality, and to providing an environment that facilitates intellectual, cultural, personal, and professional growth. UAH fosters leadership, creative and critical thinking, clear communication, a respect for knowledge and the pursuit of truth, and an engagement in the challenge and pleasure of a lifetime of learning. UAH, through its graduates and its programs, contributes to economic advancement, health care, cultural enrichment, and the quality of life of the region, state, and nation.

History

The University of Alabama in Huntsville (UAH) is a part of the University of Alabama System. In June 1969, the University of Alabama Board of Trustees established the University of Alabama System with three independent, autonomous campuses at Huntsville, Birmingham, and Tuscaloosa. Each campus has a separate president who reports to the Board of Trustees through the chancellor of the system. Academic programs were initiated in Huntsville in 1950; in 1963 degree opportunities at the master's level were provided and in 1964, at the baccalaureate level. The first master's degree based on work begun and completed in Huntsville was awarded in 1964 and the first undergraduate degrees in 1968. Doctoral programs were initiated in physics and engineering in 1971, and the School of Nursing was established the same year. In 1974, in a component of the Alabama School of Medicine, the first full-time medical students began their core clinical experience in Huntsville. (These programs were transferred to direct UAB management in 1995.) In the two decades of the 1970s and 1980s, UAH implemented a broad range of undergraduate degree programs; established master's programs in the liberal arts, nursing, and administrative science; initiated professional degree programs at both the graduate and undergraduate levels; and inaugurated selected Ph.D. programs in high-technology fields in the sciences and engineering.

UAH is focused to meet the specific needs of scientific and technological enterprises and the cultural and intellectual needs of a rapidly expanding region. It is UAH's intention to be innovative, even experimental, to explore what is new, to evaluate existing programs continually, to develop and establish curricula and pedagogical techniques calculated to help students live and perform well in a complicated environment.

Accreditation

The University of Alabama in Huntsville is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award bachelor's, master's, and doctoral degrees. Several UAH programs are accredited by their respective accrediting agencies. Academic programs in chemistry are accredited by the American Chemical Society. Six undergraduate engineering programs (chemical, civil, computer, electrical, industrial and systems, and mechanical) are accredited by the Accreditation Board for Engineering and Technology (ABET). Both undergraduate and graduate programs in nursing are accredited by the National League of Nursing (NLN). Computer science holds accreditation from the Computer Sciences Accreditation Board (CSAB). Programs in music and music education are accredited by the National Association of Schools of Music (NASM). All programs, both undergraduate and graduate, in the College of Administrative Science are accredited by the American Assembly of Collegiate Schools of Business (AACSB)-The International Association for Management Education.
Facilities

The 376-acre UAH campus is situated in Cummings Research Park which is located in northwest Huntsville. The University has 34 major buildings, including the Central Campus Residence Hall, the nine-building Southeast Campus Housing Complex, and the new Residence Hall that opens Fall Semester 2002-2003, all of which have been constructed since 1960. The buildings contain modern equipment and exemplify modern functional design.

Morton Hall, which is the oldest building on campus, houses classrooms, computer laboratories, and offices for the Dean and several of the departments in the College of Liberal Arts. It also houses the offices of Multicultural Affairs, the Institute for Science Education, the Honors Program, and International Education.

Wilson Hall contains classrooms, computer laboratories and instructional laboratories for programs in biological, environmental, and physical sciences as well as offices for the Department of Biological Sciences. The Division of Continuing Education also has offices, classrooms, and computer laboratories in the building to support its programs.

The Kenneth E. Johnson Research Center contains research laboratories and offices for that Center, the Alabama Solar Energy Center, the Propulsion Research Center, and the Office of Environmental Health and Safety.

Madison Hall contains executive administrative offices, classrooms, and the Department of Mathematical Sciences.

Von Braun Research Hall contains offices for Research Administration, and offices and research laboratories for the Center for Microgravity & Materials Research, and the Center for Automation and Robotics. Additionally, it houses the University's mainframe computer facility and the Information Services Department.

The Engineering Building contains classrooms, computer laboratories, and instructional and research laboratories as well as offices for the Dean and some of the engineering departments of the College of Engineering. It also houses the offices of Career Services and Cooperative Education.

The Materials Science Building contains offices for Chemistry and Materials Science, classrooms, and state of the art research laboratories for programs in chemistry and materials science, as well as administrative offices for the Dean of the College of Science and the Dean of the School of Graduate Studies. It also has a 350-seat auditorium/lecture hall.

The Optics Building is a four-story building designed and constructed for research and graduate studies in the field of applied optics. The building contains research laboratories, clean rooms, meeting rooms, and offices for the Center for Applied Optics and the Department of Physics.

The University Center houses the Division of Student Affairs, the Office of Admissions and Records, the Academic Advisement and Information Center, Bursar's Office, Student Government Association, Wellness Center and Exponent. It has facilities for dining, assemblies, meetings, dramatic presentations and recreational activities as well as housing the University Bookstore.

The Frances C. Roberts Hall, a two-unit complex, contains classrooms, laboratories, and offices for the art, history, and music departments in the College of Liberal Arts. The Humanities Center is located here, and there is a large auditorium/lecture room for varied university programs.

The Nursing Building is a contemporary triangular structure that houses the College of Nursing. Its four levels contain administration and faculty offices, classrooms, an auditorium, laboratories and service areas, and a large and well-equipped Learning Resources Center.

The modern Administrative Science Building contains classrooms, computer laboratories, and offices for the Dean and the departments of the College of Administrative Science. This well designed teaching facility also has a large auditorium/lecture hall and several student lounge areas. The Office of Instructional and Testing Services is also housed in this building.

Alumni House contains the offices of alumni affairs, development, university relations and special events of the Office of University Advancement.

Marion Beirne Spragins Hall has classrooms and offices for Health and Physical Education and Athletic Department faculty and staff, a gymnasium with a seating capacity of 2800, racquetball courts, and other physical education and recreational facilities.
The Central Receiving and Shipping Building houses the shipping and receiving office and storage facility, and the central mailroom.

The Physical Plant Building contains offices, shops, and storage areas for the Facilities and Operations Department, which include administrative offices, custodial services, public safety, facilities maintenance, grounds management services, stockroom, and the University motor vehicle pool.

The Tom Bevill Center has 100 hotel rooms, a restaurant, offices for the U.S. Army Corps of Engineers Training Division, meeting rooms, and computer laboratories. It also has sophisticated audio-visual systems, computer networking, links to Huntsville's super computer and easy access to other facilities on campus and in the nearby Cummings Research Park.

The WLRH Radio Station facility is located on the south end of the University campus, houses public radio station WLRH-FM. The University leases the facility to the Alabama Educational Television Commission but has no involvement in the operation of the radio station.

The Business Services Building houses administrative offices of the Business Services Department including Purchasing Services, Telephone Services, and the Copy Center.

Technology Hall is located across Sparkman Drive and contains offices, classrooms, specially equipped distance learning classrooms, a 119 fixed seating seminar room, computer classrooms and laboratories, and instructional and research laboratories for several of the departments in the College of Engineering as well as the Computer Science Department. It also houses the Center for Space Plasma and Aeronomic Research (CSPAR), the Propulsion Research Center, and the Information Technology & Systems Center.

The National Science & Technology Center (NSSTC) is located across Sparkman Drive and contains offices for Atmospheric Science, research laboratories, meeting rooms, and the Global Hydrology Resource Center computer laboratory to support the extensive ongoing research between NASA, UAH, and the Universities Space Research Association. All three have employees housed in the building.

The University Fitness Center provides facilities for student recreation and physical education activities. It contains three basketball courts, weight training area, aerobic area, cardiovascular fitness area, elevated running/walking track, swimming pool, locker rooms, offices, and support areas. The facility serves UAH students and employees as well as the general public through external memberships.

M. Louis Salmon Library

The Salmon Library supports the academic and research programs of the University. It has a collection of 331,448 volumes, a selective collection of U.S. Government Documents, materials in microform, and manuscript collections. The library currently subscribes to 1,248 periodicals and provides access to over 225 premium subscription databases, and over 12,000 full-text online journal titles. In addition, the University Archives/Special Collections offer a number of unique collections, including the papers of former Congressman Robert Jones and the personal library of Willy Ley. For students in the social sciences and humanities, microfiche collections such as the Library of American Civilization are of particular value. For students in the sciences, research at UAH is supported by the Redstone Scientific Information Center, located five miles from campus. This library was developed to support the wide-ranging research interests of NASA and the United States Army Missile Command, and is one of the finest technical libraries in the southeast. It is available without charge to UAH faculty members and graduate students. Reciprocal borrowing agreements are also in force with Alabama A&M University, the University of Alabama, the University of Alabama at Birmingham, and Auburn University to allow UAH students free access to those libraries.

The library is also a member of several consortia that provide access to research materials not owned by libraries in north Alabama. Its membership in OCLC and the Network of Alabama Academic Libraries facilitates rapid document delivery/interlibrary loan service to faculty and students without charge.

Library services, including a library computer laboratory/classroom, library instruction, and mediated database searching, assist faculty and students in their research. The library homepage (http://www.uah.edu/library) provides access to the library catalog, electronic reference and research sources, and information about the library. Guides and handouts detailing individual services of the library are available at the library's reference desk and on the library homepage.
Student Information

Student Affairs
The Division of Student Affairs provides services to individual students that facilitate the student's attainment of academic, cultural, social and personal goals. It also coordinates and supports group activities, campus events, and Student Government Association activities and programs. The Division of Student Affairs interprets and administers the Student Judicial Code, which protects student rights and assists students in their awareness of student responsibilities. These student needs and interests are served by the university center, housing, athletics, club sports, student life, auxiliary services, career services, intramurals, student development programs and leadership training, and the Wellness Center.

Tutoring Services
Tutoring services are available in academic subjects such as mathematics, English, chemistry, foreign languages, history, computer science, physics, accounting, biological sciences, and engineering. Contact the Student Development Services Office, located in the University Center, Room 113. Services are free to all UAH students. Students desiring to tutor or receive help may call 824-6203 for information or make application at UC 113.

Mathematics Lab
The mathematics lab is available for students who need tutorial help in MA 004, 033, 105, 117, 119, 121, 143, and 145. Located in Madison Hall, Room 207, the mathematics lab is staffed 20 hours every week by graduate teaching assistants. Dates and times vary each semester. For more information, please call Mathematical Sciences Department at 824-6470.

Calculus Workshop
For students enrolled in more advanced mathematics classes, the Calculus Workshop provides enrichment and experience working together in groups to solve challenging problems in calculus. It is located in Madison Hall, Room 207. For more information, please call Mathematical Sciences Department at 824-6470.

UAH Writing Center
The Writing Center, located in Morton Hall, is designed to increase opportunities for student-centered learning through peer tutoring. Students work one-on-one and in small groups to help each other understand college-level assignments; plan, organize, revise, and edit papers; prepare oral presentations; and develop critical thinking skills. The Writing Center is open to all students. For more information, call 824-6592.

Counseling Center
Personal counseling is available to all UAH students through the Counseling Center. Assistance is provided in helping students accomplish personal, social and academic goals. Issues may include relationships, self-esteem, time management, test anxiety, family concerns, and stress management. In keeping with accepted professional practice, all counseling is confidential except when such information is required by law. Students may be referred by faculty or staff members or they may contact the Counseling Center directly at 824-6203.

Services for Students with Disabilities
The Student Development Services Office provides professional counseling for students with disabilities. Services offered to students with disabilities may include: priority registration during advance registration periods, classroom accommodations, assistance locating note-takers and readers, ordering textbooks on tape, counseling, auxiliary equipment, assistance during orientation, liaison

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to UAH faculty, free tutors for most subjects, liaison to Admissions, Housing and Financial Aid Offices, and liaison to community resources.

In addition, the staff provides educational "Awareness" programs for students, faculty and staff as well as in-service faculty training on accommodating students with disabilities.

At least one month before enrolling, students with disabilities must contact this office so that preparation can be made in advance to provide assistance needed. Official documentation of stated disability is required. Appointments may be made in person or by calling the SDS office, Room 113, University Center, voice/TDD 824-6203.

**Multicultural Affairs**

The Office of Multicultural Affairs, a unit of the Office of the Provost and Vice President for Academic Affairs, assists the University in providing an atmosphere that is welcoming, supportive and rewarding as students prepare to become responsible adults. Students are encouraged to achieve and aided in attaining academic excellence while learning to be competitive with their peers. OMA endeavors to foster an understanding and a respect for cultural diversity throughout the UAH community. Programs are designed for minority as well as non-minority students in order to promote a sense of community and an acceptance of multiculturalism and racial tolerance on the UAH campus. Students may contact the Office of Multicultural Affairs, 220 Morton Hall, telephone (256) 824-6822, or willial@email.UAH.edu.

**Wellness Center (Student Health Services)**

Currently enrolled UAH students with valid ID's, may be seen for minor illnesses and injuries on an appointment basis at the Wellness Center located in Room 203 University Center.

Basic services are fee-based; however, laboratory costs will be billed to the student at a modest charge. The Wellness Center is open Monday through Friday 8:15 a.m. to 5:00 p.m. The telephone number is 824-6775.

**Career Services**

The Office of Career Services provides students valuable resources throughout all aspects of the career development process. Career development includes self-assessment (discovering personal interests, values and abilities), career exploration (applying self-assessment to career choices and exploring options), and job search (developing the skills to conduct a successful job search).

To help students and graduates discover their individual abilities, interests and values and relate these factors to relevant career choices and college majors, Career Services offers several assessment tools. FOCUS, a computer assisted career guidance system, allows students to determine individual values, skills, and interests. FOCUS also contains information concerning occupational and educational programs. One unique feature of FOCUS is that it provides information regarding careers that closely match the student's personal preferences. Another option is the COP System. This comprehensive, written inventory is comprised of three parts: Values, Abilities, and Interests. It is designed to increase self-awareness and facilitate connecting personal preferences with appropriate career choices. Other assessment tools are available. In addition to career assessment and individual career counseling, the office also offers a Career Exploration (ED 111) class twice each year. Career Services encourages students to start exploring possibilities early in their college tenure.

Career exploration resources are available in the Career Resource Center, including reference books, videos, articles, and other occupational information. In addition, the Career Resource Center houses numerous books on job search issues, salary information, company literature, employer directories, and graduate school information. On campus and off campus part-time employment opportunities are available for currently enrolled students. Gaining work experience while in school can be a big advantage upon graduation. The annual Fall and Spring Career Information Days offer an excellent exploration tool, as potential future employers talk with students about their companies, profession, and the types of employees they hire.
A student credential file facilitates the job search process. Each senior, degree-seeking graduate student, and UAH alumnus who registers with the office establishes a credential file. The file includes 10 resumes and a candidate registration form. Register with OCS at least 9 months prior to graduation. Participants receive a newsletter which provides current employment trends, job search tips, and the monthly on-campus interview schedule. Registered individuals have access to the Resume Referral program, the full-time employment opportunities listings, and on-campus interviews. Held in conjunction with the Fall and Spring Career Information Days, Interview Days provide the opportunity for students to interview with companies one-on-one in pre-scheduled interviews. Other job search resources include workshops conducted each semester on Resume Writing, Interviewing Skills, and Job Search Strategies, in addition to individual appointments on these issues.

The Office of Career Services seeks to provide students and alumni the knowledge to make informed career choices and the personal skills to reach their career objectives. Students may make appointments by contacting the Office of Career Services, 117 Engineering Building, (256) 824-6612, between 8:15 a.m. and 5:00 p.m. Monday through Friday.

University Housing

The University of Alabama in Huntsville offers a variety of housing facilities to meet the needs of its diverse student population. All first-year and sophomore students under 21 years of age who apply for University housing are assigned to the Central Campus Residence Hall (CCRH) which opened in the fall of 1991. This seven-story traditional residence hall in the center of campus is connected to the University Center by an enclosed walkway. It is close to the library, the gym, and to classrooms for liberal arts, nursing, administrative science, and natural sciences. Each CCRH resident has an air-conditioned, carpeted private room in a four-person suite and shares a bath with one other suite mate. Suites are furnished with a mini-kitchen (small refrigerator, microwave oven, and sink), study table and chairs, small sofa, and easy chairs. Each student room has an extra-long twin bed, a wardrobe, a desk, a bookshelf, and a three-position study chair. Rooms for disabled students are available. Access to the building is by electronic access card. Laundry facilities, a recreation room, a study room, and mail service are available in the hall. The "bridge" to the University Center provides all-weather access to the cafeteria, a convenience store, the game room, the bookstore, and various student activities, offices, and meeting rooms.

Southeast Housing consists of a cluster of nine three-story buildings located on John Wright Drive near Madison Hall and most engineering and science classrooms. Both double-occupancy (shared) and single (private) rooms in three-bedroom suites are available in Southeast Campus Housing for upper-class students and graduate students. In addition, one-bedroom private apartments are available for graduate students and married couples without children. Several of the one-bedroom apartments are accessible to disabled students. Some unfurnished units are available.

Each three-bedroom suite in Southeast Housing has a living room, full kitchen with refrigerator, range, oven and sink, dining area, and double bathroom with an adjoining vanity area. The units are air-conditioned, carpeted and are furnished with a loveseat, lounge chairs, end tables, and a dining table and chairs. Bedrooms have extra-long twin beds, study desks and chairs, nightstands, and a built-in closet. All Southeast Campus Housing residents have the use of a laundry room with coin operated washers and dryers and a pay telephone, a mailroom, and a study lounge. Ample parking is available in the large lot east of the residences. A sandpit volleyball court in the center of the Southeast complex and grassy fields surrounding the area provide recreational spaces for residents.

Central Campus Residence Hall has a Resident Director and a Student Resident Advisor (RA) on each floor; Southeast Campus is staffed with a Resident Director and a team of RAs. These RAs develop activities and programs, provide assistance to student residents, and help create a residential community that contributes to effective student learning, personal and social growth, and responsibility.

Anyone admitted as a student to UAH is eligible for University Housing. A Housing Application Packet is mailed to every student who applies for admission. Final housing assignments are contingent upon confirmation of admission; assignment priority is based upon
academic class standing (first year student, graduate student, etc.) and the date of receipt of the application and housing deposit. All single students sign a nine-month academic year housing lease (August-May); housing charges are due when tuition is due each academic semester. Summer housing for single students is available in the Southeast area (not in CCRH) under a separate summer lease. The lease for family and graduate student apartments is for twelve months (late August through mid-August) and rent installments are due monthly.

Current rates, and additional information are all available from the Housing Office, 606-A John Wright Drive (256/824-6108). Individual and group tours of UAH Housing may be arranged by appointment through the Admissions Office.

Preschool Learning Center

There is an on-campus preschool provided by the University Preschool Parents Association to accommodate students, faculty, and staff, as well as the public. A stimulating environment is provided daily at the center, according to a fundamental philosophy that learning should be fun. In addition to cognitive development, the center focuses attention on the social, physical, and emotional development of the children enrolled. The center is staffed by professional teachers and well-qualified teacher aides, each of whom is attentive to the needs of individual students. The center has several attendance plans to accommodate the various schedules of student parents. Call (256) 837-9553 for information.

The University Center

The University Center is a part of the co-curricular educational program of the University and is a focal point of the campus. Designed for the entire campus community, it offers facilities and programs to meet the intellectual, social, recreational, and cultural needs of students, faculty, staff, alumni, and the entire Huntsville community.

The facility offers meeting rooms, a cafeteria, lounges, a game room, TV viewing rooms, an information desk, an art gallery, and the University Bookstore.

The offices of the Vice-President for Student Affairs, the Student Government Association, Association for Campus Entertainment, the Exponent, Admissions and Records, Student Financial Services, Academic Advisement, Charger Central, Student Activities, Student Development Services and the Bursar are also located in the University Center.

Student Identification Cards

The Charger Card is the UAH official identification card, with a student photo on the front and account information magnetically encoded on the back. The Charger Card may be used for access to:

- Spragins Hall Recreation Facilities
- University Fitness Center
- Campus Athletic Events
- Salmon Library
- Wellness Center
- Residence Hall
- Computer Labs/Information Services
- Campus Entertainment Events

The Charger Card accounts are similar to a checking account (with a pre-deposit of funds), and can used to make purchases at participating locations. Opening an account is free; there are no service charges. There are three types of Charger Card accounts: Charger Dining, Charger Cash, and Charger Bookstore.
Information Desk
In addition to having general campus information, the information desk sells a variety of items. The university community may pick-up or purchase tickets for campus events, or receive directions to campus or community points.

Lounge Area
A well lit, spacious lounge, designed as a place to relax and meet friends, is equipped with comfortable furniture.

Game Room
Located in the lower level of the Center, the game room has pool tables and ping-pong tables as well as a wide variety of pinball machines and video games. Two TV lounges, with cable TV, are located in the game room.

Meeting Rooms
The Center has up to 13 meeting rooms designed for multipurpose functions. The rooms can accommodate meetings from 10 to 500 people. The Center has a large number of tables, chairs, portable stage and audio-visual equipment and can assist in designing set-up to make any conference or meeting a success.

University Bookstore
Located on the lower level in the University Center, the University Bookstore is a full-service college bookstore operating for the needs and convenience of the UAH Community. The University Bookstore provides required and supplemental textbooks, a large selection of technical and reference books, various study aids, and educationally priced software. The bookstore also buys used texts from students during the store hours year round. In addition to these services, the bookstore will special order any book in print.
In the University Bookstore, students can find UAH Campus sportswear, UAH insignia gifts, cards, imprinted notebooks, a wide variety of school supplies, calculators, and a choice of Artcarved or Josten's class rings.

University Food Service
A helpful and friendly staff provides customers of the University Cafeteria with a variety of hot entrees, grilled fare, and deli sandwiches. Also provided is a diverse convenience store located within the cafeteria. A spacious dining area is available for all guests. The Food Service will cater to all areas of the Center as well as other parts of the campus. Cafeteria hours of operation are posted outside the cafeteria entrance.
The student ID card serves as a declining balance card. Accounts may be set up in the Bookstore and Food Service. Each time a student uses the card in either place, the amount spent is deducted and the student is given a new balance. Freshmen in CCRH are required to carry a minimum food service account.

Activities
The Student Activities office offers a wide variety of activities in which students may become involved. The advisor to the sororities and fraternities and the Association for Campus Entertainment is located in this office. The Student Activities office maintains a complete listing of clubs and organizations.

Student Government Association (SGA)
The SGA is the supervising organization of student-led and -oriented clubs and organizations on the UAH campus. Students wishing to join or create a club need to contact SGA to determine if a club with their interest is already in place or to obtain help in creating an organization.
The SGA serves as an advocacy body for positive changes in the University system to improve
student life by voicing student concerns and suggesting courses of action that better serve the
student body and the University as a whole. The SGA also focuses the leadership efforts of the
student body to help create a united, cohesive campus.
The SGA is reachable at http://sga.uah.edu and via email at sga@uah.edu.

Association for Campus Entertainment (ACE)
The Association for Campus Entertainment presents student activity programs for UAH through
its four activity boards. The purpose of ACE is to provide entertainment and to enhance the
cultural, intellectual and social life of students. The activity boards in ACE are as follows:

1. Cabaret
   The ACE Cabaret Series presents various types of live performers to UAH, from comedians to
   magicians.

2. Film and Video
   The Film series consistently provides a wide variety of quality films that appeal to a broad
   spectrum of UAH students.

3. Publicity
   The Publicity and Promotions Director informs potential audiences of all programs that the
   other ACE Activity Boards are bringing to campus through various media.

4. Special Events
   The Special Events Committee is responsible for planning annual events such as Homecoming,
   Fallfest, and Springfest, which is the culmination of a year's activities. Springfest is mandatory for
   students seeking fun! Some events include “Extreme Air,” Human Foosball,” concerts,
   comedians, and “Singled Out.”

Student Organizations
UAH has more than 130 special-interest organizations and clubs. For a complete listing, see the
Director of the University Center in University Center Room 100, or call (256) 824-6445.

Greeks
Interfraternity Council (IFC)
   IFC serves as the governing body of four fraternities at UAH in order to develop cooperation
   and coordination of activities among the member fraternities. The four national social fraternities
   on campus are Alpha Tau Omega, Delta Chi, Pi Kappa Alpha, and Sigma Nu.

Panhellenic Council (NPC)
The Panhellenic Council is the organization which coordinates sorority activities at UAH. The
three social sororities available to young women at UAH are Chi Omega, Delta Zeta, and Kappa
Delta.

National Panhellenic Council (NPHC)
The National Panhellenic Council is the organization that coordinates activities for
traditionally African-American fraternities and sororities at UAH. The fraternities include Alpha
Phi Alpha and Kappa Alpha Psi. The sororities include Alpha Kappa Alpha and Delta Sigma
Theta.

Academic Honor Societies
Alpha Epsilon Delta (Pre-Medical)
The UAH chapter of Alpha Epsilon Delta, the national pre-health professional honor society,
was established in the fall of 1978 and chartered in the spring of 1979. Membership is an honor
bestowed in recognition of superior scholarship achievement and affords the student an
opportunity to develop initiative, leadership, and self-education by participating in the activities of the chapter.

**Alpha Kappa Delta (Sociology)**
The Epsilon of Alabama chapter of Alpha Kappa Delta was chartered by the national sociology honorary society in the spring of 1976. Membership in AKD is limited to students who have maintained a high standard of excellence in their courses of study in sociology and who show serious interest in this academic field. The candidate for membership must complete at least 10 credit hours in sociology, with an overall GPA of 3.0, must maintain a B average in sociology. Must be in the upper 35% of the class.

**Alpha Lambda Delta (Freshman)**
The UAH chapter of Alpha Lambda Delta, national scholastic honor society for freshmen, was installed in the fall of 1974. The purposes of the society are to encourage superior scholarship attainment among students in their first year in institutions of higher education, to promote a continued high standard of learning, and to assist students in recognizing and developing meaningful goals for their roles in society. To become a member, a student must earn a scholastic average of 3.5 during the first year of enrollment.

**Alpha Pi Mu (Industrial Engineering)**
The national honor society for industrial engineers, Alpha Pi Mu was founded at the Georgia Institute of Technology in 1959 to recognize industrial engineering students of distinguished scholarship. The Constitution states that only those ranked in the upper one-fifth of the junior class or the upper one-third of the senior class can be considered for membership.

**Beta Alpha Psi (Accounting)**
The society encourages and recognizes scholastic and professional excellence in the field of accounting.

**Beta Gamma Sigma (Business or Management)**
Founded as a national organization in 1913, membership in this society is the highest national recognition a student can receive in an undergraduate or master’s program in business or management accredited by the American Assembly of Collegiate Schools of Business-The International Association for Management Education. To be eligible, a student must rank in the upper seven percent of the junior class, upper ten percent of the senior class, or upper twenty percent of the graduating master’s class. Members are elected to membership. The mission of the organization is to encourage and honor high academic achievement and personal excellence in the study and practice of business.

**Kappa Delta Pi (Education)**
Kappa Delta Pi, an international honor society, is dedicated to scholarship and excellence in education. The society as a community of scholars pledged to worthy ideals recognizes scholarship and excellence in education, promotes the development and dissemination of worthy educational ideas and practices, enhances the continuous growth and leadership of its diverse membership, fosters inquiry and reflection on significant educational issues, and maintains a high degree of professional fellowship. Scholarship criteria for undergraduate students: junior standing, admitted to the Teacher Education Program, and maintain a 3.25 GPA. Kappa Delta Pi was chartered at UAH on November 2, 1997.

**Eta Kappa Nu (Electrical Engineering)**
The Theta Eta Chapter of Eta Kappa Nu was chartered on April 29, 1978. The objectives of Eta Kappa Nu are to honor those students in electrical engineering who have excelled in scholarship, leadership, and exemplary character, and to unify them with graduates and faculty who have attained prominence in the field of electrical engineering. Membership is open by chapter invitation only to graduates, faculty, professionals, juniors in the top fourth of the electrical engineering class, and seniors in the top third of the electrical engineering class.
Omega Chi Epsilon
Omega Chi Epsilon is the Chemical Engineering Honor Society. OXE recognizes superior service and research of undergraduate and graduate majors in chemical engineering. UAH received its charter April 17, 2001.

Omicron Delta Kappa (Leadership)
The purpose of the Omicron Delta Kappa Society is to recognize individuals who have attained a high degree of leadership in collegiate and related activities, to encourage them to continue along this line, and to inspire others to strive for similar conspicuous attainment; to bring together representative individuals in all phases of collegiate life and thus create an organization which will help mold the sentiment of the institution on questions of local and inter-collegiate interest; and to bring together members of the faculty and student body of the institution on a basis of mutual interest, understanding, and helpfulness.

Order of Omega (Greek)
Membership is open to juniors and seniors of the Greek organizations on campus who have been members at the institution for one full academic year, who rank academically above the all-fraternity or all-sorority average of the system, and are in good standing with their fraternal organization.

Phi Alpha Theta (History)
UAH has a chapter of Phi Alpha Theta, international history honorary society. Membership is by invitation only to history students who have completed a minimum of 12 hours in history with a grade point average of 3.5 and an overall average of 3.0 in all courses.

Phi Kappa Phi (Multi-discipline)
The primary objective of the national honor society of Phi Kappa Phi is the recognition and encouragement of superior scholarship in all academic disciplines. The society is convinced that in recognizing and honoring those persons of good character who have excelled in scholarship in any field, it will stimulate others to espouse excellence. The society promotes an atmosphere conducive to academic excellence.

Phi Sigma Iota (Foreign Language)
Phi Sigma Iota recognizes outstanding ability and high standards in the field of foreign languages, literatures, and cultures, including classics, linguistics, philology, comparative literature, bilingual education, and other related areas. It promotes international communication and understanding, and a sentiment of amity among nations. Membership is open by nomination to any student who is at least a junior with a B average overall, as well as in foreign languages; has completed at least one foreign language course at the 300-level; is enrolled at UAH at the time of being offered membership; and who plans to take at least two 300-level courses in foreign languages.

Pi Sigma Alpha (Political Science)
Pi Sigma Alpha is the national honorary society for political science students with junior standing having a minimum of ten semester hours and a B average or higher in political science courses.

Pi Tau Sigma (Mechanical Engineering)
Pi Tau Sigma is the national mechanical engineering honor society. Its purposes are to foster the high ideals of the engineering profession, to stimulate interest in departmental activities, to promote the mutual professional welfare of its members, and to develop in students of mechanical engineering the attributes necessary for effective leadership. Membership is open to those students in the top quarter of the juniors and the top third of the seniors in mechanical engineering.
Psi Chi (Psychology)
Psi Chi is a national recognition society for students in the field of psychology. Its purposes are to encourage, stimulate, and maintain scholarship of the individual members in all fields, particularly in psychology, and to advance the science of psychology. To achieve these goals Psi Chi offers a wide range of programs at the local, regional, and national levels. Membership is open to students with a 3.0 overall grade point average and a 3.0 in psychology having completed 12 hours of psychology courses toward a minor or 15 hours toward a major.

Sigma Pi Sigma (Physics)
The Sigma Pi Sigma honorary society operates within the Society of Physics. Students. Membership is based on general scholarship. An overall GPA of 2.75 and a GPA of 3.2 in at least five courses in physics are required for membership.

Sigma Tau Delta (English)
The UAH chapter of Sigma Tau Delta, a national English honorary society, is Upsilon Mu. Its purposes are to assist in developing, maintaining, and promoting literary and educational activities for students and alumni of the chapter, as well as the entire university and civic community. Membership is open by invitation only to English majors and minors of junior standing who have a 3.0 grade point average.

Sigma Theta Tau (Nursing)
Sigma Theta Tau is the international honor society of nursing. Its purposes include the recognition of superior achievement and leadership qualities, the fostering of high professional standards and creative work, and the strengthening of the individual's commitment to the ideals and purposes of the nursing profession. Invitation to membership may be extended to junior and senior nursing students who have completed at least one-half of the required nursing component with a grade point average of 3.0. Graduate students in nursing who have completed one-fourth of the required graduate curriculum may be eligible for membership with a grade point average of 3.3.

Society of Sigma XI (Science Research)
Sigma Xi, founded in 1886, is a scientific honor society which was organized to reward excellence in scientific research by graduates, undergraduates, and faculty researchers and to encourage a sense of cooperation among scientists in all fields. Election to membership is open to all undergraduates, graduate students, and faculty in scientific and engineering disciplines who have evidence of notable achievement in research.

Tau Beta Pi (Engineering)
The Tau Beta Pi Association was founded at Lehigh University in 1885 to mark in a fitting manner those who have conferred honor upon their alumnate by distinguished scholarship and exemplary character as students in engineering, or by their attainments as alumni in the field of engineering, and to foster a spirit of liberal culture in engineering colleges. Membership is by invitation to those whose class standing is in the top eighth of the junior class or the top fifth of the senior class who have demonstrated exemplary character.

Upsilon Pi Epsilon (Computer Science)
The Computer Science Honor Society is for both graduates and undergraduates.

Art Programs and Exhibitions
The Department of Art and Art History sponsors exhibitions and activities throughout the year, which are important to the cultural growth and enrichment of campus life at UAH. Students and faculty are welcomed and encouraged to participate in and contribute to these worthwhile opportunities.
The UAH Galleries of Art

The Art Department organizes exhibitions and events in two galleries on the UAH campus. The Union Grove Gallery and Meeting Hall, located just west of the University Center, and the University Center Art Gallery, located off the main lobby of the UC, provide opportunities for the University and Huntsville communities to view the work of local, regional, and nationally recognized artists. The exhibitions change monthly and offer a wide range of artistic perspectives.

The Annual Student Exhibition

Each spring the Art Department sponsors an exhibition, juried by the faculty, dedicated solely to showcasing the work and talents of UAH students. Any student enrolled in the University is eligible to participate.

The Visiting Artist Program

This program offers opportunities for the public to meet, listen, and talk with the artists exhibiting their work in the UAH galleries. Presentations by distinguished artists visiting the campus often include studio and classroom sessions as well as public lectures.

Music Organizations

All musical organizations are open to all students, music and non-music majors. Students should be able to make a place for themselves in some performing group, regardless of musical background and tastes. Credit is offered for most ensemble experience, and participation may be repeated with approval of the conductor.

UAH Choral Organizations

The Concert Choir, the Chamber Choir, and the Tenor-Bass Chorale perform choral literature of the great masters of music history as well as folk music of various countries. Admission is by audition with the conductor and attendance at all rehearsals and performances is required.

UAH Jazz Ensemble

This is a group designed to give the beginning through advanced jazz musician exposure to a variety of jazz literature and styles. Additionally, the members will develop a basic understanding of jazz improvisation, and, if interested, will be encouraged to explore jazz arranging. Attendance at all rehearsals and performances is required. An audition with the instructor is also required.

UAH Wind Ensemble

The Wind Ensemble is a select group of experienced musicians who perform the best available music literature for wind ensemble and concert band. Attendance at all rehearsals and concerts is required. An audition with the conductor is also required.

UAH Pep Band

The Pep Band is a musical organization of students that promotes spirit and enthusiasm at a variety of athletic events. Members and scholarship recipients are chosen by audition.

Intercollegiate Athletics

UAH is an NCAA Division II school and a member of the Gulf South Conference. The athletic department sponsors 12 intercollegiate sports providing the student-athlete with the opportunity to compete intercollegiately within a structured sporting environment that enhances personal growth and development in parallel with the goals of the institution. Sports sponsored are ice hockey, basketball, baseball, soccer, cross country, and tennis for men, and basketball, softball, volleyball, cross country, and tennis for women.

Baseball (Men)

Baseball was added in the spring of 1996, and has already become a prominent competitor in the GSC and NCAA. Home games are played at Joe Davis Stadium in Huntsville, the home of
the Huntsville Stars, the affiliate of the Milwaukee Brewers organization. The Gulf South Conference is nationally known as a premier conference for baseball.

**Basketball (Men and Women)**
Competition is high in the GSC in basketball, and UAH enjoys exciting competition during their basketball games, which are played on campus in Spragins Hall.

**Cross Country (Men and Women)**
While running is basically an individual sport, cross-country at UAH is founded on a philosophy of team effort and spirit. The team hosts an annual invitational competition in September.

**Ice Hockey (Men)**
UAH is the original “Hockey Capital of the South,” building a very strong hockey program with local players as well as skaters from points north. The Chargers have competed in a number of NCAA Championships in the last few years, winning in 1996 and 1998 before capacity home crowds at the Von Braun Center, the site of all home games. Beginning in the year 2000 UAH will compete at the Division I level.

**Soccer (Men and Women)**
The soccer teams attract players from around the world. Games are played on Charger Field located on campus. UAH has been a soccer leader in the GSC in recent years.

**Softball (Women)**
As a member of the GSC, competition is always on a quality level. In only their first year of existence in 1996, the UAH softball team competed on the NCAA regional level. Home games are played at the Metro Kiwanis SportPlex.

**Tennis (Men and Women)**
The Charger tennis programs provide an opportunity for competition in both singles and doubles. Home matches are played at the Charger Tennis Center, located next to Spragins Hall on campus.

**Volleyball (Women)**
UAH volleyball is a consistent leader in GSC competition. The program annually hosts a quality tournament which attracts a number of outstanding teams. In 1998 the team was selected to participate in the NCAA Regionals.

**Cheerleading and Dance Teams (Men and Women)**
The UAH cheerleading squad and Dance Team are composed of students whose primary purpose is to promote spirit and enthusiasm for intercollegiate athletics. Try-outs are conducted for interested students based on availability of participant spots.

**Mascot**
The UAH mascot, Charger Blue, brings recognition to the University through appearances at athletic and community events throughout the calendar year.

**Intramural Sports Program**
The intramural sports program serves the recreational needs of UAH students through a planned program of intramural athletics and other forms of recreational activities. It provides opportunities for the development of positive attitudes toward recreational activities throughout life, thus deriving optimum benefits of enjoyment, health, social contacts, and sportsmanship. The philosophy of intramural activities at UAH is based on the concept that students should have freedom of choice and responsibility for sharing in planning, supervising, and administering the program.
All students and members of the faculty and staff are eligible to participate in intramural activities. The sports offered include basketball, 3 on 3 basketball, flag football, floor hockey, racquetball, indoor soccer, 6 pac soccer, softball, tennis, volleyball, sandpit volleyball, ultimate frisbee, wallyball, and 4 on 4 volleyball.

**Student Publications**

The *Exponent* is the UAH student newspaper. The paper is published weekly except during exams and holidays. The *Exponent* office is located in Room 104 of the University Center, telephone: 824-6090. The Publications Board, a joint faculty-student board, is responsible for the policies, planning, (selection of editors) coordinating and overseeing of the *Exponent* and the student publications under its jurisdiction.

The Publications Board sponsors an art and literary magazine, the printed campus forum for art and literature. All UAH students are eligible to submit their work for publication. Anyone wishing to submit art or literature for consideration for the next issue, can bring or mail the work to the Exponent office, Room 104, University Center.
Admissions Information

The University of Alabama in Huntsville welcomes inquiries and applications from interested persons who wish to further their education. The student body is composed of individuals from a wide age range—traditional full-time college students and other adults who are combining their educational pursuits with work, family, and various activities. Prospective students should apply well in advance of the date of proposed entrance.

Application forms, detailed application instructions, and information brochures are available at the Office of Admissions in the University Center.

Information for prospective students is available through the Office of Admissions. Campus tours on an individual or group basis may be arranged (telephone 256-824-7142). Faculty members and academic advisors (telephone 256-824-6290) are eager to confer with interested individuals to discuss their enrollment plans and opportunities at UAH.

Undergraduate Admissions Information

Admission policies at UAH provide for a diversity of educational backgrounds. Admission procedures accommodate:

- students who are seeking degrees (regular)
- individuals who have not attended college since high school graduation (freshmen)
- those who are transferring from one or more previous colleges (transfers)
- students who have passed the high school equivalency examination (GED)
- students who are presently in high school, are academically talented, wish to enroll concurrently in courses at UAH (Early Start Program)
- students who are presently in high school and wish to take classes at UAH which also count as credit for required high school classes (Dual Enrollment/Dual Credit Program)
- students at other collegiate institutions who wish to attend UAH on a temporary basis (transient students)
- students who have already earned a baccalaureate degree and are seeking another baccalaureate degree (second bachelor's degree)
- students who are taking courses on a non-degree or preparatory basis for graduate school (non-degree postgraduate)
- students who have no immediate degree plans (non-degree)

Eligibility for Admission as a Regular Student

Admission as a regular student is based upon high school and previous college performance, if applicable, as well as scores on specified tests. A non-refundable $20 application fee must accompany all applications. See table below.
### Required Application Materials

<table>
<thead>
<tr>
<th>Classification</th>
<th>Application Forms</th>
<th>High School Transcripts</th>
<th>ACT/SAT Scores</th>
<th>GED Scores</th>
<th>College Transcripts</th>
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<td>If less than 18 sem. hrs. from each institution attended</td>
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**International**

See International Student Admissions section.

### High School Graduates

Admission to freshman standing at UAH requires substantial high school academic preparation. When calculating the grade point average (GPA), the University uses core or academic courses only. These may include English, mathematics, science, history, computer science, psychology, religion, languages, and other similar courses. Excluded from the calculation are courses such as driver's education, athletics (sports), band, office aide, and vocational courses.

While GPA and ACT or SAT scores are the primary factors in the admission decision, other factors are reviewed such as courses completed, AP or advanced credit courses, trend of high school grades, and other achievements in areas of leadership and scholarship.

High school seniors are expected to present the following courses: a minimum of four units of English, three units of mathematics, including Algebra I and II, geometry, three units of science, and four units of social studies. (The College of Engineering requires a minimum of 21 on the ACT or 990 on the SAT for admission.)

Any student with a high school GPA of 3.25 or higher in fourteen or more academic units will be granted unconditional admission. Any student with an ACT score of 23 or higher (or SAT of 1050 or higher), and successful completion of fourteen academic units, will be granted unconditional admission.

Students not satisfying either of the criteria above, but who present any combination of test scores and grade point averages shown in the table below and successful completion of fourteen academic units, will be granted unconditional admission.

#### High School Grade Point Averages and ACT/SAT Scores Required for Regular Admission to the Freshman Class

<table>
<thead>
<tr>
<th>If Act score is</th>
<th>If SAT score is</th>
<th>Minimum High School Grade Point Average in Academic Units Must Be</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>1010-1040</td>
<td>2.25</td>
</tr>
<tr>
<td>21-20</td>
<td>930-1000</td>
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<tr>
<td>19</td>
<td>890-920</td>
<td>2.75</td>
</tr>
<tr>
<td>18</td>
<td>850-880</td>
<td>3.00</td>
</tr>
</tbody>
</table>

Students presenting ACT scores lower than 18 (SAT scores lower than 880), and/or successful completion of less than fourteen academic units are considered for admission on an individual basis.

Applicants should present a minimum of 20 Carnegie high school units. These should include:

- 4 years of English
- 3 years of social studies
- 1 year of algebra
- 1 year of geometry
- 1 year of biology (recommended)
- 1 year of chemistry/physics (required by the Colleges of Engineering and Science; recommended by all other Colleges)
- 1 year of algebra II/trigonometry (recommended by all Colleges; the College of Engineering specifies 1 year of each)

Sufficient academic electives to meet the required 20 units

Admissions Information
Current high school students will find it to their advantage to follow the advanced diploma or college preparatory curriculum.

Prospective freshmen currently attending high school should apply during their senior year in high school. Tentative admission will be granted on the basis of ACT (or SAT) scores and high school records through the junior year. Work completed in the senior year and confirmation of graduation will be reviewed before a student’s final admission.

Applicants having deficiencies in the required high school courses may be admitted in good standing. The deficiencies, however, must be removed during the first year of enrollment in a manner approved by the department concerned. Courses taken to remedy entrance deficiencies cannot be used to satisfy degree requirements.

High school graduates who have been out of high school five or more years do not need to submit ACT/SAT test scores.

General Education Development (GED) Recipients

Persons who have not graduated from high school may be admitted on the basis of a satisfactory score on the GED test. A score of 50 is required for regular admission status. If out of high school less than 5 years, applicant must also take the ACT or SAT and have a score report sent to UAH Admissions Office. An official transcript of completed high school courses is also required. UAH is a testing center for the GED program. Anyone seeking additional information or wishing to take the GED examination should contact the Office of Testing Services (824-6725).

Home Schooled Applicants

High school students who are home schooled are reviewed for admission and for scholarships at UAH following the same criteria used for students from public and private high schools. The official high school record of courses completed should contain the titles of courses in each subject area, beginning with grade nine. This record should contain annotation of the general content in the academic courses and the textbooks used. The teaching credentials of the home school teacher should be included.

Early Start Program

UAH welcomes inquiries from academically talented high school juniors and seniors who wish to earn college credits while still enrolled in high school. Students who have an ACT of 26 and a high school GPA of 3.5 may petition UAH for acceptance into the Early Start Program. This option may be appropriate for students whose high schools do not participate in the Dual Credit program. A maximum of two courses per semester may be taken.

Dual Enrollment/Dual Credit Program

Several local school systems and UAH have an agreement permitting high school juniors and seniors to take classes at UAH that may count for both high school credit toward graduation and college credit toward a degree at the university. The same opportunity is available to students at private high schools or to students from other school systems where it is feasible.

High school juniors and seniors who meet the UAH regular admission requirements may, with the approval of their school officials, take classes at UAH and receive credit for courses completed successfully at both the high school and at UAH. Certain UAH classes are approved by the school system (or may be approved by the principal in private schools and in other school systems) for the dual credit agreement.

Applying for dual credit enrollment at UAH requires: (1) completed application for dual credit; (2) $20 application fee; (3) official transcript of high school work; (4) ACT or SAT scores; (5) written approval from the school officials; (6) written approval by the student’s parent(s) or guardian. A maximum of two courses per semester may be taken.
Residency Status

“Resident” is defined as one whose residence is in the state of Alabama as shown below. Residents of the following Tennessee counties—Bedford, Coffee, Franklin, Giles, Lawrence, Lincoln, Marion, Marshall, and Moore—are considered as residents for the purposes of this section.

A “resident student” is one who, at the time of registration, is not a minor and:
- is a resident of the state of Alabama or one of the above counties in Tennessee and has been so for at least one year immediately preceding the date of registration; or
- is a full-time (not temporary*) employee of UAH or is the spouse of such an employee; or
- is employed by UAH as a graduate assistant or fellow with at least 0.50 FTE (half-time); or
- has accepted full-time (not temporary*) employment within the state of Alabama or is the spouse of such an employee; or
- is a member or the spouse of a member of the U.S. military on full-time active duty stationed in Alabama under orders for duties other than attending school.

A “resident student” is also one who, at the time of registration, is a minor and whose supporting person:
- is a resident of the state of Alabama and has been a resident of the state for at least one year immediately preceding the date of registration; or
- is a full-time (not temporary*) employee of UAH; or
- has accepted full-time (not temporary*) employment within the state of Alabama; or
- is a member of the U.S. military on full-time active duty stationed in Alabama under orders for duties other than attending school.

*“Not temporary” means the employment is full-time and ongoing, not seasonal or for a specific period of time, nor for the express purpose of financing one’s college education.

“Residence” means the single location at which a person resides with the intent of remaining there indefinitely as evidenced by more substantial connections with that place than with any other place. Individuals claiming resident status under this policy shall certify under penalty for perjury that a specific address or location within the state of Alabama (or the aforementioned counties in Tennessee) is their residence, that they intend to remain there indefinitely, and that they have more substantial connections with the state of Alabama than with any other state. Though certification of address and an intent to remain in the state indefinitely are prerequisites to establishing status as a resident, ultimate determination of that status shall be made by the institution by its evaluation of the presence or absence of connections with the state of Alabama.

All students registering at UAH who do not establish that they are resident students shall pay non-resident tuition, which shall be at least twice the amount of resident tuition. Classification of students as resident or non-resident shall be made at the time of their initial registration and shall continue unchanged through all subsequent registrations at the institution until satisfactory evidence to the contrary is submitted to the Office of Enrollment Services, UC 118, at the time of any subsequent registration.

PLEASE NOTE: If a student came to Alabama from out-of-state primarily for the purpose of receiving an education, that student will—with few exceptions—continue to pay “non-resident” tuition.

Transfer Students

Students who have 18 semester hours of academic credit at a college or university level may be admitted to UAH as transfer students. The high school transcript of a such a transfer student will also be reviewed if the student is transferring fewer than 18 semester hours of credit to UAH. A student who is currently on suspension from another college or university is not eligible for
admission until his or her suspension period has terminated. Admission to the College of Engineering and the College of Nursing is an independent action from admission to the University.

Once a student has enrolled and has accumulated a total of 64 semester hours of credit from all sources, no additional credit may be transferred to UAH from a two-year institution. Exceptions to this policy must be approved prior to taking additional course work. Requests for exceptions must be in writing and approved by the chair of the UAH department where the course is taught, and by the dean of the college in which the student is enrolled.

Transfer students seeking admission to the College of Administrative Science are admitted with a pre-business classification and remain in this classification until they are admitted to the upper division of the College. Transfer students who intend to pursue the BSBA degree should read carefully the College's section on, "Admission as a Transfer Student" and "Admission to the Upper Division".

A prospective transfer student who has attempted fewer than 18 semester hours of work at an accredited college or university will be considered for admission on the basis of high school grades, ACT scores, and previous college records.

Applicants with previous records showing 18 semester hours or more of work attempted at accredited colleges or universities must have a minimum overall C (2.0) average on all work transferred in order to qualify for regular admission. Transfer applicants must submit official copies of transcripts from all colleges previously attended.

**Probational Admission for Transfer Students**

An individual who has applied and who does not qualify as a regular transfer student may be admitted on probation. A transfer student enrolled in this category is subject to the same periodic review of his or her academic record as a regularly admitted student who is on scholastic probation. (See Academic Information.) If at such a review point the student becomes subject to academic suspension, the suspension is for a minimum of one semester, and the student must petition the Admissions and Scholastic Affairs Committee for approval to re-enroll.

**Evaluation of Transfer Credit**

Transfer admissions decisions will be based on a full evaluation of transcripts from all colleges and universities attended. Transfer credit evaluations will be completed as early as possible, but no later than the first semester of enrollment.

Courses in which the subject matter is not acceptable at UAH will be disregarded when determining admissibility and status at UAH.

In instances where disallowance of courses reduces the total number of hours of acceptable credits below 18 semester hours with at least a 2.0 average on a 4.0 scale, the applicant will be considered for admission on the basis of high school grades, ACT scores, and acceptable credit.

An individual who enrolls as a non-degree student and later decides to work toward a degree must request an evaluation of transfer credits. The application of such accepted credits to a particular program of study will be made and approved at the time of official determination of the individual's program of study.

Acceptance of credit and application of credits to a specific degree program are two separate and distinct processes. Consult an academic advisor for degree applicability within the desired degree program.

Credits earned in quarter hours will be converted to semester hours on the basis of two-thirds of one semester hour for each quarter hour.

A maximum of 64 semester hours of credit from a junior or community college may be applied toward a degree. Exceptions to the 64-hour maximum must be justified and approved in writing by the dean of the college in which the student is enrolled.

The University of Alabama in Huntsville follows the practices specified in *Transfer Credit Practices of Selected Educational Institutions*, published by the American Association of Collegiate Registrars and Admissions Officers, in evaluating college level courses from other recognized colleges and universities for the purpose of transfer of credit to UAH.
Credits from an institution that is not yet accredited but has acquired candidate status from a regional accrediting agency are provisionally eligible for transfer to UAH. In order to obtain full credit for courses accepted as provisional credits, students must complete 30 semester hours at UAH and earn a "C" or better in each course attempted. Transfer credit will not be posted until this requirement has been met. Students with provisional credits should contact the Registrar upon completion of 30 semester hours at UAH.

Courses completed at unaccredited and non-candidate institutions are normally not accepted for credit at UAH. The student may appeal or challenge credit for these courses through the dean of the college in which the course is offered.

Credits for education completed in non-collegiate settings which have been evaluated and recommended for credit by the American Council on Education are accepted as transfer credit at UAH. As a member of Service members Opportunity Colleges, UAH is committed to easing transfer of relevant course credits and crediting learning from appropriate military training and work experiences.

Acceptance of transfer credit by the UAH Office of Admissions and Records does not mean the credit will be accepted for degree requirements by individual degree programs. The student should check with the individual degree program director to determine applicability of transfer credits to a degree program.

Transfer Students from Alabama Junior/Community Colleges
A student transferring from an Alabama junior college may choose to fulfill the degree requirements of the UAH catalog which was in effect at the time of the student's initial enrollment at the Alabama junior college, provided that the date does not exceed the seven year limit. (See time limits section of the catalog.) This policy enables students enrolled at Alabama junior colleges to plan degree programs effectively and to be assured that degree requirements specified for UAH students will be equally applicable, within specified limits, to transfer students. UAH participates in the Alabama Articulation Agreement. Students intending to transfer to UAH from Alabama community colleges are encouraged to consult with their advisors and obtain a STARS guide. This guide is also available via the Internet at www.uah.edu. When planning their programs of study, this guide will identify courses for their major and will show equivalencies for community college courses.

Admission of International Students
International students are expected to meet all established requirements for admission from secondary schools or from other colleges and universities. All international applicants should apply for admission at least six months in advance of desired attendance date.

An undergraduate international applicant must submit:
1. Completed application form.
3. Official copies including English translations of secondary school and college or university transcripts forwarded to The University of Alabama in Huntsville directly from the institution(s) attended or approved accrediting agency. Personal copies are not accepted.
4. American College Test (ACT) scores or SAT scores sent directly to UAH from the test headquarters. (ACT is not required of an applicant who has earned more than 18 semester hours of college work or was graduated from high school more than five years ago.) SAT may be used as a substitute for the ACT.
5. Scores from the Test of English as a Foreign Language (TOEFL) sent directly to UAH from Educational Testing Service. A minimum score of 500* (173 computer-based score) is required.
6. Scores from the UAH English Language Placement Test (ELPT) are required for all international students whose native tongue is not English. A student must complete any course work in English as a Second Language that the test indicates is required.
7. A certified financial statement submitted as evidence of sufficient finances to cover university and personal expenses while attending UAH.

8. Purchase of UAH health insurance coverage. Proof of continued coverage must be presented each semester the student is enrolled.

9. Individuals in the U.S. on student visas who are transferring from another college or university in the U.S. must also show evidence of release from the previous program by the international student advisor at their previous school. Transfer students must have completed the equivalent of one academic semester at those institutions before being admitted to UAH.

NOTE: A score of 3 on the APIEL will be accepted in lieu of 500 on the TOEFL. A student with an APIEL score of 4 will be exempt from English Language Placement Test and will not be required to complete any ESL course work.

Special Student Status

Non-degree Students

UAH provides simplified admission procedures for students who want to pursue their educational goals, but who have no immediate degree plans. These students, sometimes called "casual course takers," may choose to apply as special non-degree students. For information, call 824-6070.

Any adult who has completed high school or completed the GED with a minimum score of 50 may apply for admission as a non-degree student. Credits earned or courses audited as a non-degree student are recorded on the student's permanent record and will count if applicable in a regular undergraduate degree program when the individual qualifies for admission as a regular student.

A student enrolled in this category is subject to the same periodic review of his or her record as a regular student and is subject to the University's regulations regarding scholastic probation and suspension. (See Academic Information.) If a non-degree student becomes subject to academic suspension, the suspension is for a minimum of one semester, and the student must petition the Admissions Committee for approval to re-enroll.

A student enrolled as a non-degree student must satisfy course prerequisites for each course taken.

Transient Students

Students who are currently enrolled at other colleges may apply for admission to take credit classes that will count toward a degree at their own institution. A completed application and a non-refundable $20 fee, plus a "Letter of Good Standing" (LGS) from the current college is required. The LGS verifies eligibility to return to the student's home institution and verifies the home college will accept the UAH courses for degree requirements.

Concurrent Enrollment

This category permits a student to enroll concurrently at more than one collegiate institution. One institution must be declared as the "home" institution. A student may enroll at UAH and concurrently at another regionally accredited collegiate institution and earn credit toward a degree at UAH provided that prior written permission has been obtained from the student's academic advisor and the UAH Registrar. The student pays regular tuition at both institutions.

Conditional Admission for High School Graduates

An individual who has applied under the regular admission plan and who does not meet the criteria for regular admission may be considered for admission to UAH as a conditional admit. Normally, conditionally admitted students will be limited to a maximum of a 12 semester hour load until a total of 15 semester hours of work is completed with at least an overall C average. Upon satisfactory completion of 15 or more hours of work, the conditional status will be removed. Credits earned as a conditional admit are recorded on the student's permanent record and will count if applicable in a regular undergraduate degree program.
The Director of Admission is authorized to offer conditional admission based on an evaluation of the student’s previous academic credentials and evidence of serious commitment to academic pursuits. Students admitted conditionally or on probation will be evaluated for regular student status after earning a minimum of 15 hours at UAH. If the student at that time has earned at least a 2.00 GPA on all UAH coursework, the Conditional/Probational classification will be changed to regular student status.

A student enrolled in this category is subject to the same periodic review of his or her record as a regular student and is subject to the University's regulations regarding scholastic probation and suspension. (See Academic Information.) If a student becomes subject to academic suspension, the suspension is for a minimum of one semester, and the student must petition the Admissions and Scholastic Affairs Committee for approval to re-enroll.

Re-Entry
A student who has not attended UAH for one or more semesters and who wishes to return should consult with the Office of Admissions to determine enrollment status and the conditions under which studies may be resumed.
## Financial Information

### Tuition and Fees

<table>
<thead>
<tr>
<th>UNDERGRADUATE (RESIDENT)</th>
<th>UNDERGRADUATE (NON-RESIDENT)</th>
</tr>
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<tbody>
<tr>
<td>Credit Hours</td>
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<tr>
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<td>19</td>
<td>1914</td>
</tr>
<tr>
<td>20</td>
<td>1982</td>
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Each additional hour over 20: $68 (resident) $147 (non-resident)

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<thead>
<tr>
<th>GRADUATE (RESIDENT)</th>
<th>GRADUATE (NON-RESIDENT)</th>
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<tr>
<td>1</td>
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<td>1896</td>
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<tr>
<td>12</td>
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</tbody>
</table>

Each additional hour over 12: $148 (resident), $305 (non-resident)

### Laboratory and Studio Instruction Fees

Laboratory fees are assessed as applicable and are specified in course descriptions.

### Cooperative Education Fees

Parallel Work Semester is $40
Alternating Work Semester is $80
Engineering Equipment Fees

Equipment fees are assessed at $17 per credit hour.

The University reserves the right to change its fees, charges, rules and regulations at the beginning of any semester and without prior notice. Generally, the Board of Trustees of the University of Alabama System considers proposals for changes in fee structure at its May or June meeting.

These fees do not apply to any short-term, off-campus, or noncredit offering. For additional information on these courses, see section on Division of Continuing Education

ACADEMIC COMMON MARKET

The Academic Common Market is a cooperative tuition-reduction agreement among 14 Southern Regional Education Board states. If none of the public institutions in a student's home state offers the degree program the student wishes to pursue, and the program is offered at UAH, the student may be eligible to attend UAH as an in-state student for tuition classification.

When it has been determined that UAH offers the desired program through the Academic Common Market, applicants should initiate application procedures with the UAH Office of Admissions. The applicant should also contact his/her home state's Commission on Higher Education (or the equivalent office) and request permission to pursue the desired program at UAH.

When accepted as an Academic Common Market student, a student will be classified as in-state for tuition purposes. However, should the student later change to a different program that is not covered by the Academic Common Market agreement, he/she will no longer qualify for the in-state tuition rate at UAH.

ACCEPTABLE FORMS OF PAYMENT

Payment can be made in cash, by check or money order, or can be charged to a VISA, MasterCard, American Express, or Discover charge card. Sponsoring agencies, faculty/staff or University tuition assistance supported by written documentation, or anticipated financial aid verified by the Student Financial Aid Office are also valid payment forms. Awards may be applied directly to a student's account for charges incurred.

BILLING AND PAYMENT PROCEDURE

Tuition and fees should be paid in full by the first day of the semester. Payments may be charged to VISA, MasterCard, American express, or Discover by paying on the Web or calling (256) 824-7321. Students who do not pay bills in full by the first day of classes are assessed a $50.00 late fee. Students who do not pay bills in full by the end of the second week of classes for fall and spring semesters will be dropped from class rolls and enrollment will be canceled. The University assumes no responsibility for students who attend classes without official enrollment. For summer sessions, please check dates in the Schedule of Classes and on the UAH Website.

Send payments to The University of Alabama in Huntsville, Cashier's Office, University Center Room 213, Huntsville, AL 35899-5050.

DEFERRED PAYMENT PLAN

Students enrolling for at least three semester hours of credit are eligible for the deferred payment plan. This plan enables total tuition, housing, and other current charges to be divided into two payments each semester. The first payment of at least half of the total amount of charges is due by the first day of class. The second payment of the remaining balance is due the end of the sixth week of the semester. There is a $20.00 non-refundable administration fee that must accompany the deferment agreement form. Deferment agreement forms are available in the Bursar's Office. After completion and authorization, the deferment agreement form should be presented with the first payment to the Cashier's Office. The deferred payment is only offered for the Fall and Spring semesters and a deferment agreement form must be completed each semester.
Other Charges
Credit by examination or validation,
Per semester hour ........................................... $10.00
Replacement of I.D. card ........................................ $15.00
Transcript .................................................. $4.00
Graduation Application fee (non refundable) ............. $20.00
Duplicate Diploma ........................................... $10.00
Thesis and Dissertation binding
Master's thesis ............................................. $55.00
Ph.D. dissertation .......................................... $55.00
Vehicle registration
(Regulations concerning traffic and parking are available at the
Campus Safety Office) .................................... $15.00
Summer only ................................................. $5.00

Note: UMI Thesis/Dissertation publication fee: Master's thesis - $45.00; Ph.D. Dissertation - $55.00.

College of Nursing
Liability Insurance (per year) ................................ variable
College of Nursing Pin (graduation) ......................... $50.00 - $150.00
Annual health examinations ................................ variable

REFUNDS
Students may withdraw through the second week of classes and receive a 100% tuition refund. A student desiring to withdraw from one or more classes must complete a withdrawal request form at the Office of Student Records, University Center Room 116. The date of withdrawal is the date the written request is received at the Office of Student Records.

HOUSING CHARGES
Suites (Single Students: Academic Year Contract--Fall & Spring Semesters)
Private room in 4-person suite, Central Campus Residence Hall
(all freshmen and sophomores)............................... $3,080 per year
Shared room in Southeast Campus Housing ............ $1,500 per year
(available for juniors, seniors, and graduate students)
Private room in Southeast Campus Housing ............ $2,800 per year
(available for juniors, seniors, and graduate students)

Apartments
(Graduate Students; Student Families: Full Year Lease)
1-bedroom furnished ....................................... $5,220
(payable in 12 installments of $435)
1-bedroom unfurnished ..................................... $4,920
(payable in 12 installments of $410)

Note: All housing rates include basic utilities and basic television cable.

Students assigned to suites (Central Campus Residence Hall or Southeast Campus Housing) must pay the full semester's rent at the beginning of the semester. A student who fails to complete payment of fees due or fails to file a payment deferment request with the Cashier's Office by the first day of the semester will have his or her registration canceled. Students assigned to private apartments (family units in Southeast Campus Housing) may pay their rent in equal installments on a monthly basis. Rent payments are due the first day of each month.
If a student officially withdraws from the University while residing in University Housing, he or she may qualify for a prorated refund of rent. This is determined by the date of the student's
official check-out from Housing.
- During the first week of the academic semester - 80% refund
- During the second week - 60% refund
- During the third week - 40% refund
- During the fourth week - 20% refund
- After the fourth week - no refund.

**FOOD CONTRACT RATE**
Minimum for the academic years (Fall & Spring Semesters) $1,000
(payable in 2 semester installments of $500 each)

All freshman residents of Central Campus Residence Hall are required to purchase a University Food Contract in the minimum amount. The Food Contract is optional for all other residents of university housing. Additional amounts may be added to the Declining Balance Card at any time.

**Financial Aid**

Students who are receiving financial aid are responsible for completing the necessary paperwork far enough in advance to assure the proper credits to their accounts. For further information, please check with the Student Financial Services, University Center, Room 212, or the Cashier's Office, Room 213.

**Undergraduate Student Aid**

UAH has several programs to assist students in financing their college education. Comprehensive, updated information on all financial aid offered through the Office of Financial Aid is available in a booklet published annually. It includes detailed information about kinds of aid, eligibility guidelines, application procedures, criteria for awards, disbursement methods and regulations, and institutional policy followed in administration of aid. These booklets and necessary forms are available in the Office of Financial Aid.

Students of academic promise who can demonstrate financial need are encouraged to apply for assistance. Realistic financial planning is an essential part of college preparation. UAH helps qualified students find employment, scholarships, and loans as its resources permit. In planning a program of financial assistance, consideration should be given to the advisability of combining scholarships, loans, and part-time employment since one kind of aid alone is inadequate in most cases.

Students should make financial plans well in advance of entering the University. There are two important priority dates for student aid--February 1 for scholarships and April 1 for federal aid. The priority dates are the dates by which completed applications are certain to be included in the first round of review. Applicants are advised to write the Office of Financial Aid requesting a copy of the financial aid booklet at the time of application to the University. Applications for student aid should be filed at the Office of Financial Aid before the priority date of April 1, for the following school year. A new application must be submitted by this priority date each year.

Home schooled students who wish to apply for Federal Title IV financial aid must demonstrate the "ability to benefit" as defined by the U.S. Department of Education. The ability to benefit may be confirmed by presenting any one of the following:
- GED - Results (High School Equivalency Diploma)
- ASSET - Basic Skills Test, Forms B2 or C2. Approved passing scores are: Reading: 34; Writing: 34; Numerical Skills:33.
- CPAit - Career programs Assessment, Forms A, B, or C. Language Usage: 43; Reading: 44; Numerical Skills: 42.
- COMPASS - Pre-Algebra/Numerical Skills: 21; Reading: 60; Writing: 31.
- CPTS - Computerized Placement Test/ACCUPLACER. Reading Comprehension: 52;
TYPES OF FINANCIAL AID

SCHOLARSHIPS

Listed below are permanently endowed scholarships held by or for the benefit of the university. Distributions are made from these endowments to make annual awards to students. Scholarships are designated for a particular college or academic program or may be available university-wide. Many are subject to additional restrictions and are awarded based on a student’s demonstrated financial need and/or academic merit. Every attempt has been made to reflect accurately the donor designations, but the awards will ultimately be directed by the respective fund agreements.

In addition to endowed scholarships, there are a number of expendable scholarships which are funded on an annual basis, for which information is available through the Student Financial Services.

University-Wide Scholarships

Carolyne Pride Bell and Robert Kirk Bell Memorial Scholarship. This scholarship was established by a bequest to the university in memory of Carolyne Pride Bell and Robert Kirk Bell, and is awarded to students who require financial assistance.

Ehney Addison Camp, Jr. Scholarship. Established in memory of Ehney Camp, Jr., University of Alabama Trustee Emeritus, this scholarship is awarded to students who require financial assistance.

Pei-Ling Chan Presidential Scholarship. This scholarship was established by Dr. Chia-Hwa (Tony) Chan, retired UAH physics department chair and professor, and his family in memory of his father. Pei-Ling Chan was a leading distributor and manufacturer of paper products in China during the first half of the 20th century, and was a strong advocate of education. This scholarship is awarded to an incoming freshman based on academic achievement, citizenship, and leadership, and may be renewed for up to four years.

Bill Dale Wind Ensemble Endowed Scholarship. Mr. and Mrs. William I. Dale created this scholarship award for students who require financial assistance. To apply for the award, a student must be a member of the UAH Wind Ensemble. Consideration will be given to students who have participated in school and community activities, particularly the Huntsville Symphony Orchestra.

Decatur Scholarship. One scholarship is awarded annually to a student from each of the Decatur high schools--Decatur and Austin. Applicants must meet the criteria of academic merit and require financial assistance.

Emmy and Herman Ludewig Scholarship. This scholarship was established in memory of Emmy and Herman Ludewig by Mr. and Mrs. George F. McCanless, Jr. The scholarship is award-
ed to one or more full-time undergraduate students, and is based on citizenship, evidence of contributions to school and community, and financial need.

**Sarah Hardcastle McCanless Scholarship.** Established in 1998 with a gift from Mr. And Mrs. George F. McCanless, Jr. in memory of his mother, Sarah Harcastle McCanless, this scholarship is awarded to students majoring in any discipline who require financial assistance.

**McDonnell Douglas Presidential Scholarship.** Established with a gift from the McDonnell Douglas Foundation, this scholarship is awarded to entering freshmen who have demonstrated academic achievement and leadership potential. This scholarship is renewable for four years (or eight semesters if a co-op student).

**Samuel P. McManus Scholarship.** This scholarship was established in honor of Dr. Samuel P. McManus for his 34 years of outstanding service to UAH as provost/vice president of academic affairs, dean of graduate studies, and professor of chemistry. The scholarship is awarded to one or more undergraduate students based on academic achievement and citizenship.

**Pamela Mitchell Memorial Scholarship.** This scholarship was established in memory of Pamela Mitchell, who served in the Madison County District Attorney's Office for many years. The scholarship was established by Ms. Mitchell's family and friends to benefit the outstanding female athlete at UAH each year. The scholarship is awarded to a female student athlete who has combined the best elements of mind and body to achieve distinction for her achievements, and promises to be a future leader in her chosen field of career service.

**Felix L. Newman Scholarship.** Established by Felix Newman, a devoted and supportive friend to UAH, this scholarship is awarded to juniors or seniors enrolled in the College of Liberal Arts and is based on academic merit. A second scholarship can be awarded to a junior or senior in any area of study.

**William Penn Nichols Memorial Scholarship.** Virginia Josephine Holliman established this scholarship in memory of her father, William P. Nichols, a respected community leader and advocate of education. It is awarded to students in any area of study and is based on academic merit.

**F. Kenneth Noojin and Jean Beeland Noojin Memorial Scholarship.** Established by Frank K. Noojin, Jr., in memory of his parents, former UAH Foundation Trustee and one of the founding members of the Foundation, F. Kenneth Noojin, and his wife Jean B. Noojin, this scholarship is awarded to students who require financial assistance.

**Samuel Palmer Memorial Scholarship.** The university's first endowed scholarship, this award was established as a bequest of real estate which had been in the Palmer family more than 100 years. Recipients are selected based on academic merit.

**Thomas and Minnie Rast Scholarship.** Established by University of Alabama Trustee Emeritus Thomas Rast and his wife, Minnie, this scholarship is awarded to students pursuing an undergraduate degree in any field of study.

**M. Louis Salmon Scholarship.** The M. Louis Salmon Scholarship was established by members of the Watts family in recognition of Mr. Salmon's distinguished service to higher education and leadership in civic affairs. Mr. Salmon served as chairman of the UAH Foundation and was a founding member of Research Sites Foundation, Inc. (later known as the UAH Foundation), which provided the groundwork for Cummings Research Park. This scholarship is awarded to juniors and is based on academic merit. Preference is given to pre-law majors.
R. Wayne Sanders Memorial Scholarship. Established in 1979 by family and friends of R. Wayne Sanders, UAH Alumnus (Class of 1972) and former employee of Teledyne Brown Engineering, this scholarship is awarded to junior or senior students who have a minimum GPA of 2.0 in any area of academic study.

Charles E. Shaver, Sr. Presidential Scholarship. The UAH Foundation established the Shaver Scholarship in memory of Charles E. Shaver, Sr., a founding member of the UAH Foundation who served as its chairman for 13 years. This scholarship benefits students who excel in academics and show outstanding personal and leadership characteristics.

Leroy Simms Scholarship. Established in memory of Leroy Simms, former publisher of The Huntsville Times, respected advocate and loyal supporter of UAH, this scholarship is awarded to students based on academic merit in any area of academic study.

Spencer Foundation Scholarship. Established in 1983 by the Spencer Foundation, this scholarship is awarded to students in any area of academic study.

Spanish Club of Huntsville Scholarship. This scholarship was established by the Spanish Club of Huntsville. The scholarship is awarded to one or more undergraduate students of which at least one shall be majoring in Spanish. Scholarship awards are based on academic merit, evidence of contributions to school and community, and financial need. To the extent allowed by law, priority of consideration is given to students of Hispanic heritage.

Carla Thomas, M.D., Scholarship. This scholarship was established in honor of Carla Thomas, M.D., who achieved great stature as a physician in Anniston, Alabama. The endowment was established by her husband Cleophus Thomas, Jr., a prominent Alabama civic leader. The scholarship is awarded to students based on academic merit, citizenship, leadership, and financial need.

Dorothy Wright Thrasher and Tom Goodman Thrasher Presidential Scholarship. Tom Thrasher, a founding member of the UAH Foundation, and his wife, Dorothy, established this scholarship to benefit full-time students in any area of academic study, and its award is based on academic merit. Preference is given to students who demonstrate potential and require financial assistance.

UAH Alumni Association Scholarships. Awards are made to students in all areas of academic study, based on leadership ability, academic achievement, and demonstrated financial need.

UAH Foundation Presidential Scholarships. The UAH Foundation, which solely supports The University of Alabama in Huntsville, awards 22 four-year scholarships annually to students from Huntsville city and Madison County schools, based on academic merit. These scholarships can be renewed each year for a total of four years of study providing the recipients continue to meet the criteria.

University Women's Club Scholarship. Established by members of the UAH University Women's Club, this scholarship is awarded annually to a sophomore with a minimum GPA of 2.0 who requires financial assistance.

Dr. Wernher von Braun Scholarship. Honoring the father of the space industry, Dr. Wernher von Braun, this scholarship is awarded annually to a junior or senior majoring in a space-related field, with a minimum GPA of 3.5. The scholarship is awarded at the annual Wernher von Braun dinner sponsored by the Huntsville National Space Club.

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Dr. J.E. Whitaker Scholarship. Established in memory of long-time Huntsville physician, Dr. J.E. Whitaker, by his family, this scholarship benefits students who require financial assistance, with preference given to those who show evidence of leadership potential, including both the potential and inclination for contributing to the improvement of their community.

Dr. Harold J. Wilson Memorial Scholarship. Created by family, friends, students, faculty, and staff in memory of the former Dean of the College of Science, Dr. Harold J. Wilson, this scholarship benefits students based on academic merit. Preference is given to minority students.

Isadore and Mamie Wind and Children Scholarship. Established in 1983 as the result of a bequest, this scholarship is awarded to full-time students in any area of academic study.

Donald D. Zana Memorial Scholarship. Established in 1998 by family, friends, and co-workers to memorialize Donald Zana, this scholarship is awarded to students with a minimum 2.5 GPA and is renewable for four years (or eight semesters if a co-op student).

M. Carl Ziemke Memorial Research Scholarship. The M. Carl Ziemke Memorial Research Scholarship was established by family, friends, and co-workers in honor of UAH alumnus Carl Ziemke, '81, a research faculty member whose love of research was a lifelong commitment. This scholarship is awarded to a full-time student who exhibits a commitment to research. The award is based on academic merit, citizenship, and leadership.

College of Administrative Science Scholarships

AmSouth Bank-Marie Alexander Bone Memorial Scholarship. AmSouth Bank Foundation established this scholarship in memory of former city president and northern regional executive Marie Alexander Bone. Renewable for four years (or eight semesters, if a co-op student), provided the students continue to meet the minimum GPA requirement of 3.0, this scholarship benefits those majoring in finance and is awarded based on academic merit.

Barbara Cooper Bleier and Josephine Cooper Dark Presidential Scholarship. This scholarship was established by Billie B. Bleier, '91, '93, and Edwin W. Bleier, '81, in memory of his mother and her aunt. It provides scholarships annually to both undergraduate and graduate students enrolled in the College of Administrative Science who require financial assistance and maintain a 3.0 or higher GPA. Preference is given to students whose college careers have been interrupted and who have returned to complete a degree or seek a graduate degree.

Dr. Margaret S. Bond Scholarship. Named in honor of UAH Economics Professor Margaret S. Bond, this scholarship benefits junior or senior students enrolled in the College of Administrative Science. Recipients must have an overall GPA of 3.0.

Marie Alexander Bone Memorial Scholarship. This scholarship was established in loving memory of Marie Alexander Bone by her parents Mr. and Mrs. Howard C. Alexander. Ms. Bone achieved great stature as a business and civic leader during her all too brief life. The scholarship is awarded to one or more full-time undergraduate students enrolled in the College of Administrative Science, and is based on academic merit, citizenship, and leadership, with demonstrated financial need a secondary criteria. Recipients may be eligible for renewal for up to four years of undergraduate study, providing the recipient maintains a minimum GPA of 3.0, and provides evidence of good citizenship and leadership.

David and Cindi Cassis Branham Scholarship. Established by UAH alumni, David Branham, '76, '78, and Cindi Branham, '82, this scholarship is presented to full-time students enrolled in the College of Administrative Science who meet the criteria of academic merit and who require financial assistance.

Financial Information
Compass Bank Scholarship. Compass Bank established a scholarship for students enrolled in the College of Administrative Science, giving preference to those majoring in finance. The award is based on academic merit.

Josephine Cooper and Henry W. Dark Presidential Scholarship. Established by UAH alumna Billie B. Bleier, '91, '93, and her husband, Edwin W. Bleier, Jr., '81, in honor of her aunt and uncle, this scholarship benefits students enrolled in the College of Administrative Science who require financial assistance, are working on a first college degree, reside in Alabama, and are over the traditional college student age.

Benjamin and Hazeline Graves Scholarship. This scholarship was established in recognition of former UAH President Dr. Benjamin Graves and his late wife Hazeline. The scholarship honors their many years of service to UAH, students, and the community. The scholarship is awarded to one or more full-time junior or senior level undergraduate students enrolled in the College of Administrative Science based on academic merit, citizenship, and leadership.

W. L. and Lucille Howard Memorial Scholarship. The Howard Scholarship was established as a memorial gift from W.L. Howard and his wife, Lucille Howard. Mr. Howard spent his career in banking and was Vice President of State National Bank in Huntsville. The award benefits students enrolled in the College of Administrative Science who are majoring in finance, and is based on academic merit.

Gregory David Johnston Scholarship. Established by the UAH Foundation in memory of Gregory D. Johnston who was a graduate of Huntsville High School and had completed his freshman year at the University of Alabama prior to his untimely death, this scholarship is awarded to Huntsville High School graduates attending UAH, enrolled in the College of Administrative Science, and majoring in accounting or management.

Joseph Warren Jones Memorial Scholarship. Established with a memorial gift in honor of the late Joseph W. Jones, this scholarship is awarded to students enrolled in the College of Administrative Science and is based on academic merit. Preference is given to students majoring in general business and management.

Sidney L. McDonald Presidential Scholarship. These scholarships were established in honor of Sidney L. McDonald, who achieved great stature as a leader in business, public service, and education in Alabama. Scholarships are awarded to full-time students who graduated from high school while residing in the geographic area served by Brindlee Mountain Telephone Company, demonstrate financial need, attain ACT scores of 24 or higher, and are pursuing a degree in either business, science, or engineering, including premedicine.

North Alabama Instrumentation, Systems, and Automation Society (ISA) Scholarship. This scholarship was established to benefit students enrolled in the College of Administrative Science and the College of Engineering. Based on academic merit, this scholarship is awarded to students who have expressed an interest in the area of instrumentation (in the College of Engineering) or an interest in the area of productivity enhancement (in the College of Administrative Science).

W. F. Sanders, Jr. and Paula C. Sanders Scholarship. Life member of the UAH Foundation, W.F. Sanders, Jr., and his wife, Paula, established a scholarship that benefits students enrolled in the College of Administrative Science who require financial assistance. Preference is given to those majoring in finance.

Guy J. Spencer, Jr. and Sally C. Spencer Scholarship. Established by Guy J. Spencer, Jr., UAH Foundation Trustee, and his wife, Sally, this scholarship is awarded to students enrolled in the College of Administrative Science who require financial assistance and demonstrate leadership potential, and participate in community and professional activities.
College of Engineering Scholarships

**ADTRAN Scholarship.** Established by ADTRAN, Inc., this scholarship is awarded to students enrolled in the College of Engineering with preference given to ADTRAN employees or the children of ADTRAN employees. Recipients must have a minimum GPA of 2.8 and be enrolled as full-time students.

**William T. and Joe Ann Brooks Scholarship.** Established by UAH Foundation Trustee Bill Brooks and his wife, Joe Ann, this scholarship benefits students enrolled in either the College of Engineering or the College of Science. It is awarded to students who require financial assistance and is based on academic merit.

**Dr. Robert A. Brown Scholarship.** Honoring retired Engineering Professor Dr. Robert A. Brown, this scholarship is awarded to a junior or senior enrolled in the College of Engineering, majoring in industrial and systems engineering, and is based on academic merit. Recipients must have a minimum GPA of 3.0 and be enrolled as full-time students.

**Francisco J. Collazo Scholarship.** This scholarship is named in honor of Francisco J. Collazo, a prominent Alabama businessman and civic leader. The scholarship is awarded to one or more full-time students majoring in engineering, science, mathematics, or technology with preference given to children of COLSA employees and COLSA employees who receive COLSA approval, and is based on academic merit without regard to financial need. Recipients must demonstrate leadership potential and evidence of contributions to school and community.

**Harry C. Crews, Jr. Memorial Scholarship.** This memorial scholarship was established by friends and family of Harry Crews, Jr., an engineer at Teledyne Brown Engineering. It benefits juniors and seniors enrolled in the College of Engineering who participate in the co-op program and have a minimum GPA of 3.2.

**George W. Ditto Memorial Scholarship.** Established in memory of George W. Ditto, this scholarship is awarded to students enrolled in either the College of Engineering or College of Science. It is based on academic merit and is awarded to U.S. citizens who are residents of Alabama.

**Joseph C. Dowdle Scholarship.** Established by friends and co-workers from The University of Alabama in Huntsville in honor of former UAH Vice President for Finance Administration and also former Vice Chancellor for Financial Affairs with the University of Alabama System, Dr. Joseph C. Dowdle, this scholarship is awarded to students majoring in engineering and is based on academic merit.

**Broadus Adair and Leila Roberts Fincher Scholarship.** Established by Dr. Samuel P. McManus, Provost at UAH, and Mrs. Nancy Fincher McManus, Director of Alumni Relations at UAH, in honor of her parents, it is awarded to students majoring in engineering and is based on academic merit. It is renewable for four years (eight semesters if a co-op student), provided students maintain a minimum 3.0 GPA.

**Valmore and Frank R. Fogle Scholarship.** UAH professor and alumnus, Frank Fogle, '80, '87, '90, and his father, Valmore Fogle, established this scholarship to benefit full-time junior or senior students enrolled in the College of Engineering, majoring in electrical and computer engineering or industrial and systems engineering. Its award is based on academic merit.

**Reggie F. Gilland Memorial Scholarship.** Established in 1991 by the late Reginald and Hazel Gilland in memory of their son, UAH alumnus Reggie F. Gilland, who was the first student known to enter UAH after completing the eleventh grade at Lee High School in Huntsville, and
who received a B.S. degree from UAH in 1979, this scholarship is awarded to junior students enrolled in the College of Engineering who have demonstrated academic achievement and accomplishment.

Kenneth E. and Sharon H. Harwell Scholarship. This scholarship was established by UAH Associate Provost and Senior Vice President Kenneth Harwell and his wife, UAH Assistant Professor Sharon Harwell, to benefit students enrolled in the College of Engineering, and is based on academic merit.

James D. Hays Scholarship. Established in 1982 and named in honor of James Hays, a highly respected advocate and loyal supporter of UAH, who gave generously of his time and energy to ensure the growth of the university, this scholarship is awarded to a junior enrolled in the College of Engineering, and is based on academic merit.

Ru J. Hung Scholarship. Established by family and friends as a memorial to the late UAH Professor Ru J. Hung, this scholarship benefits upper class students enrolled in the College of Engineering, and is based on academic merit.

Carl T. Jones Engineering Scholarship. Established in honor of the late Carl T. Jones, a respected community leader, businessman, and loyal supporter of UAH, this scholarship is awarded to juniors who are enrolled in the College of Engineering, majoring in civil engineering. Preference is given to native Alabamians from medium income families who have an A-B average.

Dr. Bernhard F. Keiffer Scholarship. Established by friends and co-workers in memory of Dr. Bernhard Keiffer, former President of Teledyne Advanced Materials, this scholarship is awarded to full-time students enrolled in the College of Engineering, majoring in materials engineering, and is based on academic merit.

Yvonne M. Kheir Scholarship. Established by the children of the late Yvonne Kheir, this scholarship benefits students enrolled in the College of Engineering, majoring in electrical and computer engineering, and is based on academic merit.

Gary S. Lindsay Memorial Scholarship. The friends and co-workers of Gary Lindsay established this scholarship as a memorial to the former engineer with Teledyne Brown Engineering. It is awarded to a junior enrolled in the College of Engineering or College of Science, with preference given to students majoring in engineering or computer science. The scholarship is based on academic merit and is limited to students who are U.S. citizens. In addition to academic merit, students requiring financial assistance can also be candidates for this scholarship.

Dr. Frank C. Liu Memorial Scholarship. Established by family, friends, and co-workers, this scholarship is named in memory of former UAH Professor Frank Liu. It is awarded to students enrolled in the College of Engineering, and preference is given to rising juniors who have declared mechanical and aerospace engineering as a major. The award is based on academic merit.

Lockheed Martin Corporation Scholarship. Lockheed Martin established this scholarship for students enrolled in the College of Engineering, and it is based on academic merit.

Sidney L. McDonald Presidential Scholarship. These scholarships were established in honor of Sidney L. McDonald, who achieved great stature as a leader in business, public service, and education in Alabama. Scholarships are awarded to full-time students who graduated from high school while residing in the geographic area served by Brindlee Mountain Telephone Company, demonstrate financial need, attain ACT scores of 24 or higher, and are pursuing a degree in either business, science, or engineering, including premedicine.
NEC Electronics, Inc. Scholarship. Established in 1988 with a gift from NEC, this scholarship is available to incoming freshmen who plan to major in electrical and computer engineering. Its award is based on academic merit.

Erich W. Neubert Memorial Scholarship. This scholarship was established in memory of Dr. Erich W. Neubert, a member of the original German-U.S. team that arrived in Huntsville with Dr. Wernher von Braun in 1950 to lead the development of the U.S. rocket program. The endowment was established by Ms. Margot Neubert in memory of her husband. The scholarship is awarded to students majoring in electrical engineering or mechanical engineering.

North Alabama Instrumentation, Systems, and Automation Society (ISA) Scholarship. This scholarship was established to benefit students enrolled in the College of Administrative Science and the College of Engineering. Based on academic merit, this scholarship is awarded to students who have expressed an interest in the area of instrumentation (in the College of Engineering) or an interest in the area of productivity enhancement (in the College of Administrative Science).

SCI Systems, Inc./Olin B. King Scholarship. This scholarship was established in honor of Olin B. King, an Alabama business and civic leader who retired as Chairman of the Board of SCI Systems, Inc. in 2000. The scholarship is awarded to full-time students with primary preference given to students who are SCI employees or descendants of SCI employees, attain ACT scores of 26 or higher, are first-time students pursuing a degree in engineering or physical science, and demonstrate financial need.

Society of American Military Engineers-Huntsville Post Scholarship. This scholarship is awarded to juniors or seniors enrolled in the College of Engineering and is based on academic merit, with a minimum GPA of 2.5.

Jack R. Walker Scholarship. Established by family, friends, and co-workers in honor of former UAH Professor Jack Walker’s many years of service and dedication to the university, this scholarship is awarded to students enrolled in the College of Engineering. The award is based on academic merit, and preference is given to those who have declared industrial and systems engineering as their major.

College of Liberal Arts Scholarships

Jeffrey J. Bayer Memorial Scholarship. This scholarship was established in memory of Jeffrey J. Bayer by his family and friends. Professor Bayer achieved great stature as an educator, artist, and colleague at the UAH. This scholarship is awarded to one or more full-time students, excluding entering freshmen, with preference given to students who major in Art and Art History with an art studio emphasis, maintain a GPA of at least 3.0; and demonstrate artistic excellence in a body of work displayed at the annual student spring art exhibition sponsored by the Art and Art History Department.

Lella C. and Frank H. Bromberg, Jr. Scholarship. This scholarship honors Frank H. Bromberg, Jr., a University of Alabama Trustee, and his wife, Lella Bromberg. It is awarded to students enrolled in the College of Liberal Arts, with preference to those majoring in art. The award is based on academic merit.

Evans Best of Show Art Scholarship. Dr. Dorla Evans and Mr. Steven Evans established this scholarship to benefit the student who wins the “Best of Show” award at the UAH annual Student Art Exhibition, sponsored by the faculty of the Art Department.
Suzanne, Kay, and Gregory Ford Memorial Scholarship. Established by UAH alumna Melissa Ford Thornton, '84, in memory of her mother, grandmother, and brother, this scholarship benefits full-time students enrolled in the College of Liberal Arts who have scored at least 30 on the English portion of their ACT examination.

Kathryn L. Harris Women's Studies Scholarship. This scholarship is awarded to one or more undergraduate students who have declared a minor in Women's Studies, and is based on a combination of academic merit, community or school involvement, with additional consideration given to students with demonstrated financial need. Recipients shall maintain a minimum GPA of at least 2.5.

Dr. Daniel G. Hays Memorial Scholarship. Established in memory of Dr. Daniel G. Hays, former Associate Professor of Psychology at UAH, this scholarship is awarded to both graduate and undergraduate students enrolled in the College of Liberal Arts who require financial assistance. Students must have earned a high school diploma or college degree with demonstrated leadership potential, along with participation in community and professional activities, which may include the field of psychology.

John S. Hendricks Scholarship. UAH alumnus John Hendricks, '74, CEO of Discovery Communications, established this scholarship to benefit undergraduate students enrolled in the College of Liberal Arts majoring in history. The award is based on academic merit.

Heritage Junior Woman's Club Scholarship. This scholarship was established by the Heritage Junior Woman's Club of Huntsville with additional generous contributions from John S. Hendricks. The scholarship is awarded to one or more full‐time undergraduate and/or graduate students majoring in history, and is based on academic merit, citizenship, and leadership. Priority consideration is given to female students.

Robert E. James Scholarship. This scholarship was established to honor Dr. Robert E. James for the many years of service that he devoted to students and the university community as department chair of psychology and associate professor of communication arts. The scholarship is awarded to one or more full-time students who are majoring in psychology or communication arts, and is based on academic merit, citizenship, and leadership.

Music Faculty Scholarship. This scholarship is awarded to one or more full-time undergraduate students majoring in Music. The scholarship is awarded based on demonstrated music ability, academic merit, leadership potential, and financial need.

Felix L. Newman Scholarship. Established by Felix Newman, a devoted and supportive friend to UAH, this scholarship is awarded to juniors or seniors enrolled in the College of Liberal Arts and is based on academic merit. A second scholarship can be awarded to a junior or senior in any area of study.

John Carl Powell Memorial Scholarship. The John Carl Powell Memorial Scholarship was created by his wife, Laurel Brown, in memory of John who was a UAH alumnus, '83. This scholarship is awarded to students who are sophomores or above, enrolled in the College of Liberal Arts, and is based on academic merit and the need for financial assistance. Preference is given to those majoring in history, political science, or English.

Frances Cabaniss Roberts Scholarship. Established initially by the History Department to honor the many contributions of Dr. Roberts, a professor who devoted 29 years of unreserved and dedicated service to the university dating from the time of its inception. It is available to full-time junior or senior students with preference given to history majors. The award is based on academic merit, and the award period is one year period.
Gerald and Verna Smith Memorial Scholarship. Established as a memorial to Gerald and Verna Smith, this scholarship benefits students enrolled in the College of Liberal Arts, majoring in music, who demonstrate musical promise, with preference to non-string performers. The award is based on academic merit. Recipients may change their major without jeopardizing the scholarship, with the caveat that he/she must maintain active participation in the music program (as determined by the department).

Spanish Club of Huntsville Scholarship. This scholarship was established by the Spanish Club of Huntsville. The scholarship is awarded to one or more undergraduate students of which at least one shall be majoring in Spanish. Scholarship awards are based on academic merit, with evidence of contributions to school and community, and financial need. To the extent allowed by law, priority of consideration is given to students of Hispanic heritage.

Ilse and Bernhard Tessmann Foreign Languages Scholarship. Prior to his death, Mr. Bernhard Tessmann, an original member of the Dr. Wernher von Braun rocket team, established this scholarship for juniors or seniors majoring in foreign language. Preference is given to students majoring in German, and the award is based on citizenship and evidence of contributions to school and community, and with demonstrated financial need. A one year scholarship only, recipients may re-apply for consideration along with other applicants who meet the requirements.

Ilse and Bernhard Tessman Music Scholarship. Established with a gift by Mr. Bernhard Tessman prior to his death, this scholarship is awarded to juniors or seniors majoring in music. Preference is given to those whose primary area of concentration is piano, and the award is based on citizenship and evidence of contributions to school and community, and with demonstrated financial need. A one year scholarship only, recipients may re-apply for consideration along with other applicants who meet the requirements.

John F. Walsh Scholarship. This scholarship was established through a generous bequest by the late John F. Walsh. The scholarship is awarded to one or more full-time students who have graduated from Madison County High School in Gurley, Alabama and who are pursuing careers in teaching. The award is based on citizenship, leadership, and demonstrated financial need.

David Lee Wells Memorial Scholarship. The David Lee Wells Memorial Scholarship was established by family members following the untimely death of David, who had aspirations of becoming a professional musician. It is awarded to students who have demonstrated leadership potential in the music field through participation in professional or community activities and personal accomplishments, and who require financial assistance.

Irene Wright Scholarship. Established by former UAH President Dr. John C. Wright, and his wife, Margaret "Mac" Wright, in honor of his mother, this scholarship benefits students who are enrolled in the College of Liberal Arts. It is based on academic merit, with preference given to those majoring in education.

Kelly Zettle Memorial Scholarship. Mr. and Mrs. Robert Zettle established this scholarship in memory of their daughter, Jacqueline Kelly Zettle, a former violin student at UAH. It is awarded to students enrolled in the College of Liberal Arts who are majoring in music and require financial assistance.

College of Nursing Scholarships

James Allan Clark Memorial Scholarship. This scholarship was established in memory of James Allan Clark, who participated in the design of the UAH Nursing Building. It is awarded to students who require financial assistance, with preference given to LRNs or LPNs who desire to pursue a BSN.
Dean's Nursing Scholarship. Compiled from individual gifts of former students, faculty, friends, and staff, this scholarship benefits students who are meritorious academically. Financial need is secondary in selection.

Elizabeth M. Fisher Memorial Scholarship. Dr. B. Jeanne Fisher established this scholarship in memory of her mother. It is awarded to students enrolled in the College of Nursing who require financial assistance. Preference is given to minority students.

Huntsville Hospital Scholarship. Formerly the Humana Hospital Scholarship, this award benefits students enrolled in the College of Nursing, and is based on academic merit.

Christine Martin Pruitt Memorial Scholarship. Established by the family of Christine Pruitt following her untimely death, Christine was a UAH alumna, '77, from the College of Nursing. This scholarship is awarded to senior nursing students based on academic merit. Financial need may be considered, but is not a primary factor in selection.

Mildred D. Simmons Memorial Scholarship. Mr. William K. Simmons, along with other devoted family and friends, established this scholarship in memory of his wife, Mildred, who was a graduate of the Crawford W. Long School of Nursing and practiced in Huntsville for many years. This scholarship is awarded to students enrolled in the College of Nursing, and is based on academic merit.

JoAnn Sloan Memorial Scholarship. Established in 1976 from gifts to the university in memory of JoAnn Sloan, this scholarship is awarded to students enrolled in the College of Nursing.

College of Science Scholarships

Professor Elmer E. Anderson Scholarship. Established in 1997 by Professor and Mrs. Elmer E. Anderson, this scholarship is awarded to students enrolled in the College of Science, with preference given to physics majors. The award is based on academic merit. Entering freshmen must have scored 29 or higher on the ACT examination. Students already enrolled at UAH must have a minimum GPA of 3.5.

William T. and Joe Ann Brooks Scholarship. Established by UAH Foundation Trustee Bill Brooks and his wife, Joe Ann, this scholarship benefits students enrolled in either the College of Engineering or the College of Science. It is awarded to students who require financial assistance and is based on academic merit.

Francisco J. Collazo Scholarship. This scholarship is named in honor of Francisco J. Collazo, a prominent Alabama businessman and civic leader. The scholarship is awarded to one or more full-time students majoring in engineering, science, mathematics, or technology with preference given to children of COLSA employees and COLSA employees who receive COLSA approval, and is based on academic merit without regard to financial need. Recipients are eligible for one year only, with at least a 3.0 GPA and having leadership potential and evidence of contributions to school and community.

George W. Ditto Memorial Scholarship. Established in memory of George W. Ditto, this scholarship is awarded to students enrolled in either the College of Engineering or College of Science. It is based on academic merit and is awarded to U.S. citizens who are residents of Alabama.
Harry C. Fisher Memorial Scholarship. Established by Dr. B. Jeanne Fisher in memory of her father, Harry Fisher, this scholarship is awarded to students enrolled in the College of Science who require financial assistance. Preference is given to minority students.

Gerhard B. Heller Memorial Scholarship. This scholarship was established in memory of Gerhard Heller, a member of the Peenemunde team under the direction of Dr. Wernher von Braun, and the husband of former UAH professor Hertha Heller. It is awarded to a full-time junior or senior enrolled in the College of Science, majoring in physics or chemistry, and is based on academic merit.

Gerry Higgins Scholarship for Excellence. This scholarship was established in memory of UAH alumnus Gerry Higgins, 889, and is awarded to students enrolled in the College of Science who are U.S. citizens and residents of Alabama. Based on academic merit, recipients may apply for renewal if they maintain a 3.2 GPA and continue to demonstrate leadership potential.

Harry F. Hillman Scholarship. This scholarship was established in loving memory of Dr. Harry F. Hillman, a faculty member at the University of Arizona and the father of UAH faculty member Dr. Lloyd Hillman. This scholarship supports undergraduate students majoring in physics and optical science, and is based on academic achievement and campus leadership.

Gary S. Lindsay Memorial Scholarship. The friends and co-workers of Gary Lindsay established this scholarship as a memorial to the former engineer with Teledyne Brown Engineering. It is awarded to a junior enrolled in the College of Engineering or College of Science, with preference given to students majoring in engineering or computer science. The scholarship is based on academic merit and is limited to students who are U.S. citizens. In addition to academic merit, students requiring financial assistance can also be candidates for this scholarship.

Sidney L. McDonald Presidential Scholarship. These scholarships were established in honor of Sidney L. McDonald, who achieved great stature as a leader in business, public service, and education in Alabama. Scholarships are awarded to full-time students who graduated from high school while residing in the geographic area served by Brindlee Mountain Telephone Company, demonstrate financial need, attain ACT scores of 24 or higher, and are pursuing a degree in either business, science, or engineering, including premedicine.

Henry Plyler and Louise Sanders McManus Memorial Scholarship. Named in memory of his parents, this scholarship was established by Dr. Samuel P. McManus, UAH provost, and Mrs. Nancy F. McManus ’72, Director of Alumni Relations at UAH. It is awarded to students majoring in the sciences, based on academic merit. It is renewable for four years provided the recipients continue to remain in good academic standing.

Dr. Clyde Riley Scholarship. This scholarship is named in honor of Dr. Clyde Riley, who retired in 2000 after 33 years as a professor of chemistry. He chaired the chemistry department, served as faculty athletics representative for 16 years, and achieved professional recognition as a researcher and scholar. The scholarship is awarded to full-time students who are majoring in chemistry with preference given to student who maintain a GPA of at least 3.0.

Calvert Franklin Sammons Memorial Scholarship. Established with a gift from Dr. Robert A. Sammons in memory of his wife, Calvert F. Sammons, a long-time resident of Huntsville who was a strong advocate of higher education, this scholarship is awarded to Huntsville city high school graduates who are enrolled in the College of Science. The award is based on academic merit, and preference is given to women who are U.S. citizens.
SCI Systems, Inc./Olin B. King Scholarship. This scholarship was established in honor of Olin B. King, an Alabama business and civic leader who retired as Chairman of the Board of SCI Systems, Inc. The scholarship is awarded to full-time students with primary preference to students who are SCI employees or descendants of SCI employees, attain ACT scores of 26 or higher, are first-time students pursuing a degree in engineering or physical science, and demonstrate financial need.

State Nursing Scholarships
An act was passed by the Alabama legislature in 1957 to provide scholarships for basic nursing education. These scholarships are awarded to applicants from the state-at-large. Applicants must be Alabama residents and accepted for admission by the UAH College of Nursing. Continuation of the scholarship for three years after the first year is subject to annual review and contingent upon the student's progress and aptitude. A scholarship student must agree to practice professional nursing in Alabama for at least one year immediately after graduation from the UAH College of Nursing. If the recipient is unable to fulfill the obligation, it may be satisfied by repaying the amount of the scholarship received to the UAH Scholarship Fund.

Loans
Although it is sometimes necessary to borrow money to finance an education, caution is advised. Generally, a student should not rely primarily on loans and is advised not to borrow more than half of what is needed to meet expenses.

The Federal Stafford Loan Program (subsidized and unsubsidized) provides federal backing for loans made through private lending agencies such as banks, savings and loans, and credit unions. A maximum of $2,625 per academic year may be applied for in most states for freshmen, $3,500 for sophomores, $5,500 for juniors and seniors, and $8,500 for students enrolled in graduate school if the educational costs warrant borrowing this much money. Total loans outstanding may not exceed $23,000 for undergraduates. The aggregate maximum may be extended to $65,500 for students who borrow for graduate study.

Federal PLUS Loans. Federal PLUS Loans are for parents to assist with payment of education expenses for sons and daughters. These loans provide additional funds for education expenses and are not need-based. Funds are provided by banks, credit unions, or savings and loan associations. Each year parents may borrow up to the cost of education less financial aid.

Tax Credit
As part of the Taxpayer Relief Act of 1997, Congress has enacted legislation that allows taxpayers to take certain portions of tuition paid in the prior year as a direct tax credit. The HOPE tax credit provides up to a $1500 credit for tuition paid during the first two years of college. For students pursuing higher education after the first two years, the Lifetime Learning tax credit of up to $1000 will be available. Students or those who pay tuition on behalf of students should consult a tax advisor for more detailed information. General information is also available from the U.S. Department of Education's web site at www.acenet.edu/hot/html, or by contacting the Internal Revenue Service at 1-800-829-1040.

Grants
A Federal Supplemental Educational Opportunity Grant provides aid to undergraduate students who would not otherwise be financially able to attend college. A student must be accepted for enrollment, show evidence of academic promise, and be capable of maintaining good standing in the chosen course of study. Grants may be renewed for the four years of undergraduate study, subject to the availability of funds, unless a major change in the family's financial condition causes the student to be ineligible. Grants are awarded in compliance with eligibility based on federal guidelines.
The Federal Pell Grant Program assists eligible students by providing help in meeting the cost of postsecondary education. To be eligible, a student must meet the following criteria: (1) establish financial need; (2) be enrolled in an eligible program; (3) be a U.S. citizen or in the U.S. for other than a temporary purpose and intend to become a permanent resident or be a permanent resident of the Trust Territories of the Pacific Islands.

The Alabama Student Assistance Program is a state/federal aid program designed to provide Alabama residents financial assistance for undergraduate postsecondary education. Grants are awarded for one year. The grants are renewable, but new applications must be made each year. All awards are determined by student eligibility requirements, available funds, and student need. Students should contact the Office of Financial Aid for information regarding eligibility, application, selection, and awards procedures.

Federal Financial Aid Repayment

Federally funded student financial aid (Pell, SEOG, Stafford) awarded to a student who withdraws after registration but before the end of the refund period will be repaid to the respective program source. When withdrawal or reduction of class load occurs after the end of the refund period, full-tuition charges will be paid from the aid source. The unused portion of the aid will be repaid to the respective aid source. Specific regulations governing this policy may be found in Student Financial Aid, a brochure available in the Office of Financial Aid.

Federal Work-Study Program

The College Work-Study Program provides employment for students who need financial assistance. A student works part-time while attending the University and during vacation periods. Students engaged in this program work on campus or in a non-profit agency. In determining eligibility, preference will be given to students with the greatest financial need.

Tuition Assistance

Some businesses and industries provide tuition assistance to employees attending UAH. An employed student should consult the personnel office of his or her place of employment to determine its policy regarding tuition assistance.

Vocational Rehabilitation

Students with a physical disability may obtain grants-in-aid covering fees, books, and supplies through the Vocational Rehabilitation Service, which is supported by federal and state appropriations. For further information, write to: Alabama Vocational Rehabilitation Service, 407 Governors Drive, S.W., Huntsville, Alabama 35801 or the Director of Vocational Rehabilitation, Room 416, State Office Building, Montgomery, Alabama 36104.

Veterans Affairs

UAH offers a full range of services to the student attending under the Veterans Administration Educational Assistance Program. These services include veterans' advisement, educational loans, and the Veteran Tutorial Program.

Under the current Veterans Educational Assistance Programs, which affect most veterans, the veteran receives an allowance directly from the government. The veteran is responsible for paying fees directly to the University and meeting payment deadlines applicable for all students.
The Veterans Administration will make full payment only when the student carries a full academic load. To facilitate the prompt and accurate reporting of the student's status and course load, the veteran must complete a brief form every semester enrolled. This form must be turned in to the veterans affairs clerk in the Office of Financial Aid, Room 212, University Center.

It is the student's responsibility to remain in good standing with the Veterans Administration and to respond to notification of changes in regulations. For additional information, write to: Veterans Administration Regional Office, 474 South Court Street, Montgomery, Alabama 36104.

Many students who are children of veterans of World War I, World War II, or the Korean War may be eligible for benefits under the War Orphans Educational Assistance Act (PL 634). Write the nearest Veterans Administration Regional Office for additional information.

The Alabama G.I. and Dependents Education Benefits Act grants tuition assistance to eligible veterans, their children, widows and wives. Tuition is paid directly to the school. For additional information, write to: Assistant to the Director, Department of Veteran's Affairs, P.O. Box 1509, Montgomery, Alabama 36102.
Academic Information

Academic Advisement and Information Center
Jamie Clay, Coordinator
202 University Center
Telephone: (256) 824-6290
Email: advising@uah.edu

Academic advising is available to students in the Academic Advisement and Information Center (AAIC), in advising offices in the Colleges of Nursing, Engineering, Administrative Science, Science, and Liberal Arts, and in the department or program in which a major has been declared. Special advising is provided in the professional areas of law and medicine. Career counseling is available through the Office of Career Services. When students declare a major by completing a program of study form, they are assigned a faculty advisor in their major department or program. All students are encouraged to maintain contact with their advisors and to take advantage of the opportunities for academic advising which the University provides.

The Academic Advisement and Information Center is staffed by a team of professional and peer advisors. They assist prospective and enrolled students in course and program planning, disseminate accurate information about academic programs and procedures, make referrals to appropriate offices and services, and advise and register students during registration and orientation. Appointments may be made by calling 824-6290.

All early start, dual enrollment, and undeclared students are required to visit the AAIC at least once each semester to review their academic progress and to plan their schedule of courses for the next semester. These schedules must be signed by an advisor in the AAIC in order to be processed by the Office of Student Records. Undergraduates enrolled as conditional students, regardless of their major, must also meet with an AAIC advisor each semester as long as they remain in the conditional student category. All students in the Colleges of Liberal Arts and Science who do not have a program of study on file must meet with the college advisor each semester to plan and sign schedules.

Prospective transfer students who wish to gain information concerning the general requirements of various undergraduate degree programs may seek the services of the Academic Advisement and Information Center. These students are further referred to department chairs who can aid them in program planning in their major fields of interest. Transfer students will be advised and registered by the appropriate faculty advisor. Once enrolled at the University, transfer students beyond the freshmen level who are not enrolled in one of the colleges are advised by the Academic Advisement and Information Center for the first semester.

Academic rules and regulations stated in this catalog are subject to review for extenuating circumstances. Students are encouraged to use the services of the Academic Advisement and Information Center for the appropriate procedure of appeal. Academic appeals originate with the student and will be processed through the student's major department, the dean of the college and the Office of the Provost and Vice President for Academic Affairs, in that order.

Equal Opportunity and Affirmative Action Policy
The University of Alabama in Huntsville is committed to making employment opportunities available to qualified applicants and employees without regard to race, color, religion, sex, age, national origin, or disability. All personnel actions and programs, including recruitment, selection, assignment, classification, promotion, demotion, transfer, layoff and recall, termination, determination of wages, conditions, and benefits of employment, etc., shall be administered in accordance with this equal opportunity policy. It is the intent of the University that, in all aspects
of employment, individuals shall be treated without discrimination on any of the foregoing bases, and that employment decisions shall instead be premised upon a person's ability, experience, and other job-related qualifications.

Additionally, the University is an affirmative action employer of women, minorities, qualified individuals with a disability, and covered veterans. It is committed to making sustained, diligent efforts to identify and consider such individuals for employment and for opportunities arising during employment.

UAH is also committed to equal educational opportunity for all qualified students and does not discriminate in its educational policies, practices, programs, or activities on the basis of race, color, religion, sex, age, or national origin, or against qualified disabled persons. Its admissions, financial aid, athletics, student services, and other programs are administered in accordance with this policy.

Discrimination, under this policy, shall be understood to include harassment in the form of verbal or physical conduct relating to an individual's race, color, religion, sex, age, national origin, or disability. Such harassment must have the purpose or effect of either creating an intimidating, hostile, or offensive working/learning environment for an individual or unreasonably interfering with an individual's performance as an employee or student. Harassment in the form described above which adversely and substantially affects an individual's employment or educational opportunities in other ways is also considered to be unlawful discrimination.

**Sexual harassment**, in addition and more specifically, includes unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature when any of the following are present: submission to such conduct is made a condition, explicitly or implicitly, of employment or academic advancement; submission to or rejection of such conduct by an employee or student is used as the basis for employment or academic decisions; or such conduct has the purpose or effect of unreasonably interfering with an individual's performance as an employee or student or creating an intimidating, hostile, or offensive working/learning environment.

In these respects, the University affirms its desire to create a work environment for all employees and a learning environment for all students that is fair, humane, and responsible--an environment which supports and rewards career and educational goals on the basis of such relevant factors as ability and employment or academic performance. A University student or employee who is found, under established University procedures, to have been guilty of discriminatory conduct in violation of these policies will be subject to discipline, up to and including possible dismissal or expulsion, by the University.

These commitments are designed to meet nondiscrimination/affirmative action requirements imposed by the following federal and state sources of legal obligation, as amended: Title VI and VII, Civil Rights Act of 1964; Executive Order 11246; Title IX, Education Amendments of 1972; the Rehabilitation Act of 1973; the Americans with Disabilities Act of 1990; the Equal Pay Act of 1963; the Age Discrimination in Employment Act of 1967; the Age Discrimination Act of 1975; the Vietnam Era Veterans' Readjustment Assistance Act of 1974; the Immigration Reform and Control Act of 1986; contract and grant agreements with governmental agencies; and the Alabama Constitution of 1901. The University's equal opportunity policies pertaining to its employees and students include specific administrative procedures and implementing measures designed to carry out these pledges and to ensure compliance with the foregoing laws.

Inquiries or complaints concerning the application of this policy and these federal requirements should be directed to one of the following persons:

Ms. Delois Smith  
Student Equal Educational Opportunity Officer  
114 University Center  
The University of Alabama in Huntsville  
Huntsville, AL 35899 (256-824-6700)
Grievances alleging unlawful discrimination will be resolved according to the discrimination grievance procedures set forth in the Student Handbook.

Marital, Parental, or Temporary Disability Status
The University does not discriminate against any student or exclude any student from its educational program or extracurricular activity on the basis of a student's sex, marital, or parental status. Pregnancy or related conditions are treated the same as other temporary disabilities. The University may require written approval of a student's physician regarding participation in an activity or educational program, that might adversely affect the safety or health of a student with a temporary disability.

Confidentiality of Student Records
The Family Educational Rights and Privacy Act of 1974 (FERPA) is a federal law that protects the confidentiality of student education records. To implement FERPA, the University has formulated and adopted a written institutional policy governing the handling of these records. Copies of this policy document are available to students in the Office of Admissions and Records, and it should be referred to for a more comprehensive treatment of this subject.

The term "education records" under FERPA includes generally any record, whether in a printed, handwritten, audio, video, or computer media format, maintained by the University and containing information directly related to a student in his/her role as a student. Certain records are, however excluded by FERPA from this broad definition, such as those made by instructional, supervisory, and administrative personnel and kept in their sole possession, those made by campus police, and those made by a physician or other professional medical personnel in connection with treatment of the student.

Under FERPA and University policy, a student has a right of access to his/her education records and may inspect and review the information contained in them. To exercise this right, the student should present a request to the University office where the record is located, and a response will be made no later than 45 days later. In certain cases, a copy of the record may be provided, with a copying fee, as an alternative to actual inspection. Some records are not within this right of review, such as financial information from the student's parents and confidential letters or statements of recommendation where the student has waived the right of access.

A student who believes his/her education records contain information that is inaccurate, misleading, or in violation of his/her privacy rights may bring the matter to the attention of the appropriate records official. If by informal discussion with this official the student does not obtain the corrective action desired, the student will then be entitled to a hearing at which he/she may challenge the objectionable item. Additional information about hearing procedures will be given to the student at that time. The decision of the hearing official or panel shall be final. If the decision is adverse to the student, he/she may insert in the education record an explanatory statement about the disputed item.

A student's privacy interest in the education record is further protected by the rule against unauthorized disclosure. Generally, the University may not, without the student's consent, release the education record or personally identifiable information in it to other individuals or entities.
Disclosure in certain circumstances, however, is specifically excepted by FERPA from the foregoing rule. These circumstances include disclosure to certain parties—University personnel who have a legitimate educational interest in the information, officials of institutions where the student is seeking to enroll, parties to which the student is applying for financial aid, the parent of a dependent student, etc.; disclosure to comply with a judicial order or lawfully issued subpoena; or disclosure in connection with a health or safety emergency. Under the first exception, "University personnel" includes any UAH employee, and a "legitimate educational interest" means that the employee has a need for access to the record to perform appropriate tasks clearly within the area of responsibility of the employee, to perform a task related to the education or discipline of the student, or to provide a benefit or service relating to the student. Personally identifiable information will be transmitted by the University under these exceptions only upon the condition that the recipient not permit any other party to have access to it without the student's consent.

The University may also release what is called "directory information" without obtaining the student's consent. Directory information is limited to the following: the student's name, address (local and permanent), telephone number, e-mail address, date and place of birth, enrollment status (full-time or part-time), class schedule/class roster, major field of study, participation in officially recognized activities and sports, dates of attendance, degrees and awards received, the previous educational institution most recently attended, and a photograph of the student. However, a student may prevent the release of even this information, if he/she wishes, by completing a form provided for this purpose in the Office of Student Records.

Any student who believes that his/her rights under FERPA have been violated by the University may notify and request assistance from the Provost and Vice President for Academic Affairs. The student may also file a complaint with the Family Policy Compliance Office, U.S. Department of Education, 600 Independence Avenue SW, Washington, DC 20202-4605.

**Academic Responsibility**

Students at the University of Alabama in Huntsville have the following academic responsibilities:

1. To enroll in only those courses for which the stated prerequisite(s) (if there are any) has/have been satisfactorily completed. Failure to comply with this procedure may result in administrative withdrawal.
2. To attend all meetings of each class in which they are enrolled. Instructors will announce at the beginning of the semester if they consider attendance in computing final grades.
3. To observe all regulations of their college and select courses according to the requirements of that college.
4. To consult their advisors on all matters pertaining to their academic careers, including changes in their programs.
5. To answer promptly all written notices from advisors, faculty, deans and other University officers.
6. To maintain the integrity of the classroom by practicing academic honesty. Students should refer to the student handbook for details regarding academic dishonesty.
7. To file an "Application for Degree" in the Office of Student Records by the published deadline.
8. To be personally responsible for fulfilling all requirements for graduation and observing all regulations at UAH.

**Academic Honesty**

Plagiarism and other forms of cheating are subject to penalties as outlined in the student handbook. A graduate student found guilty of plagiarism or falsification of research data/results is subject to dismissal from the University.
The tests used for admissions, credit by examination, and placement which are administered through this office include: the ACT Assessment, the Alabama Basic Skills Test (BST), the College Level Examination Program (CLEP), the UAH English Language Placement Test (ELPT), the General Educational Development (GED) Testing Program, the Graduate Record Examination (GRE), the Miller Analogies Test (MAT), the Medical College Admissions Test (MCAT), and the UAH Chemistry and Mathematics Placement Tests. Applications and information pertaining to the following testing programs are also available: the Graduate Management Admissions Test (GMAT), the Law School Admission Test (LSAT), the PRAXIS Series for beginning teachers, and the Test of English as a Foreign Language (TOEFL).

Testing calendars with dates and deadlines, as well as information pertaining to testing, are available in the Office of Instructional and Testing Services.

Placement Tests

All students who are beginning college-level course work in English, mathematics, chemistry, or a foreign language (if taken in high school) are placed at the level best suited to their academic preparation and background.

ACT scores and high school grades determine placement in English and mathematics. The UAH English Language Placement Test (ELPT) is administered to non-native speakers of English to determine initial placement. A placement test may also be required for entry into some mathematics classes.

To register for Chemistry 121, a student must be placed in CH 121 from results of the Chemistry Placement Test, or must have taken CH 101 or its equivalent.

A student who has had formal training in French, German, Spanish, or Latin is placed on the level of that language according to the number of units and grades earned in high school. A student who takes a language other than the one in which he or she has had formal training will begin with level 101.

The Chemistry, Mathematics, and English Language Placement Tests are scheduled regularly. The Residual ACT Test is administered once each semester. Students wishing to take these tests should register in the Office of Instructional and Testing Services (824-6725) at least three days before the tests are to be given. Students will be notified at the time of the tests when they can expect to receive the results of the tests. There is a charge for the Residual ACT. There is no charge for the Chemistry Placement Test and the Mathematics Placement Test. If a student has not received placement recommendations before enrollment, he or she should contact the Office of Admissions.

Credit by Examination

At UAH a student may obtain a maximum of one-fourth (normally 32 semester hours) of required degree credits by examination. There are four alternatives by which a student may gain credit through examination at UAH: 1) departmental examinations, 2) the Advanced Placement (AP) Program, 3) the College Level Examination Program (CLEP), and 4) International Baccalaureate (IB). Credit by examination is not granted in the following cases: 1) if a student has been enrolled in a comparable course for more than three weeks; 2) to remove a failure already recorded for a course; or 3) to satisfy the residency requirement for graduation.

1) Credit by Department Examination

Departmental examinations for credit in specific courses may be given by a department upon application by the student and with the approval of the department chair. Students may apply for such a test if they have taken college-level work in secondary school, in a non-collegiate class or...
on a tutorial basis, or through private study. Credit, if awarded, will be recorded without grades or quality points and will not, therefore, be included in calculation of the grade point average. The amount of credit allowable through departmental examinations is determined by the appropriate academic dean and the department chair concerned.

Departments offering credit by examination on tests constructed by the department:

- Biological Sciences
- Computer Science
- Electrical and Computer Engineering
- Foreign Languages
- Music
- Nursing
- Philosophy

2) Advanced Placement Program

Several UAH departments award credit to students who have earned designated scores on Advanced Placement (AP) Program examinations of the College Entrance Examination Board. AP examinations are usually taken at the end of an AP-designed course of study in high school. The subjects in which credit is presently awarded are biological sciences, chemistry, computer science, English composition and literature, American and European history, mathematics, music, physics, political science, and some foreign languages. Credit, if awarded, will be recorded without grades or quality points and will not, therefore, be included in calculation of the grade point average.

**AP CREDIT**

- **American History**
  - Score of 4 = HY 221 and 222 (6 hrs.)
  - Score of 3 = BYS 119 (4 hrs.)
  - Score of 4 or 5 = BYS 119, 120 (8 hrs.)

- **Calculus AB**
  - Score of 4 or 5 = MA 171 (4 hrs.)
  - Score of 4 or 5 = MA 171 and MA 172 (8 hrs.)

- **Calculus BC**
  - Score of 3 or higher = CH 121, 125, 123, 126 (8 hrs.)

- **Computer Science A, AB**
  - Score of 2 or greater = CS 102 or CS 103 (3 hrs.)
  - Score of 4 or 5 + completion of CS 312 = CS 107, CS 207 (9 hrs. total: 3 hrs. for AP
  - Score of 4 or 5 = MA 171 (4 hrs.)

- **English Language/Composition**
  - Score of 4 or 5 = EH 101 and 102 (6 hrs.)

- **English Literature/Composition**
  - Score of 4 or 5 = EH 101 (3 hrs.)

- **European History**
  - Score of 4 = HY 102 (3 hrs.)

- **Foreign Languages**: French, German, Spanish:
  - Score of 3 = 101, 102, 201 (9 hrs.)
  - Score of 4 = 101, 102, 201, 202 (12 hrs.)
  - Score of 5 = 101, 102, 201, 202, 301 (15 hrs.)

- **Government & Politics (American)**
  - Score of 4 or higher = PSC 101 (3 hrs.)

- **Government & Politics (Comparative)**
  - Score of 4 or higher = PSC 102 (3 hrs.)
<table>
<thead>
<tr>
<th>Subject</th>
<th>Score of 4 or higher</th>
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</thead>
<tbody>
<tr>
<td>Music Theory</td>
<td>MU 201 and 203 (4 hrs.)</td>
</tr>
<tr>
<td>Music Listening and Literature</td>
<td>MU 100 (3 hrs.)</td>
</tr>
<tr>
<td>Physics B</td>
<td>PH 101 and 102 (8 hrs.)</td>
</tr>
<tr>
<td>Physics C</td>
<td>PH 101 and 102 (8 hrs.) or PH 111 and PH 114 (4 hrs.)</td>
</tr>
<tr>
<td>Psychology</td>
<td>PY 101 (3 hrs.)</td>
</tr>
</tbody>
</table>

3) **College Level Examination Program (CLEP)**

The College Level Examination Program is a national program under which a person can receive credit for college level achievement. Anyone who has practical knowledge in an area through independent study, work experience, cultural exposure, or intensive reading, may take these tests. The policy for CLEP credit varies with each institution. The policies listed herein are those of UAH. For a complete listing of testing dates and registration deadlines, contact the Office of Instructional and Testing Services in Room 226, Administrative Science Building.

**CLEP General Examinations**

The General Examinations are objective tests that measure achievement in five basic areas of the liberal arts: English composition, humanities, mathematics, natural sciences, and social sciences and history. Credit by General Examination can be given only if examinations were taken before entering college or during first semester in college, providing the student has not been enrolled in a comparable course for more than three weeks. The student may be awarded six hours elective credit per examination. Information about minimum score requirements is available in the Office of Admissions and the Office of Instructional and Testing Services. Credit is recorded without grades or quality points and is counted as elective credit only.

**CLEP Subject Examinations**

Credit by CLEP subject examination is allowed only if the appropriate academic department has approved the CLEP test for use by the University. Credit awarded for CLEP subject examinations will be recorded on the student's record without grades or quality points and will not, therefore, be included in calculation of the grade point average. If a student does not pass a CLEP test(s), no record is placed on his or her transcript. Subject examinations may be retaken six months after initial testing. A complete list of courses in which a student may receive CLEP credit, and minimum score requirements is available in the Office of Instructional and Testing Services. (See Foreign Language section for additional information on CLEP.)

4) **International Baccalaureate (IB)**

The University of Alabama in Huntsville recognizes International Baccalaureate (IB) credit with a score of 5, 6, or 7 on the higher-level examinations. Reports of IB scores should be sent to the UAH Office of Admissions for evaluation. Additional credit may be awarded on a course-by-course basis as approved by the department. (Some departments may award credit based on the subsidiary examinations.) The academic unit responsible for the student's program of study will determine the application of credits toward specific degree requirements. Credit, if awarded, will be recorded without grades or quality points, and will not, therefore, be included in the calculation of grade point average.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credits</th>
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<tbody>
<tr>
<td>IB Biology</td>
<td>BYS 119, 120, 464</td>
</tr>
<tr>
<td>IB Chemistry</td>
<td>CH 101, 105, 113</td>
</tr>
<tr>
<td>IB Economics</td>
<td>ECN 142</td>
</tr>
<tr>
<td>IB Economics</td>
<td>FH 101, 102, 201, 202, 301</td>
</tr>
<tr>
<td>IB German</td>
<td>GN 101, 102, 201, 202, 301</td>
</tr>
</tbody>
</table>
For further information concerning CLEP, the AP program, the IB program, or department examinations, contact the Office of Instructional and Testing Services.

**Registration**

Dates of priority and open registration are listed in the UAH calendar and the Schedule of Classes. Any continuing or returning degree student eligible to register may take part in priority registration. All past financial obligations to the University must be cleared before a student may register for courses. Non-degree students have a lower registration priority.

A student who schedules courses during any registration period (priority or open) makes a financial commitment to the University. If courses are dropped or changed, the student must submit these changes in writing to the Office of Student Records by the published deadlines. Adjustments in fees, if any, will be made by the Office of the Bursar. The University assumes no responsibility for students who attend classes without proper registration.

**The Semester System**

The academic year is divided into two semesters and one summer session. The fall semester begins in late August and ends in December. The spring semester begins in January and ends in May. The summer term consists of 12 weeks with two 6-week mini-sessions. The summer session begins in June and ends in August. (See Academic Calendar.)

Credit for a course completed is awarded in semester hours credit. In most instances, the number of semester credit hours awarded for a course represents the number of hours that course meets each week. Generally a 3-credit hour course meets for three hours each week for one semester. There are exceptions to this general rule, including laboratory courses and other courses.

**Student Course Loads**

The typical full-time undergraduate course load is 15-18 credit hours each semester. Students should take between 30 and 33 hours annually in order to graduate in four years. The minimum full-time load for an undergraduate student is 12 semester hours a semester. A part-time undergraduate student is one who is enrolled in less than 12 semester hours. Permission of the student's dean is necessary to enroll in 21 hours or more, including concurrent enrollment at other institutions and simultaneous correspondence courses. A student enrolling for a minimum load each semester should not expect to graduate in four years unless he or she enrolls in four summer terms in addition to the regular academic year.

**Orientation**

A new student orientation program is held before the beginning of each semester or during the first week of classes. Students accepted for admission will be invited and are expected to attend.

**Student Classification**

An undergraduate student is classified as indicated in the following table when he has completed the number of semester hours shown.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Semester Hours Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>0-32</td>
</tr>
<tr>
<td>Sophomore</td>
<td>33-64</td>
</tr>
<tr>
<td>Junior</td>
<td>65-96</td>
</tr>
<tr>
<td>Senior</td>
<td>97 up</td>
</tr>
</tbody>
</table>
Schedule Adjustments
After a student has completed registration, all changes in his or her schedule must be made on a change-of-course form and recorded in the Office of Student Records. Advisor signature may be required.

Credit to Audit
A student is permitted to change a course from credit to audit through the fourth week of classes. The instructor is not required to grade any written assignments that may be submitted by an auditing student. A student who elects to audit a course may not at any point after electing to audit, change to “for-credit”, i.e., graded status. Any student failing to follow established procedure for change to audit will continue to be enrolled in the class for credit and may receive a failing grade in that course.

Removal of Course from Schedule
1. In the case of a canceled class, submission of a change-of-course form by the student helps to correct the record.
2. In the case of a drop before class begins, a change-of-course form must be submitted before the first day of the semester.
3. Except in the case of (1) or (2), removal of a course after the first scheduled meeting of a class is considered a withdrawal (see below).

Other Kinds of Changes
The following kinds of changes may be accomplished only during the designated hours of open registration.
1. Change from one course to another.
2. Change from one section to another section of the same course.
3. Addition of course to schedule.
4. Change from audit to credit. Only students who are otherwise eligible to take the work for credit will be permitted to make this kind of change.

Withdrawal Policy
Through the eighth week of the Fall or Spring Semester a student may withdraw from any course. After the eighth week, a student may withdraw from a course only under extenuating circumstances and with the approval of the dean of the college in which the student is enrolled. In any case the student must initiate a formal request for withdrawal through the Office of Student Records. Class non-attendance does not constitute withdrawal nor does notification to the instructor. Any student failing to follow the established procedure for withdrawal will continue to be enrolled in the class and may receive a failing grade in that course.

Recording of Withdrawals
If the withdrawal process is completed during the first two weeks, the withdrawing student's name does not appear on the final rolls of the class from which the student withdrew, and that course does not appear on the student's permanent record. If the withdrawal process is completed after the first two weeks, then the withdrawing student's name will be on the final roll of the class from which the student withdrew, and that course will be recorded on the student's permanent record with a final grade of W. It is the responsibility of the Office of Student Records to inform each instructor in a timely manner (in writing) when a student appearing on the instructor's final class roll withdraws from that course. The University does not use grades of W to compute grade point averages.

Approvals Required
The University does not require that the student justify any course withdrawal completed before the end of the eighth week. Beginning the ninth week, the student must give evidence of extenuating circumstances to justify withdrawal from a course. Avoidance of an undesirable grade
does not justify withdrawal. The request for withdrawal approval in this situation must be submitted with a written explanation of the extenuating circumstances and any appropriate documentation to the dean of the college in which the student is enrolled, and it is the duty of the dean to verify that the circumstances justify withdrawal from a course. In addition, students participating in certain programs must secure approval or give adequate notification to the appropriate officers of these programs. It is the joint duty of these programs and the Office of Student Records to insure that students participating in these programs are aware of any such requirements.

Counseling
Students need to be aware that many potential employers, as well as graduate and professional schools, view an excessive number of W's on a transcript as a flag that the student cannot be counted on to complete demanding projects. Advisors should be informed of this fact and students should be encouraged to discuss with their advisors any plans to withdraw from a course, especially after the first two weeks of the semester.

Retroactive Withdrawal Policy
Undergraduate students may at times experience extraordinary problems during an academic semester. Within two years of having completed such a semester, a student may petition the Vice President for Student Affairs to withdraw retroactively from ALL classes taken during that semester. A retroactive withdrawal is granted only under exceptional circumstances, such as extraordinary medical or personal problems. The petition should include clear and documented evidence whenever possible. If the Vice President for Student Affairs grants a retroactive withdrawal, the grades for all courses taken during the semester in question will be changed to W's. Petitions for Retroactive Withdrawals are considered after final grades are posted.

Course Repeat Policy
Students should be aware that course repeats, for any reason, may not be looked upon favorably by some employers and by professional schools, and hence they should avoid the need for repeats.

Students may repeat any course an unlimited number of times in order to achieve a passing grade or an improved understanding.

A maximum of five course repeats may be excluded from the calculation of the student's grade point average. The student must declare the course repeats before the end of the regular registration period for the semester in which the course will be repeated. Only courses for which the student has received a grade of C, D, or F may be repeated under this option. When withdrawing from a course that has been declared as a course repeat, the previous grade will still be used in the computation of the GPA, and the course will not count toward the maximum of five repeats. Each time a student repeats a course counts against the maximum of five such repeats, under this option. Students may use all five repeats in a single course or in five separate courses or any combination of separate courses and multiple repeats of single courses. Until a grade other than W is reported, the previous grade will be used for the GPA. The transcript will show both the original grades and the course repeat grades, but only the grade points and credit hours earned in the repeated courses will count toward graduation and will be averaged into the student's GPA. Concurrent registration for multiple sections of a course is not allowed.

For all other courses repeated at UAH, both the original grade and the course repeat grade will show on the transcript and will be calculated in the student's GPA. Students are not allowed to repeat courses for which they have higher level credit. For example, a student cannot repeat MA 119 after he/she has credit for calculus.

A student wishing to exercise the Course Repeat Option must file the intent to do so in the Office of Student Records (UC 116) before the end of registration.
Academic Bankruptcy Policy

An undergraduate student may petition the Admissions and Scholastic Affairs Committee to declare academic bankruptcy. The Scholastic Affairs Committee, after reviewing the petition and consulting with the Office of Admissions and Records, will decide whether to grant the student academic bankruptcy. Under this policy, all college-level work completed at UAH prior to a date specified by the student is eliminated from computation of grade point averages and will not be applied toward a degree at UAH. Such work will not be expunged from the student's scholastic records and transcripts, although it will be designated as work not included in the computation of grade point averages or applied toward degree requirements. There must be a minimum of two calendar years between the date of petition and the date specified by the student in the bankruptcy petition. Academic bankruptcy will only be granted once during a student's academic career at UAH.

Class Attendance

Education at UAH depends upon the cooperation of students and faculty. Students are held responsible for the full work of the course in which they are registered, including participation in the discussion and work of the class at each class meeting.

A student's final grade in each course is determined on the basis of identified course requirements; therefore, regular class attendance is important.

Examinations

During each semester, one or more announced examinations of class period length may be held. At the end of each semester, a final examination period is scheduled for each course. Absences from a scheduled final examination without previous arrangement with the course instructor (except in extenuating circumstances) will be classified unexcused and a failing grade in the course will be assigned.

Any student whose final examination schedule is such that the student is scheduled to take three examinations during a single day shall have the right to have the middle examination rescheduled. The date and time of the rescheduled examination shall be by mutual agreement between the student and the affected faculty member and must be agreed upon prior to the final week of the semester. It is the student's responsibility to notify the instructor of this type of conflict, and it is the instructor's responsibility to verify that the conflict actually exists. If a student is scheduled to take four examinations during a single day, then the same procedure shall apply except that the student shall now have the right to have both the second and third examinations rescheduled.

Grading System

The University of Alabama in Huntsville's grading system includes grades of A, B, C, D, F, I, X, W, S, U, P, AU, N, and NC.

Instructors have the option of augmenting the course grades of A, B, C, and D with symbols "+" and "-" signifying, respectively, high and low achievement within the assigned grade. These augmented letter grades become part of the student's permanent record and appear on transcripts, but augmentation of a letter grade does not affect its value for the purposes of the GPA computation.

A Superior achievement. Four quality points given per semester hour.
AU Audit. Course attendance as a listener. No credit given, no quality points assigned, no attendance requirement.
B Above average achievement. Three quality points given per semester hour.
C Average achievement. Two quality points given per semester hour.
D Passing work. One quality point given per semester hour.
F Failing work. No credit given; no quality points assigned.
I Incomplete. Assigned by the instructor when a student, due to circumstances beyond his or her control, has not satisfied some requirement of the course. The deadline for a student to remedy a grade of I is the last day of class of the next semester enrolled or
one calendar year from the date of the grade whichever occurs first. If the grade of I is on a student's record at the time of graduation, it is treated as an F.

N  No grade. Assigned by the Office of Student Records when the instructor does not report a grade.

NC No credit. Assigned in some 100 level courses for failing work. No quality points assigned. A student who receives a grade of NC twice for the same course must obtain permission from the department offering that course before registering for it again.

P  Passing work. Assigned in some courses. See Pass-Fail Option.

S  Satisfactory work. Applicable to noncredit courses and to some specified credit courses, and will not be counted in the GPA.

U  Unsatisfactory work. Applicable to noncredit courses and to some specified credit courses. It will be counted as an F and computed in the GPA for undergraduates, but not graduate students.

W  Withdrawal. Recorded by the Office of Student Records when a student withdraws from a course with passing work. (See Withdrawal Policy.)

X  Excused absence from examination. Assigned by the instructor when a student completes all course requirements except the final examination. This grade becomes an F unless the examination is completed by the time of the announced deferred examination date at the beginning of the semester of next regular enrollment of the student. (See Examinations and UAH calendar.) Time schedule permits a student to take only one examination on this date. If a student receives more than one grade of X, he or she should make arrangements directly with other instructors for additional make-up examinations.

Change of Grade
When it is believed that a grading error may have occurred, a student is permitted a maximum of one semester from the date a grade is assigned to request a change of course grade. Grades submitted to the Office of Student Records can normally be changed only by submission by the instructor on a Change of Grade form containing a written explanation of the error. The Change of Grade form must be approved by the department chair and received in the Office of Student Records no later than two semesters from the date the original grade was assigned.

Pass-Fail Option
A student wishing to exercise a P-F option must apply to the Office of Registrar (UC 119) when registering or before the end of the third week of classes.

Any undergraduate student not on academic probation may take courses on a P-F basis. A student is limited to 12 semester hours of credit on a P-F basis over the course of the degree. Courses within an area of concentration (major, minor, cognate, track, cluster and option) may not be taken P-F. Required courses in English composition and mathematics may not be taken P-F. Departments may limit the P-F to courses outside the department or college.

A grade of P may be changed to a regular grade only if the student changes his or her program to an area in which a regular grade is required. The change must be initiated at the dean's office and must go through the normal grade change procedures. Once a P grade has been changed to a regular grade, the regular grade must remain.

Under the P-F system, a grade of P will not be counted in a student's grade-point average; a grade of F will be counted in a student's grade-point average.

Even though a student chooses to take courses on the P-F basis, instructor's grade sheets will reflect the regular grade and the student may be informed of the regular grade upon request.

Student Grade Report
At the completion of each semester, a report of final grades is mailed to the address furnished by the student.

Grade Point Average
The grade point average (GPA) is computed by dividing the total number of quality points earned at UAH by the total number of semester hours attempted at UAH (transfer grades are not included). Courses in which a grade of W, P, S, or AU is assigned are not included. 
Academic Achievement

Honor Scholar
An undergraduate student in good standing earning 12 or more semester hours in a semester with a GPA of 3.50-4.00 is distinguished by being identified as an honor scholar. A GPA of 4.00 is noted with an asterisk "**".
A student who takes less than 12 semester hours a semester and establishes a GPA of 3.50-4.00 at the end of the semester in which a cumulative total of at least 12 semester hours are completed will be designated as an honor scholar. For this purpose, a part-time student's work will be considered in blocks that do not overlap.

Scholar
An undergraduate student in good standing earning 12 or more semester hours in a semester with a GPA of 3.00-3.49 will be designated on the list of scholars.
A student who takes less than 12 semester hours a semester and establishes a GPA of 3.00-3.49 at the end of the semester in which a cumulative total of at least 12 semester hours are completed, will be designated on the list of scholars. For this purpose, a part-time student's work will be considered in blocks that do not overlap.

Graduation with Honors
A student graduating at the bachelor's level will have honors determined by identifying the academic sessions containing the last 64 hours of coursework taken to fulfill graduation requirements, and the GPA of all courses taken by the student at UAH to satisfy degree requirements during those terms will be computed and the honors will be determined as follows:
If the GPA computed as above is 3.90 or above, the student graduates summa cum laude.
If the GPA computed as above is 3.70 or above (but below 3.90), the student graduates magna cum laude.
If the GPA computed as above is 3.40 or above (but below 3.70), the student graduates cum laude.

Honors Convocation
The University faculty recognizes and honors those students who have attained academic excellence at a convocation held in the spring of each year. At the Honors Convocation, students who have been inducted into the honor societies, who have been named to the dean's list in each college, and who have attained excellence in academic programs are recognized.

Academic Warning, Probation, and Dismissal
In order to be in good academic standing, students must maintain a grade point average above the Academic Action Threshold (AAT) which varies according to classification. For students with 0-32 credit hours, the AAT is 1.6; for students with 33-64 credit hours, the AAT is 1.8; for students with 65 or more credit hours, the AAT is 2.0.
A student whose semester GPA at UAH falls below the applicable AAT will be placed on academic warning, probation, or dismissal.

Academic Warning. Students are subject to academic warning
1. if they are in good standing and earn less than the applicable AAT for the semester; or
2. if they earn the applicable AAT or greater for the semester but the UAH cumulative is less than the applicable AAT.

Probation. Students are subject to academic probation if they are on academic warning and the current semester GPA is less than the applicable AAT and the UAH cumulative is less than the applicable AAT.
**Dismissal.** Students are subject to academic dismissal if they are on academic probation and the current semester GPA is less than the applicable AAT and the UAH cumulative is less than the applicable AAT.

A regularly admitted student dismissed for the first time is automatically eligible to re-enter after being out of school one semester. A student admitted in any special category and dismissed for the first time must petition the Admissions Committee for permission to re-enter after an absence of at least one semester.

A student dismissed for the second time is disqualified for readmission. After a period of one year, such student may petition for re-admission.

Individual colleges may have additional requirements specific to their programs. Refer to college sections.

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**Conditional/Probational to Regular Status**

Students admitted conditionally or on probation will be evaluated for regular student status after completion of at least 15 semester hours at UAH. If the student at that time has earned a 2.00 on all UAH coursework, the conditional/Probational classification will be changed to regular student status.

**Nondegree to Regular Status**

A nondegree student will be evaluated for regular admission when all necessary regular admission application materials are received by the Office of Admissions.

**Academic Appeals Process**

Academic appeals will originate in written form by the student and will be processed through the chair of the student's major department, the dean of the college, and the Office of the Provost and Vice President for Academic Affairs, in that order. Students classified as "special" will be routed through the most appropriate academic dean, but should begin by contacting the Academic Advisement and Information Center, 824-6290. Students should contact their major advisor for assistance.

**Visiting Student Program**

**Undergraduate**

A cooperative arrangement exists with Alabama A&M University, Athens State College, Calhoun Community College, Oakwood College and the University of Alabama in Huntsville. A similar arrangement exists with the University of Alabama at Birmingham and the University of Alabama. Under either of these arrangements, a student at any of the participating institutions may request permission to attend a course at one of the other schools. Conditions governing the granting of permission include the following:

1. The student must be a full-time student or a full-time University employee who is a part-time student. The credit hours to be taken at the host institution shall be counted in determining the full-time or part-time status of the student.
2. The course desired must be unavailable at the student's home institution.
3. Visiting students are normally limited to one undergraduate course a semester at the host institution except where the second course is a laboratory required to accompany the first course or the second course is a one hour course in basic military science.
4. The student must have an overall C average, and meet all prerequisites of the host institution.
5. The student's request must be approved by his or her advisor and other appropriate personnel.
6. Students will be admitted by the host institution to a course based upon availability of space for the visitor, to be determined by the class enrollment on the last day of regular registration.

Any student interested in participating in the Visiting Student Program should contact the Office of Student Records for information regarding the procedures to be followed.

Graduate

A cooperative arrangement exists with Alabama A&M University. Any student interested in participating in this program should consult the Graduate Catalog.

Transcripts

Official transcripts are issued and sent by the Office of Student Records to recognized institutions and agencies, which require such documents. Transcripts are issued upon the written request (on a form available in the Office of Student Records) of the student involved and payment of a transcript fee. Faxed transcripts are available for a fee, but are not considered official documents.

Transcripts may be issued to individual students; however, they will be marked as issued to student.

No transcript will be issued for a person who has a financial obligation to the University.

Junior Standing/64 Hour Transfer Limit

Once a student has achieved junior standing and has accumulated a total of 64 semester hours of credit from all sources, no additional credit may be transferred to UAH from a two-year institution. Exceptions to this policy must be approved prior to taking additional course work. Requests for exceptions must be in writing and approved by the UAH chair of the department where the course is taught, and by the dean of the college in which the student is enrolled.

Correspondence Study and Other Non-resident Credit

Up to 25 percent of the credit applied toward a baccalaureate degree may be earned by means other than residence credit at an approved institution. Examples of other means are credit by examination, correspondence study, educational experiences in the armed forces, and professional certificate programs. Persons interested in taking correspondence study courses through the University of Alabama in Tuscaloosa may obtain a catalog from the Office of Instructional and Testing Services, Room 226, Administrative Science Building, or by writing to the College of Continuing Studies, Independent Study Division, University of Alabama, P.O. Box 870388, Tuscaloosa, AL 35487.

Course Numbering System

<table>
<thead>
<tr>
<th>Range</th>
<th>Year Student Normally Takes Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>001-099</td>
<td>Refresher (noncredit)</td>
</tr>
<tr>
<td>100-199</td>
<td>Freshman</td>
</tr>
<tr>
<td>200-299</td>
<td>Sophomore</td>
</tr>
<tr>
<td>300-399</td>
<td>Junior (upper level)</td>
</tr>
<tr>
<td>400-499</td>
<td>Senior (upper level)</td>
</tr>
<tr>
<td>500-599</td>
<td>Advanced undergraduate credit or graduate credit. In the Colleges of Engineering and Administrative Science, graduate credit only. In the Colleges of Liberal Arts, Nursing, and Science may be either undergraduate or graduate credit. Check course listing for specific credit level.</td>
</tr>
<tr>
<td>600-699</td>
<td>Graduate</td>
</tr>
<tr>
<td>700-799</td>
<td>Graduate, Ph.D. level</td>
</tr>
</tbody>
</table>
Undergraduate Colleges, Majors and Degrees

The undergraduate academic programs of the University of Alabama in Huntsville are administered by five colleges with the following approved major programs:

College of Administrative Science
Areas of study in which majors are currently offered are:
- Accounting
- Management Information Systems
- Finance
- Marketing
- Management

Courses are also offered in business law and management science.

College of Liberal Arts
Areas of study in which majors are currently offered are:
- Art
- Communication Arts
- Elementary Education
- English
- Foreign Language
- French
- German
- Russian
- Spanish

Other areas with course offerings are Computer-mediated communication, Japanese, Latin, linguistics, statistics, women’s studies, and physical education.

College of Engineering
Areas of study in which majors are currently offered are:
- Chemical Engineering
- Civil and Environmental Engineering
- Computer Engineering
- Electrical Engineering
- Industrial and Systems Engineering
- Mechanical and Aerospace Engineering
- Optical Engineering

College of Nursing
All majors receive instruction in the theory of nursing as well as laboratory practice in a variety of clinical settings to prepare them for beginning-level practice in professional nursing. Graduates of this first professional degree are qualified to apply for licensure as registered nurses.

College of Science
Areas of study in which majors are currently offered are:
- Biological Sciences
- Chemistry
- Computer Science
- Mathematics
- Mathematics Education
- Optical Science
- Physics

Courses are also offered in atmospheric and environmental science, and statistics.

Degrees Offered
Programs are provided as indicated below for the undergraduate degrees of Bachelor of Arts, Bachelor of Science, Bachelor of Science in Business Administration, Bachelor of Science in Engineering, and Bachelor of Science in Nursing.

Bachelor of Arts—art, biological sciences, communication arts, elementary education, English, foreign language, history, mathematics, mathematics education, music, philosophy, political science, psychology, sociology.
Bachelor of Science—biological sciences, chemistry, computer science, mathematics, mathematics education, optical science, physics.

Bachelor of Science in Business Administration—accounting, finance, management, management information systems, marketing.

Bachelor of Science in Engineering—unified programs with professional specializations.

Bachelor of Science in Nursing—unified professional curriculum.

Dual Degree/Second Bachelor's Degree

A student may choose to have a double major and earn one degree. (See Double Major.) The following policy applies to those students who wish to earn two degrees simultaneously (See Dual Degree) or sequentially to a first degree (See Second Bachelor's Degree). As early as possible, a student should meet with an assigned faculty advisor to indicate on the Program of Study form the intent to pursue a second degree. The Program of Study form must specify the requirements for each degree and contain the approval of the appropriate chairs and dean(s).

Dual Degree

If a student elects to earn a second degree simultaneously with a first degree (e.g., B.A. and B.S.), the student must: (1) satisfy all applicable requirements for each degree; (2) earn at least an average grade of C in all UAH coursework; (3) complete a minimum of 128 hours in the combined degree program; and (4) complete majors and/or minors appropriate to the degrees (a major for one degree may count as a minor for the other degree).

Second Bachelor’s Degree

If a student elects to earn a second degree at UAH after having earned a first degree at UAH or another institution (e.g., B.A. after earning a B.S.B.A.), the student must: (1) satisfy all applicable requirements for each degree; (2) earn at least an average grade of C in all UAH coursework; (3) complete a minimum of 25% of the total degree requirements at UAH for the second degree; and (4) complete majors and/or minors appropriate to the degrees (a major for one degree may count as a minor for the other degree). A specific course required for both the first and second degree does not have to be repeated; however, a course applied toward the minimum number of hours required for the first degree cannot be applied to the minimum number of additional hours for the second degree.

Double Major

With approval of the two appropriate departments, a student who wishes to concentrate in two disciplines may pursue a program of study that leads to a B.A. or B.S. degree with a double major. The minor requirement is waived for students with double majors. General education requirements and all requirements stipulated for each of the two majors must be completed. The total requirements of some programs may exceed 128 semester hours.

Declaring a Major

When applying to enter UAH, prospective students may declare a major or program of study. Some students are not yet decided, and may declare "undecided". The Colleges of Administrative Science, Engineering, and Nursing assign advisors. Students in the Colleges of Liberal Arts and Science and undecided students will be advised in the Academic Advisement and Information Center (AAIC), Room 118, University Center. When a student in the Colleges of Liberal Arts or Science declares a major, the student will be assigned an advisor by the department chair. At that time the complete advising folder will be transferred from the AAIC to the relevant department chair for permanent retention. Sophomores who have not declared a major will continue to have their registration forms signed in the AAIC. For procedures in the Colleges of Administrative Science, Engineering, and Nursing, contact the advising office of the college.
Program of Study
The Program of Study form is a document prepared cooperatively by a student and a responsible faculty advisor, with the prior assistance of the Office of Student Records in preparing the evaluation of transfer credits and reviewing general education requirements. Academic departments and colleges must assume responsibility for ensuring that each of their students has an opportunity to develop a Program of Study form before the end of the student's sophomore year. Once the Program of Study form has been accurately completed and signed by the appropriate individuals, it becomes a contract between the student and the university with responsibilities bearing on both parties.

Change of College
Students who are pursuing a program of study in one college at UAH and desire to change to a program in another college may petition to do so by making application at the Office of Student Records. Academic advisement before changing programs may help students avoid losing credits. Application of previously earned credits toward the new program will be determined after the transfer has been approved.

Application for Graduation
Candidates for graduation must file their application at least one semester prior to the time requirements are expected to be completed. Application forms may be obtained at the Office of Student Records. Early application will assist the student by confirming requirements remaining to be completed. Requirements must be completed and certified prior to the published deadline. Diplomas are issued at Spring commencement.

Total Degree Requirements
1. Minimum requirements for the Bachelor of Arts, Bachelor of Science, Bachelor of Science in Business Administration, and Bachelor of Science in Nursing degrees are 128 semester hours; for the Bachelor of Science in Electrical and Industrial and Systems Engineering degree, 129 semester hours; for the Bachelor of Science in Chemical Engineering, 134 semester hours; for the Bachelor of Science in Civil and Mechanical Engineering degree, 133 semester hours; for the Bachelor of Science in Optical Engineering degree, 137 semester hours; and for the Bachelor of Arts in Music, 134 semester hours. A minimum of 25 percent of the total requirements and 12 of the last 18 hours must be completed at UAH. Also, unless otherwise specified by the department involved, a minimum of 12 semester hours of upper-level courses numbered 300 or above must be completed at UAH in a student's program (6 hours in the major and 6 hours in the minor or cognate studies). A minimum of 30 percent of the total degree requirements must be taken in courses numbered 300 or above.
2. The maximum amount of correspondence or credit by examination allowed towards a bachelor's degree is 25 percent of the degree requirements.
3. An overall average of C is required for all courses taken at UAH; and in all courses in the major discipline taken at UAH; and in all courses in the minor discipline taken at UAH or in all courses listed in the cognate studies option taken at UAH.
4. Additional degree requirements for each degree are described in the appropriate sections of this catalog.

Requirements for Programs Leading to the B.A. Degree
Requirements for the B.A. Degree are described in the College of Liberal Arts section of this catalog.

Requirements for Programs Leading to B.S. Degree
Requirements for the B.S. Degree are described in the College of Science section of this catalog.
Requirements for Programs Leading to B.S.B.A., B.S.E., and B.S.N. Degrees

Requirements for professional programs offered are described in the appropriate sections of this catalog. These programs include the Bachelor of Science in Business Administration, the Bachelor of Science in Engineering, and the Bachelor of Science in Nursing.

Time Limit

The degree requirements for graduation are normally those specified in the catalog in effect when a student first enters UAH as a degree-seeking student. At any time during the student's enrollment that requirements for graduation are changed, a student may elect to graduate under the new requirements.

If the student does not complete requirements for graduation within seven years from the date of entry or seven years from the date of the catalog chosen, the student must then change to the catalog in effect and meet the requirements as specified. If a student breaks enrollment for a period of at least 24 months, the student must then change to the catalog in effect at the time of re-enrollment and meet the requirements as specified.

The student's advisor and college dean must approve any exceptions to this policy with the proper notation filed in the student's program of study in the Office of Student Records. At any point at which a change in catalog becomes necessary, a new program of study must be completed and proper notation filed in the Office of Student Records.

Army ROTC Program

Through the visiting student program, students at the University of Alabama in Huntsville may enroll in the ROTC Program in the Department of Military Science at Alabama A & M University. A prescribed course of study under the program prepares graduates for positions of officer leadership within the national defense structure. Depending upon qualifications students may enroll either in a basic or advanced course of study in the ROTC Program. Specific requirements and a description of the courses of study are provided in the current Alabama A&M catalog. Students interested in participating in this program should contact the Office of the Professor of Military Science at Alabama A & M University and the Office of Student Records at the University of Alabama in Huntsville.

Cooperative Education (Co-op) Program

Suzanne Norris, Director
117 Engineering Building
Telephone: (256) 824-6741
Email: coop@uah.edu
Web page: www.uah.edu/coop/

The UAH Cooperative Education (Co-op) Program provides the opportunity for the academic work of qualified students to be enriched with periods of practical work experience in business, industry, and government. It provides formal on the job training and professional contacts that will supplement the baccalaureate degree. Most students participating in the UAH Co-op Program alternate semesters of full-time study with semesters of full-time work directly related to their majors. The work experiences must accumulate to a total of at least one calendar year, be progressive in responsibilities, be monitored by the educational institution, and be related to the students' academic and career goals. Co-op students' performance on their jobs is evaluated, and completion of academic coursework is monitored. Some students may complete continuous part-time work assignments concurrently with a reduced class load.

A distinct feature of the UAH Co-op Program is the ability to find work assignments in the
local Huntsville area, although opportunities exist in other locales or states. Co-op students earn sufficient money to pay a substantial portion of their university expenses. At graduation, Co-op students are better prepared to secure full-time employment than students who do not Co-op. Over 2000 UAH students have completed the Co-op Program and gone on to successful careers.

Students majoring in all undergraduate disciplines are potential candidates for Co-op positions. There are nominal grade and credit hour requirements. While the highest demand is for engineering and technical fields, there are interesting opportunities available for administrative science, liberal arts, and nursing students. The UAH Co-op Program is accredited by the Accreditation Board for Engineering and Technology, Inc. (ABET).

The UAH Co-op Program is open to qualified UAH students, regardless of race, color, religion, sex, age, national origin, disability or veteran status. For more information, contact the Cooperative Education Office, 117 Engineering Building, Huntsville AL 35899.

**Honors Program**

Dr. Richard Modlin, Director  
336 Morton Hall  
Telephone: (256) 890-6450  
Email: modlinr@uah.edu

The Honors Program at the University of Alabama in Huntsville provides academically talented undergraduate students with opportunities to develop their special talents and skills within an expanded and enriched version of the curriculum. Honors coursework parallels regular offerings. The courses include special interdisciplinary seminars, and opportunities for independent study and research, including the opportunity to work closely with faculty on special student projects. Participating students also benefit from the interaction the Honors Program affords with other talented and highly motivated students.

Students who wish to participate fully in the program must earn a minimum of 28 hours in honors coursework by graduation. These hours easily serve in the students' curricula as courses to satisfy the GER, major and minor requirements, and electives, so they do not constitute additional hours overall. Individual courses of study will vary depending on the student's discipline. However, to fully complete the Honors Program of Study, all students need to complete four hours of Honors Forum (H100), two courses (6 hours) in Honors Interdisciplinary Seminars (H399), and an Honors Senior Project (4 hours). All entering freshman Honors Students will enroll in Honors English Seminar (EH 105) (3 hours). Students may complete additional hours to total the minimum of 28 hours by taking other designated honors courses in such disciplines as English, philosophy, music and art. Students may also contact for honors credit in other academic courses. With permission from the instructor, a student may elect to enter into a contract for honors credit for any regular academic course as well as course in their major and minor. The honors contract specifies the course content will be appropriate to earn honors credit.

The Honors Program serves academically talented students in all the colleges. Entering freshmen are invited to participate based on an evaluation of their ACT or SAT scores and high school grades. Students are encouraged to join the Honors Program at the beginning of their freshman year to gain full advantage of the program's benefits and enhanced curriculum. Interested UAH and transfer students, who have maintained a grade-point average of 3.3 or higher and who have completed less than 29 hours of coursework can still complete all requirements of the Honors Program. These, and other qualified undergraduate students with advanced academic classification, are encouraged to contact the director to determine how they may best participate in the program.

To completely review the honors course offerings, students should check the catalog course listings for each department. Courses specifically developed for the Honors Program are listed below. University students who meet appropriate admissions standards for the Honors Program may enroll in honors courses.
H 100  Honors Forum  
Regularly scheduled to enrich the experiences of Honors Program students using lectures, concerts, exhibits, and other events. Provides exposure to a broad range of academic disciplines. Prerequisite: admission to Honors Program.

EH 105(H)  Honors English Seminar  
(See offerings of the Department of English) Required for all students who enter the Honors Program before completing freshman English.

EH 250(H)  Honors World Literature I  
Focuses on major texts from the ancient world to 1700. Honors English 250 and 251 meet sophomore level literature requirements for the BS and BA degrees and constitute a sequence for engineering students.

EH 251(H)  Honors World Literature II  
Focuses on major texts from 1700 to the present.

H 399  Interdisciplinary Seminar  
Interdisciplinary study of a selected topic. The seminar will facilitate serious appraisal of an issue that crosses disciplinary boundaries and that can be explored using different scholarly methodologies.

For more information concerning the Honors Program, please write the Director of the Honors Program, The University of Alabama in Huntsville, Huntsville, AL 35899, or telephone 256-824-6450, email: modlinr@email.uah.edu.

Professional Preparatory Programs

Prelaw Program

To be admitted to an accredited law school, the student must have a bachelor's degree, an acceptable score on the Law School Admissions Test (LSAT), and, in most cases, an accumulative grade point average of B or better. The LSAT should be taken in June or October of the year before the student plans to enter law school. Applications to law school, together with test scores, transcripts, and recommendations, should be submitted to law schools no later than January 1 of the year the student plans to begin law school. For specific admission requirements, the student should consult the catalog of the law school he or she wishes to attend.

In pursuing a prelaw program at the University of Alabama in Huntsville, the student will find that the best preparation during the first two years is the completion of the general education requirements. The Statement on Prelegal Education of the Association of American Law Schools notes that "What law schools seek in their entering students is not accomplishment in mere memorization but accomplishment in understanding, the capacity to think for themselves, and the ability to express their thoughts with clarity and force." The prelaw student therefore must develop perception and skill in the English language, insight into the institutions and values with which people are concerned, and the power to think clearly, carefully, and independently. Since these skills are fostered by the general education requirements, completion of them should be the primary concern of the beginning prelaw student.

No law school recommends a particular major or minor as preparation for admission. Students should therefore design their program of study with the aim of further development and promotion of the skills listed above. Care should be taken in choosing electives. Aside from the courses in the general education requirements, the prelaw program often includes courses in political science, economics, philosophy (especially logic), American history, English, statistics, and computer science. One course in accounting is recommended. Since admission to law school is highly competitive, completion of recommended programs and requirements will not necessarily insure admission.

All prelaw students should seek academic counseling from prelaw advisors in the Departments of English, History, Political Science, and the College of Administrative Science. Materials and Academic Information
information are available in these departments or in the Academic Advisement and Information Center. The official Prelaw Handbook may be consulted in these offices or ordered from the Law School Admissions Services, Box 2000, Newtown PA 18940. (p. 75)

Preprofessional Health Programs

Preprofessional health programs could include premedical, predental, preoptometry, preveterinary medicine, preosteopathic medicine, prepharmacy, prephysical therapy, and many other related disciplines. UAH offers academic preparatory programs, which are flexible and provide a broad enough background to satisfy a wide variety of career objectives, including the diverse fields in the health professions. For some professional schools, acceptance might be dependent on good grades (i.e. above average), positive recommendations (e.g. employers, faculty), health related experiences (e.g. volunteering, internships), quality interview skills and acceptable admissions test scores (e.g. Medical, Dental, Optometry).

Many students entering professional schools (e.g. medical, dental) do so after earning an undergraduate and/or graduate degree. No particular academic major or minor is preferred. However, it is very important to consult with the desired professional school to determine specific admission requirements. Competition for admission to professional schools is very intense and students should realize that completion of only the admission requirements does not insure acceptance.

Typical of the requirements for admission to medical colleges are those which follow for the University of Alabama School of Medicine:

| 2. General chemistry with laboratory | 8 hrs. |
| 3. Organic chemistry with laboratory | 8 hrs. |
| 4. General biology with laboratory | 8 hrs. |
| (Additional biology electives recommended: genetics, embryology, cell biology.) | |
| 5. General physics with laboratory | 8 hrs. |
| 6. Two semesters of mathematics may include statistics or computer science | 6 hrs. |

Students are advised to choose programs of study according to individual interests and abilities so that they may fulfill their maximum academic potential.

Typical of the requirements for admission to dental schools are those which follow for the School of Dentistry of the University of Alabama in Birmingham:

| 1. Biological sciences | 12 hrs. |
| 2. Inorganic chemistry (including qualitative analysis) | 8 hrs. |
| 3. Organic chemistry | 8 hrs. |
| 4. Biochemistry is strongly recommended | 4 hrs. |
| 5. Physics (including laboratory) | 8 hrs. |
| 6. Analytic geometry and calculus | 6 hrs. |
| 7. 30 semester hours of non-science courses to include English (6 hrs.), history, political science, economics, philosophy, psychology, and sociology. | |
Courses to enhance manual dexterity (sculpture, painting, etc.) are encouraged. 30 hrs.

8. The completion of a minimum of 90 semester hours of collegiate work with a maximum of 60 semester hours earned at an accredited junior college.

Students interested in preprofessional health programs are encouraged to contact the UAH preprofessional advisor early in their college career by calling the Office of the Dean, College of Science.

**Introduction to University Life**

Introduction to University Life is a course designed to facilitate the successful transition of new students into the UAH community. This one credit hour elective course will assist students in the development of academic and personal skills that contribute to success in college, the workplace, and lifelong learning. The education strategy for the course includes cooperative learning, guided discovery activities, journal writing and various assessment measures.
Mission
The College of Administrative Science strives to meet the educational needs of our students by being the premier business school in north Alabama and a superior center for research in business including management of science and technology.

Accreditation and Membership
The Bachelor of Science in Business Administration (B.S.B.A.), the Master of Science in Management (M.S.M.), the Master of Accountancy (M.Acc.), and the Master of Science in Management Information Systems (MS-MIS) programs offered by the College of Administrative Science are accredited by AACSB International - The Association to Advance Collegiate Schools of Business.

The AACSB International is a not-for-profit corporation comprised of member organizations and institutions devoted to the promotion and continuous improvement of higher education for business administration and management. Organized in 1916, AACSB International is the premier accrediting agency for bachelor’s, master’s and doctoral degree programs in business administration and accounting.

The College is a member of the Association for University Business and Economic Research (AUBER). Organized in 1947, AUBER is the professional association of business and economic research organizations in universities.

The College is a member of the Alabama Small Business Development Consortium (ASBDC). The ASBDC provides management counseling and training to small business owners throughout Alabama.

Center for Management and Economic Research (CMER)
350 Administrative Science Building
Telephone: (256) 824-6407
Email: cmer@email.uah.edu

The center stimulates expansion of North Alabama’s economy by helping local managers define and realize growth opportunities and solve specific problems. It serves individuals and organizations through management and technical assistance, dissemination of economic and socio-economic information, and conducting research studies. Special emphasis is placed on businesses in technological fields.

Assistance areas include computer information systems, accounting, marketing, business strategy, human resource management, labor relations, organizational behavior, entrepreneurship, and organizational development.

CMER offers customized training programs for business and organizations. Training areas include microcomputer applications, accounting information systems, marketing, finance, competitive positioning, communication, strategic management, organizational design, and
international business.

The center conducts research studies for organizations. Typical studies include economic impact studies, benefit cost analysis, market opportunity analysis, fiscal impact analysis, and technology assessment.

Center for the Management of Science and Technology (CMOST)
350 Administrative Building
Telephone: (256) 824-6407
Email: cmost@uah.edu

The Center for the Management of Science and Technology (CMOST) is devoted to improving the state-of-the-art in the management of science and technology. CMOST funds and conducts research to develop new management techniques, is a "window on the world" source of the latest practices and a world-wide center for scientists, researchers and managers interested in the management of science and technology. CMOST focuses on the management of R&D, engineering, innovation, manufacturing, high-technology marketing, and new product development.

NorthEast Alabama Regional Small Business Development Center
225 Church Street
Telephone: (256) 535-2061
FAX: (256) 535-2050
Email: smallbus@hsvchamber.org

The NorthEast Alabama Regional Small Business Development Center (NEAR SBDC) provides assistance to small businesses and aspiring entrepreneurs. The mission of NEAR SBDC is to "Help small businesses survive and grow." The center provides four types of assistance: business management counseling, startup counseling, training/workshops, and a resource library.

Small business owners or managers receive professional assistance and direction in operating a business profitably. This may include counseling in one or more of the following areas: financial capital, business planning, personnel, record keeping, licensing, taxes, intellectual property, government procurement, governmental regulations, marketing, commercialization, Small Business Innovation and Research programs, market research, inventory control, or how to conduct a feasibility study. Small business reference materials (books and videos) are maintained in the NEAR SBDC reference library. Small business owners and entrepreneurs may visit the center and use business planning guides, watch or check out one of more than two dozen videos on business management, or work interactively with Internet, Electronic Data Interchange demos, and Electronic Commerce demos. For additional information, contact the NEAR SBDC at 225 Church Street, Huntsville, AL 35801. Mailing address: P. O. Box 168, Huntsville, AL 35804-0168.

Executive Education Program

The executive education program is designed to assist the members of the business, industry, and governmental communities in keeping abreast of changes in a complex environment. The College of Administrative Science offers an interactive blend of management educational programming ranging from one-session seminars on specific problems to a substantial sequence of classes custom tailored for corporate and governmental audiences. For more information, contact the Executive Education Program Office. Mail: ASB 202, UAH, Huntsville AL 35899. Phone: (256) 824-6736. FAX: (256) 824-6328. Email: executiv@email.uah.edu.

Degrees Offered

Bachelor's. The College of Administrative Science offers the Bachelor of Science in Business Administration (B.S.B.A.) degree. The B.S.B.A. encompasses majors in accounting, finance, management, management information systems, and marketing.

The following B.S.B.A. majors are offered during the day: accounting, finance, management-
business administration track, management-human resources management track, marketing-management track, marketing-e-business track, and management information systems. The following B.S.B.A. majors are offered after 5:00 p.m.: accounting, management-business administration track, and management information systems.

Students may obtain a second bachelor's degree in the College of Administrative Science if they:

1. Complete, in addition to credits earned while pursuing the first degree, in residence a minimum of 25 percent of the total degree requirements for the second degree;
2. Include a new major in the second degree;
3. Satisfy the College's general and major degree requirements in effect at the time they embark on the program leading to the second degree.

**Master of Science in Management (M.S.M.).** The M.S.M. degree emphasizes the management of technology including the special needs of businesses similar to those in the Huntsville metropolitan region. It was recognized by the National Research Council in 1991 as one of nineteen programs in the nation with a major thrust in the management of technology. It provides entry-level and mid-career managers with the practical and theoretical knowledge necessary to manage public and private organizations.

The M.S.M. program is an interdisciplinary curriculum that develops skills in applying advanced technology and behavioral concepts crucial to management. This curriculum supplies students with critical knowledge about a wide range of organizations through coursework in accounting, economics, finance, management, quantitative methods, marketing, management information systems, the worldwide dimension of management of organizations and the legal-social-political-ethical environment of organizations.

Highly qualified science and engineering graduates seek the degree to broaden their educational background and prepare themselves for careers in management. Highly qualified business graduates may be able to complete the requirements for a master's degree by completing one additional year of full-time course work beyond the bachelor's level. To meet the needs of employed students, courses are scheduled in the evening. Individuals who are interested in obtaining an M.S.M. degree should contact the College's Assistant Dean, 102 Administrative Science Building, (256) 824-6024. For more information on the M.S.M. program, refer to the Graduate Catalog.

**Master of Accountancy (M.Acc.).** The purpose of the M.Acc. program is to provide students with the background necessary to enter a career in public, private, or government accounting. The program is also designed to satisfy the 150 semester hours required by the Alabama State Board of Public Accountancy for Certified Public Accountant (CPA) examination candidates. The program exceeds the educational requirements for membership in the American Institute of Certified Public Accountants (AICPA), as well as those to sit for the Certified Management Accountant (CMA) and Certified Internal Auditor (CIA) examinations.

Reflective of the academic environment of UAH and the Department of Accounting and Information Systems, distinguishing features of the program include an information systems emphasis and a focus on understanding the role of accounting in managing business processes. Highly qualified undergraduate accounting graduates may be able to complete the requirements for the M.Acc. degree in one additional year of full-time course work beyond the bachelor's level. Individuals interested in the M.Acc. program should contact the M.Acc. Program Advisor, 126G Administrative Science Building, (256) 824-6159. For more information on the M.Acc. program, refer to the UAH Graduate Catalog.

**Master of Science in Management Information Systems (M.S. - M.I.S.).** The purpose of the M.S. - M.I.S. program is to provide students with advanced preparation as a specialist to enter a professional career involving the use, definition, analysis, design, implementation, and operation of management information systems. While the program will provide students with the background to enter the information technology (IT) profession in a wide variety of positions, the
overall structure of the program is designed to provide students with the educational framework appropriate for a career leading to the position of chief information officer (CIO). With program prerequisites kept to a minimum of six courses, the M.S.-M.I.S. program is designed to meet the needs of students with a wide variety of educational backgrounds. Applicants with an undergraduate degree in MIS will likely have completed all course prerequisites. Applicants with degrees in other areas will likely have completed two or three of these course prerequisites. Individuals interested in the M.S.-M.I.S. program should contact the Assistant Dean, 102 Administrative Science Building, (256) 824-6024. For more information on the M.S.-M.I.S. program, refer to the UAH Graduate Catalog.

Business Administration Minors
Students from colleges other than Administrative Science may select one of the minors in business administration. The minor consists of at least 21 semester hours but not more than 30 semester hours in subjects available in the College of Administrative Science. For minors in business administration, ECN 142 and 143 count in the general education requirement and not in the 30 semester hour maximum in the College. Students who choose one of the minors in business administration may be able to count ECN 142 and 143 to meet their social science Area IV degree requirements. A baccalaureate program with more than 30 semester hours (or 25 percent of degree requirements) in subjects commonly available in the College of Administrative Science must meet the AACSB curriculum content standard for a business degree. Such a program will be reviewed by the Director of Advisement to determine if it meets the B.S.B.A. degree requirements.

The approved business administration minors are shown below. The minor program must have the approval of the Director of Advisement, Room 102, Administrative Science Building.

Business Minor. Students may minor in business to facilitate career goals that require a broad knowledge of the functional areas of business. A minor in business includes the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>
| ECN 142 | Principles of Macroeconomics | 3 hrs.
| ECN 143 | Principles of Microeconomics | 3 hrs.
| ACC 211 | Financial Accounting         | 3 hrs.
| MSC 287 | Business Statistics I        | 3 hrs.
| FIN 352 | Money and Banking            | 3 hrs.
| MGT 301 | Managing Organizations       | 3 hrs.
| MKT 301 | Principles of Marketing      | 3 hrs. |
|          |                              | 21 hrs|

*Students taking AHS 300, MA 385, ISE 390 or equivalent introductory statistics should substitute a 300 or 400 level business elective.

International Business Minor. Students may minor in international business to facilitate careers in international trade that involve business firms, international organizations, or the U.S. government. Students interested in specializing in international trade should consider the B.A. in Foreign Languages and International Trade (FLIT) which includes a composite major offered by the College of Liberal Arts in the Department of Foreign Languages in cooperation with the College of Administrative Science. For additional information on the FLIT degree program, see the section of this catalog for the Foreign Languages Department. For the international business minor, students may fulfill the foreign language requirement by taking 12 semester hours in one or more foreign languages. A minor in international business includes the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>
| ECN 142 | Principles of Macroeconomics | 3 hrs.
| ECN 143 | Principles of Microeconomics | 3 hrs.
| ACC 211 | Financial Accounting         | 3 hrs.
| ACC 212 | Management Accounting        | 3 hrs.
| MSC 287 | Business Statistics I        | 3 hrs.
| FIN 301 | Principles of Finance        | 3 hrs.
| MGT 301 | Managing Organizations       | 3 hrs. |
Marketing Minor. Students may desire a minor in marketing to facilitate careers that involve business activities which transfer products and services from the producer to the consumer. A minor in marketing includes the following courses:

- MKT 301 Principles of Marketing 3 hrs.
- 18 hours selected from the following courses 18 hrs.
- MKT 315 Sales Management and Professional Selling
- MKT 332 Buyer Behavior
- MKT 342 Promotional Strategy
- MKT 343 Marketing Research Design
- MKT 414 Marketing Emerging Technologies
- MKT 415 International Marketing
- MKT 470 Marketing in an Electronic Environment
- MKT 480 Marketing Management 21 hrs.

Students outside of the College of Administrative Science are encouraged to take ECN 142, Principles of Macroeconomics and ECN 143, Principles of Microeconomics in their social science general education requirements.

Pre-Law Business Minor. The work of successful lawyers is increasingly associated with the rendering of opinions and counsel on business matters such as banking, insurance, real estate titles, business contracts, etc. Corporations employ many lawyers full time for their contract and other legal work, and the young lawyer who has a degree in business will be at a distinct advantage in obtaining and doing such work.

Each law school determines its own requirements, such as admission criteria, number and type of semester hours required for entrance, etc. Students planning to enter a law school should be in communication with that school shortly after entering college to insure the program they take will meet all requirements of the law school the student plans to attend. For more detailed information the student should read the Pre-Law Program section of this catalog.

The pre-law business minor includes the following courses:

- ECN 142 Principles of Macroeconomics 3 hrs.
- ECN 143 Principles of Microeconomics 3 hrs.
- ACC 211 Financial Accounting 3 hrs.
- ACC 212 Management Accounting 3 hrs.
- BLS 211 Legal Environment of Business 3 hrs.
- BLS 411 Business Law for Accountants 3 hrs.
- MSC 287 Business Statistics I 3 hrs.
- FIN 301 Principles of Finance 3 hrs.
- MGT 301 Managing Organizations 3 hrs.
- MKT 301 Principles of Marketing 3 hrs.
- 30 hrs.

Pre-MBA Minor. Students who do not major in business but plan to enter an MBA program upon graduation should be in communication during their junior and senior years with the MBA schools they are considering attending. Depending upon the MBA school selected, a student may be able to shorten the required MBA coursework by 18 graduate hours, depending upon the undergraduate coursework. The Director of Advisement for the College will assist students in
preparing a pre-MBA minor tailored for a specific school. A typical pre-MBA minor consists of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECN 142</td>
<td>Principles of Macroeconomics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ECN 143</td>
<td>Principles of Microeconomics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 211</td>
<td>Financial Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 212</td>
<td>Management Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>BLS 211</td>
<td>Legal Environment of Business</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MSC 287</td>
<td>Business Statistics I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MSC 288</td>
<td>Business Statistics II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>FIN 301</td>
<td>Principles of Finance</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 301</td>
<td>Managing Organizations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 301</td>
<td>Principles of Marketing</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MSC 385</td>
<td>Production/Operations Management</td>
<td>3 hrs.</td>
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</tbody>
</table>

Management Minor. Students planning for careers that include management responsibilities may consider a minor in management. The management minor includes the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT 301</td>
<td>Managing Organizations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 361</td>
<td>Organizational Behavior</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 405</td>
<td>New Venture Strategies</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>3 hours selected from the following courses:</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 363</td>
<td>Personnel: Human Resource Mgmt.</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 462</td>
<td>Govt. Regulation of Employment Relations</td>
<td>3 hrs.</td>
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</table>

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<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6 hours of Management courses at the 300-400 level</td>
<td>6 hrs.</td>
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</tbody>
</table>

Economics Minor. Students can minor in economics by taking 18 hours of economics courses. Twelve specific hours are required and the remaining six are electives. A total of twelve hours must be at the 300 level or above.

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECN 142</td>
<td>Principles of Macroeconomics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ECN 143</td>
<td>Principles of Microeconomics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ECN 340</td>
<td>Macroeconomic Analysis</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ECN 345</td>
<td>Microeconomic Analysis</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>6 hours selected from the following list of courses:</td>
<td>6 hrs.</td>
</tr>
<tr>
<td>ECN 352</td>
<td>Money and Banking (cross listed as FIN 352)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ECN 454</td>
<td>International Economics and Finance (cross listed as FIN 454)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ECN 470</td>
<td>Seminar in Economics</td>
<td></td>
</tr>
<tr>
<td>ECN 475</td>
<td>Labor Markets and Human Resources</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>18 hrs.</td>
</tr>
</tbody>
</table>

Economics as a Second Area of Study
Students majoring in elementary education may choose economics as their second area of study. The area of study requires 18 hours of economics and finance courses and the prior approval of the Chair of the Department of Economics and Finance.

BS/MSM 4+1 Degree Program
Students in UAH's College of Science who have an interest in business are encouraged to consider the BS/MSM 4+1 Program. By following the outline of courses shown here, students can earn a minor in Business as part of their B.S. degree, and then earn their M.S.M. graduate business degree in just one year instead of two.

Economics - Taken as part of Area IV "History, Social and Behavioral Sciences" requirements
Principles of Macroeconomics
Principles of Microeconomics

Calculus - Taken as part of Area V "Science or Engineering Course Outside the Major" if not taken in Area III or in the major or minor

Microcomputer Skills
Pre-MSM students must be proficient in the use of operating systems, word processing, spreadsheets, and presentation software. Deficiency in computer skills can be remedied by taking MIS 146 or a combination of the one-hour courses: MIS 102, 104, 106.

Statistics - Taken as part of Area V "Electives" requirement
MSC 287 Business Statistics I (or MA 385-Introduction to Probability, or ISE-390 Probability and Engineering Statistics I)
MSC 288 Business Statistics II (or MA 487-Introduction to Mathematical Statistics, or ISE 391-Probability and Engineering Statistics II)

Pre-MSM Minor (Science & Technology Business Minor)
ACC 211 Financial Accounting 3 hrs.
ACC 212 Managerial Accounting 3 hrs.
BLS 211 Legal Environment of Business 3 hrs.
MGT 301 Managing Organizations 3 hrs.
MKT 301 Principles of Marketing 3 hrs.
MSC 385 Production/Operations Management 3 hrs.
TOTAL MINOR HOURS 18 hrs.

Policies, Procedures and Assistance

Course Numbers
Course numbers are coded by prefixes as follows:
Accounting ACC
Business Legal Studies BLS
Economics ECN
Finance FIN
Management MGT
Management Information Systems MIS
Management Science MSC
Marketing MKT

Admission as a Freshman
Entering UAH freshmen interested in business administration must meet the general entrance requirements of the University. Students who intend to pursue the B.S.B.A. degree should read carefully the Admissions Information section of the catalog.

Students who have had inadequate high school preparation or who are placed in certain lower-level classes because of the results of placement tests may have to take one or more of the following courses:
EH 003 Basic English no credit
MA 004 Basic Algebra no credit
MA 033 High School Geometry no credit

These courses carry no academic credit but will appear on transcripts of students who complete the courses.

Admission as a Transfer Student
Transfer students seeking admission to UAH should read carefully the "Admissions Information" section of the catalog. Students planning to transfer into the College of
Administrative Science from a two- or four-year institution to obtain the B.S.B.A. are advised to follow the transfer program outlined below:

<table>
<thead>
<tr>
<th>Area I</th>
<th>Area II</th>
<th>Area III</th>
<th>Area IV</th>
<th>Area V</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition</td>
<td>Humanities and Fine Arts:</td>
<td>Natural Sciences and Mathematics</td>
<td>History, Social and Behavioral Sciences</td>
<td>Business</td>
</tr>
<tr>
<td>6 hrs.</td>
<td>Literature</td>
<td>Laboratory Science</td>
<td>History</td>
<td>Business Statistics</td>
</tr>
<tr>
<td>6 hrs.*</td>
<td>Fine Arts</td>
<td>Precalculus Algebra</td>
<td>Principles of Micro and Macro Econ.</td>
<td>Legal Environment of Business</td>
</tr>
<tr>
<td>3 hrs.</td>
<td>Humanities Elective</td>
<td>8 hrs.</td>
<td>Psychology, Sociology, Anthropology</td>
<td>Financial and Managerial Accounting</td>
</tr>
<tr>
<td>3 hrs.</td>
<td></td>
<td>3 hrs.</td>
<td></td>
<td>Microcomputer Applications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Business Calculus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6 hrs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6 hrs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>
| | | | | **Must take a 6 hour sequence in any literature.**

The specific credit for work done at other institutions that will apply toward the B.S.B.A. degree is determined by the College's Director of Advisement. Allowance of transfer credit by the Office of Admissions and Records does not necessarily mean that such credit will be applied toward a B.S.B.A. degree. All inquiries concerning the applicability of credit should be made to the College's Director of Advisement (256-824-6024).

Credit for business administration courses taken in schools with programs accredited by the AACSB-The International Association for Management Education is transferable to UAH. Credit for courses taken in programs without AACSB accreditation may be accepted with validation or approval of the Dean.

Course work taken at a junior college after a student has earned more than 64 semester hours of credit may not be accepted for transfer. Courses taken at the lower-division at another institution that are upper-division courses at UAH will be accepted for transfer only after successful validation.

See the College's Director of Advisement for the policy about specific transfer courses.

**Admission to the Upper-Division**

*Pre-Business Classification.* All undergraduate students entering the College of Administrative Science are admitted with a pre-business classification (code L). Regular students remain in this classification until they are admitted to the upper division of the College of Administrative Science (code U). Any request for deviation from these requirements must be petitioned through the College's Director of Advisement.

Students not admitted into the upper division may not attempt any business course numbered above 299.

To have the pre-business classification changed, students should apply through the College's Office of Academic Assistance for admission to the upper division of the College. The Office of Student Records cannot make this change.

*Special Student Classification.* Individuals admitted to the University as conditional/probational must have their status changed to regular through the Office of Student Records and complete all lower-division admission requirements before applying for admission to the upper
division of the College and choosing a major. Special students may not attempt upper-division business courses.

**Admission Standards.** Admission to the upper-division of the College of Administrative Science is available to students who have:

1. Completed 64 semester hours comprising the lower-division requirement.
2. Earned a minimum grade of "C" in both English Composition courses (EH 101 and 102).
3. Earned a minimum average GPA of 2.0 out of 4.0 ("C" average) for the 26 hours comprising the pre-professional business administration core.

Note: For degree-seeking students in the College of Administrative Science, admission to the upper-division is a prerequisite for all upper-division courses (numbered 300-499) in the College. Degree-seeking students in the College registering in upper-division business courses without completing the prerequisites and without being admitted to the upper-division will be administratively withdrawn from those classes.

**Student Advisement and Enrollment**

Advising for B.S.B.A. degree candidates is handled by the Director of Advisement in the College. The College's Office of Academic Assistance is a student's point of contact for information concerning possible majors, declaring a major, transfer credit and degree requirements.

First-year students are required to plan their course selection with the Director of Advisement in the Office of Academic Assistance (Room 102; ASB, telephone 256-824-6024).

All College of Administrative Science undergraduate students must have their registration cards signed by the Director of Advisement. Juniors and seniors who have met the following requirements do not need an advisor's signature:

1. A formal declaration of major (signed by the Director of Advisement and the student) is on file in the UAH Records Office.
2. Satisfactory completion of the lower-division general education requirements and the pre-professional business administration core curriculum.
3. Attained a minimum GPA of 2.0 out of 4.0 ("C" average) in the combined lower-division general education requirements and the pre-professional business administration core curriculum.

Each student is responsible for registering for all required courses in their proper sequence and for fulfilling all requirements for admission and graduation.

**Types of Advising Assistance Available**

The focus of advising in the College of Administrative Science is to help students progress toward their educational objectives. Advising is designed to provide assistance where desired and appropriate. Students, especially those nearing graduation, are encouraged to make full use of the advising system. The College's advising system offers:

**Transcript Evaluation.** Two aspects of transcript evaluation affect students: (1) Evaluation of course work to be transferred to UAH for degree credit and (2) the continuing evaluation of completion of graduation requirements. The evaluation of transfer work is initially accomplished by the University's Office of Admissions. Evaluation of business and economics course work is conducted by the Director of Advisement, working with various departments within the College.

The College's Office of Academic Assistance also keeps a current record of each student's progress at UAH.

**Schedule Building.** Schedule building is the determination of specific courses the student should take in a given semester. Students should refer to the UAH Schedule of Classes and the undergraduate catalog in consultation with the faculty advisor or the Director of Advisement to determine a specific course of study. Selection of specific course sections and times is the student's responsibility. The tentative schedule must be approved by the Director of Advisement, with certain exceptions explained above.
Program Planning. Students are encouraged to outline an entire plan of study early in their academic career. This program planning activity is provided by the College’s Director of Advisement and includes suggested model programs for each of the major fields of study offered by the College.

Referrals. Students seeking career guidance, personal counseling or other types of assistance will be directed to the appropriate university office by the Office of Academic Assistance.

Where to Find Advising Assistance

College’s Office of Academic Assistance (102 Administrative Science Building).

Students should come to this office for special advising assistance that cannot be resolved at other locations and to file appeals and waiver requests relative to College and University regulations. This office will also refer students to the appropriate office should the student be unsure as to where to find assistance.

University’s Student Records Office (University Center). The student records office maintains a complete and up-to-date file for each student admitted to the University.

Management Information Systems Placement Policy

Prior to enrolling in sophomore or upper division administrative science courses, students are presumed to have acquired basic computer skills. These skills include the use of a PC operating system, spreadsheet, word processing, and database software. Students are advised to enroll in three hours of microcomputer applications before taking any 200-level business courses. Students who have had a reasonable level of prior microcomputer experience beyond keyboarding will normally take MIS 146 to fulfill this requirement. Students with little or no prior computer experience should take MIS 101. This extra credit hour of microcomputer applications will count in the “Electives in Business Administration” area. Advanced students may choose at least 3 credit hours from other 100 level microcomputer applications courses approved by the College’s undergraduate curriculum committee (UCC). All students enrolling in upper division administrative science courses will be expected to have mastered word processing, spreadsheets, and database software.

Probation and Dismissal

Students are placed on probation at the end of any semester in which they do not attain a cumulative GPA necessary for satisfactory progress. For more detail on the process, see the Academic Probation and Suspension section of the catalog.

When dismissed, the student must petition the College of Administrative Science for readmission. Application should be made in the Student Records Office, University Center.

Residence Requirement

At least 12 of the last 18 semester hours of a student's program and a minimum of 32 semester hours of the total degree program must be completed at UAH. For B.S.B.A. students, the hours taken in residency must include at least 50 percent of the B.S.B.A. program (core curriculum and major option) including a minimum of 12 hours in the major option and MGT 499, Business Policy. Students who are required to take additional courses within the College of Administrative Science in order to meet the residence requirement may be required to complete more than 128 semester hours in order to graduate.

Cooperative Education Program

The College of Administrative Science participates in the University's Cooperative Education Program. The program is designed to provide relevant paid employment experiences that integrate, complement and enhance the student's academic program. The students are placed in co-op positions in a variety of business settings, including government agencies, financial institutions, social agencies, accounting firms, entrepreneurial companies and many others. Co-op placements must be approved by the student's faculty sponsor.
Participation in the co-op program requires completion of designated entry-level courses. The program is open to both undergraduate and graduate students in business. More information is available from the business coordinator in the Office of Cooperative Education.

Internship Program Guidelines

The internship program is designed to provide professional work experience for students in a field relevant to their major.

The program consists of active involvement in a project in a business enterprise, professional organization or in a government agency that has particular interest and relevance to the student. The course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.

The prerequisites are junior standing, 9 semester hours of upper-division work in the student's discipline, and approval of the department chair.

In addition to making a judgment on the merit, quality, and relevance of the proposed internship program, the chair will require the following academic prerequisites prior to approval:

1. completion of sufficient coursework in the major relevant to the internship project
2. a minimum GPA of 3.0 in all courses attempted in the College
3. completion of at least 15 semester hours at UAH

An internship may be elected only once, i.e. a maximum of 3 semester hours toward the B.S.B.A. degree. The internship may count as an elective within the major.

The current cooperative education activity does not qualify for an internship. However, in exceptional cases, a student may be allowed to do an internship at the "Co-op" organization during the study semester. The student must meet all the requirements for internship.

Interested students should contact the Director of Advisement in Room 102 ASB and/or the internship coordinator in the Office of Career Services for information on obtaining an internship and its requirements for satisfactory completion.

Catalog Requirements and Changes

The College of Administrative Science reserves the right to modify curricula and specific courses of instruction including course prerequisites, to alter requirements for graduation and to change the majors to be awarded at any time the College may determine. Such changes may be applicable to either prospective or currently enrolled students.

All official notices affecting the College of Administrative Science undergraduate students are posted in the Office of Academic Assistance (102 ASB). The notices officially update the university catalogs and are binding, as if published in the catalogs, on students pursuing programs offered by the College.

All College of Administrative Science students enter the College under all university and College policies then in effect. Each student is responsible for meeting all catalog requirements for graduation, including taking courses in the proper sequence as shown in the catalog.

Due to rapid advancement in knowledge, a student is permitted seven years from the original date of entry to complete a four-year curriculum, after which time a re-evaluation of all work previously taken may be required. Each time a student changes a major or option, a re-evaluation of all work already taken is done in terms of that particular program's requirements. It may occasionally be necessary to revise the curriculum for the B.S.B.A. degree. However, any student may graduate under the catalog in effect at the time he or she entered the university, provided that all degree requirements are satisfied within seven years from the day of admission.

Any deviations from curricular and other College requirements (for example, substitution of courses) must be approved in writing in advance of the deviation. Such changes must normally be recommended by the student's department chair and approved by the Director of Advisement.
Bachelor of Science in Business Administration
Degree Requirements

The Bachelor of Science in Business Administration degree program is a comprehensive four-year program which includes a liberal arts and science foundation, a business administration core curriculum, a major, and a choice of elective courses.

The undergraduate curriculum is divided into the lower and upper division. The lower division is the first two years of courses (courses numbered 100-299); the upper division is the last two years (courses numbered 300-499). Prior to taking their first courses in the upper division, students must be admitted to the upper division by the Director of Advisement. To prepare students for the challenges of the future, the College's program provides a solid foundation in the diverse academic disciplines related to the needs of business, industry, and government. At the undergraduate level students concentrate the first two years of study on general course work in composition, the humanities and fine arts, history, social and behavioral sciences, and natural and physical sciences and mathematics. Successful completion of these courses broadens intellectual awareness and enhances the development of cultural literacy and analytical thinking. This general education component, along with the pre-professional business administration core curriculum, prepares the student for admission to upper-division course work in the College of Administrative Science.

The remaining two years of course work develops the student's understanding of the diverse functions of business in the U.S. and world-wide economy. This is accomplished by studying the essential concepts of business administration as well as focusing on one of the major disciplines. The student may declare a major in accounting, finance, management, management information systems, or marketing. Students enrolling in the College's programs who have already chosen the major they wish to pursue may designate that major when they register. Students who are undecided about what major they wish to pursue should mark management on the registration form.

To be awarded a B.S.B.A. degree, each student must meet the following degree requirements established by the university and the faculty of the College of Administrative Science:

1. Complete the lower-division general education requirement;
2. Complete the lower-division pre-professional business administration core curriculum;
3. Complete the upper-division general education requirement;
4. Complete the upper-division business administration core curriculum;
5. Complete the courses required for the major;
6. Complete a minimum of 128 semester hours of work with a minimum of 39 semester hours in courses numbered 300 and above;
7. Attain a minimum grade point average of 2.0 (C) in all course work attempted;
8. Attain a minimum grade point average of 2.0 (C) in the business administration core curriculum (50 hours);
9. Attain a minimum grade point average of 2.0 (C) in the major.
10. Complete the business policy course (MGT 499) with a minimum grade of "C"; and
11. Comply with University and College of Administrative Science residence requirements.

Three levels of requirements must be completed in order to receive the Bachelor of Science in Business Administration degree: (1) university general education and graduation requirements, (2) College of Administrative Science core requirements, and (3) College of Administrative Science major requirements. The recommended sequence of courses is presented in the following sections.

Lower Division Requirements: 64 Semester Hours

The lower-division courses provide a foundation for advanced study. While students broaden their intellectual background through the general education requirements, they also
develop basic business skills in the pre-professional business administration core curriculum. The general education requirements expose students to composition, humanities and fine arts, natural sciences and mathematics, and history, social and behavioral sciences.

I. Lower Division General Education Requirements

1. English Composition I & II (EH 101-102) 
2. Humanities and Fine Arts
   a. Survey of Literature*
      (EH 205-206 or 240-241)
   b. Fine Arts
      Art History Survey: Ancient to Renaissance (ARH 100)
      Art History Survey: Renaissance to Modern (ARH 101)
      Introduction to Drawing (ARS 160)
      Introduction to Music Literature (MU 100)
      Introduction to Music Theory (MU 101)
      Theater Appreciation (CM 122)
   c. Humanities Electives
      Recommended: Introduction to Ethics (PHL 202)
3. Natural Sciences and Mathematics
   a. Laboratory Science**
      Choose biology, chemistry, environmental science or physics
   b. Mathematics (MA 117 and 145)***
4. History, Social and Behavioral Sciences
   a. History
   b. Psychology, sociology, or anthropology

Total General Education Requirements

*Must take a 6-hour sequence in any literature.
**Students who have completed 10 quarter hours (or 6.6 semester hours) of laboratory science will be considered to have met this requirement.
***Students may select MA 117 or 119. MA 117 is recommended for business students.

However, students should note that MA 117 may not be accepted as transfer credit by other institutions in Alabama if they transfer from UAH before completing MA 145. If they transfer after completing MA 145, there is no transferability problem. ACT Mathematics Placement: Students scoring below 20 on the quantitative section of the ACT will be required to pass MA 004 (Basic Algebra) before enrolling in MA 117 (or MA 119). Students scoring 26 or higher should enroll in MA 145 and choose 3 hours of electives outside the College of Administrative Science. Mathematics Placement Test: Students scoring sufficiently high on a mathematics placement test at UAH may skip MA 117 (119) and/or MA 004. Students placing at Level III on the placement test should enroll in MA 145 and choose 3 hours of electives outside the College of Administrative Science. Students planning to emphasize quantitative methods, to minor in an area requiring at least two semesters of calculus, or to attend graduate school should choose the following mathematics sequence: MA 119, 121, 171.

II. Pre-professional Business Administration Core Curriculum

Macro and Micro Economics (ECN 142, 143) 
Microcomputer Applications (MIS 146 *)
Business Statistical Analysis I & II (MSC 287, 288)
Legal Environment of Business (BLS 211)
Financial Accounting (ACC 211)

Semester Hours

6 hrs.
3 hrs.
6 hrs.
3 hrs.
3 hrs.

85 College of Administrative Science
Management Accounting (ACC 212) 3 hrs.
Electives in Business Administration** 2 hrs.
    Recommend: MIS 103, 105, 110
Total Pre-professional Business Administration Core Curriculum 26 hrs.

Total Lower-division Requirements 64 hrs.

*Refer to MIS placement policy.
**Students in the Marketing: e-Business track should take MIS 108 and MIS 110.

Lower Division Schedule for Full-time Student

FRESHMAN

Fall Semester
English (EH 101)
Economics (ECN 142 or ECN 143)
Microcomputer Applications (MIS 146*)
Mathematics I***
History

(15 hours)

Spring Semester
English (EH 102)
Economics (ECN 143 or ECN 142)
Humanities Elective
Mathematics II **
Psychology, Sociology or Anthropology

(15 hours)

SOPHOMORE

Fall Semester
Financial Accounting (ACC 211)
Business Statistics I (MSC 287)
Literature I ***
Lab Science I (4 hrs.)
Business electives (2 hrs.)
Fine Arts

(18 hours)

Spring Semester****
Management Accounting (ACC 212)
Business Statistics II (MSC 288)
Literature II ***
Lab Science II (4 hrs.)
Legal Environment of Business (BLS 211)

(16 hours)

Total 64 hrs.

*Refer to Management Information Systems placement policy.
**If the student requires MA 004, the lower-division requirement will be 67 hours. In this case, the student is encouraged to enroll in summer school before the freshman year to complete MA 004.
***Must take a 6-hour sequence in any literature.
****The student should apply for admission to the upper-division at the beginning of the spring semester of the sophomore year, or upon completion of 64-semester hours.

Upper Division Requirements: 64 Semester Hours

Work in the last two years of study builds upon the foundation established by the general education requirements and the pre-professional business administration core curriculum. Upper-division requirements include upper-division general education courses, the business administration core curriculum, and courses in the major. Registration for courses in the upper-division is restricted. Please read the College's section, "Admission to the Upper-Division", to determine requirements to register.
III. Upper Division General Education Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategies of Business Writing (EH 300)*</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Business and Professional Communications (CM 313)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Economics Requirement (ECN 340, 345, 454, 475)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Electives outside the College of Administrative Science</td>
<td>5 hrs.</td>
</tr>
<tr>
<td>(These electives may be taken at the lower-division level)</td>
<td></td>
</tr>
<tr>
<td>Total Upper Division General Education Requirements</td>
<td>14 hrs.</td>
</tr>
</tbody>
</table>

*EH 300 is a co-requisite or prerequisite for all business courses with a number greater than 301 and a prerequisite for 400-level courses.

IV. Upper Division Business Administration Core Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting Information Systems (ACC 307)*</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Principles of Finance (FIN 301)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Managing Organizations (MGT 301)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Information Systems in Organizations (MIS 301)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Principles of Marketing (MKT 301)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Production Management (MSC 385)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>International Business (MGT 450)**</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Business Policy (MGT 499)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Total Business Administration Core Curriculum</td>
<td>24 hrs.</td>
</tr>
</tbody>
</table>

*Required for accounting and MIS majors. Students in other majors may substitute another 300-level accounting course.

**International Business Requirement. Business majors acquire a broad knowledge of international business and economic theories, problems and practices through taking MGT 450 and through the weaving of global issues in the business administration core curriculum. This requirement has been in effect since March 4, 1994.

V. Major (each major is described below)                                 | 21 hrs.        |
VI. Free electives (May be selected from any college within the        |                |
     University) (Marketing e-Business track requires MIS 114 and       |                |
     one of the following: MIS 340, MKT 496, CM 401, MIS 460)           | 5 hrs.         |
| Total Upper Division Requirements                                     | 64 hrs.        |
| Total minimum hours for a B.S.B.A. Degree                             | 128 hrs***     |

***No more than 6 hours of HPE activity and music ensemble courses may count toward graduation.

Majors in the B.S.B.A. Degree

The College offers the following majors: accounting, finance, management-business administration, management-human resources management, marketing management, marketing-e-business, and management information systems.

Department of Accounting and Information Systems

126 Administrative Science Building
Telephone: (256) 824-6593
Email: acc-mis@uah.edu

Associate Professors Bryson, Floyd; Assistant Professors Kile, Maddocks, Pendley, Reed, Reid, Rieder, Spearing, Templeton, Woodward; Lecturers Geinert, Knight, Whitten.
Accounting

Careers in accounting are frequently identified as being in public accounting, management accounting, governmental accounting, and internal auditing. The undergraduate accounting curriculum provides students with the basic educational background necessary to pursue careers in their fields. Accounting majors are encouraged to consult with the faculty about the opportunities available and the preparation needed in the different career areas.

Students considering the professional certification examinations upon graduation, such as the Certified Public Accountant (CPA), the Certified Management Accountant (CMA), or the Certified Internal Auditor (CIA), will need course work in accounting beyond the minimum requirements for the B.S.B.A. degree. The Alabama State Board of Public Accountancy requires 150 semester hours of credit in order to sit for the CPA examination. The College offers a Master of Accountancy (M.Acc.) degree that meets or exceeds requirements for professional accounting certification.

The accounting major is offered during the day and during the evening.

Requirements for a major in accounting within the B.S.B.A. degree are as follows:

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 313</td>
<td>Individual and Small Business Income Taxes</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 314</td>
<td>Cost Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 431</td>
<td>Principles of Auditing</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC XXX</td>
<td>Accounting Electives*</td>
<td>6 hrs.</td>
</tr>
</tbody>
</table>

*Students planning to sit for the CPA examination are advised to take two of the following as electives: ACC 413, 415, 417, 432. They should also take BLS 411 as a free elective.

Upper Division Schedule for Full-time Student

**JUNIOR YEAR**

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH 300*</td>
<td>MSC 385</td>
</tr>
<tr>
<td>FIN 301</td>
<td>MGT 301</td>
</tr>
<tr>
<td>MKT 301</td>
<td>ACC 313 (Tax)</td>
</tr>
<tr>
<td>ACC 310 (Intermediate I)</td>
<td>ACC 311 (Intermediate II)</td>
</tr>
<tr>
<td>ACC 307 (Systems)</td>
<td>ACC 314 (Cost)</td>
</tr>
<tr>
<td>MIS 301</td>
<td>(18 hrs.)</td>
</tr>
<tr>
<td></td>
<td>(15 hrs.)</td>
</tr>
</tbody>
</table>

**SENIOR YEAR**

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT 450</td>
<td>MGT 499</td>
</tr>
<tr>
<td>ACC 431 (Auditing)</td>
<td>ACC Electives</td>
</tr>
<tr>
<td>CM 313</td>
<td>ECN Requirement</td>
</tr>
<tr>
<td>Electives (3 hrs.)**</td>
<td>Electives (7 hrs.)**</td>
</tr>
<tr>
<td>ACC Elective</td>
<td>(16 hrs.)</td>
</tr>
<tr>
<td>(15 hrs.)</td>
<td>Total 64 hrs.</td>
</tr>
</tbody>
</table>

*EH 300, is a co-requisite or prerequisite for administrative science courses with a number greater than 301 and a prerequisite for 400-level courses.

**At least 5 of the 10 semester hours of electives must be outside the College of Administrative Science.

College of Administrative Science 88
Management Information Systems

The major in management information systems (MIS) is designed for students who want to become administrators or designers of information systems that utilize computers in a business or administrative environment. MIS subject matter includes computer hardware, computer software, database design, data communication, electronic commerce, systems analysis and design methodologies, behavioral issues and the business or administrative context within which computer systems are applied.

The MIS major is offered during the day and the evening.

Requirements for a major in management information systems within the B.S.B.A. degree are as follows:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIS 210*</td>
<td>Intro. to Computer Programming in Business</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 310*</td>
<td>Advanced Computer Programming in Business</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 340</td>
<td>Databases for Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 412</td>
<td>Information System Design &amp; Implementation</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 420</td>
<td>Electronic Commerce</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 460</td>
<td>Telecommunications</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS XXX</td>
<td>Upper division MIS elective</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

*MIS majors must complete a minimum of six semester hours (2 courses) of computer programming. While MIS 210 and MIS 310 are recommended, students may select courses in C, C++, COBOL, JAVA, and Visual Basic.

Management Information Systems Major
Upper Division Schedule for Full-time Student

JUNIOR YEAR

Fall Semester
EH 300 *
MIS 210
ACC 307
MIS 301
MGT 301
(15 hrs.)

Spring Semester
MSC 385
FIN 301
MKT 301
MIS 310
MIS 340
Electives (2 hrs.)**
(17 hrs.)

SENIOR YEAR

Fall Semester
MIS 420
MIS 460
CM 313
MGT 450
Electives (5 hrs.)**
(17 hrs.)

Spring Semester
MGT 499
MIS 412
MIS Elective
ECN Requirement
Electives (3 hrs.)**
(15 hrs.)
Total 64 hrs.

*EH 300, is a co-requisite for administrative science courses with a number greater than 301 and a prerequisite for 400-level courses.  
**At least 5 of the 10 semester hours of electives must be outside the College of Administrative Science.
Finance

The B.S.B.A. degree in finance equips students with the modern analytic principles of the discipline that prepare them to function in a wide variety of institutional settings. The finance major prepares students for careers in investment management, banking, and corporate finance.

To be successful, a finance student should be proficient in economic analysis, algebra, elementary calculus, and statistics. The finance major is offered only during the day.

Requirements for the finance major within the B.S.B.A. degree are as follows:

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECN 345</td>
<td>Intermediate Microeconomics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>FIN 352</td>
<td>Money and Banking</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>FIN 361</td>
<td>Investments</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>FIN 431</td>
<td>Short-Term Capital Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>FIN 461</td>
<td>Portfolio Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>FIN 470</td>
<td>Commercial Bank Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>FIN 478</td>
<td>Long-Term Capital Management</td>
<td>21 hrs.</td>
</tr>
</tbody>
</table>

Finance Major
Upper Division Schedule for Full-time Student

**JUNIOR YEAR**

**Fall Semester**
- EH 300*
- FIN 301
- FIN 352
- MGT 301
- Elective (3 hrs.)**

(15 hrs.)

**Spring Semester**
- MSC 385
- MIS 301
- ACC 307***
- FIN 470
- ECN 345
- Electives (2 hrs.)**

(17 hrs.)

**SENIOR YEAR**

**Fall Semester**
- MKT 301
- FIN 361
- FIN 478
- FIN 431
- CM 313
- Electives (2 hrs.)**

(17 hrs.)

**Spring Semester**
- MGT 450
- MGT 499
- FIN 461
- ECN Requirement****
- Electives (3 hrs.)**

(15 hrs.)

Total 64 hrs.

*EH 300, is a co-requisite for administrative science courses with a number greater than 301 and a prerequisite for 400-level courses.

**At least 5 of the 10 semester hours of electives must be outside the College of Administrative Science.

****or a 300-level accounting elective

****FIN 454 recommended.
Management

A major in management enables the student to develop a better understanding of today's social, political, and industrial society. Such an understanding complements the skills developed in the program which are necessary for the effective and efficient operation of a wide range of governmental, business, and industrial organizations.

This major generally describes the planning, organizing and controlling of a business, including organizational and human aspects, with emphasis on various theories of management, the knowledge and understanding necessary for managing people and functions, and decision making.

The management major is structured to provide the broad education students will need for flexibility and mobility as future managers in various possible types of organizations. This permits students to elect one of two tracks to assist them in more adequately fulfilling requirements of their planned initial employment and to prepare students for advanced studies in their chosen fields.

There are two tracks in the management curriculum. The business administration track is offered for students whose career goals require a broad knowledge of the functional areas of management rather than the specialization of a major field. This major option would be used primarily by students planning to enter a small business where a specialization (such as accounting or management information systems) is not as appropriate an educational background as is extensive upper division coursework in three or four functional areas.

The human resource management track focuses on personnel administration, organizational behavior, and labor relations. This major option would be used primarily by students planning to enter positions as a personnel staff specialist, training director, wage and salary specialist, employment manager, benefits analyst, and industrial relations supervisor.

Requirements for a major in management within the B.S.B.A. degree are as follows:

Business Administration Track:

The Business Administration Track consists of 21 hours of coursework taken at the 300- or 400-level. A minimum of 6 hours must be taken in at least 3 of the disciplines shown below:

| Accounting | Management |
| Economics | Management Information Systems |
| Finance | Management Science |
| Marketing | |

Human Resource Management Track:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT 361</td>
<td>Organizational Behavior</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 362</td>
<td>Management &amp; Labor Relations</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>
MGT 461  Strategic Compensation Management  3 hrs.
MGT 462  Government Regulation of Employment Relations  3 hrs.
MGT 460  Employee Staffing and Development  3 hrs.
ECN 475  Economics of Labor Markets & Human Resources Administration  3 hrs.

Business Administration Track
Upper Division Schedule for Full-time Student

JUNIOR YEAR

Fall Semester
MGT 301
MKT 301
EH 300*
ACC 307***
Electives (3 hrs.) **

(15 hrs.)

Spring Semester
FIN 301
MSC 385
MIS 301
Discipline I
Discipline I
Electives (2 hrs.) **

(17 hrs.)

SENIOR YEAR

Fall Semester
MGT 450
Discipline II
Discipline II
Discipline II
CM 313
Electives (3 hrs.)**

(18 hrs.)

Spring Semester
MGT 499
Discipline III
Discipline III
ECN Requirement
Electives (2 hrs.)**

(14 hrs.)

Total  64 hrs.

*EH 300, is a co-requisite for administrative science courses with a number greater than 301 and a prerequisite for 400-level courses.
**At least 5 of the 10 semester hours of electives must be outside the College of Administrative Science.
***Or a 300-level accounting elective.

Human Resource Management Track
Upper Division Schedule for Full-time Student

JUNIOR YEAR

Fall Semester
ACC 307***
EH 300*
FIN 301
MGT 301
MKT 301
MGT 363
(18 hrs.)

Spring Semester
MSC 385
MIS 301
CM 313
MGT 362
Electives (3hrs.) **

(15 hrs.)
Marketing

The marketing major is composed of two tracks. The first is the marketing management track and the second is the e-business track. The marketing management track focuses on principles, practices and concepts involved in business activities which transfer products and services from the producer to the consumer. It includes the study of consumers and their behavior in the market, the channels of distribution, promotional consideration, and other related topics. In particular, this program focuses on the marketing research activities such as analysis of data on product and sales, the conducting of surveys and interviews, test marketing of new products, and preparation of recommendations to clients or internal management. The marketing management track prepares the student for careers with manufacturers, distributors, retailers, government, and other business operations. The program places particular emphasis on marketing in a high technology environment.

The second track within the marketing major is the e-business track. This track focuses on the strategic implications of e-business for both the consumer and business-to-business markets. Courses in this track include topics such as advertising and sales on the Internet, the use of web sites to provide service and support to customers, supply chain management via the Internet, utilizing the web for data mining in marketing research, mass customization, web site development, security issues in conducting transactions over the web, virtual shopping carts, database fundamentals, and legal issues associated with marketing on the Internet.

The marketing management and e-business tracks are offered only during the day.

Requirements for a major in marketing within the B.S.B.A. degree are as follows:

Marketing Management Track:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 315</td>
<td>Sales Management &amp; Professional Selling</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 332</td>
<td>Buyer Behavior</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 343</td>
<td>Marketing Research Design</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 414</td>
<td>Marketing Emerging Technologies</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 470</td>
<td>Marketing in an Electronic Environment</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 480</td>
<td>Marketing Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT XXX</td>
<td>Upper Division Marketing Elective</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

E-Business Track*:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 343</td>
<td>Marketing Research Design</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 480</td>
<td>Marketing Management</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

*EH 300, is a co-requisite for administrative science courses with a number greater than 301 and a prerequisite for 400-level courses.

**At least 5 of the 10 semester hours of electives must be outside the College of Administrative Science.

***Or a 300-level accounting elective.
### Marketing Management Track:
**Upper Division Schedule for Full-Time Student**

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JUNIOR YEAR</strong></td>
<td><strong>Spring Semester</strong></td>
</tr>
<tr>
<td>MKT 301</td>
<td>MSC 385</td>
</tr>
<tr>
<td>MGT 301</td>
<td>MIS 301</td>
</tr>
<tr>
<td>FIN 301</td>
<td>MKT 315</td>
</tr>
<tr>
<td>EH 300*</td>
<td>MKT 332</td>
</tr>
<tr>
<td>ACC 307***</td>
<td>MKT 343</td>
</tr>
<tr>
<td>Electives (3 hrs) **</td>
<td>(15 hrs.)</td>
</tr>
<tr>
<td>(18 hrs.)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SENIOR YEAR</strong></td>
<td><strong>Spring Semester</strong></td>
</tr>
<tr>
<td>MKT 470</td>
<td>MGT 499</td>
</tr>
<tr>
<td>MKT elective</td>
<td>MKT 480</td>
</tr>
<tr>
<td>MGT 450</td>
<td>MKT 414</td>
</tr>
<tr>
<td>CM 313</td>
<td>ECN Requirement</td>
</tr>
<tr>
<td>Electives (4 hrs) **</td>
<td>Electives (3 hrs) **</td>
</tr>
<tr>
<td>(16 hrs.)</td>
<td>(15 hrs.)</td>
</tr>
<tr>
<td></td>
<td>Total 64 hrs.</td>
</tr>
</tbody>
</table>

*EH 300 is a co-requisite for administrative science courses with a number greater than 301 and a prerequisite for 400-level courses.

**At least 5 of the 10 semester hours of electives must be outside the College of Administrative Science.

***Or a 300-level accounting elective.

### E-Business Track
**Upper Division Schedule for Full-Time Student**

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JUNIOR YEAR</strong></td>
<td><strong>Spring Semester</strong></td>
</tr>
<tr>
<td>MKT 301</td>
<td>MSC 385</td>
</tr>
<tr>
<td>MGT 301</td>
<td>MIS 301</td>
</tr>
<tr>
<td>FIN 301</td>
<td>MKT 315</td>
</tr>
<tr>
<td>EH 300*</td>
<td>MKT 332</td>
</tr>
<tr>
<td>ACC 307****</td>
<td>MKT 343</td>
</tr>
<tr>
<td>MIS 301</td>
<td>(15 hrs.)</td>
</tr>
<tr>
<td>(18 hrs.)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SENIOR YEAR</strong></td>
<td><strong>Spring Semester</strong></td>
</tr>
<tr>
<td>MKT 470</td>
<td>MGT 499</td>
</tr>
</tbody>
</table>

College of Administrative Science
MIS 420  
MIS 440  
MGT 450  
Electives (4 hrs)**  
(16 hrs.)  

ECN Requirement  
MKT 480  
e-Business Elective (3 hrs)***  
Electives (3 hrs)**  
(15 hrs.)  
Total  
64 hrs.

*EH 300 is a co-requisite for administrative science courses with a number greater than 301, and a prerequisite for 400 level courses.  
**At least 5 of the 10 hrs. of upper level electives must be outside of the College of Administrative Science. The E-Business track requires MIS 114 (1 hr.) as one of the free electives.  
***Choose one of the following: MIS 340, MKT 496, CM 401, MIS 460. This elective is a required part of the ten hours of upper division electives.  
****Or a 300-level accounting elective.

Possible Minors for the B.S.B.A. Degree  
B.S.B.A. degree candidates may supplement their degree program by choosing a minor. Students electing a minor may use the courses completed in the general education requirements as part of the required hours in a minor. However, students who choose a minor may be required to complete more than 128 hours. Courses counted in a minor may not be applied to core or major course requirements for a B.S.B.A. degree. Check with the Director of Advisement (Room 102, ASB).

Certificate in Accounting  
Many individuals express a desire to pursue a career in accounting after having earned a bachelor's degree in a discipline other than accounting. In order to meet the needs of such individuals, UAH offers a Certificate in Accounting program with three options, as described below:  
1. General Accounting Option—For individuals with a career interest in accounting who do not plan to sit for professional certification examinations.  
2. Management Accounting Option—For individuals with a career interest in management accounting who plan to sit for the Certified Management Accountant examination.  
3. Public Accounting Option—For individuals with a career interest in public accounting who plan to sit for the Certified Public Accountant examination.

Admission and Academic Standards for Accounting Certificate Candidates  
Admission to the certificate in accounting program requires that the student hold a bachelor's or master's degree in any discipline. The student must seek counsel from the College's Director of Advisement, and be admitted to UAH as a regular student before enrolling in the certificate in accounting program.  
To receive a Certificate in Accounting, a student must complete the curriculum shown below for the applicable option. Credit for work done on a prior degree may be accepted for any course in any option. However, a minimum of 18 hours must be taken at UAH for the General Accounting Option and a minimum of 24 hours must be taken at UAH for the Management and Public Accounting Options. At least 12 hours of the required UAH hours for any option must be in accounting courses. If necessary to meet the 18 or 24 hour requirement, electives may be selected from any 300 or 400 level course in the College of Administrative Science or may be selected from outside the College with the approval of the department chair.

General Accounting Option  
Business Curriculum:  

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 211</td>
<td>Financial Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 212</td>
<td>Management Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>BLS 211</td>
<td>Legal Environment of Business</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ECN 143</td>
<td>Principles of Microeconomics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 146</td>
<td>Microcomputer Applications</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MSC 287</td>
<td>Business Statistics</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

Total Business Curriculum 18 hrs.

### Accounting Curriculum:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 307</td>
<td>Accounting Information Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 313</td>
<td>Individual &amp; Small Business Income Taxes</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 314</td>
<td>Cost Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 431</td>
<td>Auditing</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

Total Accounting Curriculum 18 hrs.

### Management Accounting Option

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Accounting Option Requirements:</td>
<td></td>
<td>36 hrs.</td>
</tr>
<tr>
<td>FIN 301</td>
<td>Principles of Finance</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 301</td>
<td>Managing Organizations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Electives*</td>
<td></td>
<td>6 hrs.</td>
</tr>
</tbody>
</table>

Total Hours Required 48 hrs.

*Electives may be selected from any 300- or 400-level course in the College of Administrative Science or may be selected from outside the College with the approval of the department chair.

Completion of the Management Accounting Option, with a careful selection of electives, provides the basic educational background necessary to sit for the CMA examination. However, prior to taking the CMA examination, additional coursework or a rigorous preparatory course may be necessary in order to improve one's ability to pass the examination.

### Public Accounting Option

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Accounting Option Requirements:</td>
<td></td>
<td>36 hrs.</td>
</tr>
<tr>
<td>FIN 301</td>
<td>Principles of Finance</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 301</td>
<td>Managing Organizations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 413</td>
<td>Corporation, Partnership &amp; Estate Taxes</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 415</td>
<td>Advanced Financial Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 417</td>
<td>Government Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 432</td>
<td>Advanced Auditing</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC Elective</td>
<td></td>
<td>3 hrs.</td>
</tr>
<tr>
<td>BLS 411</td>
<td>Business Law for Accountants</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Electives*</td>
<td></td>
<td>9 hrs.</td>
</tr>
</tbody>
</table>

Total Hours Required 69 hrs.

*Electives may be selected from any 300- or 400-level course in the College of Administrative Science other than accounting.

College of Administrative Science 96
To receive the Certificate in Accounting—Public Accounting Option, a student must have a minimum of 150 semester hours from prior degree work and certificate work. If necessary to meet the total 150-hour requirement, electives may be selected from any 300 or 400 level course in the College of Administrative Science or may be selected from outside the College with the approval of the department chair. Completion of the Public Accounting Option meets the requirements of the Alabama State Board of Public Accountancy to sit for the CPA examination in Alabama. However, prior to taking the CPA examination, a rigorous review course may be necessary to improve one's ability to pass the examination.

A student who has no course work from a prior degree that can be accepted toward the certificate program should seek counsel from the College's Director of Advisement to determine whether a second bachelor's degree in accounting is preferable to completing the certificate program.

Certificate in Human Resource Management

The Certificate in Human Resource Management is designed to serve the needs of individuals who desire to pursue a career in human resource management or who are currently working in the field of human resource management after having earned a bachelor's degree that did not allow them to specialize in human resource management.

Admission Requirements for Certificate in Human Resource Management Candidates

Admission to the certificate in human resource management program requires that the student hold a bachelor's degree in a discipline other than human resource management. The candidate must secure the approval of the Chair of the Department of Management and Marketing and must be admitted to UAH as a regular postbaccalaureate student before enrolling in the human resource management certificate program.

Curriculum for Certificate in Human Resource Management

To receive a certificate in human resource management, the student must complete the curriculum shown below with a grade of at least a “C” in each course to be applied to the certificate. A student may transfer a maximum of 6 semester hours toward the certificate.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT 301</td>
<td>Managing Organizations: Theory</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Behavior, &amp; Communications</td>
<td></td>
</tr>
<tr>
<td>MGT 362</td>
<td>Management and Labor Relations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 460</td>
<td>Employee Staffing and Development</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 461</td>
<td>Strategic Compensation Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 462</td>
<td>Government Regulation of Employment Relations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Business electives</td>
<td></td>
<td>6 hrs.</td>
</tr>
<tr>
<td>Total Hours Required</td>
<td></td>
<td>24 hrs.</td>
</tr>
</tbody>
</table>

Courses of Instruction, Admission, and Descriptions

**Lower Division.** Courses numbered 100 to 199 are designed primarily for freshmen and courses numbered 200 to 299 are designed primarily for sophomores. Juniors, seniors and graduate students may be admitted for lower division credit. Graduate students may take these courses and receive lower division credit, but not graduate credit.

**Upper Division.** Courses numbered 300 to 499 are available only to juniors, seniors and graduate students. All students, both those admitted as majors in the College of Administrative Science and those admitted as majors in other colleges in the University, must meet College of Administrative Science
Administrative Science general prerequisite requirements in order to be admitted to upper division College of Administrative Science courses in addition to the specific course prerequisites cited in the course descriptions.

General prerequisites for all upper division College of Administrative Science courses are the completion of English 101 and 102, upper division standing (see above for requirements) and admission to UAH as a regular student. Any faculty member teaching an upper-division course in the College of Administrative Science may assume that all students have completed the specific courses listed under "Lower Division Requirements" above; and for courses with a number greater than 301, will have completed EH 300.

Graduate students may take these courses for upper division credit, but not for graduate credit.

Offerings. The following abbreviations indicate the component of the calendar the course normally will be offered: Su-Summer Term, F-Fall Semester, and Sp-Spring Semester. Course offerings by semester are subject to change dependent upon availability of faculty resources and to accommodate the needs of students.

Accounting (ACC)

Lower Division Courses

211 Financial Accounting 3 hrs.
Introduction to basic concepts that underlie accounting information. Topics include the statement of financial position, the income statement, the accounting cycle, internal control, and ethical and behavioral issues in financial reporting. Emphasis is placed on proper use of financial statement information. Prerequisites: Sophomore standing and equivalent. F, Sp, Su.

212 Management Accounting 3 hrs.
Introduction to the use of accounting information for internal planning and control. Topics include cost behavior, cost-volume-profit analysis, introduction to cost measurement, relevant costs for decision making, budgeting, performance evaluation, and ethical and behavioral issues related to the development and presentation of management accounting information. Personal computer and spreadsheet software are used. Prerequisite: ACC 211. F, Sp, Su.

Upper Division Courses (see requirements for upper division standing)

307 Accounting Information Systems 3 hrs.
Detailed review and analysis of procedures required to capture, classify, summarize, and report financial information. Topics include elements of accounting systems, business documents, considerations in systems design, flowcharting, and procedures to protect property and information. Emphasis on accounting information systems for small businesses. Extensive use of the personal computer. Prerequisite: ACC 212. F, Sp.

In-depth examination of issues concerning the measurement and reporting of income, cash flows, assets, liabilities, and owner's equity in financial statements. Topics include time value of money, current assets, fixed assets, and intangible assets. Reference is made to professional pronouncements and current literature, with attention to the financial reporting environment and rule setting process. This is the first of a two-course sequence. Prerequisite: ACC 212.
In-depth examination of issues concerning the measurement and reporting of income, cash flows, assets, liabilities, and owner’s equity in financial statements. Topics include long-term debt, leases, deferred taxes, and revenue recognition. Reference is made to professional pronouncements and current literature, with attention to the financial reporting environment and rule setting process. This is the second of a two-course sequence. Prerequisite: ACC 310. Sp, Su.

313 Individual and Small Business Income Taxes 3 hrs.
Determination of taxable income, business and non-business deductions, and selected aspects of tax accounting for individuals and sole proprietorships. Prerequisite: ACC 211. F, Sp, Su.

314 Cost Accounting 3 hrs.
Development and use of cost data for external reporting and internal planning and control. Topics include cost estimation and prediction, job costing, process costing, joint product and by-product costing, service department cost allocation, standard costing, activity-based costing, and transfer pricing. Development of relevant cost information for special purposes is also considered. Personal computer and spreadsheet software are used. Prerequisite: ACC 212. F.

413 Corporation, Partnership, and Estate Taxes 3 hrs.
Tax accounting for partnerships, corporations, S corporations, estates, and trusts. Tax administration and research are emphasized. Prerequisite: ACC 313. F.

415 Advanced Financial Accounting 3 hrs.

417 Government (Fund) Accounting 3 hrs.
Fund accounting at federal, state and local governments, hospitals and universities. Special accounting principles, budgeting, accounting for various funds and account groups, are emphasized. Prerequisite: ACC 211. F, Sp.

431 Principles of Auditing 3 hrs.

432 Advanced Auditing 3 hrs.
Practical application of auditing concepts and standards. An understanding of auditing principles is reinforced and expanded by exposure to problems and cases. Prerequisite: ACC 431. F, Su.

470 Seminar in Contemporary Accounting Issues 3 hrs.
Current topics in professional accounting. Pre- or Co-requisite: ACC 431 and senior standing.

490 Special Projects 3 hrs.
Independent study in an area of interest to the student in the fields of accounting. Prerequisites: senior standing and approval of the department chair.

495 Internship in Accounting 3 hrs.
Active involvement in a project in a business enterprise, professional organization, or government agency that has particular interest and relevance to the student. Prerequisites: senior standing and approval of the department chair, and subject to the College’s guidelines on internship. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis. F, Sp, Su.
Business Legal Studies (BLS)

Lower Division Courses

211 Legal Environment of Business 3 hrs.
Legal environment of business including ethical, social, and political influences on both profit and non-profit organizations. F, Sp, Su.

Upper Division Course (see requirements for upper division standing)

411 Business Law for Accountants 3 hrs.
In-depth study of legal principles and problems encountered in practice by professional accountants. This course covers legal topics from a Uniform Commercial Code perspective. Prerequisite: BLS 211. F.

Economics (ECN)

Lower Division Courses

142 Principles of Macroeconomics 3 hrs.
Reviews basics of individual market functions, then moves to the measurement of aggregate economic activity, models the determination of national income, and structures policy alternatives and their implications. Explains reasons for measurement of aggregate economic activity and presents measurements of output and income in nominal and real terms. Problems associated with achieving and maintaining macroeconomic stability are discussed. The aggregate expenditure model of output determination is presented and its application to fiscal policy demonstrated. Topics include structure and function of commercial banking, functions of money and mechanics of money creation, monetary policy options and their implications. Alternative macroeconomic models are presented and critiqued. The open economy model and its implications for the effectiveness of domestic fiscal and monetary policy is incorporated. Prerequisite: MA 004. F, Sp, Su.

143 Principles of Microeconomics 3 hrs.
Comprehensive coverage of individual market functioning, beginning with scarcity and the economizing problem, supply and demand are defined, and their non-price determinants presented along with obtaining of equilibrium price and quantity. The concept of elasticity is introduced and its measurement and interpretation in a variety of applications is demonstrated. Theories underlying demand and supply, utility maximization, and the production-cost relationship are developed. The firm's profit maximizing behavior is analyzed and applied to various demand conditions, market structures. Market functioning for each classification of resource is presented along with their implications for income distribution. Functioning of international markets and resulting exchange rate determination. Prerequisite: MA 004. F, Sp, Su.

Upper Division Courses (see requirements for upper division standing)

340 Macroeconomic Analysis 3 hrs.
Comprehensive study of the nation's economic system. Interdependent market processes in determining income, consumption, saving, investment, interest, employment, and the aggregate price level. Economic growth as influenced by institutional structure, technological change, business management, and government monetary and fiscal policy. Prerequisite: ECN 143. Sp.

345 Microeconomic Analysis 3 hrs.
Economic principles underlying the determination of prices in final goods and resource markets with additional training in application of these principles to problems of analysis. Prerequisite: ECN 143. F, Sp.
352 Money and Banking 3 hrs.

454 International Economics and Finance 3 hrs.
Behavior of foreign-exchange rates under different monetary standards, methods of financing international trade, historical development of international financial institutions, current and proposed methods for fostering international trade, and problems of international liquidity. Prerequisite: FIN 301. Sp.

470 Seminar in Economics 3 hrs.
Extensive readings and reports reflecting current developments and trends in economic theory and its application to the decision-making process in business and government. Prerequisite: Permission of the department chair.

475 Economics of Labor Markets and Human Resources 3 hrs.
Economic analysis of labor markets and institutions. Focus is primarily on understanding two general types of choices: (1) labor market choices of individuals which have implications for human resource management; and (2) choices made by organizations in the management of human resources and implications of those choices for employee behavior. Topics include individual decisions to supply labor, compensating wage differentials, human capital investments, discrimination in labor markets, pay and productivity, collective bargaining and strikes. Prerequisite: ECN 143.

Finance (FIN)
Lower Division Course
100 Personal Financial Planning 3 hrs.
Introduction to fundamental problems and concepts of personal financial planning. Topics include budgeting, real estate ownership, insurance, investments, and retirement and estate planning.

Upper Division Courses (see requirements for upper division standing)
301 Principles of Finance 3 hrs.
In-depth study of the basic principles of modern finance. Time value of money, security valuation, portfolio theory and net present value. Prerequisites: ECN 143, MSC 287, ACC 212. F, Sp, Su.

352 Money and Banking 3 hrs.

361 Investments 3 hrs.
Various investment media and an overall view of the investment decision process. Topics will include risk and return, valuation models, and fundamental portfolio theory. Prerequisite: FIN 301. F.

400 Investment Practicum 1, 2, or 3 hrs.
Small number of students work closely with faculty to invest real funds in the stock market. Emphasis is placed on individual stock selection and management of the portfolio to meet objectives. Prerequisite: FIN 301 (or its equivalent) and permission of the instructor. F, Sp, Su.
Short-term Capital Management 3 hrs.
Financial principles applied to financial management problems such as cash management; payables and receivables management; cost of short-term credit; and forecasting and financial planning. Prerequisite: FIN 301. F.

International Economics and Finance 3 hrs.
Behavior of foreign-exchange rates under different monetary standards, methods of financing international trade, historical development of international financial institutions, current and proposed methods for fostering international trade, and problems of international liquidity. Prerequisite: FIN 301. Sp.

Portfolio Management 3 hrs.
Continuation of FIN 361 with emphasis on theory, models, and functional application of investment portfolio management. Use of models in effective investment decision-making is stressed. Prerequisite: FIN 361. Sp.

Commercial Bank Management 3 hrs.
Financial management of commercial banks with emphasis on asset and liability management and techniques such as hedging and financial engineering to manage interest rate risks. Prerequisite: FIN 352. Sp.

Long-term Capital Management 3 hrs.
Financial theory as it relates to corporate policy, the efficient market hypothesis, capital structure theory, long-term financing and dividend policies. Prerequisite: FIN 301. F.

Special Projects 3 hrs.
Independent study in an area of interest to the student in the field of finance. Prerequisite: Senior standing and approval of department chair.

Internship in Finance 1, 2, or 3 hrs.
Active involvement in a project in a business enterprise, professional organization or in a government agency that has particular interest and relevance to the student. Prerequisite: Senior standing and approval of department chair, and subject to the College's guidelines on internship. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.

Management (MGT)
Lower Division Courses
100 Introduction to Business 3 hrs.
Career options for students interested in business are stressed. Fundamentals of business organizations, effective management and the functions of business are explored.

101 Introduction to Entrepreneurship 3 hrs.
Introduction to the startup of a new business and the entrepreneurial career. Focuses on elementary concepts of planning, financing, developing, and managing a new business.

Upper Division Courses (see requirements for upper division standing)
301 Managing Organizations: Theory, Behavior, and Communications 3 hrs.
Elements of the managerial process fundamental to successful operation of various types of enterprises including a study of organization theory, behavior, and interpersonal communication. Prerequisite: junior standing.

361 Organizational Behavior 3 hrs.
and social-systems approach to behavior of people at work in organizations. Behavioral decision-making, organizational theory, communication process, work motivation, groups, leadership, organizational climate, organizational development and other aspects of human behavior in organizations. Prerequisite: MGT 301.
Management and Labor Relations 3 hrs.
Examination of theory, institutions, and practice of union-management relations. Topics include environmental context of labor relations, the organizing process, the collective bargaining contract negotiation process, the administration of the collective bargaining contract, union effects on organizations and society, and comparisons of the U.S. labor relations system with labor relations systems in other countries.

Theories and practices related to human resource management functions, including strategic planning, internal and external staffing, training and development, compensation management, employee and labor relations, and international human resource management.

Negotiation Techniques 3 hrs.
Develops principles, skills, and techniques for effective negotiation and conflict resolution. Describes common mistakes in negotiation and provides a framework to prepare students for business or personal negotiation sessions. Prerequisite: senior standing.

New Venture Strategies 3 hrs.
Theory and application of strategies for start-up, operation, and control of new ventures. Role of entrepreneurship in the economy. Case studies of corporate and independent new ventures. Prerequisites: MGT 301 and senior standing, or permission of instructor.

Small Business Counseling 3 hrs.
Practical exposure to problems and opportunities of small business firms. Serve as a consultant to assist local business managers with identification of problems and formulation of alternative solutions, as well as identification of areas of market opportunity. Experience gained under the supervision of the Director of the Small Business Development Center. Prerequisite: approval of SBDC Director.

International Business 3 hrs.
Cross-discipline course combining theoretical and practical aspects of doing business in the global market. Three modules consisting of international management, marketing and economics/finance cover topics including the legal, socio-political environment, negotiations/diplomacy, import/export mechanics, international distribution, balance of payments, hedging, trade agreements (GATT), and international business strategy. Prerequisites: MGT 301, MKT 301, FIN 301.

Employee Staffing and Development 3 hrs.
Study of the fundamental concepts, issues and tools of employee staffing and development. Topics include forecasting staffing needs, recruitment strategies, development and validation of selection procedures, placement, socialization and development of employees, and the utilization of contingent workers.

Strategic Compensation Management 3 hrs.
Introduction to management of employees' compensation. Overview of compensation practices, behavioral and economic theories of compensation, and research on compensation programs.

Government Regulation of Employment Relations 3 hrs.
Analysis of the impact of government regulation on the management of human resources. Examines the implications for employer responsibilities and employee rights of evolving public policies pertaining to separations, discrimination, compensation, occupational safety and health, privacy, union-management relations, and other terms of employment.

Special Topics in Management 3 hrs.
In-depth study of a selected special topic relevant to contemporary management. Different sections of this course may address different topics. Prerequisite: senior standing.
490 Special Projects 3 hrs.
Active involvement in an on-going project in a business enterprise that has particular interest and relevance to the student, or an in-depth investigation of contemporary management problems. Prerequisites: senior standing and approval of department chair.

495 Internship in Management 1, 2, or 3 hrs.
Under the direction of a faculty advisor, experience is gained with an entrepreneur in a small business firm or a manager in a large firm. Prerequisite: Senior standing, approval of the department chair.

499 Business Policy 3 hrs.
Strategic decision-making with an emphasis on analyzing complex business situations. Formulation and implementation of business and corporate level strategies with emphasis on defining the mission; setting goals and objectives; analyzing current operating conditions, the general and industry environment and setting a unified strategic direction. This course should be taken with 12 or fewer semester hours. Prerequisites: Senior standing, EH 300, FIN 301, MGT 301, MIS 301, MSC 385, MGT 450. (Any of the last 4 courses listed may be taken concurrently with permission of instructor.)

Management Information Systems (MIS)
Lower Division Courses

101 Introduction to Microcomputing 1 hr.
Introduction to the use of microcomputing hardware and software with an emphasis on microcomputer operating systems and Windows.

102 Spreadsheet Applications 1 hr.
Introduction to the use of MS-Windows spreadsheet software to create and manage spreadsheets and graphics (bar, line, and pie charts) and to the application of spreadsheets for data analysis. Prerequisite: MIS 101.

103 Spreadsheet Applications II 1 hr.
Application of MS-Windows spreadsheets in advanced data analysis, graphical presentations, fundamentals of spreadsheet databases and macros, and the incorporation of spreadsheet data into other computer applications. Prerequisite: MIS 102.

104 Word-processing I 1 hr.
Introduction to MS-Windows based word-processing for creating, editing, and printing documents; font types and sizes; page formatting; spell and grammar checking. Prerequisite: MIS 101.

105 Word-processing II 1 hr.
Advanced word-processing techniques such as tables, graphical figures, equations, headers, footers, editing multiple documents, mail merge, and integration of word-processing with other computer applications. Prerequisite: MIS 104.

106 Presentation Graphics 1 hr.
Introduction to the fundamentals of MS-Windows presentation graphics with emphasis on freeform art, shapes, text, and animation. Integration of graphics, data and text to develop slide shows. Prerequisite: MIS 101.

108 Database Applications 1 hr.
Introduction to MS-Windows database application software with emphasis on creating and managing simple databases, querying and modifying records, and report generation. Prerequisite: MIS 101.

110 Introduction to the Internet 1 hr.
Introduction to the Internet, the World Wide Web, and e-mail with emphasis on browsing, searching, and remote computer access. Prerequisite: MIS 101. Lab. Fee: $20. (Same as CS 110.)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>112</td>
<td>Introduction to PC UNIX</td>
<td>1 hr.</td>
<td>Introduction to a PC-based UNIX (Linux) operating system, commands, file management, networking, and e-mail. Prerequisite: MIS 101. (Same as CS 112.)</td>
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</tr>
<tr>
<td>114</td>
<td>Web Publishing Using HTML</td>
<td>1 hr.</td>
<td>Hands-on instruction in HyperText Markup Language (HTML) and its application to web page creation and publication. Students will learn how to develop and publish their own home pages. Prerequisite: Knowledge of UNIX and Internet such as obtained in CS/MIS 110, 112. (Same as CS 114.)</td>
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</tr>
<tr>
<td>146</td>
<td>Computer Applications in Business</td>
<td>3 hrs.</td>
<td>Overall structure of computer problem solving and method of constructing computer solutions in a business environment. Overview of hardware/software systems. Data and information processing in organizations and other computer uses in management. Usage of business software packages such as Windows, word processing, spreadsheets, presentation graphics, and databases. Applications and examples will generally be from administrative areas. F, Sp, Su.</td>
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</tr>
<tr>
<td>210</td>
<td>Introduction to Computer Programming in Business</td>
<td>3 hrs.</td>
<td>Fundamentals of structured design and programming using a procedural language such as COBOL. Table handling and hierarchical data structure. Prerequisites: MIS 146 or CS 108. F, Sp, Su.</td>
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### Upper Division Courses (see requirements for upper division standing)

<table>
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<tr>
<th>Course Code</th>
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<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>301</td>
<td>Information Systems in Organizations</td>
<td>3 hrs.</td>
<td>Understanding the role of information systems in organizations and how they relate to organizational objectives and organizational structure. Introduces information system applications. Prerequisites: MIS 101, 104, 146, MSC 287, ACC 211, 212. F, Sp, Su.</td>
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</tr>
<tr>
<td>310</td>
<td>Advanced Computer Programming in Business</td>
<td>3 hrs.</td>
<td>Advanced business language such as COBOL features, control language and file handling (sequential, random and indexed sequential), program structure documentation, and maintenance. Course project in development and documentation of significant business application. Prerequisite: MIS 210. F, Sp, Su.</td>
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</tr>
<tr>
<td>320</td>
<td>Web Site Development</td>
<td>3 hrs.</td>
<td>Explores Internet technologies as they relate to web site development in a combination lecture and lab environment. Examines the various business models organizations employ when developing and designing web sites. Extensive exposure to web site design theory, visual web site development tools, web site management and deployment software, and the layout and processing of web based forms. Students develop a full-featured commercial web site. Prerequisites: MIS 110 and 114, or equivalent.</td>
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</tr>
<tr>
<td>340</td>
<td>Databases for Management</td>
<td>3 hrs.</td>
<td>Management of data resources to effectively support the information systems of organizations. Concepts supported by use of current DBMS software on mainframe and/or PC. Prerequisite: MIS 301. F.</td>
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</tr>
<tr>
<td>350</td>
<td>Advanced Data Bases for Management</td>
<td>3 hrs.</td>
<td>In-depth investigation of data modeling, system development, and data administration in a data base environment. Course project in development and documentation of significant business applications. Prerequisite: MIS 340.</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>Decision Support Systems and Expert Systems</td>
<td>3 hrs.</td>
<td>Analysis of information system components and technologies which aid the manager in the decision making process. Concepts supported by use of current DSS/ES software Prerequisites: MIS 301, MGT 301, MKT 301, FIN 301, and MSC 385.</td>
<td></td>
</tr>
</tbody>
</table>
412 Information Systems Design and Implementation
3 hrs.
Advanced coverage of the strategies and techniques of structured systems development. Emphasizes information analysis and the logical specifications of the system. Students prepare exercises and case studies to develop proficiency in information analysis techniques. Integrates computer technology, systems analysis, systems design, and organizational behavior in designing large-scale application or decision support systems. Prerequisites: MIS 301 or equivalent. F, Sp, Su.

420 Electronic Commerce
3 hrs.
Explores the benefits, capabilities, and related information technologies that comprise the current state of electronic commerce. Examines how to design and develop electronic commerce transaction processing based applications. Primary emphasis is on web-based e-commerce systems; Electronic Data Interchange (EDI) technology is also discussed. Students will develop an electronic commerce business application that utilizes a virtual shopping cart. Prerequisites: MIS 146 and a course introducing database concepts, such as ACC 307, MIS 108, 340. F, Sp, Su.

440 Web Programming and Database Integration
3 hrs.
Explores the use of scripting languages, such as Java Script, Active X controls, and Java Applets in web site development. Examines the use of relational databases to create dynamic web sites. Extensive exposure in lecture and lab to web-based application development tools. Students will develop a full-featured web-based business application that is interactive and requires database integration. Prerequisites: MIS 146 and MIS 320, or equivalent. Sp.

460 Telecommunications
3 hrs.
Overview of geographically distributed computer-communications facilities. Network design, structure and optimization are addressed. Regulated common carriers, data transmission, routine techniques, reliability, protocols, error detection, modems and controllers are included. Prerequisite: MIS 301. F, Sp.

465 Web Server and Internet Telecommunications Technology
3 hrs.
Examines the Internet telecommunications technologies required to implement, manage, and maintain an organization's web site. Topics include TCP/IP, IP addressing, subnet masks, routers, configuration and maintenance of web and DNS servers, and security issues. Prerequisites: MIS 301. Sp.

470 Management of the Microcomputer Environment
3 hrs.
Examines management issues, such as hardware and operating system selection, associated with operating in a distributed computing business environment. Emphasis is on micro computers using the Intel x86 architecture and their operating systems. The course is designed for end user managers or professionals who need to understand hardware and software comments and their implications without necessarily wanting to build or maintain microcomputers. Prerequisites: MIS 301 or the equivalent.

480 Current Topics in Management Information Systems
3 hrs.
Selected topics in management information systems. Topics will reflect the contemporary issues and current technological advancements which impact the development, implementation and management of effective information systems in organizations. Prerequisites: MIS 301 and approval of the instructor. F, Sp, Su.

490 Special Projects
3 hrs.
Independent study in an area of interest to the student in the field of management information systems. Prerequisite: senior standing and approval of department chair. F, Sp.
Internship in Information Systems 1, 2, or 3 hrs.
Active involvement in a project in a business enterprise, professional organization or in a government agency that has particular interest and relevance to the student. Prerequisites: senior standing and approval of department chair, and subject to College's guidelines on internship. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis. F, Sp, Su.

Systems Development Project 3 hrs.
Capstone course emphasizing the development of a computer application via the life cycle methodology. Semester projects will produce current system specifications, devise logical system design, develop a physical design for a new design and implement the design to the extent possible. Prerequisites: MIS 412.

Management Science (MSC)

Lower Division Courses
287 Business Statistics I 3 hrs.
Introduction to the concepts of probability and business statistics. Topics include collection, classification, and presentation of data, measures of central tendency, and dispersion of data; probability distributions; confidence limits and hypothesis testing. Prerequisite: MIS 101, MA 117 and 145 or other Level III mathematics. F, Sp.

288 Business Statistics II 3 hrs.
Inferential statistics for business decisions. Topics include: review of sampling distributions and estimation; inferences about means, proportions, and variances with one and two populations; goodness of fit tests; analysis of variance and experimental design; simple linear regression; multiple linear regression; non parametric methods. Prerequisite: MSC 287. F, Sp.

Upper Division Courses (see requirements for upper division standing)
385 Production/Operations Management 3 hrs.
Survey of the concepts, processes, and institutions involved with the production function of a firm. Topics include forecasting, production planning, and control, materials management, and quality control. Applications of management science tools to production problems. Prerequisites: MA 145, MIS 146, and MSC 288. F, Sp.

490 Special Projects 3 hrs.
Independent study in an area of interest to the student in the field of management science. Prerequisites: senior standing and approval of department chair.

495 Internship in Management Science 1, 2, or 3 hrs.
Active involvement in a project in a business enterprise, professional organization or in a government agency that has particular interest and relevance to the student. Prerequisites: senior standing and approval of department chair, and subject to College's guidelines on internship. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.

Marketing (MKT)
Upper Division Courses (see requirements for upper division standing)
301 Principles of Marketing 3 hrs.
Integration and study of functional commodity, and institutional approaches from view point of consumer and marketing manager. Prerequisite: junior standing.

315 Sales Management and Professional Selling 3 hrs.
Integration of techniques and concepts of professional selling with problems of sales management. Objectives and policies for sales managers concerning managing sales force and methods of marketing analysis in terms of sales forecasts and budgeting. Problems faced by sales management in competition, pricing, and promotion. Prerequisite: MKT 301.
316 Retailing Policy and Management
Policies, practices, and problem solutions in efficient operation of chain and independent retail stores. Store location, organizational layout, merchandise planning and control, buying, pricing, and promotion. Prerequisite: MKT 301.

325 Legal and Ethical Issues of Marketing on the Internet
Discussion of legal issues and ethical issues associated with marketing on the Internet. Topics include privacy issues, security, intellectual property, and Internet content licensing. Prerequisite: BLS 211.

332 Buyer Behavior
Interdisciplinary and organizational approach to analyze and interpret consumer buying habits and motives and the resultant purchases of goods and services. Purchaser's psychological, economic, and sociocultural actions and reactions as they relate to better understanding of consumption. Prerequisite: MKT 301.

342 Promotional Strategy
Promotional techniques available to marketing management. Consumer behavior and communication process by which products can be effectively promoted. Specific tools of personal selling, advertising, sales promotion, and publicity as components of overall promotional strategy. Prerequisite: MKT 301.

343 Marketing Research Design
Introduction to the principles and purposes of marketing research; relationship to other marketing functions and marketing information systems, data sources, review of research methodologies and ethical considerations. Prerequisites: MKT 301, MSC 287.

344 Marketing Research Applications
Application of the principles and purposes of marketing research; laboratory, field and historical research methodologies, experimental design, sampling procedures, questionnaire design, and data analysis. Prerequisites: MSC 287, MKT 301, 343.

345 Market Channel Structure and Strategy
Marketing channels as a functional area and the alternative choices available to marketing management in developing overall marketing strategy. Institutional structures and dynamic interrelationships in distribution logistics. Prerequisite: MKT 301.

414 Marketing Emerging Technologies
Comprehensive review of the new product development and marketing process. Emphasizes actual case examples showing how companies develop and market radically new products. Prerequisites: MKT 301.

415 International Marketing
Procedures and problems associated with establishing and carrying out marketing operations in or with foreign companies. Institutions, principles, and methods involved in solving these business problems. Effect of national differences in business practices and regulation. Prerequisites: MKT 301.

470 Marketing in an Electronic Environment
This course focuses on the strategic implications of electronic commerce for both the consumer and business-to-business marketplace. Through a combination of lecture, readings, and application exercises the impact of the Internet and related technological developments are explored in relation to their effect on the firm’s marketing activities. Topics for discussion include: advertising and selling on the Internet, the use of web sites to provide service and support to customers, supply chain management in the digital world, and data mining. Prerequisite: MKT 301.

480 Marketing Management
Management of marketing function of the firm; determination of objectives, organization and controls for effective utilization of marketing resources in coordinated effort with other functional areas. Identification and selection of market opportunities. Competitive
strategies and development of marketing policies and programs. Prerequisites: MSC 287, 288, MKT 332, 343.

490 Special Projects 1, 2, or 3 hrs.
Independent study in an area of interest to the student in the field of marketing. Prerequisite: senior standing and approval of the department chair.

495 Internship in Marketing 1, 2, or 3 hrs.
Active involvement in a project in a business enterprise, professional organization or in government agency that has particular interest and relevance to the student. Prerequisites: Senior standing, approval of department chair, and subject to College's guidelines on internship. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.

496 Internship in E-Business 1, 2, or 3 hrs.
Active involvement in an e-business project in a business enterprise, professional organization, or in a government agency that is of particular interest and relevance to the student. Prerequisites: Senior standing, approval of the department chair, and subject to the college's guidelines on internships. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.
Engineering is the profession that translates scientific thought into reality. By combining synthesis, analysis and design in creative and innovative modes, the engineer produces systems, processes, and products for the benefit of mankind. Those who desire to be part of this important effort can gain entry into the engineering profession by attending UAH. The College of Engineering is located in an urban area and also in the state's high technology area. Close proximity to the Marshall Space Flight Center, Redstone Arsenal, and much of Alabama's fastest growing technological industry gives the College of Engineering a special character that leads to outstanding educational opportunities for its students. This special setting, combined with a high quality faculty, affords maximum growth potential for those desiring to pursue a career in engineering. The College of Engineering is strongly committed to the advising of both undergraduate and graduate engineering students.

Laboratory fees have been eliminated from engineering courses. A surcharge (presently $15 per semester hour) is assessed on all engineering courses. The proceeds are earmarked for the upgrading of engineering laboratories, and for the acquisition, maintenance, repair and replacement of instrumentation and equipment to support the various engineering programs.

Degrees and Programs
The College of Engineering offers the Bachelor of Science in Engineering degree with options in chemical engineering, civil engineering, computer engineering, electrical engineering, industrial and systems engineering, mechanical engineering, and optical engineering. The undergraduate engineering programs are built around a core consisting of courses in mathematics, the physical sciences, humanities, and engineering. Students then take additional engineering courses in the areas of their specializations. The net result is that at UAH, engineering students first develop breadth in important fundamental areas and then depth in their particular field of specialization. This provides an added dimension to UAH engineering graduates that enhances their professional performance. The UAH engineering student is also able to obtain "real world" engineering experience through the Cooperative Education Program or by part-time employment with the many governmental and industrial facilities in Huntsville.

Graduate degrees offered in engineering include the Master of Science in Engineering, a Master of Science in Operations Research, and the Doctor of Philosophy. Interaction with the high technology area of Huntsville strongly enhances the high quality engineering graduate programs and, thereby, offers the candidate a degree that has added significance.

When desirable, as evidenced from continuous studies, the College of Engineering may modify
its curricula and specific courses of instruction, alter requirements for admission or for graduation, and change degrees to be awarded.

Minors and Clusters
Engineering students wishing to obtain a minor in addition to their engineering major may do so in one of the following areas: biological sciences, business, communications, computer science, environmental science, mathematics, music, French, German, Russian, or Spanish. Non-engineering students who wish to obtain an engineering cluster may do so in the following areas: circuits/digital electronics, civil engineering, mechanical engineering, electrical systems, and industrial and systems engineering. Information on minors and clusters can be obtained from the Engineering Student Affairs Office, Room 157, Engineering Building.

Course Numbers
Course numbers are coded for engineering by prefixes as follows:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Prefix</th>
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<tbody>
<tr>
<td>Chemical Engineering</td>
<td>CHE</td>
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<tr>
<td>Civil Engineering</td>
<td>CE</td>
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<tr>
<td>Computer Engineering</td>
<td>CPE</td>
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<tr>
<td>Electrical Engineering</td>
<td>EE</td>
</tr>
<tr>
<td>Industrial and Systems</td>
<td>ISE</td>
</tr>
<tr>
<td>Mechanical and Aerospace</td>
<td>MAE</td>
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<td>Optical Engineering</td>
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Bachelor of Science in Engineering Degree Program
The engineering program has as its primary objective the preparation of qualified students for careers in any one of many engineering disciplines, for research, and for advanced studies. It stresses a broad education in mathematics, physical sciences, humanities, social sciences, engineering science, and engineering design and synthesis.

The College of Engineering achieves this objective by offering a unified program of undergraduate engineering studies that serves as a foundation for creative participation in most areas of engineering, especially those associated with new evolving technologies. All engineering students follow a 12-hour core engineering curriculum with specialization in the junior and senior years in chemical engineering, civil engineering, computer engineering, electrical engineering, industrial and systems engineering, optical engineering, or mechanical engineering. The chemical engineering, civil engineering, computer engineering, electrical engineering, industrial and systems engineering, mechanical engineering, and optical engineering options are accredited by the Accreditation Board for Engineering and Technology (ABET). The degree awarded is the Bachelor of Science in Engineering (B.S.E.)

Admissions Criteria
First year and transfer students admitted into the University of Alabama in Huntsville without any stipulations (i.e., pending, probation, etc.) are admissible directly into the College of Engineering. Students admitted with stipulations can be admitted after they have completed 12 semester hours (including a calculus course) at UAH and have a cumulative GPA of 2.0 or better.

Credit for engineering courses taken in schools with ABET accredited programs is transferable to UAH. Credit for engineering courses taken at an institution that is in the process of becoming ABET accredited will be determined on a case by case basis. Engineering courses taken in non-ABET accredited programs may also be applied to a B.S.E. degree based on an appropriate examination (written or oral) at the discretion of the responsible department. All inquiries concerning applicability of credit should be made to the Assistant Dean for Student Affairs.

Students in the College of Engineering, especially those transferring from other institutions, must assume the responsibility for registering for all required courses in their proper sequence and for fulfilling all requirements for admission and graduation. All first and second year
students, along with transfer students unconditionally admitted into the College of Engineering, are advised in the Office of Engineering Student Affairs (EB 157). Third and fourth year students should seek counseling and advice from the appropriate department.

Prerequisites

The College of Engineering requires, after matriculation, that a grade of C or better be earned in each course that serves as a prerequisite to any course applied toward completing B.S.E. degree requirements. If a grade of less than C is received in a course taken at UAH which is a prerequisite course, the course must be repeated and a grade of C or better earned BEFORE a student enrolls in the subsequent course. A student not satisfying this requirement will be suspended from the College of Engineering. The student must petition the College of Engineering Readmission Committee through the Engineering Student Affairs Office in order to be readmitted. Only one repeat attempt or a total of two attempts is allowed in each of these prerequisite courses.

Probation and Dismissal

In order to remain in good academic standing in the College of Engineering, an undergraduate engineering student must maintain an average of 2.0 (C) or better on all work attempted at UAH. At any point that an engineering student's cumulative grade point average at UAH falls below 2.0 (C) the student will be placed on probationary status in the College of Engineering. A beginning student will be reviewed for the first time at the end of the semester in which he or she has attempted at least 12 semester hours of work (or accumulated for part-time students).

Once a student is placed on probationary status in the College of Engineering, such a student is reviewed in intervals of a minimum of 12 semester hours of work attempted or accumulated. At such review points, three actions are possible:

1. If the cumulative GPA is 2.0 or greater on all work attempted at UAH, the student is removed from probationary status.
2. If the cumulative GPA is less than 2.0 on all work attempted at UAH, but the GPA on the block of work being reviewed is 2.0 or higher, the student is continued on College of Engineering probation.
3. If the cumulative GPA is less than 2.0 on all work attempted at UAH and the GPA on the block of work being reviewed is less than 2.0, the student is suspended from the College of Engineering.

All students suspended from the College of Engineering must petition the College of Engineering Readmission Committee through the Engineering Student Affairs Office to be readmitted to the College. Students suspended from the College are not permitted to enroll in engineering courses without specific advance written permission from the Assistant Dean of Student Affairs.

Any student who wants to take an engineering course and who is not in the College of Engineering must obtain prior approval from the College of Engineering either through a program of study which requires the course, through a cluster which lists the course, or by special permission (e.g., for transient students).

Any student admitted to the College of Engineering who is subsequently suspended from the University must, upon readmission to the University, reapply for admission to the College of Engineering.

All students must attain a C or better average in all engineering courses in the selected engineering option in order to graduate. Mechanical engineering, civil engineering, and chemical engineering students are required to register and take the Fundamentals of Engineering (FE) examination prior to graduation (in addition to meeting UAH's graduation requirements). Applications for graduation must be filled out at the Office of Student Records at least one semester prior to graduation.
Course Requirements

Students must successfully complete courses in each of six categories. The normally required courses are shown; however, the Dean of Engineering may approve other courses which also meet ABET guidelines. Please note that the pass-fail grading option is not available to engineering students for any chemistry, engineering, mathematics, or physics courses required for the B.S.E. degree.

Semester Hours

1. Engineering core. The engineering core consists of 4 courses, including the 3 courses listed below:
   - Statics - MAE/CE 271 .......................................................... 3
   - Electrical Circuits 1 - EE 300 .............................................. 3
   - Engineering Economy - ISE 321 .......................................... 3
   Plus one course from the following list as specified by program requirements:
   - Solid State Fundamentals - EE 310 ....................................... 3
   - Thermodynamics I - MAE 341 ............................................. 3
   - Fluid Mechanics I - MAE 352 ........................................... 3

2. English - EH 101, 102 ........................................................................ 2

3. Humanities and social sciences .................................................. 18

   Engineering students are required to take a total of 18 semester hours (in addition to EH 101 and 102) in the humanities/social sciences. Included in the 18 semester hours is a demonstration of in-depth study of the humanities and fine arts, or the social and behavioral sciences, through completion of a 6-hour sequence in a particular discipline.

   Study in the humanities addresses the ability to deal with questions of values, ethics, or aesthetics. Requirements include at least 9 semester hours in humanities, including PHL 202, a minimum of 3 semester hours in literature and 3 semester hours in the arts. Courses should be broad in scope and in content, rather than specific, and should emphasize a global perspective. Courses in the arts emphasize historical perspectives and appreciation rather than performance. Disciplines in the humanities include literature, philosophy, religious studies, speech, foreign languages, art, music, theater, and dance.

   Study in the social and behavioral sciences deals primarily with the study of human behavior, social and political structures, and economics. Requirements include 9 semester hours in the social and behavioral sciences with a minimum of 3 semester hours in history. Disciplines include anthropology, economics, geography, history, political science, psychology, and sociology.

   A list of courses which satisfy the humanities and social sciences electives is maintained in the Engineering Student Affairs Office, EB 157.

4. Mathematics ........................................................................ 18(15)
   - Calculus and Analytic Geometry - MA 171, 172, 201 ................. 12
   - Linear Algebra - MA 244 (Except Chemical Engineering Option) ... 3
   - Differential Equations - MA 324 ........................................... 3

5. Basic Sciences ........................................................................ 12
   - General Physics - PH 111,114,112,115 ..................................... 8
   - Chemistry - CH 121, 125 ................................................... 4
Additional courses are listed under each option.

6. Engineering options
   Students are required to take one of the following options:
   Chemical Engineering
   Civil Engineering
   Computer Engineering
   Electrical Engineering
   Industrial and Systems Engineering
   Mechanical Engineering
   Optical Engineering
   Each of these options is described under the portion of the catalog devoted to the respective programs.

CHEMICAL AND MATERIALS ENGINEERING
130 Engineering Building
Telephone: (256) 824-6810
Email: che@uah.edu

Degree: Bachelor of Science in Engineering

Professors Cerro (Chair), Chen, Chittur, Smith; Associate Professors Hayes, Weimer.

Chemical engineering deals with any situation in which changes in the chemical composition or the physical state of matter (or both) are involved and, hence, finds unusually wide application. Heat and mass transfer, fluid mechanics, thermodynamics, chemical reaction kinetics, and process control constitute the heart of chemical engineering. Chemical engineers work in many diverse fields ranging from production of many basic chemical products required by today's industrial society to research on major technical and social problems, including energy resources development, space applications, pollution control, and biotechnology.

Mission Statement
The Department of Chemical and Materials Engineering is dedicated to developing and maintaining undergraduate and graduate programs that educate students in the safe control and manipulation of matter in industrially important chemical and materials systems. The faculty will continue to educate students and maintain its programs by providing intellectual leadership, innovative teaching, university and community service, while conducting internationally recognized research. Undergraduate and graduate programs within the department are continuously refined based on national standards and are designed to encourage interdisciplinary education. Research objectives focus on technology important to the further development of the university, the community, the state of Alabama, and the nation.

Program Objectives, Strategies, and Actions
Consistent with the mission of the department, the chemical engineering curriculum has the following objectives:

1. Provide students a solid understanding of the application of fundamental principles in mathematics, science, and engineering to chemical engineering problems. To achieve this objective the faculty will: (a) verify that students have a solid foundation in mathematics, science, and engineering science, (b) provide students with a foundation in chemical engineering science through an integrated CHE curriculum, (c) provide students the tools to design components and processes to meet desired needs, (d) provide students with instruction in Areas of Concentration in Biotechnology and Materials.

2. Educate students on the importance of ethics, health, safety, the environment, and
life-long learning. To achieve this objective, the faculty will: (a) make safety and health issues an integral part of CHE courses, (b) present engineering problems that provide professional and ethical challenges, (c) show the impact of engineering decisions on the environment, and (d) demonstrate with recent technical literature the new frontiers for technology.

3. Develop the laboratory, design, computational, communication, and teamwork skills of students. To achieve this objective the faculty will: (a) teach experimental design and practice, (b) provide access to and training in the use of modern computer and computational methods, (c) provide training to work in team environments, and (d) teach effective oral and written communications skills.

Chemical Engineering Option
To obtain a Bachelor of Science in Engineering degree with the chemical engineering option, students are required to take:

**Additional Basic Sciences**
- Chemistry-CH 123, 126, 331, 335, 332, 336, 341 .................................................. 15
- Advanced science electives from approved area .......................................................... 7

**Chemical Engineering Option**
- CHE 197-Computer Methods for Chem. Engrs. .............................................................. 3
- CHE 244-Stoichiometry ........................................................................................................ 3
- CHE 295-Nature and Properties of Materials Laboratory ............................................... 1
- CHE 344-Chemical Engineering Thermodynamics ........................................................... 3
- CHE 347-Quant. Modeling for Chem. Engrs. ..................................................................... 3
- CHE 352-Fluid Mechanics I ............................................................................................... 3
- CHE 440-Unit Operations Laboratory .................................................................................. 3
- CHE 441-Chemical Kinetics and Reactor Design ............................................................... 3
- CHE 442-Introduction to Heat and Mass Transfer ............................................................... 4
- CHE 443-Mass Transfer Operations .................................................................................... 4
- CHE 445-Chemical Process Control .................................................................................... 3
- CHE 446-Anal. & Design of Transport Equip. .................................................................... 3
- MAE 448-Chemical Engineering Design ............................................................................ 4
- MAE 455-Fluid Mechanics Laboratory .............................................................................. 1
- Advanced engineering electives from approved area ....................................................... 6

Students applying for graduation in the chemical engineering option must show evidence of having taken the Fundamentals of Engineering (FE) Examination. The examination is offered by the State of Alabama Board of Registration for Professional Engineers, P.O. Box 304451, Montgomery, AL. 36130-4451. Phone: (334) 242-5568. Contact the College of Engineering Student Affairs Office for further information.

**Suggested Schedule of Courses for Full-time Chemical Engineering Students**

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115 College of Engineering
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<td>HU/SS* 3</td>
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<td>MAE 455 1</td>
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*HU/SS-18 hours in humanities/social sciences.

**Sci Elec-Minimum of 7 hours from an approved area of concentration with courses 300-level or above. Approved areas of concentration currently include physical chemistry, biochemistry, polymer chemistry, and biophysical chemistry.

***Advanced engineering electives minimum of 6 hours of a 300-level or above course. The advanced engineering electives plus the 7 hours of advanced science electives are used to create two alternative sequences with a total of 13 credit hours each. These courses are necessary to develop depth in materials engineering and biotechnology.

Undergraduate Chemical Engineering (CHE) Courses

197 **Computer Methods for Chemical Engineering** 3 hrs.
Introduction to industrial processes used in the production of commodity chemicals important to chemical engineers. Computer programming, spreadsheets, symbolic math, and drawing packages to model fundamental stages of these processes will be presented. Prerequisite: Precalculus.

244 **Stoichiometry** 3 hrs.
Introduction to basic calculations of chemical engineering, emphasizing material and energy balances on physical and chemical processes. Prerequisites: PH 111, CH 123, CHE 197.

Introduction to the fundamental nature (chemistry and structure), and properties of materials, including metals, polymers, ceramics, and semiconductors. Bonding, composition, and phase diagrams, as well as the nano- and micro-structure of materials will be highlighted. How the nature and properties of materials are characterized or tested will be discussed. Composite materials and aspects of materials processing, including diffusion, nucleation, and transformation diagrams, will also be presented. Companion laboratory is CHE 295, to be taken concurrently with or after MAE 294. Prerequisites: CH 121, PH 111. (Same as MAE 294.)

295 **Nature and Properties of Materials Laboratory** 1 hr.
Typical experiments include characterizing structure, using x-ray diffraction and
microscopy, testing mechanical properties using tensile and creep tests, and mapping phase diagram boundaries using cooling curves. Emphasis is placed on proper numerical and statistical analysis of the data. Written reports are required, and elements of materials design are presented.

**344 Chemical Engineering Thermodynamics**
Thermodynamics of phase equilibria, chemical reactions and thermodynamic analysis of chemical processes, with emphasis on topics of special interest to chemical engineers. Prerequisites: CHE 244 and CH 341.

**347 Quantitative Modeling for Chemical Engineers**
Modeling and analysis of physical phenomena that arise in chemical engineering and an introduction to computer-aided design. Prerequisites: CHE 197, 244, and MA 324.

**352 Fluid Mechanics I**
Properties of fluids and fundamental principles governing fluid motion, including fluid statics, conservation of mass, momentum, and energy with applications to pipe, and channel flows of incompressible fluids. Prerequisite: MA 324. (Same as MAE 352.)

**440 Unit Operations Laboratory**
Experimental studies covering topics from reaction kinetics, fluid flow, heat transfer, and chemical thermodynamics. Specific applications of standard laboratory safety practices, probability, and statistical data analysis. Ethical issues in real situations taken from professional practice. Emphasis placed on written and oral laboratory report presentation techniques. Prerequisites: CHE 441 and 443.

**441 Chemical Kinetics and Reactor Design**
Fundamental principles of chemical kinetics and chemical reactor engineering along with the design of both thermal and catalytic reactors. Prerequisites: CHE 344. (Same as CHE 540.)

**442 Introduction to Heat and Mass Transfer**
Principles of heat and mass transfer: application of principles to problems in conductive, convective, and radiative-heat transfer, and mass transfer; laminar and turbulent flow processes; boiling and condensation: heat exchangers. One credit hour laboratory included. Prerequisites: MAE/CHE 352 and CHE 347. (Same as MAE 442.)

**443 Mass Transfer Operations**
Theory of mass transfer phenomena, with applications to both stagewise and diffusion controlled distillation, gas absorption/desorption, humidification and extraction processes. Prerequisites: CHE 344, 352. Parallel CHE 442.

**445 Chemical Process Control**
Fundamental principles of chemical process control; control system design for chemical processes. Prerequisites: MA 324, CHE 347 and 441.

**446 Analysis and Design of Transport Equipment**
Theory of transport phenomena from a unified approach to momentum, heat and mass transfer. Application of theory to the design of various transport equipment. Prerequisites: CHE 352, Prerequisite or parallel: CHE 442 and 443.

**448 Chemical Engineering Design**
Individual design of chemical engineering components, concluding with an overall team design effort, using modern computer-aided design techniques. Overall design requires a preliminary design, simulation, and economic evaluation of a chemical production flow sheet. Ethical issues in real situations taken from professional practice will be examined. This capstone design course requires a written report detailing a preliminary plant design, requiring students to show evidence of organization, research, and presentation. Prerequisites: CHE 441, 443, 446, and parallel CHE 445.

**449 Introduction to Environmental Engineering**
Engineering aspects of air, water, and thermal pollution. Hydrologic cycle, water sources and uses; industrial and other sources of primary and secondary pollutants. Transport process in environmental problems and in their control. Prerequisite: MAE/CHE 352. (Same as CHE 549, CE 449/559.)
450 Environmental Control 3 hrs.
Engineering design and synthesis of environmental control systems. Control of multiphase systems with application to air and water pollution control. Prerequisite: MAE/CHE 442. (Same as CHE 550.)

459 Selected Topics in Chemical Engineering 1-3 hrs.

460 Introduction to Bioprocess Engineering 3 hrs.
Application of engineering principles to analysis of and development and design of processes using biological catalysts including enzymes, plant and animal cells, and genetically engineered cells. Other topics include fermentation and biological mass transport processes. Prerequisites: CH 361 and 362. (Same as CHE 560.)

461 Bioseparations 3 hrs.
General characteristics of separation processes used in the biotechnology industry, including the removal of insolubles, isolation and purification of thermally sensitive products and the preparation for final use by the customer. Application of unit operation principles for biological separations, recombinant DNA techniques, and protein engineering. Prerequisites: CH 361, 362, and CHE 460. (Same as CHE 561)

494 Applied Materials Engineering 3 hrs.
Synthesis and processing methods of materials for engineering applications. Selection and use of materials performance factors for design of structural and functional components. Use of computational methods in solving open-ended design problems that depend on an understanding of the nature and properties of materials will be emphasized. All classes of materials are covered. Prerequisites: CHE 294, 347, and either CH 342 or 348. (Same as CHE 594.)

495 Polymer Engineering 3 hrs.
Engineering principles of polymers and their role in manufacturing processes. Aspects of polymer phenomena and their relationship to processing of structural and functional components. Prerequisites: CHE 344, 352, and CH 332. (Same as CHE 595.)

CIVIL AND ENVIRONMENTAL ENGINEERING
S201 Technology Hall
Telephone: (256) 824-6854
Email: cee@uah.edu

Degree: Bachelor of Science in Engineering

Professors Cruise, Gopu (Chair); Associate Professors Leonard, Toutanji; Assistant Professor Anderson.

Civil engineers are involved in many aspects of modern life, such as structural engineering, transportation planning, environmental systems, and geotechnical analysis. The modern civil engineer uses traditional design and analysis methods as well as advanced experimental and computational techniques. At the University of Alabama in Huntsville students are exposed to all of these areas of civil engineering and introduced to techniques that will make them competent practicing professional engineers. The Bachelor of Science in Engineering degree from the Civil and Environmental Engineering Department at UAH can be obtained by completing either a broad civil engineering curriculum or by specializing in structural, transportation, or environmental engineering. The civil engineering curriculum consists of general engineering classes (required of all engineering students), the civil engineering core, and the civil engineering concentration selected.

The undergraduate structural engineering stem at UAH provides students with a strong background in many aspects of structural analysis, foundations, reinforced concrete, and advanced structural design. The student may take additional courses in such areas as concrete mix proportioning, construction materials, experimental mechanics, vibrations, and finite element methods.
The undergraduate environmental engineering concentration provides an education necessary for many aspects of environmental management and remediation. Within the framework of the program, students will be introduced to many topics, including water quality, atmospheric pollution, environmental systems, and statistics.

The transportation engineering concentration provides students with the skills necessary to tackle tomorrow's data and transportation issues. Student are introduced to various topics, including transportation modeling and simulation, application of GIS to transportation issues, use of traffic crash data, and urban transportation planning.

Mission Statement
The mission of the Department of Civil and Environmental Engineering is to provide a high quality civil and environmental engineering education that instills in our students the fundamental knowledge, analytical skills and practical abilities necessary to prepare them to be leaders in their profession. Through excellence in teaching, research and service, the Department promotes opportunities for the intellectual, personal, and professional growth of our students, faculty and alumni, while providing graduates who are prepared to support the diverse needs of Huntsville, the State of Alabama, the region, our nation and the international community.

CEE Program Educational Objectives
The objectives of the Civil and Environmental Engineering Program are to produce graduates who:

- are rigorously educated in the most modern aspects of the field while obtaining a solid foundation in the traditional knowledge and skills of the profession;
- have the technical knowledge to analyze and interpret data, as well as problem solving skills necessary to design a component, process or system;
- have demonstrated leadership, team-building, and inter-disciplinary problem-solving skills;
- have demonstrated proficiency in written, oral, and multi-media communication skills necessary for the effective, successful practice of civil engineering; and
- have an understanding of ethical responsibility, appreciation for service to the profession and society, and a recognition of the need for a lifetime of learning.

Degree Requirements
To obtain a Bachelor of Science in Engineering, civil engineering students are required to take:

Additional Basic Sciences
Chemistry - CH 123, 126 ......................................................... 4

Civil Engineering Option:
CE 101 - Prelude to Civil Engineering ........................................ 1
CPE 112 - Computer Methods in Engineering ............................... 3
MAE 198 - Engineering Graphics ............................................. 2
CE 284 - Surveying ..................................................................... 2
CE 321 - Transportation Engineering and Design ......................... 3
MAE 341 - Thermodynamics I .................................................... 3
MAE 352 - Fluid Mechanics I ................................................... 3
CE 362 - Dynamics .................................................................. 3
CE 370 - Mechanics of Materials ............................................... 4
CE 381 - Structural Analysis I .................................................... 3
CE 372 - Soil Mechanics .......................................................... 3
CE 373 - Soil Mechanics Lab ...................................................... 1
ISE 390 - Probability and Engineering Statistics I ......................... 3
CE 449 - Intro. to Environmental Engrg. ..................................... 3
CE 441 - Hydraulic Engineering ............................................... 3
CE 499 - Civil Engineering Design Project .................................. 3
Technical Electives .............................................6
(Choose from CE 375, 384, 411, 461, 471, 472, 474, 477, 478, 480, 485, MAE 342, 394, 442, 451, 454, 470, 485, 486, 489, or other 300-level or above course approved by a civil and environmental engineering program academic advisor.)

Civil Engineering Concentration ........................................ 12

Structural Engineering Concentration:
CE 481 - Structural Analysis II ........................................... 3
CE 483 - Reinforced Concrete Design ..................................... 3
CE 484 - Structural Steel Design .......................................... 3
CE 485 - Foundation Engineering ......................................... 3

Environmental Engineering Concentration
CE 455 - Water Quality Laboratory ...................................... 3
CE 456 - Water Quality Control Processes ............................... 3
CE 457 - Hydrology ........................................................... 3
CE 458 - Environmental Engineering Design ............................ 3

Transportation Engineering Concentration
CE 384 – Advanced Surveying .............................................. 3
CE 411 – Introduction to GIS .............................................. 3
CE 420 – Urban Transportation Planning ............................... 3
CE 422 – Traffic Engineering .............................................. 3

General Civil Engineering:
Choose 12 hours from CE 420, 422, 455, 456, 457, 458, 481, 483, 484, 485 subject to satisfactory completion of prerequisite requirements .............. 12

Courses with a CE prefix are typically offered once a year, except for Statics, Dynamics, and Mechanics of Materials. Civil engineering students are encouraged to seek the advice of a full-time civil engineering faculty member as soon as possible after their enrollment at UAH to ensure the timely completion of their program of study.

Students applying for graduation must show evidence of having taken the Fundamentals of Engineering (FE) Examination. The examination is offered by the State of Alabama Board of Registration for Professional Engineers, P.O. Box 304451, Montgomery, AL 36130-4451. Phone: (334) 242-5568. Contact the College of Engineering Student Affairs Office for further information.

Suggested Schedule of Courses for Full-time Civil Engineering Students

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<tr>
<th>First Year</th>
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<th>Spring</th>
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<tbody>
<tr>
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College of Engineering 120
| Third Year | MAE 341 | 3 | MAE 352 | 3 |
|            | ISE 321 | 3 | CE 372  | 3 |
|            | HU/SS*  | 3 | CE 373  | 1 |
|            | ISE 390 | 3 | HU/SS*  | 3 |
|            | EE 300  | 3 | CE 321  | 3 |
|            | CE 381  | 3 | Tech.Elect. | 3 |
|            |         |   |         |   |
| Fourth Year| CE 449  | 3 | CE 485/456/384 | 3 |
|            | CE 484/458/420 | 3 | CE 499  | 3 |
|            | CE 483/457/411 | 3 | CE 441  | 3 |
|            | Tech.Elect | 3 | HU/SS*  | 3 |
|            | HU/SS*  | 3 | CE 481/455/422 | 3 |
|            |         |   |         |   |
|            |         | 18 |         | 16 | 34 |

*HU/SS-18 hours in humanities/social sciences.

Total Hours 132

Undergraduate Civil Engineering Courses (CE)

101 Prelude to Civil Engineering
1 hr.
Primer in the practice of civil engineering and engineering design concepts. Includes history and seminars on different branches of civil engineering by faculty and professionals. Exercises in planning and design of a team project. Students will be required to write a short design proposal and present their results. Freshman standing.

271 Statics
3 hrs.
Topics include: forces, resultant forces, moments, couples equivalent force systems, equilibrium, distributed loads, two force members, trusses, centroids, moments of inertia, shear and bending moment diagrams, static and kinematic friction. Prerequisites: PH 111, MA 201. (Same as MAE 271.)

284 Surveying
2 hrs.
Basic theory and practical field methods for engineering applications. Measurements and errors in surveying. Leveling, traversing, stadia, topographic surveys, mapping, and circular curves. 1.5 hour lecture and 2 hour lab. Prerequisite: CE 101, MAE 198 or consent of instructor/advisor.

321 Transportation Engineering and Design
3 hrs.
Theory, design, and operation of various modes of transportation with emphasis on traffic flow. Prerequisite: CE 284.

362 Dynamics
3 hrs.
Kinematics and kinetics of particle and systems of particles with applications to central force motion, impact, relative motion, vibrations, and variable mass systems. Dynamics of rigid body in plane motion, relative motion in rotating coordinates, and gyroscopic motion. Prerequisite: CE 271. (Same as MAE 362.)

370 Mechanics of Materials
4 hrs.
Topics include: theory of stress and strain. Hooke's law, analysis of stresses and deformations in bodies loaded by axial, torsional, bending and combined loads, and analysis of statically indeterminate systems. Required laboratory section includes: the determination of selected properties of various engineering materials, experimental verification of theories presented, use of strain measuring devices, test procedures, instrumentation, and interpretation of results. Prerequisite: CE 271. (Same as MAE 370.)

372 Soil Mechanics
3 hrs.
Index properties and characteristics of soils. Compaction shear, compressibility and permeability. Application to analysis and design of foundation elements. Laboratory included. Prerequisite: CE 370; parallel MAE/CHE 352.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>373</td>
<td>Soil Mechanics Lab</td>
<td>1 hr.</td>
</tr>
<tr>
<td>375</td>
<td>Civil Engineering Systems Analysis and Design</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Analysis, optimization, and design of civil engineering systems including structures, water resources, and transportation. Includes lab with design project. Initial and optimized designs will be developed. Prerequisites: MA 324, CE 271, CPE 112.</td>
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</tr>
<tr>
<td>380</td>
<td>Engineering Design Project</td>
<td>1-3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Individualized design project under supervision of instructor. Prerequisite: Junior standing.</td>
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</tr>
<tr>
<td>381</td>
<td>Structural Analysis I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>384</td>
<td>Advanced Surveying</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Surveying public lands; topography, mapping, construction surveys, and boundary surveys. Topographic surveying project, computer applications and laboratory work included. Prerequisite: CE 284.</td>
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</tr>
<tr>
<td>411</td>
<td>Introduction to Geographical Information Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Introduces vector, raster, and tabular concepts, emphasizing the vector approach. Topics include: spatial relationships, map features, attributes, relational database, layers of data, data ingesting, digitizing from maps, projections, output, applications, and availability of public data sets. Prerequisite: Senior standing or approval of instructor. (Same as CE 511, ES 411/511, and ATS 411/511.)</td>
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</tr>
<tr>
<td>420</td>
<td>Urban Transportation Planning</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Planning of highway systems and terminals as part of a complete planning approach; public transportation system planning; transportation planning studies, projection analysis, plan formulation, and programming. Prerequisite: CE 321. (Same as CE 520.)</td>
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<tr>
<td>422</td>
<td>Traffic Engineering</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Driver, pedestrian and vehicle characteristics. Principles of traffic flow for improved highway traffic service and safety. Examines freeways, rural roads, urban streets, traffic signals, signs, channelization, and other traffic control measures. Prerequisite: CE 321. (Same as CE 522.)</td>
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<tr>
<td>441</td>
<td>Hydraulic Engineering</td>
<td>3 hrs.</td>
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<td></td>
<td>Water-hammer analysis, open channel flow, hydraulic structures such as dams, spillways, stilling basins, flood control devices, locks, pipe-flow systems and water-supply facilities, computational methods. Prerequisite: MAE/CHE 352.</td>
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<tr>
<td>449</td>
<td>Introduction to Environmental Engineering</td>
<td>3 hrs.</td>
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<td></td>
<td>Engineering aspects of air, water, and thermal pollution. Hydrologic cycle, water sources and uses; industrial and other sources of primary and secondary pollutants. Transport process in environmental problems and their control. Prerequisite: MAE 341 and parallel MAE 352/CHE 352. (Same as CE 549 and CHE 449/549.)</td>
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<tr>
<td>455</td>
<td>Water Quality Laboratory</td>
<td>3 hrs.</td>
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<td></td>
<td>Properties of natural water sources and laboratory methods associated with municipal water and wastewater treatment systems. Student design and demonstration of a water treatment system to bring a water sample into compliance with drinking water standards. Prerequisite or parallel: CE 456/556. (Same as CE 555.)</td>
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<tr>
<td>456</td>
<td>Water Quality Control Processes</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Principles of public water-supply design. Source selection, collection, purification, and distribution for municipal use. Collection of waste waters, their treatment and disposal. Prerequisite: CE 449/549. (Same as CE 556.)</td>
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<tr>
<td>457</td>
<td>Hydrology</td>
<td>3 hrs.</td>
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<td></td>
<td>Occurrence and movements of water over the earth's surface for engineering planning and design. Relationship of precipitation to streamflow with frequency analysis, flood routing, and unit hydrograph theory. Prerequisite: CHE/MAE 352. (Same as CE 557.)</td>
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<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
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</tr>
<tr>
<td>458</td>
<td>Environmental Engineering Design</td>
<td>3 hrs.</td>
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<td></td>
<td>Engineering design and project management of environmental quality/restoration systems. Students will complete a design project focusing on one of the following systems: sanitary landfill, municipal incinerator, or groundwater/site remediation. Addresses skills for technical presentations and proposal writing as well as process design and decision making. Prerequisite: CE 449. (Same as CE 558.)</td>
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<tr>
<td>459</td>
<td>Selected Topics in Civil Engineering</td>
<td>1-3 hrs.</td>
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<tr>
<td>461</td>
<td>Vibration of Elastic Systems</td>
<td>3 hrs.</td>
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<td></td>
<td>Formulation of the equations of motion of discrete and continuous systems, analytical and numerical methods of solution, eigenvalue problems and dynamic response. Prerequisite: MAE 488. (Same as CE 561 and CE 561/561.)</td>
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<tr>
<td>471</td>
<td>Advanced Soil Mechanics</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Continuum mechanics applied to soil behavior. Theoretical approaches to consolidation, shear strength, slope stability and soil stabilization. Prerequisite: CE 372. (Same as CE 571.)</td>
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<tr>
<td>472</td>
<td>Soil Dynamics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Behavior of soils under dynamic, earthquake and blast loading. Analysis of foundation vibration and isolation. Prerequisite: CE 372. (Same as CE 572.)</td>
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<tr>
<td>474</td>
<td>Applied Mechanics of Solids</td>
<td>3 hrs.</td>
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<td></td>
<td>Stresses and strains at a point, theories of failures, stress concentration factors, thick-walled cylinders, torsion of noncircular members, curved beams, unsymmetrical bending and shear center. Prerequisite: CE 370. (Same as CE 574 and MAE 474/574.)</td>
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<tr>
<td>477</td>
<td>Experimental Techniques in Solid Mechanics</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Experimental methods to determine stress, strain, displacement, velocity, and acceleration in various media. Theory and laboratory applications of electrical resistance strain gages, brittle coatings, and photo-elasticity. Application of transducers and experimental analysis of engineering systems. Prerequisites: CE 370 and junior standing. (Same as CE 577 and MAE 477/577)</td>
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<tr>
<td>478</td>
<td>Matrix Methods in Structural Mechanics</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Matrix application to formulation and solution of linear problems in structural mechanics. Stresses, vibrations, and stability of engineering structures. Prerequisite: CE 362, 370. (Same as CE 578 and MAE 478/578.)</td>
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<tr>
<td>480</td>
<td>Civil Engineering Materials</td>
<td>2 hrs.</td>
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<td>This course introduces properties of civil engineering materials, both concrete and advanced composites, in both theoretical and practical applications. Topics include: concrete structures, rheology, mechanical properties, environmental durability, dimensional stability, advanced concrete technologies. It includes a three hour weekly lab. Prerequisite: CE 370, 372. (Same as CE 580.)</td>
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<tr>
<td>481</td>
<td>Structural Analysis II</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Reactions, shears, moments and deformations in complex structural systems. Statically indeterminate systems, advanced geometric and energy methods. Prerequisite: CE 381.</td>
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<tr>
<td>483</td>
<td>Reinforced Concrete Design</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Design of reinforced concrete structures with emphasis on the ultimate strength method. Computer applications. Prerequisite: CE 381. (Same as CE 583.)</td>
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<tr>
<td>484</td>
<td>Steel Design</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Principles of design of steel structures using ASD methods. Analysis and design of structural elements including beams, columns, connection details. Prerequisite: CE 381. (Same as CE 584.)</td>
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<tr>
<td>485</td>
<td>Foundation Engineering</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Design of foundations with emphasis on reinforced concrete, footings, caissons, piles, retaining walls, and mat foundations. Effect of bearing pressure on foundations. Prerequisites: CE 372 and 483. (Same as CE 585.)</td>
<td></td>
</tr>
</tbody>
</table>
486 Advanced Cementitious and Composite Materials 3 hrs.
Concrete structures, rheology, mechanical properties, environmental durability, dimensional stability, advanced concrete technologies (such as high strength, fiber reinforced, and fracture mechanics), advanced fiber polymer composites, and repair/rehabilitation of concrete structures. Prerequisites: CE 381. (Same as CE 586.)

499 Civil Engineering Design Project 3 hrs.
Analysis and design of a complete civil engineering project including establishment of design criteria, cost estimates, specifications, and plans. Topics include ethical considerations in engineering design and practice. Emphasis on developing written and oral communication skills. Prerequisite: Senior standing.

ELECTRICAL AND COMPUTER ENGINEERING
272 Engineering Building
Telephone: (256) 824-6316
Email: eceinfo@ece.uah.edu

Degree: Bachelor of Science in Engineering

Distinguished Professor Johnson; Professors Abushagur, Adhami (Chair), Aunon, Fork, Ho, Jarem, Kulick, Nordin, Poularikas, Shen, Singh, Stensby; Professor Emeritus Audeh; Associate Professors Boykin, Gaede, Shtessel, Wells; Assistant Professors English, Joiner, Jovanov; Lecturer Corsetti; Adjunct Professors Berinato, Brackett, Budge, Carroll, Gilbert, Moore.

Mission
The mission of the Electrical and Computer Engineering Department is to develop and maintain high quality undergraduate and graduate programs in electrical, computer, and optical engineering to meet the needs of its constituents, and to participate in scholarly and productive research that contribute to the economic well being and quality of life for the residents of Huntsville, the State of Alabama, and the citizens of the United States of America.

Engineering Clusters in ECE
The ECE Department offers three clusters which contain a minimum of 21 credit hours in ECE courses. The request for a cluster is initiated in the Engineering Student Affairs Office, EB 157. Electrical Systems: EE 100, 300, 301, 313, 315, 382, 383, 384, 425
Circuits/Digital Electronics: EE 100, 300, 301, 305, 310, 313, 315, 382, 436.
Music Technology: EE 100, 300, 301, CPE 112, EE 315, 305, 382, 383, 384, 494.

Double Majors in ECE
The ECE Department provides the opportunity for a double major with a primary major in CPE, EE, or OPE, and a distinctly different secondary major selected from EE, OPE, or CPE. None of the secondary major courses are permitted as primary major electives. The request for a double major should be submitted to the ECE Information/Advisory Office. Listed below are the possible double major combinations.

CPE-EE: EE 100, 307, 313, 384, and 2 courses from EE 425, 426, 424, or 448.
EE-OPE: OPE 451, 455, 454, OPT 341, 342, 411, and EE 447 as an EE option elective.
OPE-EE: EE 100, 416, 425, 448, 494.
EE-CPE: CPE 212, 321, 336, 337, 431, and 1 course from CPE 451, 448, or 427.
Computer Engineering Option

The Department of Electrical and Computer Engineering offers a four-year program leading to a Bachelor of Science in Engineering degree with specialization in computer engineering. The purpose of the program is to produce a broadly educated individual, who qualifies as a professional in the analysis, design and application of computer systems. The computer engineering program provides a background in non-engineering areas such as English, mathematics, basic science, humanities and social sciences. A broad background in engineering is developed through the engineering core curriculum and further courses from electrical and computer engineering. The program's focus on computer engineering is developed through a blend of courses in computer engineering and computer science. The graduate computer engineer will be professionally qualified in a number of technical specialties which include computer architecture, interface, communications and networking, and software engineering. In professional life, the computer engineer considers carefully the role of the engineer in dealing with a broad spectrum of commercial, legal, and ethical issues.

Objectives

The objectives of the computer engineering program are to:

1. Provide graduates with background, knowledge, skills and hands-on experience to enter the practice of computer engineering.
2. Prepare graduates for graduate studies, life-long learning, and professional development.
3. Emphasize problem solving skills throughout the curriculum.
4. Integrate hardware/software and computer systems issues throughout the computer engineering curriculum, especially in the context of real-time, embedded, and networked systems.
5. Provide a broad-based undergraduate education in Computer Engineering with a thorough basis in mathematics, probability & statistics, physical sciences, engineering sciences, laboratory experiments and design experience.
6. Provide general education to identify the impact of engineering decisions in the broader societal context.

The computer engineering faculty is committed to sustaining a vigorous academic environment that values quality and diversity in the educational experience. Program strengths include a major engineering design experience; integration of hardware/software and computer systems issues, especially in the context of real-time, embedded, and networked systems; use of contemporary engineering design and modeling tools throughout the curriculum; and advanced engineering design options in hardware, software and networking. The curriculum provides a thorough basis in mathematics, probability and statistics, physical sciences, engineering sciences, laboratory experience, and design experience. This background enables students to apply computer engineering principles to a variety of contemporary problems. An engineering approach is emphasized throughout computer related coursework.

Computer Engineering Program Changes

The undergraduate and graduate computer engineering programs have recently undergone an extensive review. As a part of this review, courses have been grouped together under categories for easier identification. Additionally, 400-level versions of 500-level only courses have been added to enhance the elective offerings for CPE majors. Conversely, 500-level versions of 400-only courses have been added. The categories used for both the undergraduate and graduate program are as follows:

- Languages and Theory Oriented (x1x)
- Hardware and VLSI (x2x)
- Architecture and Operating Systems (x3x)
- Computer Networks (x4x)
- Software Engineering (x5x)
- Compilers and Translators (x6x)
- Special (x9x)
New Courses

CPE 412  Introduction to Parallel Programming
CPE 461  Translation Systems

Additional Basic Sciences

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 113 - General Physics with Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>PH 116 - General Physics Laboratory III</td>
<td>1</td>
</tr>
</tbody>
</table>

Computer Engineering Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPE 112 - Introduction to Computer Programming</td>
<td>3</td>
</tr>
<tr>
<td>EE 201 - Digital Logic Design Lab</td>
<td>1</td>
</tr>
<tr>
<td>EE 202 - Introduction to Digital Logic Design</td>
<td>3</td>
</tr>
<tr>
<td>CPE 212 - Fundamentals of Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EE 301 - Electronic Measurement Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CPE 321 - Computer Organization</td>
<td>3</td>
</tr>
<tr>
<td>EE 315/305 - Electronics I &amp; Lab</td>
<td>4</td>
</tr>
<tr>
<td>EE 382 - Analytical Methods for Continuous Time Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE 383 - Analytical Methods for Multivariable and Discrete Time Systems</td>
<td>3</td>
</tr>
<tr>
<td>CPE 336/337 - Operating Systems &amp; Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>CPE 421 - Microcomputers</td>
<td>3</td>
</tr>
<tr>
<td>CPE 422 - Advanced Logic Design</td>
<td>3</td>
</tr>
<tr>
<td>or CPE 427 VLSI Design</td>
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<tr>
<td>CPE 431 - Introduction to Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>CPE 438 - Real Time &amp; Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>or CPE 448 - Introduction to Computer Networks</td>
<td></td>
</tr>
<tr>
<td>CPE 451 - Software Design &amp; Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EE 420 - Random Signals and Noise (or ISE 390)</td>
<td>3</td>
</tr>
<tr>
<td>CPE 495 - Computer Engineering Design I</td>
<td>2</td>
</tr>
<tr>
<td>CPE 496 - Computer Engineering Design II</td>
<td>2</td>
</tr>
<tr>
<td>CS 214 - Discrete Structures</td>
<td>3</td>
</tr>
<tr>
<td>CS 317 - Design &amp; Analysis of Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>CPE Electives (300-level or above approved by a computer engineering advisor)</td>
<td>9</td>
</tr>
</tbody>
</table>

Suggested schedule of courses for full-time Computer Engineering students.

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>MA 171 4</td>
<td>MA 172 4</td>
</tr>
<tr>
<td></td>
<td>CH 121/125 4</td>
<td>PH 111/114 4</td>
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<td></td>
<td>HU/SS* 6</td>
<td>EH 102 3</td>
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<td></td>
<td>EH 101 3</td>
<td>CPE 112 3</td>
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<td></td>
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<td>HU/SS* 3</td>
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<td>17</td>
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<tr>
<td>Second Year</td>
<td>MA 201 4</td>
<td>MA 244 3</td>
</tr>
<tr>
<td></td>
<td>PH 112/115 4</td>
<td>MA 324 3</td>
</tr>
<tr>
<td></td>
<td>CPE 212 3</td>
<td>EE 201 1</td>
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<td>EE 202 3</td>
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<td>PH 113 3</td>
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<td>PH 116 1</td>
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<td></td>
<td></td>
<td>MAE 271 3</td>
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<td></td>
<td>17</td>
<td>17 34</td>
</tr>
</tbody>
</table>
### Undergraduate Computer Engineering Courses (CPE)

**112 Introduction to Computer Programming in Engineering**  
3 hrs.  
Solution of engineering problems using a digital computer. Hardware structure of the stored-program computer; programming in a high level language such as C or C++; engineering approximation of dynamic systems; top-down design and algorithms. Practice in solving engineering problems. Prerequisite or parallel: Precalculus. Students enrolling in CPE 112 must enroll concurrently in CPE 112L.

**112L Laboratory Component of Introduction to Computer Programming** 0 hrs.  
Students enrolling in CPE 112L must enroll concurrently in CPE 112.

**212 Fundamentals of Software Engineering** 3 hrs.  
Introduction to structured programming using C++. Search and sort algorithms. Introduction to data structures. Applications to engineering related problems. Prerequisite: CPE 112.

**321 Computer Organization** 3 hrs.  
Functional organization of stored-program digital computers including number representation, assembly language programming, computer hardware, micro-operations, and control logic; microprocessor architecture. Prerequisite: EE 202. (Same as EE 321.)

**336 Operating Systems** 3 hrs.  
Study of the fundamentals of operating systems. Emphasis on processes, file management, interprocess communication, input-output, virtual memory, networking and security. Prerequisites: CPE 212 and CPE/EE 321. Students must take this course concurrently with CPE 337. (Same as CS 490.)

**337 Operating Systems Laboratory** 1 hr.  
Laboratory component of Operating Systems course. Experiments will include implementation of device drivers, process and thread management, virtual memory management, dynamic memory management, file-systems. Students must take this course concurrently with CPE 336.

**412 Introduction to Parallel Programming** 3 hrs.  
Introduction to processing in parallel and distributed computing environments. General concepts of parallel machine models, processes, mutual exclusion, process synchronization, message passing, and programming languages for parallel computing and scheduling. Design and analysis of parallel algorithms. Parallel programming environments: Pthreads for shared memory multiprocessor systems and PVM/MPI for distributed networked computers. Prerequisites: CPE 212 and CS 317. CPE 336 Recommended. (Same as CPE 512.)
421 Microcomputers 3 hrs.
The microcomputer as a component in digital design. Laboratory experience in interfacing and design projects. Prerequisite: EE 202; Prerequisite or parallel EE 315; EE 436 recommended. (Same as EE 421, CPE 521, and EE 521.) Students enrolling in CPE 421 must enroll concurrently in CPE 421L.

421L Laboratory Component of Microcomputers 0 hrs.
Students enrolling in CPE 421L must enroll concurrently in CPE 421.

422 Advanced Logic Design 3 hrs.
Advanced concepts in Boolean algebra, use of hardware description languages as a practical means to implement hybrid sequential and combinational designs, digital logic simulation, rapid prototyping techniques, and design for testability concepts. Focuses on the actual design and implementation of sizeable digital design problems using representative Computer Aided Design (CAD) tools. Prerequisite: EE 202. (Same as CPE/EE 522 and EE 422.) Students enrolling in CPE 422 must enroll concurrently in CPE 422L.

422L Laboratory Component of Advanced Logic Design 0 hrs.
Students enrolling in CPE 422L must enroll concurrently in CPE 422.

426 VLSI Design Using Hardware Description Languages, Modeling, and Synthesis 3 hrs.
Modern VLSI design techniques and tools, such as silicon compilers, (V)HDL modeling languages, placement and routing tools, synthesis tools, and simulators. Students will design, simulate, and layout using both programmable logic families and ASIC libraries. Prerequisites: EE 202 and EE 315. (Same as CPE 526.)

427 VLSI Design I 3 hrs.
Introduction to VLSI design using CAD tools, CMOS logic, switch level modeling, circuit characterization, logic design in CMOS, systems design methods, test subsystem design, design examples, student design project. Design project to be fabricated and tested in EE/CPE 428. Prerequisites: EE 202 and 315. (Same as EE 427 and CPE 527.) Students enrolling in CPE 427 must enroll concurrently in CPE 427L.

427L Laboratory Component of VLSI Design I 0 hrs.
Students enrolling in CPE 427L must enroll concurrently in CPE 427.

428 VLSI Design II 3 hrs.
Advanced experience with CAD tools for VLSI design, IC testing. Design Project from EE/CPE 427 to be fabricated and tested. Implementation and verification of test programs, IC testing and troubleshooting, legal, economic, and ethical design issues. Oral presentations and written reports are required. Prerequisite: CPE/EE 427. (Same as EE 428 and CPE 528.) Students enrolling in CPE 428 must enroll concurrently in CPE 428L.

428L Laboratory Component of VLSI Design II 0 hrs.
Students enrolling in CPE 428L must enroll concurrently in CPE 428.

431 Introduction to Computer Architecture 3 hrs.
Study of existing computer structures. Computer organization with emphasis on busing systems, storage systems, and instruction sets. Performance models and measures, pipelining, cache and virtual memory, introduction to parallel processing. Prerequisite: CPE 321. (Same as CPE 531.)

436 Internals of a Modern Operating System 3 hrs.
In-depth study of the design of modern operating systems such as Unix, NT and Linux. Emphasis on the internals and implementation details of interrupt processing, real-time clocks, device independent I/O, process management, memory management, file management. Prerequisites: CPE 336. (Same as CPE 536.)

438 Real Time and Embedded Systems 3 hrs.
Study of design methodologies for reliable real time systems. Prerequisites: CPE 336. (Same as CPE 538.)

448 Introduction to Computer Networks 3 hrs.
Introduction to the concepts and architecture of computer networks. Review of
communication protocols using the Internet and the TCP/IP model as major examples. High-speed networking, congestion control, data compression, security and distributed processing. Prerequisites: CPE 112 and CPE/EE 321. (Same as EE 468, CPE 548, EE 548, and CS 470.)

451 **Software Design & Engineering** 3 hrs.
Basic concepts of software engineering. Software project management including specification, design, implementation, testing, and documentation. Software tools for project management. Includes a multi-student software project. Prerequisites: CS 317, CPE 212. (Same as CPE 551.)

461 **Translation Systems** 3 hrs.
Grammars, parsers, and lexical analyzers; implementation of translators via top-down and bottom up techniques; grammar analysis to identify ambiguities. Practical applications of translators including conversion of file formats and compilation of traditional computer languages. Prerequisites: CPE 212 and CPE 321. Recommended CPE 431. (Same as CPE 561.)

490 **Special Topics in Computer Engineering** 1, 2, or 3 hrs.
Topics will vary. The course may be repeated when topics vary. Prerequisite: Consent of Advisor.

495 **Computer Engineering Design I** 2 hrs.
First course in the senior capstone design sequence. The focus of this class is the application of techniques to the design of electronic systems that have digital hardware and software components. Students will apply the theory acquired from numerous engineering courses to solve real-world design problems. Prerequisites: CPE/EE 321, CPE/EE 421.

496 **Computer Engineering Design II** 2 hrs.
Second course in the senior capstone design sequence. The focus of this class is the application of techniques to the design of electronic systems that have digital hardware and software components. Students will apply the theory acquired from numerous engineering courses to solve real-world design problems. Prerequisite: CPE 495.

**Electrical Engineering Option.**
The electrical engineering option offers a background that enables students to pursue careers in any of the many diverse facets of electrical engineering such as electronics, networks, power systems, instrumentation, communications, and controls. The student may also select advanced undergraduate courses to develop individual and specific interests.

**Objectives**
The objectives of the Electrical Engineering Program are to:

1. Provide the student with education in mathematics, science, and fundamental concepts in engineering.
2. Enable the student to function effectively in an interdisciplinary environment in industry and government.
3. Give the student in-depth knowledge of electrical engineering through elective courses for different areas of specialization such as controls, computer hardware/software, communications, signal processing, electronics, electromagnetic fields, and optics.
4. Provide the student with an ability to apply electrical engineering knowledge in the analysis, design and testing of electrical engineering systems, processes and components. This includes the ability to use appropriate computer and software tools, competence with laboratory techniques, analysis and interpretation of data, and application of modern analysis tools in advanced courses for a better understanding of the subjects.
5. Enhance the student's written and oral communication skills. The curriculum will require written and oral communications in several courses, introduce the student to engineering practice and to its ethical and societal aspects, and help make him/her proficient in articulating issues.
6. Provide the opportunity for in-depth study of social sciences and humanities outside of engineering.
7. Prepare students for graduate studies, lifelong learning, and professional development.

Program strengths include an engineering design experience; use of contemporary engineering design and modeling tools throughout the curriculum; and advanced engineering design options in analysis/design. The electrical engineering faculty is committed to sustaining a vigorous academic environment that values quality and diversity in the educational experience.

**Additional Basic Sciences**

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
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<tbody>
<tr>
<td>General Physics with Calculus III - PH 113</td>
<td>3</td>
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<tr>
<td>General Physics Laboratory III - PH 116</td>
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**Electrical Engineering Option**

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>EE 100 - Concepts in Digital Signals and Systems</td>
<td>3</td>
</tr>
<tr>
<td>CPE 112 - Computer Methods in Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EE 201 - Digital Logic Design Lab</td>
<td>1</td>
</tr>
<tr>
<td>EE 202 - Introduction to Digital Logic Design</td>
<td>3</td>
</tr>
<tr>
<td>EE 301 - Electronic Measurement Lab</td>
<td>1</td>
</tr>
<tr>
<td>EE 305 - Electronics Devices and Design Lab</td>
<td>1</td>
</tr>
<tr>
<td>EE 307 - Electricity and Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>EE 313 - Electrical Circuit Analysis II</td>
<td>3</td>
</tr>
<tr>
<td>EE 315 - Introduction to Electronic Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>EE 382 - Analytical Methods for Continuous Time Systems</td>
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<tr>
<td>EE 383 - Analytical Methods for Multivariable and Discrete Time Systems</td>
<td>3</td>
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<tr>
<td>EE 384 - Digital Signal Processing Lab</td>
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<tr>
<td>EE 420 - Random Signals and Noise</td>
<td>3</td>
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<tr>
<td>EE 425 - Introduction to Control and Robotic Systems</td>
<td>3</td>
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<tr>
<td>EE 448 - Analytical and Computational Methods in EE</td>
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<tr>
<td>EE 494 - EE Design Projects</td>
<td>3</td>
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<tr>
<td>Electrical Engineering Electives*</td>
<td>18</td>
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<tr>
<td>Technical Electives**</td>
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*These must include at least one of: EE 447, 424, or 426. The remaining hours can be chosen from any courses at 300 level or above offered by the ECE Department.

**Choose any science or engineering course, level 200 or above.

**Suggested Schedule of Courses for Full-time Electrical Engineering Students**

<table>
<thead>
<tr>
<th>Year</th>
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<td></td>
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College of Engineering 

130
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<th>Third Year</th>
<th>Fourth Year</th>
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<tr>
<td>EE 307</td>
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<td>EE 310</td>
<td>EE Elect.</td>
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<td>EE Elect</td>
<td>EE 420</td>
<td>131</td>
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<td>HU/SS*</td>
<td>HU/SS*</td>
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<td>EE 384</td>
<td></td>
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<tr>
<td>EE 301</td>
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</table>

**Total Hours**: 131

*HU/SS - 18 hours in humanities and social sciences.

Undergraduate Electrical Engineering Courses (EE)

**100 Concepts in Digital Signals and Systems** 3 hrs.
Introduction to and utilization of visualization and simulation tools in areas such as music, image processing, speech processing, control, optics, and mechanical systems. Introduction to Information Superhighway. Oral and written presentations of projects are required. Prerequisite: Precalculus (Students enrolling in EE 100 must enroll concurrently in EE 100L.)

**100L Laboratory Component of Concepts in Digital Signals and Systems**
Students enrolling in EE 100L must enroll concurrently in EE 100.

**201 Digital Logic Design Lab** 1 hr.
Experiments on logic gates, combinational logic circuit design, flip-flops, sequential circuit design, counter registers, and shift registers. Prerequisite or parallel: EE 202.

**202 Introduction to Digital Logic Design** 3 hrs.
Engineering approaches to design and analysis of digital logic circuits. Boolean algebra, Karnaugh maps, design using MSI and LSI components, algorithmic state and machine design of sequential circuits. Prerequisite: CPE 112.

**300 Electrical Circuit Analysis I** 3 hrs.
Circuit elements, voltage-current characteristics for circuit elements; independent and dependent sources; Kirchhoff's laws and circuit equations. Source transformations; Thevenin's and Norton's theorems; superposition. Transient response of RC, RL, and RLC circuits. Sinusoidal steady-state and impedance. Instantaneous and average power. Prerequisites: PH 112; Prerequisite or parallel: MA 324.

**301 Electronic Measurement Laboratory** 1 hr.
Experimental exercises in use of laboratory instruments. Voltage, current, impedance, frequency, and waveform measurements. Frequency and transient response. Elements of circuit modeling and design. Prerequisite: EE 300.

**305 Electronics Devices and Design Laboratory** 1 hr.
Experiments in the measurement of electronic device characteristics. Design of biasing networks, small signal amplifiers and switching circuits. Prerequisites: EE 301; Prerequisite or parallel EE 315.

**307 Electricity and Magnetism** 3 hrs.
Basic concepts of electrostatics, electric potential theory, electric fields and currents, fields of moving charge, magnetic fields, Maxwell's equations. Prerequisite: EE 300.
310 **Solid State Fundamentals**

Basic physical processes occurring in solids. Schrödinger equation and its applications. Energy bands and charge carriers in semiconductors, excess carriers in semiconductors, introduction to semiconductor junctions, the bipolar junction transistor, the metal-insulator-semiconductor field-effect transistors. Prerequisite: PH 113; Prerequisite or parallel MA 324.

313 **Electrical Circuit Analysis II**

Continuation of EE 300. Use of Laplace transform techniques to analyze linear circuits with and without initial conditions. Characterization of circuits based upon impedance, admittance, and transfer function parameters. Determination of frequency response via analysis of poles and zeros in the complex plane. Relationship between the transfer function and the impulse response of a circuit. Use of continuous time convolution to determine time domain responses. Properties and practical uses of resonant circuits and transformers. Input-output characterization of a circuit as a two-port. Low- and high-pass filter design. Prerequisite or parallel: EE 307.

315 **Introduction to Electronic Analysis and Design**

Diode, bipolar transistor and FET circuit models for the design and analysis of electronic circuits. Single and multistage analysis and design. Computer aided design calculations, amplifier operating point design, and frequency response of single and multistage amplifiers. High frequency and low frequency designs are emphasized. Prerequisite: EE 301.

321 **Computer Organization**

Functional organization of stored-program digital computers including number representation, assembly language programming, computer hardware, micro-operations, and control logic; microprocessor architecture. Prerequisite: EE 202. (Same as CPE 321.)

382 **Analytical Methods for Continuous Time Systems**


383 **Analytical Methods for Multivariable and Discrete Time Systems**

Discrete time signals and systems, sampling techniques, $Z$ and discrete Fourier transforms, multivariable systems. Introduction to digital signal processing. Prerequisite: EE 382.

384 **Digital Signal Processing Laboratory**

Design and programming of digital processing algorithms such as DFT, FFT, IIR, and FIR filtering. Prerequisite or parallel: EE 383.

401 **Digital Signal Processor Architectures**

Introduction to digital signal processor architectures, applications, assembly language programming, and development tools for designing and implementing DSP systems. Prerequisite: EE 383.

410 **Selected Topics in Electrical Engineering**

1-3 hrs.

411 **Electric Power Systems**

Power generation, transmission, and distribution. Three-phase circuits and per unit analysis, load-flow studies, symmetrical components, and power systems stability. Prerequisite: EE 313.

412 **Senior Design Project in Electrical Engineering**

1-3 hrs.

Individual design project under the direction of an ECE faculty member. Prerequisites: Senior standing and permission of instructor.

414 **Analog and Digital Filter Design**

Analog filter design via Butterworth, Chebyshev, and elliptical approximation. Active filter design using operational amplifiers. Digital filter design methods. Prerequisite: EE 383.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>416</td>
<td>Electronics II</td>
<td>3 hrs.</td>
<td>Integrated circuits and microdevices related to multistage amplifiers, oscillators, design specifications, operational amplifiers, and microcircuits. Computer simulation.</td>
<td>EE 313, 315</td>
</tr>
<tr>
<td>420</td>
<td>Random Signals and Noise</td>
<td>3 hrs.</td>
<td>Random variables and probability description of signals. Introduction to random processes: autocorrelations, cross correlation, power spectral density. Noise analysis: thermal, shot, white, and colored. Response of electrical systems to random inputs.</td>
<td>EE 382</td>
</tr>
<tr>
<td>421</td>
<td>Microcomputers</td>
<td>3 hrs.</td>
<td>The microcomputer as a component in digital design. Laboratory experience in interfacing and design projects. Prerequisite: EE 202; Prerequisite or parallel: EE 315; EE 436 recommended. (Same as CPE 421, CPE 521, and EE 521.) Students enrolling in EE 421 must enroll concurrently in EE 421L.</td>
<td></td>
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<tr>
<td>421L</td>
<td>Laboratory Component of Microcomputers</td>
<td>0 hrs.</td>
<td>Students enrolling in EE 421L must enroll concurrently in EE 421.</td>
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<tr>
<td>422</td>
<td>Advanced Logic Design</td>
<td>3 hrs.</td>
<td>Advanced concepts in Boolean algebra, use of hardware description languages as a practical means to implement hybrid sequential and combinational designs, digital logic simulation, rapid prototyping techniques, and design for testability concepts. Focuses upon the actual design and implementation of sizeable digital design problems using a representative set of Computer Aided Design (CAD) tools. Prerequisite: EE 202. (Same as CPE/EE 522 and CPE 422.) Students enrolling in EE 422 must enroll currently in EE 422L.</td>
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</tr>
<tr>
<td>422L</td>
<td>Laboratory Component of Advanced Logic Design</td>
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<td>Students enrolling in EE 422L must enroll concurrently in EE 422.</td>
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<tr>
<td>424</td>
<td>Introduction to Data Communication Networks</td>
<td>3 hrs.</td>
<td>Overview of historic development of modern telephone and data communication system, system architecture, standards, broadband switching systems, multirate switching, asynchronous transfer function mode (ATM), integrated services for digital networks (ISDN, B-ISDN), modems, protocols, satellite communications, personal and mobile communications. Prerequisite: EE 383. (Same as EE 504.)</td>
<td></td>
</tr>
<tr>
<td>425</td>
<td>Introduction to Control and Robotic Systems</td>
<td>3 hrs.</td>
<td>Basic theories and analytical techniques for modeling, analysis and control of dynamical systems. Transfer functions, block-diagrams, frequency response, stability criteria, series and feedback controller design, digital control. Introduction to the dynamic analysis and control of robotic systems. Prerequisite: EE 382 or permission of instructor. (Same as EE 505.)</td>
<td></td>
</tr>
<tr>
<td>426</td>
<td>Communication Theory</td>
<td>3 hrs.</td>
<td>Review of elementary signals and systems including the Hilbert transform, cross and auto correlation, power density spectrum, and the Wiener-Khintchine theorem. Butterworth and Chebyshev lowpass filters. Bandpass signals and systems. The lowpass equivalent of a bandpass signal/system. Commonly used forms of linear and nonlinear modulation. Demodulation methods and circuits. Phase lock and frequency feedback techniques. Prerequisites: EE 382 or permission of instructor. (Same as EE 506.)</td>
<td></td>
</tr>
<tr>
<td>427</td>
<td>VLSI Design I</td>
<td>3 hrs.</td>
<td>Introduction to VLSI design using CAD tools, CMOS logic, switch level modeling, circuit characterization, logic design in CMOS, systems design methods, test subsystem design, design examples, student design project. Design project to be fabricated and tested in EE/CPE 428. Prerequisite: EE 202 and EE 315. (Same as CPE 427 and CPE 527.) Students enrolling in EE 427 must enroll concurrently in EE 427L.</td>
<td></td>
</tr>
<tr>
<td>427L</td>
<td>Laboratory Component of VLSI Design I</td>
<td>0 hrs.</td>
<td>Students enrolling in EE 427L must enroll concurrently in EE 427.</td>
<td></td>
</tr>
</tbody>
</table>
428 VLSI Design II 3 hrs.
Advanced experience with CAD tools for VLSI design, IC testing. Design project from EE/CPE 427 to be fabricated and tested. Implementation and verification of test programs, IC testing and troubleshooting, legal, economic, and ethical design issue. Oral presentations and written reports are required. Prerequisite: EE/CPE 427. (Same as CPE 428 and CPE 528.) Students enrolling in EE 428 must enroll concurrently in EE 428L.

428L Laboratory Component of VLSI Design II 0 hrs.
Students enrolling in EE 428L must enroll concurrently in EE 428.

436 Digital Electronics 3 hrs.
Introduction to digital electronics. The Metal-Oxide-Semiconductor (MOS) transistor. MOS inverters and gate circuits. Bipolar junction transistors, ECL inverters, and bipolar digital gates. Semiconductor Memories. Must parallel EE 439. Prerequisites: EE 202 and 315. (Same as EE 516.)

437 Electronics Manufacturing Processes 3 hrs.
Current concepts, facilities, and technology utilized in the manufacture of electronic components and products. Includes printed wiring board fabrication and component mounting methods, automation, quality and reliability, product testing, and economic issues. Prerequisite: Senior standing. (Same as ISE 437 and 537.)

447 Electromagnetic Waves 3 hrs.
Review of Maxwell’s equations, uniform plane waves in different types of media, reflection, and transmission of uniform plane waves, transmission lines, waveguides, antennas. Prerequisite: EE 313. (Same as EE 527.)

448 Analytical and Computational Methods in Electrical Engineering 3 hrs.
Analytical and numerical solutions to problems arising in electrical engineering. Dynamic analysis of circuits and systems, matrix algebra approach, sequences and series with applications in signal analysis, complex variables and functions, vector differential operators and their applications. Prerequisite: EE 382.

451 Optoelectronics 3 hrs.
Basic concepts for understanding electro-optic devices and systems. Blackbody radiation; light sources; quantum and thermal detectors, noise in detectors; optical hetero-dyning; acousto-optic, magneto-optic, and electro-optic modulation. Prerequisite: EE 315. (Same as OPE 451.)

452 Optical Systems Design 3 hrs.
Introduction to the geometrical design and analysis of optical systems, and to the design principles of lens systems. Prerequisite: EE 461. (Same as EE 532.)

453 Laser Systems 3 hrs.
Spontaneous and stimulated emission, population inversion, optical resonators, three-and four-level systems, Q-switching and mode-locking, semiconductor lasers, integrated optic waveguides and couplers, scanning systems, high-power industrial application. Prerequisite: EE 307. (Same as OPE 453.)

454 Optical Fiber Communications 3 hrs.
Introduction to optical fibers and their transmission characteristics, optical fiber measurements, sources and detectors, noise considerations for digital and analog communication, optical fiber systems. Prerequisite: EE 307 or PH 432. (Same as OPE 454.)

461 Optical Systems Design 3 hrs.
Intermediate geometrical optics, first-order optics, linear transformations, paraxial optics, reflection and transmission at an interface, polarized light, Jones and Mueller calculi, matrix methods, ray tracing, apertures and stops, third-order optics and aberrations. Prerequisite: OPT 342. (Same as OPT/PH/OPE 441.)

462 Interference and Diffraction 3 hrs.
Two beam interference. Multiple beam interference. Optical testing. Fraunhofer diffraction. Fresnel diffraction. The Fourier transform. Fourier methods in optics. Coherence, Holography. Prerequisite: OPT 441. (Same as OPT/PH/OPE 442.)
468  Introduction to Computer Networks  
3 hrs.
Introduction to concepts and protocols of computer networks, including ISO layers, error detection and control, packet switching, programming interfaces, and data services. Local area networks, TCP/IP, and applications. Prerequisites: CPE 112, CPE/EE 321. (Same as CPE 448, 548, EE 548, and CS 470.)

494  EE Design Projects  
3 hrs.
Design, simulation, and construction of selected interdisciplinary projects. Review of legal, economic, and ethical issues. Students work as individuals or teams under the direction of a faculty member to design, implement, test, and evaluate their projects. Oral presentation and written reports are required. Prerequisite: Senior standing.

Optical Engineering Option (ECE Emphasis)  
The Department of Electrical and Computer Engineering administers the accredited undergraduate degree option in optical engineering. This program prepares students for careers in opto-electronics, including the design and application of systems for optical fiber communications, optical instrumentation, holography, image forming and processing, lasers and optical detection, as well as areas such as optical testing.

Objectives  
The undergraduate program in optical engineering is offered by the Department of Electrical & Computer Engineering. The program:

1. Provides the student with education in mathematics, science, and fundamental concepts relevant to interface areas involving optical engineering.
2. Enables the student to function effectively in the interdisciplinary environment in industry and government with a special emphasis on interdisciplinary problems that involve optical engineering.
3. Gives the student in-depth knowledge of optical engineering with an emphasis on areas involving optics through elective courses. These courses address areas such as controls, computer hardware/software, communications, signal processing, electronics, electro-magnetic fields, and optics with an emphasis on building skills and knowledge relevant to tasks at the interface between optical engineering and electrical engineering.
4. Provides the student with an ability to apply optical engineering knowledge in the analysis, design, and testing of systems, processes, and components that involve either or both, optical and electrical engineering. This includes the ability to use appropriate computer and software tools, competence with laboratory techniques, analysis and interpretation of data, and application of modern analysis tools in advanced courses that relate to interface issues involving both optical engineering and electrical engineering.
5. Enhances the student's written and oral communication skills. The curriculum will require written and oral communications in several courses, introduce the student to optical and electrical engineering practice and to its ethical and societal aspects, and help make him/her proficient in articulating relevant issues.
6. Provides the opportunity for in-depth study of social sciences and humanities with an emphasis on areas that involve both optical and electrical engineering.
7. Prepares students for graduate studies, lifelong learning, and professional development with a special emphasis on the interface between optical engineering and electrical engineering.

Optical Engineering Option  
Additional Basic Sciences  
PH 113 - General Physics with Calculus III  
PH 116 - General Physics Laboratory III  

Optical Engineering Core  
CPE112 - Computer Methods in Engineering  

Semester Hours  
135
### Remaining Required Courses

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<tr>
<th>Course Code</th>
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<tr>
<td>EE 201</td>
<td>Digital Logic Design</td>
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<td>Introduction to Digital Logic Design</td>
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<td>EE 301</td>
<td>Electronic Measurement Laboratory</td>
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<td>Electronics Devices and Design Laboratory</td>
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<td>EE 382</td>
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<td>Digital Signal Processing Laboratory</td>
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<td>EE 420</td>
<td>Random Signals and Noise</td>
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<td>EE 426</td>
<td>Communication Theory</td>
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<td>OPE 451</td>
<td>Optoelectronics</td>
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<td>OPE 454</td>
<td>Optical Fiber Communications</td>
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*Courses at 300 level or above, approved by optical engineering advisor

**Total optical engineering course requirements: 134**

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### Suggested Schedule of Courses for Full-time Optical Engineering Students

#### First Year

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<th>Course Code</th>
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#### Second Year

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#### Third Year

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#### Fourth Year

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<td>OPE 451</td>
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**College of Engineering: 136**
Undergraduate Optical Engineering Courses (OPE)

**441 Optical Systems Design**  
Intermediate geometrical optics, first-order optics, linear transformations, paraxial optics, reflection and transmission at an interface, polarized light, Jones and Mueller calculi, matrix methods, ray tracing, apertures and stops, third-order optics and aberrations. Prerequisite: OPT 342. (Same as EE 461, and PH/OPT 441.)

**442 Interference and Diffraction**  

**451 Optoelectronics**  
Basic concepts for understanding electro-optic devices and systems. Blackbody radiation; light sources; quantum and thermal detectors; noise in detectors; optical heterodyning; acousto-optic, magneto-optic, and electro-optic modulation. Prerequisite: EE 315. (Same as EE 451.)

**453 Laser Systems**  
Spontaneous and stimulated emission, population inversion, optical resonators, three- and four-level systems, Q-switching and mode-locking, semiconductor lasers, integrated optic waveguides and couplers, scanning systems, high-power industrial application. Prerequisite: EE 307. (Same as EE 453.)

**454 Optical Fiber Communications**  
Introduction to optical fibers and their transmission characteristics, optical fiber measurements, sources and detectors, noise considerations for digital and analog communications, optical fiber systems. Prerequisite: EE 307 or PH 432. (Same as EE 454.)

**455 Optical Engineering Laboratory**  
Introduction to physical optics phenomena, Young's double slit experiment, Lloyd's mirror, Fresnel biprism, Newton's rings, intensity distribution in fringe systems, Michelson interferometer, Fabry-Perot interferometer, Fresnel andFraunhofer diffraction, diffraction by circular, rectangular and multiple openings, diffraction gratings, curve generating, polishing and testing optical surfaces with emphasis on design aspects of these systems. Prerequisites: PH 113, OPT 342, and EE 382 or OPT 442. (Same as OPT 412.)

**456 Photonics Laboratory**  
Intensive laboratory work with experiments and design projects on lasers, optical fibers, spatial light modulators, image processing, spatial filtering, optical fiber communication and optical computing. Prerequisites: OPE 453 and 454.

**459 Optical Engineering Design**  
Senior design project. Analysis, design, and testing of optical and optoelectronic systems. Case studies of legal, economic, and ethical issues. Prerequisite: Senior standing.
INDUSTRIAL AND SYSTEMS ENGINEERING AND ENGINEERING MANAGEMENT
N143 Technology Hall
Telephone: (256) 824-6256
Email: ise@uah.edu

Degree: Bachelor of Science in Engineering

Professors Rhoades, Schroer, Swain (Chair), Westbrook, Wyskida; Associate Professors Farrington, Messimer, Tippett; Associate Professor Emeritus Walker; Assistant Professors Componation, Gholston, Utley; Lecturer Cottingham; Adjunct Professors Dorsett, Safie; Adjunct Associate Professor Thomas; Adjunct Assistant Professors Evans, Fogle

Industrial and Systems Engineering and Engineering Management (ISEEM) Vision
The ISEEM Department vision is to be known as the best applications oriented department in the southeastern U.S. in the areas of industrial engineering, systems engineering, and engineering management. This vision encompasses three tightly coupled areas: students, faculty, and research. The department focus on student development is strengthened by applicable research and faculty service. Creative problem solving and the ability to work in teams are considered critical skills for the students. Students will possess good verbal and writing skills and be able to articulate their ideas. The department recruits and attracts a diverse, academically superior student body. The mission of the department is to provide a high quality education to students both in the Huntsville area and beyond in industrial engineering, systems engineering, and engineering management.

To realize the mission of the department, the following educational objectives have been adopted for the undergraduate program. These objectives cover the fundamentals of both engineering and the humanities that characterize a university education, plus the specialized knowledge of industrial and systems engineering needed for a successful career in industry, the government, or academia.

1. Producing graduates whose broad education and knowledge of contemporary issues illuminates their understanding of the interaction between technology and society.

2. Producing graduates with the core competencies of engineering practice: the ability to apply the fundamentals of science and technology, the ability to conduct experiments, and the ability to formulate and solve problems.

3. Producing graduates with the ability to apply the methodology of Industrial Engineering to effectively analyze, design and implement integrated systems of material, energy, information, equipment, and people.

4. Producing graduates who can function effectively in the work environment through effective communication, participation and leadership on teams, within the code of professional conduct and ethics, and able to continue learning throughout their careers.

Engineering Cluster in ISE
The ISEEM Department offers one engineering cluster that requires 21 credit hours of ISE courses. The request for a cluster is initiated in the Engineering Student Affairs Office. Industrial and Systems Engineering: ISE 224, 321, 340, 390, 391, 423, 430.

Industrial and Systems Engineering Option
Industrial engineering has evolved as a result of the ever increasing store of human knowledge...
and specialization. Industrial engineers integrate resources to solve society's problems. They seek solutions that effectively utilize people and technology to address problems in industry and government while maintaining a high regard for the environment and society as a whole. The department's goal is to provide a student-focused environment providing students with the skills necessary for success in their future careers. ISEEM courses are application oriented, integrating information and experiences from regional industry. The ISEEM student population is one of the most diverse on campus.

Students take courses in facilities design, human factors engineering, financial decision making, manufacturing systems design, production and inventory control, statistics and quality control, computer modeling/simulation and systems management. ISEEM graduates might find themselves in such diverse industries as electronics, automotive, manufacturing, aerospace, government agencies and health care. An ISEEM professional may design the facility for the best product flow through the plant; use computer simulation to test various alternative design decisions; help design the inside compartments for the next space shuttle considering the limited space requirement and human interface with the controls; help design or track a total process system to help coordinate all functions for a successful end product; or help track quality using statistical methods.

### Additional Basic Sciences

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
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### Industrial Engineering Option

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<td>Ergonomics and Methods Analysis</td>
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<td>Management Systems Analysis</td>
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<td>ISE 428</td>
<td>Systems Analysis and Design I</td>
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<td>ISE 429</td>
<td>Systems Analysis and Design II</td>
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<td>ISE 430</td>
<td>Manufacturing Systems &amp; Facilities Design</td>
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<td>ISE 433</td>
<td>Production and Inventory Control Systems</td>
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<td>**Technical Electives</td>
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* Choose from ISE 426, 437, or other upper-level courses approved by the Department.

**Choose any 200-level or above engineering or science course.
### Suggested Schedule of Courses for Full-time Industrial and Systems Engineering Students

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#### Third Year

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#### Fourth Year

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**Total Hours**: 131

### Undergraduate Industrial and Systems Engineering Courses (ISE)

#### 224 Introduction to Industrial & Systems Engineering
- **3 hrs.**
  - Overview of industrial engineering concepts. Includes history and development of classical industrial engineering; documentation and computational methods; basic work methods and measurement; manufacturing systems; and economic decision analysis.
  - Prerequisite: MA 172.

#### 321 Engineering Economy
- **3 hrs.**
  - Economic evaluation of engineering alternatives. Interest, time-value of investments, depreciation and income taxes, break-even cost analysis. Prerequisite: MA 172; sophomore standing.

#### 340 Operations Research
- **3 hrs.**
  - Fundamental methods, models and computational techniques of operations research. Linear programming including transportation, assignment and simplex algorithms. Queueing theory. Prerequisite or parallel: ISE 390.

#### 378 Materials and Manufacturing Processes
- **3 hrs.**
  - Engineering properties of materials, sources of information for properties of materials, cost considerations for material selection, manufacturing processes, casting, forming, machining, cost considerations for machining operations. One or more field trips are included. Prerequisites: MAE/CE 370. (Same as MAE 378.)

#### 390 Probability and Engineering Statistics I
- **3 hrs.**
  - Engineering uses of probability theory, discrete and continuous probability distributions including the binomial, Poisson, hypergeometric, normal, uniform, lognormal, and exponential distributions. Statistical sampling, distributions of means, variances, and proportions. Hypothesis testing and confidence intervals. Prerequisite or parallel: MA 201.
391 Probability and Engineering Statistics II 3 hrs.
Continuation of ISE 390 with regression analysis, analysis of variance, and nonparametric statistics. Introduction to design of engineering experiments, and computer-based solution of large-scale problems. Prerequisite: ISE 390.

423 Statistical Quality Control 3 hrs.
Statistical theory and techniques to control quality of manufactured products. Includes laboratory exercises. Prerequisite or parallel: ISE 391. (Same as ISE 523.)

424 Ergonomics and Methods Analysis 3 hrs.
Introduces students to basic principles of methods analysis and ergonomics. Methods analysis topics include: work measurement, work measurement tools, work sampling, job analysis, job evaluation, and the development and use of flow and activity charts for methods improvement. Ergonomics topics include anthropometric data, workplace design, design of the physical environment, work organization, and display and control design. Includes term project and laboratory exercises. Prerequisite: ISE 390. (Same as ISE 524.)

426 Design and Analysis of Experiments 3 hrs.
Advanced topics in statistical experiments with emphasis on the design aspect. Factorial designs, including fractional replication and confounding. Includes computer laboratory exercises. Prerequisite: ISE 391. (Same as ISE 526.)

427 Management Systems Analysis 3 hrs.
Formal organization structures and functions. Analysis of organization planning leading toward the accomplishment of goals. Techniques for making decisions within formal organizations, together with ethical constraints. Emphasis on technical writing. Prerequisite: ISE 390.

428 Systems Analysis and Design I 3 hrs.
Philosophy and methods of industrial and nonindustrial systems analysis and design. Methods of systems definition, analysis, simplification, evaluation, and optimization. Design project required. Ethics and technical writing are emphasized. Prerequisites: ISE 340, 391, and senior standing.

429 Systems Analysis and Design II 3 hrs.
Continuation of design project begun in ISE 428. Prerequisite: ISE 428.

430 Manufacturing Systems and Facilities Design 3 hrs.
Overview of modern manufacturing systems design with emphasis on facility location and plant layout. Includes classical systems, just-in-time systems, basic principles of integrated manufacturing systems design, as well as analysis of process flow, process productivity, and available space to determine facility layout. Includes term project and laboratory exercise. Prerequisite: Senior standing. (Same as ISE 530.)

433 Manufacturing Systems 3 hrs.
The course presents a systematic description of the underlying behavior of manufacturing systems. Students will develop the analytical skills needed to identify opportunities to improve existing systems, design effective new systems, and conduct trade studies to coordinate manufacturing policies. Prerequisites: ISE 390 or instructor approval. (Same as ISE 533.)

437 Electronics Manufacturing Processes 3 hrs.
Current concepts, facilities, and technology utilized in the manufacture of electronic components and products. Includes printed wiring board fabrication and component mounting methods, automation, quality and reliability, product testing and economic issues. Prerequisite: Senior standing. (Same as ISE 537, EE 437.)

439 Selected Topics in ISE 1-3 hrs.

447 Introduction to Systems Simulation 3 hrs.
Philosophy and elements of digital, discrete-event simulation. Emphasis on modeling and analysis of stochastic systems, including probabilistic models, output analysis, and the use of simulation software. Prerequisites: CPE 112, ISE 391. (Same as ISE 547.)
MECHANICAL AND AEROSPACE ENGINEERING
N274 Technology Hall
Telephone: (256) 824-6154
Email: mae@uah.edu

Degree: Bachelor of Science in Engineering

Eminent Scholar Coleman; Distinguished Professors Chung, Wu; Professors Cost, Gilbert, Hawk, Karr, Wallace, Wessling (chair); Adjunct Professors Blair, Schultenhofer; Professor Emeritus, Shih; Associate Professors Bower, Frederick, Frendi, Hampton, Landrum, Lin; Research Professor Blackmon; Assistant Research Professor Moser.

Mechanical Engineering Option
Mechanical engineering is a broad field that traditionally comprises three primary subfields: energy, mechanisms and machinery, and manufacturing. The work done by mechanical engineers includes the design, construction, and use of systems for the conversion of energy available from natural sources (water, fossil fuels, nuclear fuels, solar radiation) to other forms of useful energy (for transportation, heat, light, power); design and production of machines to lighten the burden of servile human work and to do work otherwise beyond human capability; processing of materials into useful products; and creative planning, development, and operation of systems using energy, machines, and resources.

Mission Statement

The mission of the Mechanical and Aerospace Engineering (MAE) Department is to achieve excellence in undergraduate and graduate education, research, and public service in the engineering profession in general and in the mechanical and aerospace disciplines in particular. The department seeks to provide an educational environment that will: 1) inspire students to attain the highest levels of intellectual and personal growth throughout their lives, 2) enable students and faculty to make lasting contributions to the advancement of knowledge and the creative practice of engineering, and, 3) engage the faculty in service that enhances the public's understanding of technology for the betterment of society. The MAE Department seeks to provide leadership and continuing engineering education, research, and practice; promote equality of opportunity for engineering education; and, produce graduates who are prepared to support the diverse needs of Huntsville, the State of Alabama, the region, our nation, and the international community.

Goals

Development of Academic Programs

Provide quality undergraduate and graduate education in mechanical and aerospace engineering for a diverse student body. Achieve the maximum obtainable accreditation from ABET for MAE undergraduate programs and maintain strong undergraduate and graduate programs.

Development of Research

Develop research programs that enable the department to achieve and maintain national prominence in areas that support its educational mission and in areas that are important to the economy of the region. Success is evidenced by external funding, referred publications and presentations, projects, theses and dissertations. Encourage partnerships among the department, and UAH research centers, other UAH departments, the community, industry, and government through its instructional, research, and service programs.
Improving National Visibility

Achieve national recognition as a leading Mechanical and Aerospace Engineering Department. Emphasize space-related instruction, research, and service in direct support of UAH's designation as a Space Grant University.

Student Development

Strive to maximize student performance and retention through accurate advising, quality instructing, continuous progress monitoring, and frequent meetings with students. MAE students will be assigned advisors from the full-time faculty. Each faculty advisor will be expected to monitor progress, facilitate communication, select appropriate courses, and help solve students' problems by referring them to appropriate campus resources. Student retention will be emphasized. Efforts will be made to increase informal student-faculty interaction.

Support and foster student organizations that enhance and enrich the student's life in the department. Such organizations include student chapters of engineering professional and academic societies and minority societies (e.g. AIAA, ASME, SAE, SBE, SWE, etc.).

Student Recruitment

The department will promote efforts to recruit a diverse student body.

Facilities Development

Continuously improve and maintain instructional and research laboratories that reflect the latest technological and scientific advances. Provide adequate levels of support personnel.

Faculty Development

Support a rigorous faculty development program that will allow faculty to improve their performance, to continue their education, and to participate in national and international professional activities.

Engineering Cluster in MAE

The MAE Department offers one engineering cluster that requires 23 credit hours of MAE courses. The request for a cluster is initiated in the Engineering Student Affairs Office.


Additional Basic Sciences

CH 123, 126 - Chemistry II .................................................. 4

Mechanical Engineering Option

MAE 100 - Introduction to Mechanical & Aerospace Engineering .......... 2
CPE 112 - Computer Methods in Engrg ........................................ 3
MAE 198 - Engineering Graphics ................................................. 3
CHE 295 - Nature & Properties of Materials Lab .......................... 1
MAE 311 - Principles of Measurement & Instrumentation .................. 3
MAE 341 - Thermodynamics I ................................................. 3
MAE 342 - Thermodynamics II .................................................. 3
MAE/CHE 352 - Fluid Mechanics I .............................................. 3
MAE/CE 362 - Dynamics .......................................................... 3
MAE 364 - Kinematics & Dynamics of Machines ............................ 4
Suggested Schedule of Courses for Full-time Mechanical Engineering Students

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</tbody>
</table>

| Total Hours | 134 |

*Hu/SS: 18 hours in humanities/social sciences

College of Engineering 144
Aerospace Concentration in Mechanical Engineering

Aerospace engineering is a diverse and rapidly changing field which consists of four primary technology areas: aerodynamics, structures and materials, propulsion, and flight mechanics. Aerospace engineers have traditionally applied their knowledge in these areas to the design and development of high performance flight systems such as aircraft, spacecraft, missiles and rockets. However, today's aerospace engineer may also participate in new areas such as ground transportation systems (automobiles, trains and nautical craft) and environmental aerodynamics (wind loads on structures, atmospheric pollutant dispersal). Therefore, the field of aerospace engineering is interdisciplinary in nature and draws upon knowledge from many of the traditional sciences. At UAH a student may obtain a B.S.E. degree option in mechanical engineering with a concentration in aerospace engineering. The curriculum for the aerospace concentration is essentially the same as that for the mechanical engineering option through the junior year. At that time the student takes a series of specialized aerospace engineering courses in aerodynamics, propulsion, structures, and flight mechanics. These courses can also be used as technical electives in other engineering and science programs.

Aerospace Engineering Concentration

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAE 100 -</td>
<td>Introduction to Mechanical &amp; Aerospace Engineering</td>
<td>2</td>
</tr>
<tr>
<td>CPE 112 -</td>
<td>Computer Methods in Engineering</td>
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<tr>
<td>MAE 198 -</td>
<td>Engineering Graphics</td>
<td>3</td>
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<tr>
<td>MAE/CHE 294* - Nature &amp; Properties of Materials</td>
<td>3</td>
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<tr>
<td>CHE 295 -</td>
<td>Nature &amp; Properties of Materials Lab</td>
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<tr>
<td>MAE 311 -</td>
<td>Principles of Measurement &amp; Instrumentation</td>
<td>3</td>
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<tr>
<td>MAE 341 -</td>
<td>Thermodynamics I</td>
<td>3</td>
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<tr>
<td>MAE 342 -</td>
<td>Thermodynamics II</td>
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<tr>
<td>MAE/CHE 352 - Fluid Mechanics I</td>
<td>3</td>
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<tr>
<td>MAE 362 -</td>
<td>Dynamics</td>
<td>3</td>
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<tr>
<td>MAE 370 -</td>
<td>Mechanics of Materials</td>
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<tr>
<td>MAE 371 -</td>
<td>Aerospace Structures</td>
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<td>MAE 372 -</td>
<td>Aerospace Structures Lab</td>
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<tr>
<td>MAE 396 -</td>
<td>Numerical Methods &amp; Computations</td>
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<tr>
<td>MAE/CHE 442 - Introduction to Heat &amp; Mass Transfer</td>
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<td>Aerospace Propulsion</td>
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<td>Fluid Mechanics II</td>
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<td>Fundamentals of Aerodynamics</td>
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<td>MAE 464 -</td>
<td>Aerospace Design</td>
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<td>MAE 480 -</td>
<td>Aircraft Stability &amp; Control</td>
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<tr>
<td>MAE 488 -</td>
<td>Analysis of Engineering Systems</td>
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<tr>
<td>MAE 493 -</td>
<td>Introduction to Engineering Design</td>
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<tr>
<td>MAE 497 -</td>
<td>Aerospace Engineering Senior Project</td>
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<tr>
<td>*Technical Electives</td>
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</table>

*MAE courses at 300-level or above, or other upper level courses approved by the department.

Students applying for graduation in the aerospace engineering concentration must show evidence of having taken the Fundamentals of Engineering (FE) Examination. The examination is offered by the State of Alabama Board of Registration for Engineers and Land Surveyors, P. O. Box 304451, Montgomery, AL 36130-4451. Telephone (334) 242-5568. Contact the College of Engineering Student Affairs Office, EB 157, for further information.
## Suggested Schedule of Courses for Full-Time MAE/Aerospace Engineering Concentration

### First Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>MA 171</td>
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<td>CH 121/125</td>
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<td>MAE 198</td>
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### Second Year

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<td>MAE 370</td>
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### Third Year

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*HU/SS - 18 hours in humanities/social sciences.

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**Undergraduate Mechanical and Aerospace Engineering Courses (MAE)**

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<th>Hours</th>
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<tr>
<td>100</td>
<td>Introduction to Mechanical and Aerospace Engineering</td>
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<tr>
<td>198</td>
<td>Engineering Graphics</td>
<td>2</td>
</tr>
<tr>
<td>271</td>
<td>Statics</td>
<td>3</td>
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</tbody>
</table>

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**Introduction to Mechanical and Aerospace Engineering (2 hr.)**

Introduction to engineering in mechanical and aerospace fields; Introduction to the various tools and facilities used to design and analyze engineering systems and present the results to others. Includes working with appropriate computer software. A project is performed and the results are presented in both written and oral form. One credit hour laboratory, MAE 100L, is included. Prerequisites: Precalculus.

**Engineering Graphics (2 hrs.)**


**Statics (3 hrs.)**

Topics include: forces, resultant forces, moments, couples equivalent force systems, equilibrium, distributed loads, two force members, trusses, centroids, moments of inertia,
shear and bending moment diagrams, static and kinematic friction. Prerequisites: MA 201, PH 111. (Same as CE 271.)

294 Nature and Properties of Materials
3 hrs.
Introduction to the fundamental nature (chemistry and structure), composition, and properties (mechanical and chemical) of solid materials, including metals, polymers, ceramics, and semiconductors. Bonding, composition, and phase diagrams, as well as the nano- and micro-structure of materials will be highlighted. How the nature and properties of materials are characterized or tested will be discussed. Composite materials and aspects of materials processing, including diffusion, nucleation, and transformation diagrams, will also be presented. Companion laboratory is CHE 295, to be taken concurrently with or after MAE 294.

311 Principles of Measurement and Instrumentation
3 hrs.
Fundamentals of instrumentation and techniques for measurement of mechanical phenomena such as temperature, flow, pressure, force, strain, displacement, and acceleration. Instrument calibration, measurement standards, computerized data acquisition, statistical error analysis, signal conditioning, and time domain analysis. Includes practical lab experiences using thermocouples, pressure transducers, strain gages, flowmeters, and accelerometers. Prerequisite: EE 300.

341 Thermodynamics I
3 hrs.
Basic laws of energy that apply in all branches of engineering and science. Properties of matter, state variables, reversible processes, first and second laws of thermodynamics with applications to closed and open systems. Availability of energy and irreversibility. Prerequisite: MA 201, CH 123, CH 126.

342 Thermodynamics II
3 hrs.
Continuation of ME 341. Thermodynamic cycles, thermodynamic relations among properties, chemical reactions, and phase and chemical equilibrium. Prerequisite: MAE 341.

352 Fluid Mechanics I
3 hrs.
Fluid properties and fundamental principles governing fluid behavior. Fluid statics, basic equations in integral form and differential form, potential flow, dimensional analysis, and internal incompressible viscous flows. Prerequisites: CPE 112 or CHE 197, MAE/CE 271 and MA 324. (Same as CHE 352.)

362 Dynamics
3 hrs.
Kinematics and kinetics of a particle and of systems of particles with applications to central force motion, impact, relative motion, vibrations, and variable mass systems. Dynamics of rigid body in plane motion, relative motion in rotating coordinates, and gyroscopic motion. Prerequisite: CPE 112, MAE/CE 271 (Same as CE 362.)

364 Kinematics and Dynamics of Machines
4 hrs.
Kinematics and dynamics of planar machinery. Principles of mechanisms, design of cams, fundamentals of gears and epicyclic gear trains, methods of determination of velocity and acceleration in mechanisms. Inertia forces in machines, balancing of rotating masses and reciprocating masses, and vibration analysis. Prerequisite: MAE 198, MAE/CE 362.

370 Mechanics of Materials
4 hrs.
Topics include: theory of stress and strain, Hooke's law, analysis of stresses and deformations in bodies loaded by axial, torsional, bending, and combined loads, and analysis of statically indeterminate systems. Laboratory includes: determination of selected properties of various engineering materials, experimental verification of theories presented, use of strain measuring devices, test procedures, instrumentation, and interpretation of results. Prerequisite: CPE 112, MAE/CE 271. (Same as CE 370.)

371 Aerospace Structures
3 hrs.
Analysis and design of lightweight aerospace structures including sandwich structures, stiffened panels, and tubing stress and deflection analysis. Design of members in tension, torsion and bending. Space structures. Prerequisites: MAE/CE 362, MAE/CE 370.

147 College of Engineering
372 Aerospace Structures Laboratory
Experimental studies of the behavior of aerospace structures. Investigation of column and plate instabilities, stiffened thin panels, and composite structures. Prerequisites: MAE/CE 370; Co-requisite: MAE 371.

378 Materials and Manufacturing Processes
Engineering properties of materials, sources of information for properties of materials, cost considerations for material selection, manufacturing processes, casting, forming, machining, cost considerations for machining operations. One or more field trips included. Prerequisite: MAE/CE 370. (Same as ISE 378.)

394 Introduction to CAD/CAM
Introduction to computer aided graphics. Representation of systems and bodies using computers, graphic file organization. Elements of computer graphics, manipulation of elements, rotation of views, and use of I-DEAS. Laboratory projects. Prerequisite: MAE 198, MAE/CE 271.

396 Numerical Methods and Computation
Numerical techniques associated with complex problems. Evaluation of functions, finding roots of equations, solution of simultaneous algebraic and differential equations. Use of computers. Prerequisites: CPE 112, MA 244, and prerequisite or parallel MA 324.

398 Selected Topics in Mechanical Engineering
1-3 hrs.

442 Introduction to Heat and Mass Transfer
Principles of heat and mass transfer; application of principles to problems in conductive, convective, and radiative-heat transfer and mass transfer; laminar and turbulent flow processes; boiling and condensation; heat exchangers. One credit hour laboratory included. Prerequisites: MAE/CHE 352, MAE 396. (Same as CHE 442.)

444 Analysis and Design of HVAC Systems
Analysis and design of heating, ventilation, and air-conditioning (HVAC) systems. Design requirements for human comfort, exterior weather conditions, and energy conservation. Calculation of heating and cooling loads for residential and commercial buildings, air and liquid distribution systems, selection and specification of system components, energy recovery and system efficiency, and commercially available systems. Prerequisites: MAE 342, MAE/CHE 442. (Same as MAE 544.)

445 Aerospace Propulsion
Introduction to the operation and analysis of liquid and solid rockets, nuclear and electric propulsion systems, and airbreathing engines used in aerospace applications. Prerequisite: MAE/CHE 352 and concurrent registration in MAE 453.

446 Design of Thermal Systems
Principles of heat transfer, thermodynamics, and fluid mechanics applied to analysis and design of systems for storage and transport, and exchange of thermal energy. Modeling of thermal equipment, simulation of system performance, optimization of system design, and comprehensive design of thermal systems. Prerequisites: MAE 342, MAE/CHE 442; and MAE 493 recommended.

447 Energy Conversion and Power Generation I
Application of principles of thermodynamics, fluid mechanics and economics to analysis and design of conventional hydro and steam power plants. Energy sources and end uses, fossil fuels, combustion equipment, steam generators, and pollution control devices. Hydro, steam, and wind turbines. Prerequisites: MAE/CHE 352, MAE 442, 454, MAE 446 recommended. (Same as ME 547.)

451 Atmospheric Fluid Dynamics
Fluid dynamics in the atmosphere. Coriolis acceleration, scale analysis, and appropriate approximations of the complete governing equations. Numerical analysis and interpretation of weather phenomena. Prerequisites: MA 324, MAE 341, MAE/CHE 352 or equivalent. (Same as MAE 551/ES 551.)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>452</td>
<td>Experimental Techniques in Fluid Mechanics</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Overview of intrusive and nonintrusive experimental techniques in fluid mechanics for measurement of pressure, velocity, temperature, and species; Schlieren, interferometry, laser Doppler velocimetry, thermocouples, emission and absorption spectroscopy, laser-induced fluorescence. Laboratory included. Prerequisite: MAE 454 or consent of instructor. (Same as CHE 452 and MAE/CHE 552.)</td>
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<tr>
<td>453</td>
<td>Propulsion Laboratory</td>
<td>1 hr.</td>
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<tr>
<td></td>
<td>Experimental investigation of the performance of various aerospace propulsion systems. Prerequisite: Concurrent registration in MAE 445.</td>
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<tr>
<td>454</td>
<td>Fluid Mechanics II</td>
<td>2 hrs.</td>
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<tr>
<td></td>
<td>Continuation of MAE 352, External incompressible viscous flows, steady one-dimensional compressible flows, and fluid machinery. Concurrent registration in MAE 455 (Fluid Mechanics Laboratory) required. Prerequisite: MAE/CHE 352.</td>
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<tr>
<td>455</td>
<td>Fluid Mechanics Laboratory</td>
<td>1 hr.</td>
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<tr>
<td></td>
<td>Introduction to experimental uncertainty analysis and statistical data analysis. Application in experiments concerning fluid properties, flow losses, pipe flows, lift and drag, compressible flow and other fluid phenomena. Prerequisites: MAE 352, concurrent registration in MAE 454.</td>
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<tr>
<td>456</td>
<td>Aerodynamics Laboratory</td>
<td>1 hr.</td>
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<td></td>
<td>Experimental investigation of airfoils and other bodies in subsonic flow. Pressure distributions, boundary layer studies, and vortex formation. Computer simulations. Prerequisites: MAE 342 and 454.</td>
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<tr>
<td>457</td>
<td>Fundamentals of Aerodynamics</td>
<td>3 hrs.</td>
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<td></td>
<td>Application of the principles of fluid mechanics and thermodynamics to the prediction of aerodynamic performance of aircraft, missiles, and other flight vehicles. Topics include lift and drag, thrust and power, and the influence of wing loading, power loading, zero-lift drag, wing geometry, high lift devices, and Mach number on the performance and design trades of flight vehicles. Prerequisites: MAE 342 and 454. (Same as MAE 557/457)</td>
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<tr>
<td>459</td>
<td>Selected Topics in Engineering</td>
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<tr>
<td>461</td>
<td>Vibrations of Elastic Systems</td>
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<td>Formulation of the equations of motion of discrete and continuous systems, analytical and numerical methods of solution, eigenvalue problems and dynamic response. Prerequisite: MAE 488. (Same as MAE 561 and CE 461/561.)</td>
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<tr>
<td>464</td>
<td>Aerospace Design</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Senior design project. Prerequisite: MAE 493 or equivalent, senior standing and permission of instructor.</td>
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</tr>
<tr>
<td>465</td>
<td>Mechanical Engineering Design</td>
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<tr>
<td></td>
<td>Senior design project. Prerequisites: MAE 493 or equivalent, senior standing, and permission of instructor.</td>
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<tr>
<td>466</td>
<td>Mechanics and Design of Machine Elements</td>
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<td>Detailed design and selection of machine elements such as gears, shafts, and bearings. Analysis of stresses and deformations under combined static and dynamic loads, stress concentrations, and fatigue. Prerequisites: MAE 364, MAE/CE 370.</td>
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<tr>
<td>468</td>
<td>Spacecraft Dynamics</td>
<td>3 hrs.</td>
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<td>Introduction to fundamental spacecraft dynamics including kinematics and dynamics of rigid-body orbital motion. Orbital maneuvers relative to transfer orbits, lunar transfer, and interplanetary missions. Study of attitude maneuvers, control devices and design of automatic control. Prerequisites: MAE/CE 362, MA 324.</td>
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</tr>
<tr>
<td>470</td>
<td>Mechanics of Materials II</td>
<td>3 hrs.</td>
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</table>
474 Applied Mechanics of Solids 3 hrs.
Stresses and strains at a point, theories of failures, stress concentration factors, thick-walled cylinders, torsion of noncircular members, curved beams, unsymmetrical bending, and shear center. Prerequisite: MAE/CE 370. (Same as MAE 574 and CE 474/574.)

476 Mechanics and Fabrication of Composite Materials 3 hrs.
Introduction to the mechanics of advanced composite materials. Design and analysis of composite structures. Analysis of orthotropic and transversely isotropic materials and systems. Hands on fabrication of a composite structure. Prerequisites: MAE 370 and MAE 466.

477 Experimental Techniques in Solid Mechanics 3 hrs.
Experimental methods to determine stress, strain, displacement, velocity, and acceleration in various media. Theory and laboratory applications of electrical resistance strain gages, brittle coatings, and photoelasticity. Application of transducers and experimental analysis of engineering systems. Prerequisites: MAE/CE 370 and junior standing. (Same as MAE 577 and CE 477/577.)

478 Matrix Methods in Structural Mechanics 3 hrs.
Matrix application to formulation and solution of linear problems in structural mechanics. Stresses, vibrations, and stability of engineering structures. Prerequisite: MAE 370. (Same as MAE 578 and CE 478/578.)

480 Aircraft Stability and Control 3 hrs.
The stability and control of aerodynamic vehicles. The design of aircraft to obtain good flying characteristics. The complete governing equations and analog solutions of linearized equations. Prerequisites: MAE 454 and 488. (Same as MAE 580.)

485 Numerical Methods and Computation II 3 hrs.
Advanced topics in numerical methods and computation including Gaussian quadrature; interpolation, integration and differentiation using cubic splines; eigenvalue and eigenvector analysis of large systems; round-off error analysis; stability and convergence analysis of iterative methods. Prerequisite: MAE 396. (Same as MAE 585.)

486 Numerical Engineering Analysis 3 hrs.
Finite elements and finite differences in solving various engineering problems. Numerical applications to fluid mechanics, heat transfer, structural mechanics, and machine design. Prerequisite: MAE 396. (Same as MAE 586.)

488 Analysis of Engineering Systems 3 hrs.
Development of mathematical engineering models of physical systems including: mechanical, electrical, and fluid systems and combined systems. Determination of the dynamic response of physical systems. Prerequisites: EE 300, MAE 352, 362, and 396.

489 Computer-Aided Engineering 4 hrs.
Application of computer methods in the analysis and design of structural, thermal, and dynamical systems. Uses of state-of-the-art finite element and finite difference computer programs. Practical guidelines for discrete modeling; analysis of modeling errors. Comparison of exact and approximate solutions to boundary value problems. Use of microcomputers in engineering design and analysis. Prerequisite: MAE 396.

493 Introduction to Engineering Design 2 hrs.
Application of basic design principles and concepts. Design methodology, decision making, creativity, product liability, human factors, patents, ethics, technical writing, and others. Team design projects. Prerequisites: ISE 321, MAE/CE 362, EE 300.

496 Selected Topics in Mechanical Engineering 1-3 hrs.

497 Aerospace Engineering Senior Project 1 hr.
Application of basic design principles and concepts to the analysis and/or design of aerospace engineering systems. Written final report and oral presentation required.

559 Selected Topics in Aerospace Engineering 1-3 hrs.
Optical Engineering Option (MAE Emphasis)

This program prepares students for careers in opto-electronics, including the design and application of systems for optical fiber communications, optical instrumentation, holography, image forming and processing, lasers and optical detection, as well as areas such as optical testing.

Mission

The optical engineering program in the Department of Mechanical and Aerospace Engineering is dedicated to developing optical engineers with strong mechanical engineering backgrounds to enable them to function effectively in interdisciplinary environments in industry and government. This is particularly important as the use of optics and photonics technology continues to enjoy strong growth in a wide variety of commercial products and processes. The undergraduate optical engineering program is supported by faculty devoted to innovative teaching, university and community service, and conducting internationally recognized research.

Goals and Objectives

1. Provide a high quality optical engineering undergraduate education. Quality is assured by maintaining national accreditation standards and annually reviewing the program within the department’s Optoelectronics Committee.
2. Increase the number of students within the undergraduate program while seeking to diversify the ethnic and cultural origin of both traditional and non-traditional students.
3. Continue to improve the national ranking and visibility of the optical engineering program.

Optical Engineering Option

<table>
<thead>
<tr>
<th>Additional Basic Sciences</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>PH 113 - General Physics with Calculus III</td>
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</table>

**Optical Engineering Core**

| CPE 112 - Computer Methods in Engineering       | 3              |
| EE 307 - Electricity and Magnetism              | 3              |
| EE 313 - Electrical Circuits II                 | 3              |
| EE 447 - Electromagnetic Waves                  | 3              |
| OPE 453 - Laser Systems                         | 3              |
| OPE 455 - Optical Engineering Lab               | 2              |
| OPE 459 - Optical Engineering Design            | 3              |
| OPT 341 - Geometrical Optics                    | 3              |
| OPT 342 - Physical Optics                       | 3              |
| OPT 411 - Geometrical Optics Lab                | 2              |

**Remaining Required Courses**

| CHE 295 - Nature and Properties of Materials Lab | 1              |
| MAE 311 - Principles of Measurement and Instrumentation | 3 |
| MAE 341 - Thermodynamics I                       | 3              |
| MAE 352 - Fluid Mechanics I                      | 3              |
| MAE 362 - Dynamics                                | 3              |
| MAE 364 - Kinematics and Dynamics of Machines    | 4              |
| MAE 370 - Mechanics of Materials                  | 4              |
| MAE 396 - Numerical Methods and Computation      | 2              |
| MAE 442 - Introduction to Heat and Mass Transfer  | 4              |
| MAE 454 - Fluid Mechanics II                      | 2              |
| MAE 455 - Fluid Mechanics Laboratory              | 1              |
| MAE 465 - Mechanical Engineering Design           | 3              |
| MAE 493 - Introduction to Engineering Design      | 2              |
| EE 382 - Analytical Methods for Continuous Time Systems | 3 |

*HU/SS - 18 hours in humanities/social sciences
Suggested Schedule of Courses for Full-time Optical Engineering Students (MAE Emphasis)

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<tr>
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<td>ISE 321</td>
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<tr>
<td>MAE 271</td>
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<td>MAE 362</td>
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<td>PH 112/115</td>
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<td>MAE 294</td>
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<td>MA 244</td>
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<tr>
<td>Total Hours</td>
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Undergraduate Optical Engineering Courses (OPE)

441 Optical Systems Design
3 hrs.
Intermediate geometrical optics, first-order optics, linear transformations, paraxial optics, reflection and transmission at an interface, polarized light, Jones and Mueller calculi, matrix methods, ray tracing, apertures and stops, third-order optics and aberrations. Prerequisite: OPT 342. (Same as EE 461, and PH/OPT 441.)

442 Interference and Diffraction
3 hrs.

451 Optoelectronics
3 hrs.
Basic concepts for understanding electro-optic devices and systems. Blackbody radiation; light sources; quantum and thermal detectors, noise in detectors; optical heterodyning; acousto-optic, magneto-optic, and electro-optic modulation. Fall, odd years. Prerequisite: EE 315. (Same as EE 451.)

453 Laser Systems
3 hrs.
Spontaneous and stimulated emission, population inversion, optical resonators, three- and four-level systems, Q-switching and mode-locking, semiconductor lasers, integrated

College of Engineering
152
optic waveguides and couplers, scanning systems, high-power industrial application. Prerequisite: EE 307. (Same as EE 453.)

454 **Optical Fiber Communications** 3 hrs.
Introduction to optical fibers and their transmission characteristics, optical fiber measurements, sources and detectors, noise considerations for digital and analog communications, optical fiber systems. Prerequisite: EE 307 or PH 432. (Same as EE 454.)

455 **Optical Engineering Laboratory** 2 hrs.
Introduction to physical optics phenomena, Young's double slit experiment, Lloyd's mirror, Fresnel biprism, Newton's rings, intensity distribution in fringe systems, Michelson interferometer, Fabry-Perot interferometer, Fresnel and Fraunhofer diffraction, diffraction by circular, rectangular and multiple openings, diffraction gratings, curve generating, polishing and testing optical surfaces with emphasis on design aspects of these systems. Prerequisites: PH 113, OPT 342 and EE 382 or OPT 442. (Same as OPT 412.)

456 **Photonics Laboratory** 2 hrs.
Intensive laboratory work with experiments and design projects on lasers, optical fibers, spatial light modulators, image processing, spatial filtering, optical fiber communication and optical computing. Prerequisites: OPE 453 and 454.

459 **Optical Engineering Design** 3 hrs.
Senior design project. Analysis, design and testing of optical and optoelectronic systems. Case studies of legal, economic, and ethical issues. Prerequisite: Senior standing.
College of Liberal Arts
256 Morton Hall
Telephone: (256) 824-6200
Email: dean-la@uah.edu

Dean: Sue W. Kirkpatrick, B.Sc., M.Sc., Ph.D., Professor of Psychology

The College of Liberal Arts provides educational experiences and programs of study in the major fields of the arts, humanities, and social sciences. These programs are designed to contribute to the intellectual development of students and to assist them in preparing for successful careers by emphasizing the development of written and oral communication skills, critical analysis, and problem solving abilities. They also promote an understanding of relationships among people as well as an awareness of the relationship between human beings and elements of the physical and biological world.

The arts and the humanities, encompassing art, history, languages and literatures, music, and philosophy, lead to a cognizance and appreciation of life as humankind has perceived it and as individuals have lived it. This study leads to heightened critical faculty, cultivation of taste and the ability to be more effective in utilizing language and in appreciating, using, and evaluating values and ideas. The study of the arts and the humanities is essential to a broad and sensitive awareness of humankind as it has been, is, and aspires to be.

The social sciences encompass the knowledge that deals with the behavior of humankind and the culture it has created, knowledge that becomes more necessary as the world grows more complex and interrelated. Social scientists perform a dual function, assembling and ordering complex systems of technical knowledge related to human relationships and providing a continual appraisal of the value systems in our society. The social science programs at UAH—political science, psychology, and sociology—are designed to prepare the student to value and perform both of these roles. Since these disciplines are concerned with a social milieu that is both possible and desirable, the approach involves both the understanding and use of the scientific method and an appreciation of, and a sensitivity to, questions of values.

The College of Liberal Arts offers courses of study that provide its students, and those in the sciences, the preparation that is necessary to gain teacher certification. These programs include the in-depth study of at least one field in the liberal arts and sciences and intensive professional training in the field of education.

Throughout its curriculum, the College of Liberal Arts attempts to utilize and build upon the richness and diversity of our tradition and diverse talents of our faculty in preparing persons to be secure, productive, and successful in a free and humane society in a high technology age. Its goals are to aid in the development of more sensitive and successful scientists, more creative and powerful artists, and more disciplined students of the humanities. In sum, it seeks to contribute to the individual's development as a well-rounded and capable person and professional who is prepared to undertake successfully and to provide leadership in effectively confronting the many challenges of life.
Undergraduate Degrees and Study

The College of Liberal Arts awards a Bachelor of Arts degree. All degree programs include 1) general education requirements, 2) a major, 3) a minor or supporting cognate studies. A student's Program of Study must include a major and a minor or supporting cognate studies. The major may be chosen from the following disciplines: art, communication arts, elementary education, English, foreign languages (French, German, Russian, Spanish; may be combined with a concentration in foreign languages and international trade) history, music, (performance, music education, and music technology), philosophy, political science, psychology, and sociology. With the exception of elementary education, minors are available in the disciplines listed in the previous sentence. Minors are also available in classical studies and women's studies. A cognate in computer-mediated communications is also available. In addition to these majors, minors, and cognate, courses are offered in linguistics, physical education, and statistics. A minor is not available in education. The minimum requirement for a major is 30 semester hours of coursework, with at least 21 of these hours at the 300-level or above.

The supporting studies must include one of the following variations:
1. A minor drawn from any discipline with a minimum of 12 hours at the 300 level or above (See Department of Music for exceptions).
2. An approved cognate area from two or more closely related disciplines approved by the major department with 12 semester hours at the 300 level or above. (See individual department programs for specific requirements of each minor, or consult with an advisor in the major department for the development of an approved cognate area.)

Any minor chosen by a student is subject to approval by the department offering the minor. Cognate studies are subject to approval of the chair of the student's major department. All programs of study are subject to approval by the dean of the college.

Academic Advising in the College of Liberal Arts

College of Liberal Arts Academic Advisor: Frank E. Bell, B.A., M.A.

The College of Liberal Arts provides academic advising for its students through the various academic departments and through the office of the Academic Advisor for the College of Liberal Arts. The goals of academic advising include:
1) assisting students in planning academic and life goals;
2) assisting students in their personal adjustment to the UAH campus;
3) aiding students in the assessment of academic needs and in developing appropriate educational plans;
4) explaining and clarifying graduation requirements as well as academic policies; and
5) facilitating student success.

All freshmen and most sophomores with an expressed interest in liberal arts are advised by the Academic Advisor for the College of Liberal Arts who is located in Room 216 Morton Hall, 824-2867. Students are assisted in fulfilling the General Education Requirements and provided information about possible major fields. An official declaration of major should be filed by the end of the sophomore year. When students decide on a specific major, they will then initiate a Program of Study whereupon they are advised by faculty within the declared majors. These faculty members are specialists in their fields of interest. All students are strongly encouraged to seek advising assistance at the beginning of their academic careers and to continue working with their advisors throughout their academic experience.

Requirements for Programs of Study Leading to the B.A. Degree

General Education Requirements for B.A. Degree

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition I and II: EH 101-102</td>
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</tr>
<tr>
<td>Honors students take EH 105H only, if the Honors Program is completed</td>
<td>3</td>
</tr>
</tbody>
</table>
HUMANITIES AND FINE ARTS
(Students may take no more than 6 semester hours in a single discipline.)

**Fine Arts. Choose one.**
- ARH 100 - Art History, Ancient to Medieval .................................................. 3
- ARH 101 - Art History: Renaissance to Modern .................................................... 3
- ARS 160 - Introduction to Drawing ........................................................................... 3
- CM 122 - Theater Appreciation ............................................................................... 3
- MU 100 - Music Literature ...................................................................................... 3

**Literature. Choose one from Area I and one from Area II.**

**Area I:** Choose one.
- EH 205 - English Literature to Renaissance ......................................................... 3
- EH 240 - World Literature to Renaissance .............................................................. 3
- EH 250 - Honors Literature: to 1700 ..................................................................... 3

**Area II:** Choose one
- EH 206 - English Literature (Restoration to Present) ........................................... 3
- EH 230 - American Literature .................................................................................. 3
- EH 241 - World Literature (Enlightenment to Present) .......................................... 3
- EH 251 - Honors Literature: 1700 to Present ......................................................... 3

**Humanities and Fine Arts. Choose two.**
- ARH 100 - Art History: Ancient to Medieval ......................................................... 3
- ARH 101 - Art History: Renaissance to Modern ...................................................... 3
- ARS 160 - Introduction to Drawing ........................................................................... 3
- CM 122 - Theater Appreciation ............................................................................... 3
- MU 100 - Music Literature ...................................................................................... 3
- PHL 101 - Introduction to Philosophy ...................................................................... 3
- PHL 201 - Introduction to Logic ............................................................................... 3
- PHL 202 - Introduction to Ethic ............................................................................... 3
- WS 200 - Introduction to Women's Studies .............................................................. 3
- FL 200 level course in a foreign language .................................................................. 3

Education major must take CM 113 - Speech in this area.

**Foreign Language and Literature. Choose one language. (9-10 semester hours)**
- FL 101 ...................................................................................................................... 5 each
- FL 102 ...................................................................................................................... 5 each

Placement is required for native speakers and for students planning to continue a language taken in high school.

**NATURAL SCIENCE AND MATHEMATICS**
(See Education Department for specific science course options for elementary education majors.)

**Natural Science. Choose two.**
- AST 106 - Exploring the Cosmos I ........................................................................... 4
- AST 107 - Exploring the Cosmos II .......................................................................... 4
- BYS 119 - Principles of Biology ............................................................................... 4
- BYS 120 - Organismal Biology ............................................................................... 4
- CH 101/CH 105 - Introduction to Chemistry plus laboratory .................................... 4
- CH 113 - Elementary Organic Chemistry .............................................................. 4
- CH 121/125 - General Chemistry plus laboratory ................................................... 4
- CH 123/126 - General Chemistry plus laboratory ................................................... 4
- ES 102 - Planetary/Atmospheric Science II ............................................................. 4
- PH 100 - Conceptual Physics .................................................................................. 4
PH 101 - General Physics I ................................................. 4
PH 102 - General Physics II ................................................. 4
PH 106 - Same as AST 106 ................................................. 4
PH 107 - Same as AST 107 ................................................. 4
PH 111/PH 114 - Physics I with Calculus plus laboratory ............ 4
PH 112/PH 115 - Physics II with Calculus plus laboratory ............ 4

Mathematics. Choose one.
Level I: MA 117 - Mathematics with Applications I ................. 3
          MA 119 - Precalculus I ............................................. 3
          MA 143 - Finite Mathematics ...................................... 3
Level II: MA 121 - Precalculus II ...................................... 3
Level III: MA 171 - Calculus I ......................................... 4
Placement required prior to enrollment.
Elementary education majors must complete 4 courses in science and 3 college level courses in mathematics.

HISTORY, SOCIAL AND BEHAVIORAL SCIENCES
(Students may take no more than 6 semester hours in a single discipline.)

History. Students take both courses.
HY 101 - Western Civilization I ........................................... 3
HY 102 - Western Civilization II ......................................... 3

Social and Behavioral Sciences. Choose four.
PSC 101 - American Government ........................................... 3
PSC 102 - Comparative Politics and Foreign Governments ............ 3
PSC 260 - International Relations ........................................ 3
PY 101 - General Psychology I .............................................. 3
PY 201 - Lifespan Development ............................................. 3
SOC 100 - Introduction to Sociology .................................... 3
SOC 200 - Introduction to Anthropology ................................ 3
ECN 142 - Principles of Macroeconomics ................................ 3
ECN 143 - Principles of Microeconomics ................................ 3
ECN 239 - Honors Economics .............................................. 3

NOTE: COURSES TAKEN TO SATISFY REQUIREMENTS FOR ONE AREA ARE NOT APPLICABLE TO A SECOND AREA.

Major Requirements for B.A. Degree ................................... 30-37
A minimum of 30 semester hours in a program of study in a single
department with at least 21 of those hours 300-level or above.
Consult individual departments for specific requirements.

Minor Requirements for B.A. Degree ................................... 18-21
A minimum of 18 semester hours in a single discipline with a
minimum of 12 hours at the 300-level or above. Consult the
Mathematics, Foreign Language, and Music Departments for exceptions.

In lieu of a minor, students may choose a minimum of 21 semester hours in cognate studies
drawn from two or more closely related disciplines.
A minimum of 12 hours must be 300 level or above. Cognate studies must be approved by the
major department.
Electives
The student may select any elective courses outside the major and minor as needed to complete the university requirement of a minimum of 128 hours for graduation.

Minimum upper level degree requirements..........................................................39

Minimum Degree Requirements, Bachelor of Arts..............................................128

Graduate Degrees and Study
Graduate study in the College of Liberal Arts brings together faculty and advanced students to share the excitement of creative learning. All degree candidates plan a program of study with faculty members who share the student's intellectual interests. Within the framework of the requirements established by the Department and the School of Graduate Studies, students design, in consultation with a faculty advisor, a graduate program fitted to their particular interests and needs.

The College of Liberal Arts offers programs of study leading to the Master of Arts Degree with concentrations in English, History, Psychology, and Public Affairs. Class "A" teacher certification is available with concentrations in English and history in the College of Liberal Arts and biology, chemistry, mathematics, or physics in the College of Science. Certification may be achieved through either traditional or non-traditional "fifth year" approaches.

Interdisciplinary Course
The College of Liberal Arts offers an interdisciplinary course in statistics which is required of majors in political science, psychology, and sociology, and satisfies the statistics requirement in the College of Nursing.

Arts, Humanities, and Social Sciences (AHS)
300 Statistical Analysis 4 hrs.
Collection, classification, and presentation of social science data, measures of central tendency and dispersion, introduction to probability distribution and sampling theory, confidence limits and tests of significance, chi-square and t-distribution, introduction to regression and ANOVA. Includes laboratory. Prerequisite: Level I mathematics course or Level II or above placement.

Art and Art History Department
313 Roberts Hall
Telephone: (256) 824-6114
Email: art@uah.edu

Professors Crouse (Chair), Dasher; Associate Professors, Marchlinski, Stewart; Assistant Professors Jones, Joyce.

The Department of Art and Art History offers courses in the studio arts and art history leading to a Bachelor of Arts major, a minor, or as part of a program of cognate studies in art or art history. Three basic programs of study have been established for students majoring in art. They are the studio discipline, the art history discipline, and the studio discipline with teacher certification. The studio discipline allows a student to specialize at the upper division in drawing/painting, graphic design, photography, printmaking, or sculpture.

Most studio and art history courses do not require any previous experience and any student enrolled at the university is encouraged to consider taking art courses as a major, a minor, or simply as electives for personal enrichment through involvement with the visual arts or art history.

College of Liberal Arts 158
Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Roberts Hall, Room 313) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

Transfer students must submit a portfolio of representative samples of their work for review by the art faculty before registration. Credit for equivalent coursework and advanced placement in art courses will be determined by the art faculty. Art majors transferring to UAH must complete at least 12 semester hours of art courses at the 300 level or above. Art minors transferring in must take at least 6 semester hours of art courses at the 300 level or above.

I. The Studio Discipline: (Drawing, Graphic Design, Painting, Photography, Printmaking, Sculpture)

A. Lower Division Requirements (21-27 hours)

1. Art Studio Requirements
   - ARS 123 - Two-Dimensional Design and Color Theory 3 hrs.
   - ARS 140 - Three-Dimensional Design 3 hrs.
   - ARS 160 - Introduction to Drawing 3 hrs.
   - ARS 260 - Intermediate Drawing 3 hrs.
   - Three additional 200-level ARS courses 9 hrs.

2. Art History Requirements
   - ARH 100 - Art History Survey: Ancient to Medieval 3 hrs. (GER)
   - ARH 101 - Art History Survey: Renaissance to Modern 3 hrs. (GER)

   Note: There are no prerequisites for ARH 100 and 101, ARS 123, 140, and 160 which introduce the student to basic concepts and skills in the visual arts.

B. Upper Division Requirements (24 hours)

Six courses at the 300 level and two courses at the 400 level. A student choosing to specialize in a specific studio area may take no more than four upper-level courses in an individual area. ARH 309 - Contemporary Art and Issues is required for all majors concentrating in the studio discipline.

   - Graphic Design - ARS 331, 332, 430, 431
   - Painting/Drawing - ARS 360, 375, 376, 377, 475, 476, 477
   - Printmaking - ARS 380, 381, 383, 480, 481, 483
   - Photography - ARS 352, 353, 452, 453
   - Sculpture - ARS 340, 341, 342, 346, 440, 441, 442
   - Other - ARS 393, 493, 495

To fulfill upper division elective studio requirements, a student may take two art studio courses at Alabama A&M. These courses must be selected from ART 305 Beginning Ceramics; ART 306 Advanced Ceramics; ART 307 Beginning Jewelry; ART 308, Advanced Jewelry, ART 317 Beginning Glassblowing, and ART 318 Advanced Glassworking.

Note 1: 400-level courses are to be taken only after successful completion of the appropriate 300-level courses.

Note 2: Majors with a studio art concentration must satisfy an exit exhibition or portfolio requirement. Students emphasizing graphic design must successfully present a comprehensive portfolio as part of the coursework for ARS 431. All other students with a studio art emphasis must successfully mount a senior exhibition of their work. Contact the Department of Art and Art History for specific requirements.

ARS 230 and 331 should be taken in sequence. The remaining three ARS 332, 430, and 431 may be taken in any order after successful completion of ARS 230 and 331. Most other 300-level ARS courses need not be taken in sequence.
C. Total Number of Hours
51 semester hours within the Department of Art and Art History
48 hours if ARS 160 or ARH 100 or 101 is applied to the fine arts GER
45 hours when ARH 100, 101 and 201 are part of an art history cognate
42 hours if ARH 100 and 101 are included in an art history minor

An Illustrative Plan for Completing the B.A. Degree
With A Major in Art
Focus on Art Studio*

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td><strong>First Year</strong></td>
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<tr>
<td>EH 101</td>
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<tr>
<td><strong>Total Hours</strong></td>
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</tbody>
</table>

*This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a major in Art Studio. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.

II. The Art History Discipline

A. Lower Division Requirements (15 hours)

1. Art History Courses
   ARH 100-Art History Survey: Ancient to Medieval 3 hrs.(GER)
   ARH 101-Art History Survey: Renaissance to Modern 3 hrs.(GER)

2. Art Studio Courses
   Any two 100-level courses 6 hrs.
   One 200-level course 3 hrs.

B. Upper Division Requirements (24-27 hours)

1. Art History Courses
ARH 309 - Contemporary Art and Issues
Five additional courses at the 300-level or above
ARH 400 - Art History Seminar

2. Art Studio Courses
One 300-level course, selected in consultation with advisor

Note 1. An additional 3 hr. upper-level studio, art history, or approved related discipline is required for art history majors with a studio minor. Please consult with advisor or chair.

Note 2. Prerequisites for 300-level art history courses required for art majors and recommended for non-majors are ARH 100, 101, and 309.

Note 3. All students with an art history concentration must satisfy an exit requirement that is included in the ARH 400 coursework. Six or more upper-level art history courses must be completed before taking ARH 400 as an exit requirement.

Note 4. To fulfill an upper-level art history requirement, a student may substitute Philosophy of Art (PHL 310) for a 300-level art history course.

C. Total Number of Hours
39 semester hours with the Department of Art and Art History
42 hours for art history majors with an art studio minor
36 hours if ARS 160, ARH 100 or 101 is applied to the fine arts GER
33 hours when ARH 100 and ARH 101 or ARS 160 are applied to the fine arts GER

An Illustrative Plan for Completing the B.A. Degree With A Major in Art Focus on Art History*

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Total Hours
129
*This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a major in Art Studio. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.

III. Studio Discipline with Teacher Certification

The program for teacher certification, available to students majoring in art, fulfills the certification requirements for teaching art in Alabama's nursery through secondary schools.

A. Lower Division Requirements (21-27 hours)

1. Art Studio Courses
   ARS 123 - Two-Dimensional Design and Color Theory 3 hrs.
   ARS 140 - Three-Dimensional Design 3 hrs.

   ARS 160 - Introduction to Drawing 3 hrs.
   ARS 230 - Introduction to Graphic Design 3 hrs.

   Choose one:
   ARS 260 - Intermediate Drawing 3 hrs.
   ARS 250 - Introduction to Photography

   Choose two:
   ARS 240 - Introduction to Sculpture 6 hrs.
   ARS 270 - Introduction to Painting
   ARS 280 - Introduction to Printmaking

2. Art History Requirements
   ARH 100 - Art History Survey: Ancient to Medieval 3 hrs (GER)
   ARH 101 - Art History Survey: Renaissance to Modern 3 hrs (GER)

B. Upper Division Requirements (21 hours)

1. Art Studio Courses
   Choose one:
   ARS 375, 376, 377 3 hrs.
   Choose one:
   ARS 380, 381, 383 3 hrs.
   Choose one:
   ARS 340, 341, 342, 346 3 hrs.
   Choose two:
   ARS 300-level in painting, printmaking, sculpture 6 hrs.

2. Art History Courses
   ARH 309 - Contemporary Art and Issues 3 hrs.
   One 300-level before 1800 3 hrs.

C. Total Number of Hours

48 semester hours within the Department of Art and Art History
45 hours if ARS 160 or ARH 100 or ARH 101 is applied to the fine arts GER.
42 hours when ARH 100 and ARH 101 or ARS 160 are applied to the fine arts GER.

For a sample Studio Discipline with Teacher Certification Schedule of Courses, please see the Education Department.
Minors and Cognate Studies Programs

1. Art History Minor
   21 semester hours within the Department of Art and Art History
   15 hours when ARH 100 and ARH 101 are applied to the fine arts GER.

   ARH 100 - Art History Survey: Ancient to Medieval 3 hrs.(GER)
   ARH 101 - Art History Survey: Renaissance to Modern 3 hrs.(GER)
   ARH 309 - Contemporary Art and Issues 3 hrs.
   One 300-level art history before 1800 3 hrs.
   One 300-level or art history after 1800 3 hrs.
   Two 300-level or above art history electives 6 hrs.

   Note: Studio discipline majors are strongly encouraged to pursue a minor in art history which will give them a better understanding of the visual arts tradition.

2. Art History Cognate
   21 semester hours within the Department of Art and Art History and related discipline
   15 hours when ARH 100 and ARH 101 are applied to the fine arts GER.

   ARH 100 and 101 - Art History Surveys 6 hrs.
   Three 300-level or above history of art electives 9 hrs.
   Two 300-level or above courses in a related discipline 6 hrs.

3. Studio Art Minor
   21 semester hours within the Department of Art and Art History
   18 hours if ARS 160 is applied to the fine arts GER.

   ARS 160 - Introduction to Drawing 3 hrs.(GER)
   Two 200-level studio courses 6 hrs.
   Four 300-level studio courses 12 hrs.

4. Art for Second Area of Study (with Elementary Education)
   21 semester hours within the Department of Art and Art History
   18 hours when ARS 160 is applied to the fine arts GER.

   ARS 160 - Introduction to Drawing 3 hrs.(GER)
   Two 200-level studio courses 6 hrs.
   Choose four:
   ARS 340-346 - Sculpture
   ARS 375, 376 - Painting
   ARS 380, 383 - Printmaking
   12 hrs.
schedule an exit examination/presentation prior to the last semester.

Note 2: ARH 100 and 101 should be taken to fulfill the general studies requirement for the elementary education program.

5. Cognate in Computer-Mediated Communication (Web Development)

Students majoring in Art Studio may minor in an interdisciplinary cognate in computer-mediated communication (Web Development). This program combines courses in graphic arts, communication, and MIS to prepare students for work in the growing field of computer-mediated communication, especially those involving the design, development, and management of Web sites. See more information on this program under this catalog's section on "Computer-Mediated Communication Program."

Art Studio (ARS)

Lower Division Courses

Lower division studio courses stress the development of visual and manual skills, problem-solving abilities, critical thinking, and an awareness of the tools and materials used in the making of art.

123 Two-Dimensional Design and Color Theory 3 hrs.
Principles and elements of composition including color theory. Problem-solving assignments explore formal and intuitive design concepts and the analytical and expressive understanding and application of color. Lab Fee: $30.

140 Three-Dimensional Design 3 hrs.
Introduction to three-dimensional design through the investigation of a wide range of forms and processes. Problem-solving assignments address a variety of design approaches, while considering the traditional and non-traditional roles of materials and the proper use of tools. Lab Fee: $30.

160 Introduction to Drawing 3 hrs.
Introduction to the principles, tools, materials, techniques, and concepts of drawing. Through exercises in rendering from observation, studies in perspective, and problem-solving, students develop strong visual skills, consider the role of aesthetics, and begin to explore a variety of means for artistic expression. Lab Fee: $30.

215 Art for Elementary Teachers 3 hrs.
Methods and media presented by lecture, demonstration, discussion, reading, and studio experience for elementary school teachers. Does not satisfy departmental core requirements. Lab Fee: $30.

230 Introduction to Graphic Design 3 hrs.
Introduction to graphic design theories, principles, and tools, with instruction in the basics of graphic design through practical understanding of visual communication and logistics of advertising media, stressing traditional and electronic techniques. Students will also become familiar with the Macintosh platform and digital layout methods, using software applications currently used in the industry. Prerequisites: ARS 123 and ARS 160 or approval of instructor. Lab Fee: $30.

240 Introduction to Sculpture 3 hrs.
Introduction to basic concepts employed to create sculptural forms. Students will develop and explore their ideas using a variety of traditional and non-traditional tools, materials and processes. Making of sculpture through assemblage, subtraction, modeling, and casting processes will be addressed to gain an understanding of the relationship between the formal, conceptual, and aesthetic concerns that are integral to the making of all art. Prerequisite: ARS 140 or approval of instructor. Lab Fee: $30.

250 Introduction to Photography 3 hrs.
Understanding and practice of photography through its use as a fine art medium.
Introduction to camera use and darkroom techniques. Students are required to provide their own 35 mm camera. Prerequisite: ARS 123 or approval of instructor. Lab Fee: $30.

260 Intermediate Drawing 3 hrs.
Further development of drawing skills and individual expression through the study and practice of selected drawing approaches, with an emphasis on the figure. Nude models will be used. Prerequisite: ARS 160 or approval of instructor. Lab Fee $30.

270 Introduction to Painting 3 hrs.
Introduction to formal and technical problems of painting. Experimentation with basic painting media, techniques, preparation of grounds, and other mechanisms of painting. Problem solving assignments emphasizing two-dimensional design and color theory concepts and practices. Prerequisites: ARS 123 and 160, or approval of instructor. Lab Fee: $30.

280 Introduction to Printmaking 3 hrs.
Introduction to the basic printmaking processes of monotype, relief, stencil, and intaglio for generating ideas and images. Emphasis on improving two-dimensional design concepts, color theory ideas, and drawing skills. Prerequisites: ARS 123, 160 or approval of instructor. Lab Fee: $30.

Upper Division Courses
Upper division studio courses explore the specific nature of each area of specialization. Students are guided in their development of artistic facility and of a vocabulary of visual symbols for personal expression. They learn that the making of art is not solely the exercise of artistic skill, but that it requires the employment of reasoning and intellectual ability in entirely new and uniquely personal ways.

331 Graphic Design II 3 hrs.
Continuation of ARS 230 with close attention to contemporary graphic design production techniques, problems, and solutions. Students will learn effective methods of page layout, print production, and logistics using current software applications. Prerequisites: ARS 230 or approval of instructor. Lab Fee $30.

332 Graphic Design III 3 hrs.
More advanced course in page layout and design, using the Macintosh platform. Emphasis will be on understanding typography and achieving successful type-oriented layouts using current software applications. Prerequisites: ARS 331 or approval of instructor. Lab Fee $30.

340 Sculpture: Assemblage 3 hrs.
Exploration of a variety of assemblage processes including wood construction and metal fabrication. Emphasis is placed on idea development and investigating a wide range of forms and materials. Prerequisite: ARS 240 or approval of instructor. Lab Fee: $30.

341 Sculpture: Carving 3 hrs.
Stone and wood carving are investigated with emphasis placed on developing the ability to see and release hidden form and on the unique relationship formed between maker and material. Prerequisite: ARS 240 or approval of instructor. Lab Fee: $30.

342 Sculpture: Casting 3 hrs.
Investigation of foundry processes and materials involved in mold making and lost-wax bronze casting, metal chasing, and patination. Prerequisite: ARS 240 or approval of instructor. Lab Fee: $30.

346 Sculpture: Figure Modeling 3 hrs.
Study of the human form through direct clay modeling from life including anatomical studies, armature construction, mold making and casting. Prerequisite: ARS 240 or approval of instructor. Lab Fee: $30.

352 Non-Silver Photography 3 hrs.
Investigation and use of alternative processes such as gum-bichromate, cyanotype, xerography, and related media to produce works of photographic art. Prerequisite: ARS 250 or approval of instructor. Lab Fee: $30.
353 Advanced Photography 3 hrs.
Advanced use of black/white and color photography as a means of expression in the production of fine art. Prerequisite: ARS 250 or approval of instructor. Lab Fee: $30.

360 Advanced Drawing 3 hrs.
Drawing as a vehicle for personal expression utilizing traditional and contemporary methods and materials. Prerequisites: ARS 260 or approval of instructor. Lab Fee: $30.

375 Painting: Traditional Approaches 3 hrs.
Traditional painting approaches are investigated through selected techniques ranging from fresco and egg tempera to under-painting, glazing and alla-prima work with oils. Prerequisite: ARS 270 or approval of instructor. Lab Fee: $30.

376 Painting: Contemporary Approaches 3 hrs.
Contemporary approaches toward painting are explored as means of expression, through both spontaneous and deliberate handling of acrylics and other painting media. Prerequisite: ARS 270 or approval of instructor. Lab Fee: $30.

377 Painting: Mixed Media 3 hrs.
Exploration of painting with mixed and non-traditional media as vehicles of expression including the use of assemblage and collage processes, shaped or contoured canvasses, and related media. Prerequisite: ARS 270 or approval of instructor. Lab Fee: $30.

380 Printmaking: Intaglio 3 hrs.
Beginning studio practice in etching, engraving, aquatint, photo-etching and dry-point. Prerequisite: ARS 280 or approval of instructor. Lab Fee: $30.

381 Printmaking: Lithography 3 hrs.
Beginning studio practice in autographic and photographic lithography processes utilizing aluminum plate and stone. Prerequisite: ARS 280 or approval of instructor. Lab Fee: $30.

383 Printmaking: Screenprinting 3 hrs.
Investigation of silkscreen processes, including autographic and photographic methods. Prerequisite: ARS 280 or approval of instructor. Lab Fee: $30.

393 Multi-Media 3 hrs.
Study and practice of artistic approaches which freely combine elements of various art forms such as painting, printmaking, photography, sculpture, or performance, usually developed along strong conceptual or thematic lines. Prerequisite: None. Art major and minors must have completed all lower division foundation requirements. Lab Fee: $30.

Entry into a 400-level course must be preceded by successfully completing the appropriate 300-level course.

430 Advanced Graphic Design I 3 hrs.
Advanced level of instruction in graphic design and digital illustration using current illustration software, including assembly of Web graphics through vector path applications. Course will include development of student portfolio. Prerequisites: ARS 332 or approval of instructor. Lab Fee $30.

431 Advanced Graphic Design II 3 hrs.
Advanced level of instruction focusing on digital construction of major visual communication projects for both print and Web applications. Emphasis will be on current photographic manipulation software. Course will further the development of student portfolio to completion. Prerequisites: ARS 430 or approval of instructor. Lab Fee $30.

440 Advanced Sculpture: Assemblage 3 hrs.
Continued exploration of assemblage processes. Prerequisites: ARS 340 or approval of instructor. Lab Fee: $30.

441 Advanced Sculpture: Carving 3 hrs.
Continued exploration of subtractive processes. Prerequisites: ARS 341 or approval of instructor. Lab Fee: $30.
Art History (ARH)

Lower Division Courses
Lower division art history courses explore the major monuments of western art, ancient through contemporary, in their historical and cultural contexts. These courses introduce the student to the basic analytic tools of art history.

100 Art History Survey: Ancient to Medieval 3 hrs.
Survey of the material culture, including architecture, sculpture, painting, mosaic, jewelry, and ceramics, produced by Pre-historic European, Near Eastern, Egyptian, Bronze Age Aegean, Greek, Roman, Byzantine East, and Medieval European cultures. Course emphasizes study of the cultural contexts that fostered the creation of art.

101 Art History Survey: Renaissance to Modern 3 hrs.
Survey of the major works of art and architecture produced since the Renaissance, their major themes, the artists, and the critical issues that affected the cultures in which they were created.

Upper Division Courses
Upper division art history courses present the art of specific periods in its historical, literary, philosophical, political, and social contexts. These courses guide the student in critical reading of selected art historical and interdisciplinary scholarship.
301 Ancient Greek Art 3 hrs.
Major works of art and architecture produced in the ancient Greek world from the ninth through first century B.C. in their social and political context. Attention given to the relationship of art to other forms of cultural expression such as philosophy, religion, literature, and drama. Prerequisite: ARH 100, 101, 309 required for majors and recommended for non-majors.

302 Medieval Art 3 hrs.
Art and architecture of the medieval period from the transformation of the Roman Empire into a Christian state at the beginning of the fourth century to the late Gothic period around AD 1400. Cultural contexts in which art and architecture were produced in Europe and the Greek East. Examine architecture, sculpture, manuscripts, metalwork, stained glass, and other media. Prerequisites: ARH 100, 101, 309 required for majors and recommended for non majors.

303 Renaissance Art 3 hrs.
Art and architecture within the context of fourteenth through sixteenth century western Europe, marked by the rise of art theory and criticism and new concepts of the artist's role in society. Prerequisite: ARH 100, 101, 309 required for majors and recommended for non-majors.

304 Twentieth Century Art 3 hrs.
Developments in European and American art from 1890 to World War II, covering major movements including Cubism, Dada, Surrealism, Expressionism, Russian Constructivism, and Abstract Expressionism. Prerequisite: ARH 100, 101, 309 required for majors and recommended for non-majors.

305 Ancient Roman Art 3 hrs.
Art and architecture of the ancient Romans, from the Etruscans through the fourth century AD in their religious, political, and social context. Special attention given to focused study of specific periods, such as the age of Augustus, or physical contexts, such as Pompeii. Prerequisite: ARH 100, 101, 309 required for majors and recommended for non-majors.

307 Impressionism and Post-Impressionism 3 hrs.
European and American art from 1860 to 1900 will be examined through historical, political, social, philosophical, and literary perspectives. Impressionism, Post-Impressionism, Symbolism, and the "Art for Art's Sake" movement will be studied through the works of artists such as Monet, Renoir, VanGogh, Rodin, and Whistler. Prerequisite: ARH 100, 101, 309 required for majors and recommended for non-majors.

309 Contemporary Art and Issues 3 hrs.
Major movements since World War II, including abstract expressionism, neo-dada, pop, photo-realism, minimalism, conceptual art, earth works, new realism, neo-expressionism, performance, and post-modernism. Prerequisites: ARH 100, 101, required for majors and recommended for non-majors.

310 Nineteenth Century Art 3 hrs.
European and American art from 1780 to 1860 will be examined through historical, political, social, philosophical, and literary perspectives. Neoclassicism, Romanticism, the Hudson River School, and Realism will be studied through the works of artists such as David, Goya, Turner, Cole, and Courbet. Prerequisite: ARH 100, 101, 309 required for majors and recommended for non-majors.

320 Special Topics in Art History 3 hrs.
Special topics on periods of art history selected from ancient to contemporary as offered. Prerequisite: ARH 100, 101, 309, required for majors and recommended for non-majors.

400 Art History Seminar 3 hrs.
Directed study for the development of a scholarly research paper on special topics in art history as offered. Required for all students with an Art History Concentration. Prerequisites: 18 semester hours of upper-level ARH courses and approval of instructor.

500 Special Problems in Art History 3 hrs.
Directed reading and research. Prerequisites: 18 semester hours of upper-level ARH courses and approval of instructor.
Communication Arts Department
342 Morton Hall
Telephone: (256) 824-6645
Email: comm@uah.edu

Associate Professor Rountree (Chair); Assistant Professors Bell, Givens and Hubler.

The Department of Communication Arts offers a comprehensive program of study leading to a Bachelor of Arts degree. Majors and minors gain practical, critical, historical, and theoretical perspectives on human communication, preparing them for work, for social life, and for further academic studies. Majors elect to specialize in courses following two distinct tracks in communication arts: a rhetoric track and a technical communication track. The rhetoric track focuses upon how discourse—especially persuasive discourse—is adapted to various contexts. The technical communication track focuses specifically on the communication of technical information to non-technical audiences, particularly in written discourse. In addition, the department offers courses in theater, media writing, film, nonverbal communication, and other specialized communication contexts.

Major in Communication Arts

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Morton Hall 342) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

A major in communication arts consists of either 33 or 39 hours of coursework within the department, at least 21 hours of which must be at or above the 300-level. Transfer students must take at least 12 hours of upper-level coursework in the major at UAH. All majors are required to take the following three core courses:

- CM 113 Introduction to Rhetorical Communication
- CM 231 Foundations of Human Communication
- CM 309 History of Rhetoric

Additionally, majors must elect one of the following tracks and take the required core of courses listed under that track:

**Rhetoric Track**
- CM 375 Rhetorical Criticism
- SOC 300 Research Methods
- CM 431 Senior Seminar in Communication Theory and Research
- 15 hours of electives from CM or other approved courses in allied disciplines.

**Technical Communications Track**
- CM 301 Technical Writing
- CM 302 Technical Editing
- SOC 300 Research Methods
- CM 320 Practicum in Writing or CM 400 Communication Arts Internship
- CM 501 Theory and Practice in Technical Communications
- 15 hours of electives from CM or other approved courses in allied disciplines, including 6-9 hours of technical courses.

Minor in Communication Arts

Students in major courses of study which might be complemented by rhetorical or technical communication studies are invited to consult the chair of communication arts about developing a minor. Among those whose studies might be complemented by a minor in communication arts are: liberal arts students seeking to enhance their career opportunities through an understanding of
practical discourse; English majors interested in rhetorical perspectives on literature; psychology and sociology majors who believe communication will be central to their work; engineering and science students who need to know how to present their ideas effectively to both technical and non-technical audiences (especially if they enter management positions); political science students interested in understanding communication processes central to political life; administrative science majors planning to enter a field where effective communication skills are highly valued, and pre-law majors.

A minor in communication arts consists of 21 hours of coursework taken within the department, at least 12 hours of which must be taken at or above the 300-level. At least half of the upper-level requirement must be taken at UAH. All minors are required to take the following:

- CM 113 Introduction to Rhetorical Communication
- CM 231 Foundations of Human Communication
- CM 309 History of Rhetoric
- 12 hours of electives from CM (or approved courses in an allied discipline)

Those choosing a minor emphasizing technical communication should elect to take CM 301, 302, 320, and one approved technical course.

Cognate in Computer-Mediated Communication (Web Development)

Students majoring in communication arts may minor in an interdisciplinary cognate in computer-mediated communication (or Web development). This program combines courses in communication, graphic arts, and management of information systems to prepare students for work in the growing field of computer-mediated communication, especially those involving the design, development, and management of Web sites. See more information on this program in the catalog section “Computer-Mediated Communication Program.”

An Illustrative Plan for Completing the B.A. Degree
With a Major in Communication Arts*

Communication Arts Major, Rhetoric Track

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<tr>
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<td>Course for Minor</td>
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<tr>
<td></td>
<td>300-level elective</td>
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**Communication Arts Major, Technical Communication Track**

**Freshmen**

<table>
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<tbody>
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**Sophomore**

<table>
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<tbody>
<tr>
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**Junior**

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<td>Course for Minor</td>
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<td>CM or technical elective</td>
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**Senior**

<table>
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<td>Course for Minor</td>
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</table>

*This plan is provided as one example of the many ways a student may schedule coursework to complete a*
B.A. degree with a major in Communication Arts. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.

Communication Arts (CM)

100 Introduction to Computer-Mediated Communication 3 hrs.
This course weaves a practical introduction of internetworking tools into an overview of the dynamic context of pioneers, events, and innovations that led to the creation of the Internet. Students will be introduced to computer-mediated communication theory that asks them to critically reflect on the World Wide Web as a technical and artistic medium for human communication. The course teaches the HTML scripting and Web authoring software skills necessary to build a simple Web site that reflect sound communication principles. Lab Fee: $40. Prerequisite: Working knowledge of Windows© operating system and word processing such as that gained in MIS 146.

110 Voice and Diction 3 hrs.
Language, speech, and hearing as part of developmental training in vocal skills. (Does not satisfy College of Engineering HU/SS requirement.)

113 Introduction to Rhetorical Communication 3 hrs.
Develops public speaking skills through an examination of rhetorical theory, training, and practice.

122 Theater Appreciation 3 hrs.
Introductory survey of theater art focusing on understanding performance components and genres. (Satisfies fine arts elective.)

205 Media Writing 3 hrs.
Basic news writing, learning how to identify news, develop leads, organize information, develop stories, revise drafts, and copyedit articles, all while working under simulated deadline pressure.

214 Oral Performance of Literature 3 hrs.
Theory and practice in intellectual, artistic, and communicative skills required to read prose, poetry, and drama aloud effectively.

221 Acting 3 hrs.
Fundamentals of acting, including physical, vocal, and intellectual skills. Theory and practice in script analysis, scene study, improvisation, and mime.

230 Mass Media in America: Theory and Criticism 3 hrs.
Mass communication theory, history and criticism in the United States. (Same as SOC 230.)

231 Foundations of Human Communication 3 hrs.
Examines how human communication shapes and adapts to a variety of practical settings--public, interpersonal, organizational, mass, and technical.

250 Interpersonal Communication. 3 hrs.
Examines the process of communication between individuals.

251 Decision-Making in Small Groups 3 hrs.
Introduction to the theories and techniques of group discussion and decision-making, emphasizing the skills of leadership, participation, and oral presentation.

301 Technical Writing 3 hrs.
Practical writing, especially technical or scientific reports and proposals, with emphasis on organization, research and presentation. Lab Fee: $40. Prerequisite: EH 101, junior standing; EH 102 recommended. (Same as EHT 301.)

302 Technical Editing 3 hrs.
Clarifying, expanding, reducing, and rewriting technical reports and other documents created by others. Emphasis on elements of style and usage, revision, proofreading, and application of rhetorical techniques to the work of engineers, scientists, and technicians. Lab Fee: $40. Prerequisite: EHT 300 or EHT/CM 301. Offered spring semester only. (Same as EH 302.)

College of Liberal Arts 172
309  History of Rhetoric 3 hrs.
Survey of rhetorical theory from ancient Greece and Rome through twentieth century. Prerequisite: CM 113 or approval of instructor.

310  Persuasion 3 hrs.
Principles and practices in persuasive communication, emphasizing observation and analysis of persuasive events on qualitative and quantitative levels.

311  Interviewing 3 hrs.
Interviewing, theory and practice.

313  Business and Professional Communication 3 hrs.
Examines communication theories and practices relevant to the business context with a focus on oral presentations, interviewing, group leadership, and face-to-face communication. Develops knowledge and skills necessary for effective communication within business environments. (Prepares administrative science students to meet the oral communication requirement in upper division and graduate business courses.)

315  Argumentation and Debate 3 hrs.
Theory and practice of argumentation and debate. Argumentation is examined as a mode of inquiry for presenting the processes by which people give reasons to justify their acts, beliefs, and values. Prerequisite: CM 113 or approval of instructor.

320  Practicum in Writing 1-3 hrs.
Writing and editing under the supervision of professionals. May be repeated up to 3 times for no more than 3 hours total credit. Prerequisites: CM 301, 302, enrollment in the Technical Writing Track, and a successful interview with the participating technical supervisor. Enrollment requires advance planning.

322  Theater History I 3 hrs.
Explores the development of theater art from its origins to French neoclassicism and Moliere with particular emphasis on the Greeks, Shakespeare, and his contemporaries.

323  Theater History II 3 hrs.
Traces the development of world theater from French neoclassicism to contemporary drama with emphasis on changes in the twentieth century.

330  Psychology of Nonverbal Communication 3 hrs.
Investigates the processes of nonverbal communication such as body language, gestures, and paralinguistics through empirical studies and naturalistic observation. Prerequisite: 3 hrs. CM. AHS 300 is strongly recommended. (Same as PY 330.)

334  History of American Cinema 3 hours
Investigates the American cinema as a cultural artifact by studying cultural and historical context of representations, audiences, aesthetics and industry practices in American cinema from its beginnings (1895) to present.

340  Special Topics in Communication Arts 3 hrs.
Topics announced in advance. Representative topics include Communication and Gender, Intercultural Communication, and Legal Rhetoric. May be repeated twice for credit.

350  Organizational Communication 3 hrs.
Investigation of formal and informal communication in organizations, with emphasis on the relational and cultural forces affecting communication in corporations and government agencies.

400  Internship 1-6 hrs.
Practical experience in the workplace allows the student to apply principles, theories, and skills learned in communication arts courses. Arranged by the student with consent of the chair, the student meets regularly with a faculty advisor, keeps a log of activities, and submits a report on the internship. Prerequisite: Senior standing with CM major.

401  Computer-Mediated Communication 3 hrs.
Examines the process by which people create, exchange, and perceive information using networked telecommunications that facilitate encoding, transmitting, and decoding messages. Explores the forms and functions of electronic communication, with particular emphasis on the World Wide Web. Prerequisite: CM 100. Lab Fee: $40.
405 Advanced Media Writing 3 hrs.
Introduces and investigates a variety of media writing genres through the generation of advertising, public relations, magazine, and multimedia copy. Prerequisite: CM 205 or permission of instructor.

410 Political Communication 3 hrs.
Investigation of the role communication plays in the political process. Examines the theories of communication and assesses their application in both election strategies and political maintenance functions.

415 Contemporary American Public Address 3 hrs.
Examines public address in America during the twentieth century. Applies principles of rhetorical criticism to analyze selected examples and trends in public communication. Prerequisite: CM 309, 310, or approval of instructor.

416 Women Orators 3 hrs.
Critical examination of women's public address as it has developed through women's participation in movements for abolition, temperance, women's suffrage, and equal rights.

431 Senior Seminar in Communication Theory and Research 3 hrs.
Research and public presentation of original work demonstrating the ability to carry out a complete scholarly project. Prerequisites: 15 hours of CM and senior standing. Offered spring semester.

450 Studies in Organizational Communication 3 hrs.
Examines various research methods and findings in the interpretive tradition. Special emphasis on investigations of symbolic inducement of meanings and ways in which the research and writing processes reflect them. Prerequisite: CM 350.

499 Senior Project Management 3 hrs.
Students will develop and/or manage a Web site for a business or organization. Projects are arranged with the help of the instructor.

Explores the relationships between common practices in technical communication and the theories that legitimize those practices. Introduces students to research and theories about fundamental issues in technical communication, and may then become the basis for further graduate study in technical communication. Prerequisites: Advanced undergraduate standing, CM 301, 302 are strongly recommended. (Same as EH 501.)

505 Advanced Media Writing 3 hrs.
Introduces and investigates a variety of media writing genres through the generation of advertising, public relations, magazine, and multimedia copy.

601 Communication for Engineers 1 hr.
Introduction to technical presentations for advanced engineering students. Touches briefly on rhetorical theory, provides training in oral communication skills and the opportunity to practice rhetorical communication.

Computer-Mediated Communication Cognate
(The Web Cognate)
Dr. Clarke Rountree, Director
342 Morton Hall
Telephone: (256) 824-6646
Email: comm@email.uah.edu

The Computer-Mediated Communication cognate is an interdisciplinary course of study that focuses on Web design, development and management. This program combines courses in
communication, graphic arts, and management of information systems (MIS) to prepare students for work in the growing field of Web-based communication. When combined with an appropriate major, the program prepares students for work in a number of increasingly Web-reliant fields, including marketing, public relations, journalism, graphic design, technical communication, corporate communication, and publishing. A cognate may be used in lieu of a minor within a degree program.

The number of courses required for the cognate is quite large at 40 semester hours; however, students may complete cognate courses as part of their major and their general education requirements. Students majoring in communication arts, art studio, and MIS are particularly well positioned to complete cognate courses in their major degree programs, with only 21-24 hours of cognate courses normally required outside of the major. Students with other majors should contact the program director to determine the number of hours they can complete outside the cognate. Pending final approval by ACHE, a certificate of Computer-Mediated Communication will be awarded to students who complete at least half of the cognate's coursework at UAH and maintain a minimum 2.5 grade point average in the cognate.

Cognate in Computer-Mediated Communication (Web Development)

The cognate in computer-mediated communication consists of 40 semester hours of required coursework in communication, art studio, and MIS, consisting of the following:

1. **Introductory Course (3 hours)**
   - CM 100 - Introduction to Computer-Mediated Communication

2. **MIS Courses (10 hours)**
   - MIS 108 - Database Applications
   - MIS 320 - Web Site Development
   - MIS 440 - Web Programming and Database Integration
   - MIS 465 - Web Server and Internet Telecommunications Technologies

3. **Communication Arts Courses (12 hours)**
   - CM 113 - Introduction to Rhetorical Communication
   - CM 231 - Foundations of Human Communication
   - CM 301 - Technical Writing
   - CM 401 - Computer-Mediated Communication

4. **Art Studio Courses (12 hours)**
   - ARS 123 - Two-dimensional Form in Design
   - ARS 230 - Introduction to Graphic Design
   - ARS 430 - Advanced Graphic Design I
   - ARS 431 - Advanced Graphic Design II

5. **Senior Project Management Course (3 hours)**
   - The senior project management course requirement may be fulfilled with a number of courses (approved by the program director) which allow real-world work in Web site development and management including:
     - CM 499 - Senior Project Management
     - MIS 499 - Systems Development Project
     - EHT 320 - Practicum in Technical Writing
   
   Other approved project management courses.

Course descriptions for these courses can be found under the program description for Communication Arts (CM), Art Studio (ARS), and Management of Information Systems (MIS).
Students interested in the cognate should contact the program director who will coordinate their major and general education courses to develop an integrated program of study which best meets their educational and professional needs.

An Illustrative Plan for a Computer-Mediated Communication Cognate

Because the Computer-Mediated Communication Cognate may be taken as a part of any Bachelor's degree program (B.A., B.S., B.S.B.A., B.S.N., or B.S.E.), there may be differences in general education requirements from those illustrated here. This illustration assumes that the student plans to earn a B.A. degree.

<table>
<thead>
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| Junior           | MIS 320   | CM 301     |
|------------------| 3         | 3          |
|                  | GER       | GER        |
|                  | 3         | 3          |
|                  | GER       | Course for Major |
|                  | 3         | 3          |
|                  | Elective  | Course for Minor |
|                  | 3         | 3          |
|                  | Course for Major | Course for Minor |
|                  | 2         | 3          |
|                  | 18        | 15 (32)    |

| Senior           | CM 401    | MIS 440    |
|------------------| 3         | 3          |
|                  | ARS 430   | ARS 431    |
|                  | 3         | 3          |
|                  | MIS 465   | CM 499 (or substitute) |
|                  | 3         | 3          |
|                  | Course for Major | Course for Major |
|                  | 3         | 3          |
|                  | Elective  | Course for Major |
|                  | 3         | 3          |
|                  | Elective/Major | Course for Major |
|                  | 2         | 2          |
|                  | 17        | 15 (32)    |

Total Hours 128

College of Liberal Arts 176
Education Department
232-K Morton Hall
Telephone: (256) 824-6180
Email: educ@uah.edu
Associate Professors Harwell, Johnson, Piersma (chair), Spor; Assistant Professors Confer, Goodson-Espy, Enger, Horn, Scott

HISTORY AND OBJECTIVES
The Department of Education at UAH has been concerned with programs for the preparation of public school personnel since the University's inception in 1949. The earliest teacher education programs were initially connected directly to the College of Education at the University of Alabama, Tuscaloosa; in effect the UAH programs were offered under the Extension Division of the University of Alabama. During the next 18 years, the Department of Education became more independent and autonomous as the demand for courses and programs expanded. Finally, by 1967 students could complete all coursework in teacher education at UAH. That spring the education program at UAH was officially approved, and the first independent Department of Education was established. The program has continued to prepare prospective elementary and high school teachers at the graduate and undergraduate levels to assume leadership roles in public and private schools. The faculty in the department is committee to a knowledge base for these programs which reflects the view that educators are reflective decision-makers who facilitate student learning.

ACCREDITATION
Teacher education programs at UAH are approved by the Alabama State Board of Education, according to standards of the National Association of the State Directors of Teacher Education and Certification (NASDTEC), for the issuance of appropriate professional certificates for service in public schools.

FACILITIES
The Department of Education utilizes the facilities and resources of the entire university, the community, and the schools. The department maintains a special partnership with the teachers and students at University Place Elementary School adjacent to the UAH campus. Classrooms and faculty offices are located in Morton Hall. The department also maintains a Teacher Materials Center in Morton Hall and a Computer Education Laboratory in the Salmon Library where current teaching materials are available and where laboratory classes are held. The Institute for Science Education, a resource center for teaching and research in science and mathematics, is also located in Morton Hall.

SERVICES
In addition to its teaching function, the department provides in-service education for schools, agencies, and institutions of higher learning; conducts and disseminates research to solve educational problems; and provides consultative service to all types and levels of educational institutions.

DEGREES AND PROGRAMS OFFERED
The Department of Education, in conjunction with the College of Liberal Arts and the College of Science, offers undergraduate certification programs in the following areas:

- Art Education (P-12)
- Elementary Education (K-6)
- Secondary/High School Education (6-12) with majors in biology, chemistry, English-language arts, foreign language (German, French, Russian, Spanish), general science, history, mathematics, physics, social science.
- Middle School Endorsement with teaching fields biology, chemistry, English-language arts, foreign language (German, French, Russian, Spanish), general science, history, mathematics, physics, and social science.
A minor is not available in education.

ACADEMIC ADVISING

Students who plan to enroll in the Teacher Education Program and qualify for teacher certification should contact the chair of the Department of Education to be assigned an advisor as early as the freshman year. Students are expected to consult their advisors about curricular and degree requirements. In addition, students are expected to consult with advisors from their teaching field departments to coordinate the planning of programs of study.

CAREER SERVICES AND PLACEMENT

The Career Services Office, 117 Engineering Building, assists all students who have completed an approved Teacher Education Program at UAH and who are eligible for an Alabama professional certificate, in securing teaching positions. All teacher education students are encouraged to file their credentials with the Career Services Office during their senior year.

THE STATE BOARD OF EDUCATION PERIODICALLY REVISES THE REQUIREMENTS GOVERNING CERTIFICATION IN THE STATE OF ALABAMA. THEREFORE, REQUIREMENTS FOR DEGREES LEADING TO CERTIFICATION ARE SUBJECT TO CHANGE FROM THOSE PUBLISHED IN THIS CATALOG. THE STUDENT IS REQUIRED TO SEEK ADVISEMENT FROM THE EDUCATION DEPARTMENT (AS EARLY AS POSSIBLE IN THE PROGRAM OF STUDY) TO ENSURE THAT BOTH DEGREE REQUIREMENTS AND CERTIFICATION REQUIREMENTS ARE MET.

ADMISSION TO AND ENROLLMENT IN THE TEACHER EDUCATION PROGRAM

General Regulations

Student Responsibility. Education students are expected to register for appropriate courses necessary to make reasonable progress toward completing program requirements by the expected date of graduation. They must familiarize themselves with the requirements contained in this catalog and initiate the application process for a program of study. Faculty advisors are available to assist students as needed.

Local Mailing Address. Students are expected to maintain a mailing address at which communication from the department will, with reasonable certainty, reach them. The address should be recorded in the department office.

Registration and Enrollment. Education students seeking an institutional recommendation from UAH for professional certification must complete all professional education coursework at UAH. Transfer students will have their credits evaluated on an individual basis to determine course equivalency. In cases of extreme hardship, students may petition for an exception to the policy.

Course Substitution. When a course substitution in professional studies or the teaching field is desired, permission must be obtained prior to enrolling in the course. Students should contact the Certification Officer in the UAH Department of Education to complete appropriate forms for such approval. This requirement is very crucial and must be adhered to. Courses taken without approval may prevent a student from completion as planned.

Course Repeat Policy. The UAH course repeat policy allows students to repeat courses on a limited basis in order to improve the grade in a course. Education students may take advantage of this policy in all subjects. Education students, however, are required to repeat teaching field and professional education courses at UAH. This is in compliance with the Alabama State Code of Education, but differs from the UAH course repeat policy in this regard. See the Academic Information section of this catalog for the UAH course repeat policy.
Program Completion. If a student does not complete requirements for the undergraduate degree within a period of seven years from the date of admission, the Department of Education will modify the student's program to bring it into harmony with current degree and certification requirements. In addition, students in the teacher education program must complete that program's requirements within four years from the date of formal admission to the program, or they must re-apply for admission.

Admission to the Teacher Education Program

Admission to the university does not qualify a student for admission to the Teacher Education Program (TEP). Eligibility for admission to teacher education is determined after completion of the sophomore year. Transfer students who have completed two years of undergraduate study may be eligible for admission if they have a grade point average of 2.5 on 9 semester hours of work at UAH.

Criteria for Admission to the Teacher Education Program. Applications for admission to the Teacher Education Program are available in the department office or from the Certification Officer. Students who meet the following minimum criteria may apply for admission to the Teacher Education Program (TEP). However, meeting the minimum criteria does not guarantee admission. Students should complete at least 9 semester hours of coursework in education before they are admitted to the TEP. In addition to meeting the following criteria, all students who are admitted to the Teacher Education Program must have an approved program of study on file in the department.

1. Submit a formal written application for admission to the Teacher Education Program
2. Complete at least 60 hours including 48 semester hours in the general education requirements.
3. Maintain a cumulative grade point average of 2.5 on all work attempted.
4. Achieve a passing score of at least 300 on the Alabama Basic Skills Test (BST) required by the State of Alabama.
5. Successfully complete the 5 days of full-time structured field experience in ED 301.
6. Successfully complete (with a grade of "C" or higher) ED 305, 306, or equivalent courses.
7. Submit an an essay that summarizes the applicant's strengths and reasons for choosing teaching as a profession.
8. Complete a satisfactory interview(s) with faculty advisor in the Department of Education to provide information of the applicant's personality, interests, and aptitudes consistent with the requirements for successful teaching.

Admission by reciprocity. Students who have been admitted previously to a teacher education program at an accredited university or college in Alabama may apply for reciprocal admission to the TEP at UAH. To be considered for this option, the student must supply documentation of previous admission.

Retention and Completion of the Teacher Education Program. Admission to the TEP implies continuous evaluation of the student's progress and qualifications for teaching. A student may be removed from the program, after due process, at any time the advisor, area head, and others in a position to judge determine that the student's potential for success as a teacher is minimal.

1. A grade of "C" or above must be earned in all professional education courses. A student who receives a grade below "C" in a required education course may repeat the course only one time. The student is required to repeat the course at UAH. In cases of extreme hardship the student may petition the department for permission to repeat the course at another institution.
2. To remain in the program each student shall make satisfactory progress as determined by continuous evaluation. Students enrolled in the TEP at UAH must maintain the 2.5 grade point average which was required for admission to the program. In addition, admitted students must maintain a 2.75 average in all professional education courses and a 2.5 average in the teaching field(s) courses. This grade point average is consistent with requirements for student teaching and certification.
3. Students whose grade point average in professional education courses falls below the 2.75
average at any time following admission to the TEP will be required to make an appointment with the advisor and will be notified in writing that they are placed on departmental probation for one semester. During the probationary semester the student may enroll in only one professional education course and progress will be closely monitored. Enrollment in courses outside of the education department will not be limited. Any student who fails to raise the grade point average to at least 2.75 during the probationary semester will not be permitted to continue in the TEP.

4. A student who wishes to apply for readmission should submit a letter to the chair of the Department of Education. A department committee will evaluate each request for readmission. Readmitted students who subsequently earn a grade lower than “C” in any professional education course will be permanently dismissed from the program.

Practicum Requirements

The Department of Education requires that a student pursuing a degree in education must engage in observation/practicum experiences in schools and communities as specified by instructors of the professional education courses in his/her degree program. For further details, check with the instructor of the respective education course as to the practicum requirements.

Internship Semester

Students are required to make formal application for the Internship Semester. In order to accommodate students with appropriate clinical settings, the following priority dates for applications have been established: January 31 for the following Fall Semester and June 30 for the following Spring Semester. Please note that student teaching is offered only in the Fall and Spring Semesters, and must be taken the last semester before graduation.

Internship Requirements

The teaching internship (student teaching) is one of the most important experiences teacher education students have. It is generally regarded as the culminating activity of one’s preparation to become a teacher. At UAH the internship is a full-time, full-semester assignment of 15 weeks. Students enrolling for an internship should not expect to be enrolled in other courses while interning.

Eligibility Requirements for the Internship Semester

1. Be accepted into the Teacher Education Program
2. Have a completed Program of Study on file in the Education Department
3. Maintain a minimum grade point average of 2.5 overall
4. Maintain a minimum grade point average of 2.5 on all work attempted in the teaching field(s)
5. Maintain a minimum grade point average of 2.75 in all work attempted in professional education courses, with no grade lower than "C"
6. Complete satisfactorily all appropriate General Education Requirements,
7. Complete all appropriate professional education courses with no grade lower than “C”

In Elementary Education, completion of the following professional courses is required before enrolling in student teaching: ED 305, 306, 308, 309, 350, 360, 371, 372, 373, 374, 375, and EDC 301. ED 490 is to be taken concurrently with student teaching. (Exceptions may be possible with the permission of the department chair.)

In Secondary Education, completion of the following professional courses is required before enrolling in student teaching: ED 305, 306, 308, 309, 350, 408, 410, 416, and EDC 301. ED 490 is to be taken concurrently with student teaching.

8. Obtain a passing score on Part I of the comprehensive written exit examination. Part I - Foundation Knowledge exam covers concepts associated with (a) human growth and development, (b) educational psychology, (c) history and philosophy of education, and (d) special education. This examination is scheduled each semester and should be taken immediately after completion of the four foundation courses (ED 305, 306, 308, EDC 301). Students who fail the examination should consult with recommended education
faculty for remediation and then re-take the examination. Students are permitted to re-take the examination only twice. Those who fail the examination on their third attempt will have their entire file reviewed and may be dismissed from the Teacher Education Program by a majority faculty decision.

**Internship Placements.** All internship placements are coordinated by the Department of Education faculty. Placement sites are selected in a manner to assure the diversity and quality of the internship experience and of the supervision provided by the cooperating teacher. All internship placements are usually in the Huntsville-Madison County area, in order to facilitate supervision of students by UAH faculty. **Elementary Education** students must complete a primary and intermediate grade assignment during the 15-week internship. **Secondary Education** students will complete a middle and high school assignment during the 15-week internship. Students seeking dual certification in Elementary Education and Collaborative Teaching will have two placements.

**Exit Examinations**
Exit examinations are required of all teacher education students. Students in Class B certification programs at UAH must take Part II of the exit examination (Professional Teaching Abilities). This examination is taken at the end of the internship and consists of the submission of a portfolio and an oral presentation. An inadequate or incomplete portfolio may be revised and re-submitted to a faculty committee.

Students must also take a comprehensive examination over each teaching field. These examinations are designed by the teaching field department and use a variety of assessment techniques: oral examinations, multiple choice tests, performance assessments, and written examinations. Students should contact their teaching field department(s) before their internships to schedule these examinations.

**Graduation**
The student must have met all general University and degree program requirements as outlined in the catalogue. The student must have maintained a 2.5 grade-point average in all teaching field courses and a 2.75 in all professional education courses at UAH and/or all other institutions attended.

**Application for Certification**
The issuance of an Alabama teaching certificate is the legal responsibility of the Alabama State Department of Education. Colleges and universities cannot issue a professional certificate. However, in order to be recommended for a professional teacher's certificate, a student must complete an appropriate course of study at a college or university which has been approved by the State Board of Education. When the student has completed the course of study, the institution recommends to the State Department of Education that an appropriate certificate be awarded. **It is the responsibility of the student to initiate the application for initial certification.**

Programs offered by the Department of Education are designed to prepare teachers for professional certification at the Class B (bachelor's degree) or Class A (master's degree) level. The Department of Education, in accordance with the Alabama State Board of Education, also provides courses for persons who hold expired certificates and wish to reinstate them.

Students who expect to teach in states other than Alabama are responsible for a knowledge of the licensure requirements in those states. Some states have reciprocity with Alabama through interstate agreements of the State Department of Education. Such students should inform their advisor or the certification officer of their intentions, as the advisor and certification officer may be of assistance in ensuring compliance with other state's requirements.

**Requirements for Alabama Certification**
1. Applications for an Alabama professional teaching certificate are available in the certification office. Students should make application for a teaching certificate during the final semester of their program.
2. To be eligible for a recommendation for a certificate, the candidate must earn a passing score on all exit examinations which cover the content of the teaching field(s) and professional education courses.

3. No grade below "C" in the teaching field or professional studies may be used to meet certification requirements.

4. The applicant must submit a finger print card to the Alabama State Department of Education (the appropriate fee in the form of a money order or cashier's check made payable to the Alabama Department of Education must accompany the finger print card) and successfully pass a background review conducted by the Alabama Bureau of Investigation and the Federal Bureau of Investigation. Individuals who obtain background clearance through the ABI will not be required to obtain another background clearance for additional certification as long as they hold a valid Alabama certificate. Individuals who obtain background clearance for the issuance of an Alabama certificate and allow their certificates to lapse for more than 90 days (holding no Alabama certificate for that 90-day period) will be required to obtain another background clearance for the issuance of any certificate or license.

5. Anyone convicted of a felony and/or misdemeanor other than a minor traffic violation may be denied certification or have certification revoked by the State Superintendent.

Initial Certification
Successful completion of the bachelor's program in teacher education leads to Alabama Class B certification which is valid for five years. This certification may be renewed upon verification of successful teaching for four years and completion of an approved professional development program; or earning upper division or graduate level credit in the certification areas. Teachers are encouraged to earn Class A certification which may be incorporated into their employer's professional development program.

Ensuring the Competence of Graduates
For a period of two years after program completion and recommendation for certification, the University of Alabama in Huntsville, through the Department of Education, shall warranty and provide remediation at no cost to students who are evaluated to be unsatisfactory or deficient in any area of preparation. Remediation in professional education and/or teaching field departments will be based upon recommendations from the performance evaluations conducted by public school administrators who use the Alabama Professional Education Personnel Evaluation (PEPE) or comparable evaluations recognized and approved by the State Board of Education. This policy is consistent with the Alabama State Code of Education.

General Education Requirements (B.A.)
B.A. programs are available for the following certification programs: art, biology, chemistry, collaborative teacher, elementary education, English-language arts, French, general science, German, history, mathematics, music, Russian, social science, and Spanish. (Students seeking teaching certification will find additional requirements and modification of requirements indicated in italics.)

Courses
Semester Hours

- English Composition: EH 101 and EH 102
  (Students in the Honors Program may substitute EH 105H)

  6

- Humanities and Fine Arts
  (No more than 6 hours may be taken in any single discipline.)
  3 hours fine arts: ARH 100, 101, ARS 160, CM 122, MU 100
  6 hours literature: EH 205, 240, or 250 and 206, 230, 241, or 251
  6 hours humanities and fine arts: ARH 100, 101, ARS 160, CM 122, FL 200 Level,
MU 100, PHL 101, 201, 202, WS 200

(Exception for students seeking teacher certification: CM 113 must be completed in lieu of one course in this area.)

10 hours foreign language and literature (through 102; course dependent on placement)

Natural Science and Mathematics

Elementary education (16 hours). Select two biology courses (BYS 119 and 120); then choose 2 additional courses: AST 106, 107, ES 102, CH 101/105, 113, PH 100, 101, 102

Secondary education (8 hours), two courses, one of which must be biology

Choose from: AST 106, 107, BYS 119, 120, 214, CH 101/105, 113, 121/125, 123/126, PH 100, 101, 102, 106, 107, 111/114, 112/115

3 hours mathematics: Level I: MA 117, 119, 143; Level II: MA 121, 145; Level III: MA 171, 145 Level III.

(See advisor for appropriate course.)

(Additional requirements for students seeking teacher certification: Elementary education majors must complete 4 courses in science, including 2 in biology, and 3 courses in mathematics to meet State Department of Education Requirements.)

History, Social and Behavioral Sciences

(No more than 6 hours may be taken in any single discipline.)

6 hours history: HY 101, 102

12 hours social science: ECN 142, 143, 239, PSC 101, 102, 260, PY 101, 201, SOC 100, 200.

General Education Requirements (B.S.)

AREA I

English Composition:
EH 101 and 102 (Honors EH 105H)

AREA II

Humanities and Fine Arts (No more than 2 courses in any one discipline)

Fine Arts (1 course): ARH 100, 101, ARS 160, MU 100, 101, CM 122

Literature (1-2 courses):* EH 205-206, 205-241, 240-206, 240-241, 205-230, or 250-251

Humanities and Fine Arts (1-2 courses): CM 113 is required; additional course as needed from PHL 101, 202, WS 200, ARS 160, ARH 100, 101, CM 122, MU 100, 101, FL 101, 102 chosen from FH, GN, JE LN, RN, or SH.

AREA III

Natural Science and Mathematics

Mathematics: (1 course at Level I) MA 119, 143

(All B.S. degrees require a level III calculus course. See major department for specific requirements.)

Natural Science: A 2-course sequence in a laboratory natural science outside the major and minor (See disciplines for specific course requirements.)

AREA IV

History, Social and Behavioral Sciences (No more than 2 courses in any one discipline)

History (1-2 courses):* HY 101-102

Social and Behavioral Sciences (2-3 courses): Chosen from PSC 101, 102, 260, PY 100, SOC 100, 200, ECN 142, 143

AREA V

Preprofessional and Elective courses (See individual major for specific requirements.)

One science or engineering course outside major and not in minor requirements.

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Mathematics and computer science majors must take a laboratory science (AST, ATS, BYS, CH, ES, PH) to meet this requirement.

One computer science course: CS 100, 102, 104 or higher. See major department for specific requirement.

Technical Writing: EHT 301

Electives: Level III mathematics must be taken here if not taken in AREA III or in major or minor.

* Education majors in the College of Science must take two literature and two history courses.

ELEMENTARY EDUCATION (K-6 certification)

The curriculum in elementary education provides a broad liberal education base, professional studies, and includes the study of a single discipline. It prepares the elementary teacher for the general responsibilities expected of all teachers and the specific competencies of the elementary classroom. In addition, this curriculum provides a base for movement into the middle school, if the teacher so desires.

Because of the scope of the elementary education program the student must inform the Education Department of this goal as early as possible. The student will be assigned an advisor to aid in planning an effective course of study. This planning also requires the student to seek counseling from an adviser in the department of the student's second area of study. Students enrolled in the elementary education program should expect their program to take longer than four (4) years.

Upon successful completion of the elementary education program, the student will be awarded a B.A. degree, will be recommended for the Alabama Class B Elementary Professional Teachers Certificate, and will be prepared to teach in grades K-6.

The illustrative plan that follows is one example of the many ways elementary education majors may schedule coursework to complete the B.A. degree. A student's schedule may differ slightly, namely 1) in order of some coursework and 2) number of coursework taken each semester. Students should speak with their advisor regarding the optimum sequence for education courses. To the extent possible, schedules will be designed to fit the scheduling needs of the student.

Elementary Education

An Illustrative Plan for Completing the B.A. Degree with a Major in Elementary Education

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fall</th>
<th></th>
<th>Spring</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EH 101</td>
<td>3</td>
<td>EH 102</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>FL 101</td>
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<td>Math</td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>Social Science</td>
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<td>Fine Arts</td>
<td>3</td>
</tr>
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<td></td>
<td></td>
<td>14</td>
<td>Social Science</td>
<td>2</td>
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|                | EH 200 level | 3  | EH 200 level | 3  |
|                | HY 101      | 3  | HY 102      | 3  |
|                | Math        | 3  | Social Science | 3  |
|                | Lab Science | 4  | Lab Science | 4  |
|                | CM 113      | 2  | Humanities  | 3  |
|                |            | 16 |            | 32 |

|            | ED 301 | 1  | ED 308 | 3  |
|            | ED 305 | 3  | ED 309 | 3  |
|            | ED 306 | 3  | EDC 301 | 3  |
|            | ED 350 | 3  | Lab Science | 4  |

College of Liberal Arts 184
### Program of Study—Elementary Education Major

**Social Science** 3  
2nd Area of Study 3  
16  

**Summer** *  
ED 310 3  
ED 372 3  
6  

**Fourth Year**  
ED 373 3  
ED 374 3  
ED 375 3  
2nd Area of Study 3  
Lab Science 4  
16  

**Fifth Year**  
Internship 9  
ED 490 1  
10  

Total Hours 142  

### Second Area of Study

A student planning to teach in an elementary school must select a second area consisting of a minimum of 15 hours. Available programs in the College of Liberal Arts are: art, English, communication arts, history, foreign language (French, German, Russian, Spanish), music, political science, philosophy, psychology and sociology. Students may also select the Collaborative Teacher Cognate. Approved programs in the College of Science are biology, chemistry, mathematics and physics. Other cognate fields may be approved by petitioning for special consideration.

<table>
<thead>
<tr>
<th>Art</th>
<th>9 hours</th>
<th>History</th>
<th>21 hours</th>
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<tbody>
<tr>
<td>ARS 200: 240, 250, 270, or 280</td>
<td>6</td>
<td>HY 221, 222 U. S. History</td>
<td>6</td>
</tr>
<tr>
<td>ARS 300: 275, 276, or 377; 280, 283, 340, 341, 342, 346</td>
<td>3</td>
<td>HY 225 History of Alabama</td>
<td>3</td>
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<tr>
<td><em>ARS 160 in GER -3 hrs.</em></td>
<td></td>
<td>HY 392 Europe</td>
<td>3</td>
</tr>
<tr>
<td><em>ARH 100 or 101 in GER -3 hrs.</em></td>
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<td>HY 300 Elective</td>
<td>6</td>
</tr>
<tr>
<td>Biology</td>
<td>15 hours</td>
<td>HY 400+Electives</td>
<td>3</td>
</tr>
<tr>
<td>BYS 219* General Genetics</td>
<td>4</td>
<td><em>HY 101, 102 in GER-6 hrs.</em></td>
<td></td>
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<tr>
<td>*CH 121, 125 Prerequisite (4)</td>
<td></td>
<td>HY 300, 400 level - one US &amp; one non-US history</td>
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</tr>
<tr>
<td>BYS 312 Principles of Ecology</td>
<td>4</td>
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<table>
<thead>
<tr>
<th>Mathematical Science</th>
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<tr>
<td>MA 201 Calculus C</td>
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<tr>
<td>MA 244 Linear Algebra</td>
<td>3</td>
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</table>
**RECOMMENDED:**
BYS 301* *Elementary Biochemistry 3
*CH 113 Prerequisite (4)
OR BYS 340 Basic Cellular
*CH 121 Prerequisite (4)
BYS 300+Elective
*BYS 119, 120 in GER - 8 hrs.

**Collaborative** 18 hours
EDC 301 Teaching Exceptional. Child 3
EDC 302 Intro. Low Incident Pop. 3
EDC 311 Instructional Strategies 3
EDC 321 Collaborative/Consultation 3
EDC 331 Critical Issues in Education 3
EDC 341 Transition of K-12 Students 3

**English** 18 hours
EH 300+American Literature 3
EH 360 Shakespeare 3
EH 307 Structure of Modern English 3
EH 400 Composition for Teachers 3
EH 300+Literature Before 1800 3
EH 300+Literature After 1800 3
*EH 101, 102 & EH 200 level survey in GER 12 hrs. EH 310 or 311 may be substituted for pre-/post 1800 categories.

**Communication Arts** 15 hours
CM 221 Acting 3
CM 231 Foundations of Communication 3
CM 309, 310 or 315 3
CM 205 Media Writing 3
CM 305 Advanced Media Writing 3
*CM 113 and CM 122 in the GER.

**Foreign Language** 15 hours
(French, German,Russian, Spanish)
FL 200 Intermediate Foreign Language 3
FL 301 Conversation 3
FL 302 Composition 3
FL 304 Culture 3
FL 305 Introduction to Literature 3
*FL 101, 102 in GER-10 hrs.
MA 330 Foundations of Mathematics 3
MA 333 Geometry 3
MA 385 Probability 3
MA 442 Algebraic Structures 3
MA 452 Real Analysis 3
MA/ST487 Intro Mathematical Statistics 3
*MA 171 Calculus A, MA 172 Calculus B - 8 hrs.

**Music** 18 hours
MU 202 Theory of Music 3
MU 203, 204 Musicianship Skills 2
MU 310 American Music 3
MU 312 Music History II 3
MU 300+Ensembles 4
MU326 Teaching Gen. Music Elem.Sch. 3
*MU 100 and 201 in GER-6 hrs.

**Philosophy** 9 hours
PHL 300+ electives 9
*PHL 101 or 202, and 201 in GER - 6 hrs.

**Political Science** 12 hours
PSC 103 State and Local Government 3
PSC 484 Senior Seminar 3
PSC Electives 6
*PSC 101, 102 in GER - 6 hrs.

**Psychology** 15 hours
PY 102 General Psychology II 3
PY 315 Developmental Psychology 3
PY 375 Social Psychology 3
PY 301 Personality OR 3
PY 433 Psychology of Abnormal Behavior 3
PY 314 Learning OR 3
PY 380 Cognition *PY 101 in GER-3 hrs.

**Sociology** 15 hours
SOC 102 Social Problems OR 3
SOC 106 Marriage and Family 3
SOC 325 Sociology of Education 3
SOC 300+Electives *SOC 100 in GER-3 hrs.
COLLABORATIVE TEACHER PROGRAM (K-6 or 6-12 certification options)

The Collaborative Teacher-Special Education program is designed to prepare classroom teachers to better meet the diverse needs of all children, including those who have been diagnosed with specific learning problems, i.e. mentally retarded, mild learning disabilities, multi-disabilities, specific learning disabilities, emotional conflicts, orthopedically impaired, and other health impaired. Based on a collaborative model, classroom teachers and special education teachers serve as teaching partners within an inclusive classroom setting.

The UAH Collaborative Teacher-Special Education program is innovative, allowing education students to receive dual certification upon completion of courses in the elementary and/or secondary education programs and the collaborative teacher area of study. Students enroll in either the elementary or secondary certification program and take additional courses from the collaborative teacher area of study. Collaborative teacher courses provide a background for a variety of disabilities, instructional strategies, collaborative consultation, critical issues, and transition of K-12 students. Each of these courses includes a practicum in an inclusive classroom. Methods courses have been redesigned with an instructional module focusing on specific learning problems and appropriate teaching strategies in a specific discipline.

Elementary Education-Collaborative Teacher Certification Program (K-6)
An Illustrative Plan for Completing the B.A. Program with Dual Certification

<table>
<thead>
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<tbody>
<tr>
<td>EH 101</td>
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<tbody>
<tr>
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<td>EH 200 level</td>
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<tr>
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<tr>
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<td>ED 305</td>
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<td>ED 306</td>
<td>3</td>
<td>EDC 301</td>
</tr>
<tr>
<td>ED 350</td>
<td>3</td>
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<tr>
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<table>
<thead>
<tr>
<th>Summer *</th>
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<tr>
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<td>ED 310</td>
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<td>EDC course</td>
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College of Liberal Arts
Fifth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Internship</td>
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<td><strong>Total Hours</strong></td>
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<td><strong>145</strong></td>
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</table>

Program for Collaborative Teacher Area of Study

- EDC 301 - Teaching Exceptional Children: 3 hours
- EDC 302 - Introduction to Low Incidence Populations: 3 hours
- EDC 311 - Instructional Strategies: 3 hours
- EDC 321 - Collaborative Consultation: 3 hours
- EDC 331 - Critical Issues in Education: 3 hours
- EDC 341 - Transitions of K-12 Students: 3 hours

Total: 18 hours

Secondary Education - Collaborative Teacher Certification Program (6-12)

Students who are seeking teacher certification for grades 6-12 may also add the Collaborative Teacher-Special Education program as a second area of study. Because programs of study for students seeking 6-12 certification vary greatly, students who choose to add the Collaborative Teacher area of study to their first teaching field (English, history, biology, etc.) should consult with the Certification Officer and the special education advisor in the Education Department. It is not possible to design an illustrative plan that would be appropriate; therefore individual programs of study will be developed for any student choosing to add the collaborative teacher area of study to their major teaching field. Students should be aware that adding dual certification in the Collaborative Teacher at the secondary level will lengthen the time to degree.
SECONDARY/HIGH SCHOOL EDUCATION (6-12 certification)

The curriculum in high school education is planned to provide a broad liberal base, professional studies in high school teaching, and an in-depth study of a comprehensive field for the purpose of preparing teachers for service in senior high schools. Students may, at their option, also seek certification in middle/junior high school education, with additional coursework and internships. Preparation will be rigorous and will equip the teacher to work in the high school setting and to deal with adolescents.

Students should seek advisement as early as possible. Advisors will be assigned in both professional education and in the teaching field(s). The student will earn a B.A. or B.S. depending on the field chosen. Upon successful completion of the program the student will be recommended for the Alabama Class B High School Certificate, and will be prepared to teach in grades 6-12.

SECONDARY EDUCATION 6-12 TEACHER PREPARATION PROGRAMS OFFERED

Biology B.A., B.S. Chemistry B.S. English Language Arts B.A.

Foreign Language B.A. General Science B.A., B.S. History B.A.
(\text{German, French, Russian, Spanish})

Mathematics B.A., B.S. Physics B.S. Social Science B.A.

The following pages contain illustrative plans for completing B.A. or B.S. degree programs with majors in the above listed teaching fields. These plans are provided as examples of the many ways a student may schedule coursework to complete a B.A. or B.S. degree with a teaching field major. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student. The major teaching field departments have selected specific courses as most appropriate for the preparation of teachers. The programs, including those courses listed for each major, have been approved by the Alabama State Department of Education for teacher certification in grades 6-12; therefore students choosing to teach in a high school setting should seek early advisement from the Education Department and the teaching field department in order to register for courses within the state approved program.

Biology B.A. (6-12 Certification)

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th></th>
<th>Spring</th>
</tr>
</thead>
</table>
| First Year    | EH 101             | 3          | EH 102               | 3
|               | BYS 119            | 4          | BYS 120              | 4
|               | CH 101, 105        | 4          | CS 100, 102          | 3-4
|               | MA 121, 145 or 171 | 13-14      | Social Science       | 2
|               |                    |            | 13                   | 27-28
| Second Year   | EH 200 level       | 3          | EH 200 level         | 3
|               | BYS 219            | 4          | BYS 312              | 4
|               | PH 101             | 4          | PH 102               | 4
|               | FL 101             | 5          | FL 102               | 5
|               | HY 101             | 3          | HY 102               | 3
|               |                    | 19         |                      | 19
|               |                    |            |                      | 38

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**Program for Biology B.A. Certification**

**Summer**
- **CM 113** 3 Social Science 3 6

**Third Year**
- **ED 301** 1 ED 308 3
- **ED 305** 3 ED 309 3
- **ED 306** 3 EDC 301 3
- **ED 350** 3 Social Science 3
- **BYS 321** 4 BYS 300+elective 3-4
- **CH 113** 4 CH 301 2

18 18-19 36-37

**Fourth Year**
- **ED 408** 3 ED 416 3
- **BYS 340** 3 BYS 300+ 3
- **BYS 300+elective** 3-4 Social Science 3-4
- **Fine Arts** 3 BYS 490 2
- **EH 301** 3 HUM/FineArts 2

16 15-16 31-33

**Fifth Year**
- **Internship** 9
- **Senior Seminar** 1
- **Total Hours** 10

151-154

**BYS 119** - Principles of Biology 4 hours (GER)
**BYS 120** - Organismal Biology 4 hours (GER)
**BYS 219** - Genetics 4 hours
**BYS 312** - Principles of Ecology 4 hours
**BYS 321** - General Microbiology 4 hours
**BYS 340** - Basic Cellular, Molecular, & Developmental Biology 4 hours
**BYS 490** - Senior Seminar 2 hours
**BYS 300+** - Electives 10 hours

Total: 36 hours

**Ancillary requirements:**

Chemistry:
- **CH 101, 105** - Introduction to Chemistry and Lab OR 4 hours (GER)
- **CH 121, 125** - General & Inorganic Chemistry
- **CH 113** - Elementary Organic Chemistry OR 4 hours
- **CH 331, 335** - Organic Chemistry & Lab
- **CH 301** - Elementary Biochemistry OR 3-4 hours*
- **CH 361, 362** - General Biochemistry & Lab

Physics:
- **PH 101, 102** - General Physics I and II OR 8 hours (GER)
- **PH 111, 114** - Physics with Calculus I & Lab
- **PH 112, 115** - Physics with Calculus II & Lab

Total: 19-20 hours

*CH 113 AND 301 if beginning with CH 101, 105—CH 331, 335 & CH 361, 362 if beginning with CH 121, 125

College of Liberal Arts 190
### Biology B.S. (6-12 Certification)

#### First Year

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### Program for Biology B.S. Certification

- **BYS 119 - Principles of Biology**: 4 hours (GER)
- **BYS 120 - Organismal Biology**: 4 hours (GER)
- **BYS 219 - Genetics**: 4 hours
- **BYS 312 - Principles of Ecology**: 4 hours
- **BYS 321 - General Microbiology**: 4 hours
- **BYS 340 - Basic Cellular, Molecular, & Developmental Biology**: 4 hours
- **BYS 490 - Senior Seminar**: 2 hours
- **BYS 300+ - Electives**: 10 hours
- **Total**: 36 hours
Ancillary requirements:
Chemistry:
CH 121, 125 - General & Inorganic Chemistry & Lab I 4 hours (GER)
CH 123, 126 - General & Inorganic Chemistry & Lab II 4 hours
CH 113 - Elementary Organic Chemistry OR 4 hours
CH 331, 335 - Organic Chemistry & Lab
CH 301 - Elementary Biochemistry OR 3-4 hours*
CH 361, 362 - General Biochemistry & Lab

Physics:
PH 101, 102 - General Physics I and II OR 8 hours (GER)
PH 111, 114 - Physics with Calculus I & Lab
PH 112, 115 - Physics with Calculus II & Lab

Total: 23-24 hours

Chemistry B.S. (6-12 Certification)

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| Second Year         |                             |                            |
| HY 101              | 3                           | HY 102                     |
| EH 200 level        | 3                           | EH 200 level               |
| CH 223              | 3                           | CH 315                     |
| PH 11,114           | 4                           | PH 112,115                 |
| MA 201              | 4                           | Social Science             |
|                    | 17                          |                            |
|                    |                              | 29                         |

| Third Year          |                             |                            |
| ED 301              | 1                           | ED 308                     |
| ED 305              | 3                           | ED 309                     |
| ED 306              | 3                           | EDC 301                    |
| ED 350              | 3                           | EH 301                     |
| CH 331, 335         | 4                           | CH 332, 336                |
| PH 113, 116         | 4                           |                            |
|                    | 18                          | 16                         |
|                    |                              | 34                         |

| Summer              |                             |                            |
| ED 410              | 3                           |                            |
|                    |                              | 3                          |

| Fourth Year         |                             |                            |
| ED 408              | 3                           | ED 416                     |
| Social Science      | 3                           | BYS 300+elective           |
| CH 347              | 3                           | CH 348                     |
| CH 361, 362         | 4                           | CS 102 or 107              |
|                    | 13                          | HUM/FineArts               |
|                    |                              | 16-17                      |
|                    |                              | 29-30                      |

| Fifth Year          |                             |                            |
| ED 490              | 1                           |                            |
| ED 497              | 9                           |                            |
|                    | 10                          |                            |
|                    |                              | 10                         |
|                    | Total Hours                 | 134-135                    |

College of Liberal Arts 192
Program for Chemistry Certification

Chemistry Courses:
CH 121, 125 - General and Inorganic Chemistry I and Lab 4 hours
CH 123, 126 - General and Inorganic Chemistry II and Lab 4 hours
CH 223 - Quantitative Analysis 3 hours
CH 315 - Chemical Demonstration 2 hours
CH 331, 335 - Organic Chemistry I and Lab 4 hours
CH 332, 336 - Organic Chemistry II and Lab 4 hours
CH 347 - Biophysical Chemistry I 3 hours
CH 348 - Biophysical Chemistry II 3 hours
CH 361, 362 - General Biochemistry I and Lab 4 hours

Total: 31 hours

Ancillary Courses:
PH 111, 114 - General Physics I with Calculus 4 hours
PH 112, 115 - General Physics II with Calculus 4 hours
PH 113, 116 - General Physics III with Calculus 4 hours
MA 171, 172, 173 - Calculus A, B, C 12 hours
BYS 119 or 120 - Principles of Biology or Organismal Biology 4 hours

Total: 28 hours

English-Language Arts (6-12 Certification)

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### Fourth Year

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### Fifth Year

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### Program for English Language Arts Certification

- Sophomore Survey (as described in the GER) (6) GER
- Shakespeare (EH 360) 3
- Structure of Modern English (EH 307) 3
- Composition Studies for Teachers (EH 400) 3
- American Literature (EH 330, 331, 339, 430, 431, 530, 532, 533) 3
- Literature before 1800 (EH 380, 381, 450, 460) 3
- Literature after 1800 (EH 330, 331, 390, 391, 418, 421, 430, 431, 493, 500, 520, 522, 533, 592) 3
- Literature elective (must be 300 level or above) 3
- One course in creative writing (EH 310, 311, or 412) may serve as the literature elective.
- Speech and Communication (CM 113 in GER) (6) GER
- Communication Arts Elective (CM 309, 310, or 315) 3
- Drama and Theatre (CM 122 and 221) 6
- Journalism and Media Writing (CM 205 and 305) 6

Total: 36 hours

Note: One course devoted entirely to the novel. Two courses in 400 or 500-level courses. No more than one creative writing course may count toward major.

### Foreign Language (6-12 Certification)

**German, French, Russian, or Spanish**

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College of Liberal Arts 194
Third Year

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Fourth Year

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Fifth Year

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Total Hours 129

Program for Foreign Language Certification (French, German, Russian, or Spanish)

FL 101, 102 - Introductory Foreign Language I and II 10 hours (GER)
FL 200 - Intermediate Foreign Language 3 hours
FL 204 - International Cinema 3 hours
FL 301 - Conversation 3 hours
FL 302 - Composition 3 hours
FL 303 - Foreign Language for Life and Professions 3 hours
FL 304 - Culture 3 hours
FL 305 - Introduction to Literature 3 hours
FL 404 - Texts and Contexts: Seminar in Literature 3 hours
FL 410 - Comparative Languages & Culture in Practice 3 hours
Total: 37 hours

General Science B.A. (6-12 Certification)

First Year

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Second Year

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195

College of Liberal Arts
| Summer | CM 113 | 3 | Social Science | 3 |
|        | ES 101 | 4 | ES 102         | 4 |
|        |        | 7 |                | 14|
| Third Year | ED 301 | 1 | ED 308         | 3 |
|          | ED 305 | 3 | ED 309         | 3 |
|          | ED 306 | 3 | EDC 301        | 3 |
|          | ED 350 | 3 | Social Science | 3 |
|          | BYS 321| 4 | BYS 300+elective | 3-4 |
|          | CH 113 | 4 | CH 301         | 3 |
|          |        | 18 | 18-19         | 36-37 |
| Summer | ED 410 | 3 |                | 3 |
| Fourth Year | ED 408 | 3 | ED 416         | 4 |
|           | BYS 340 | 3-4 | BYS 300+elective | 3-4 |
|           | BYS 300+elective | 3-4 | PH 107         | 4 |
|           | PH 106 | 4 | Social Science | 3 |
|           | EH 301 | 3 | Humanities/Fine Art | 3 |
|           | CH 480 | 1 | BYS 490        | 2 |
|           |        | 17-19 | 19-20       | 36-39 |
| Fifth Year | ED 490 | 1 |                | 10 |
|           | ED 497 | 2 |                | 166-171 |
|           |        | 10 |                | 10 |

**Program for General Science B.A. (6-12 Certification)**

**Biology Courses:**
- BYS 119 - Principles of Biology (GER) 4
- BYS 120 Organismal Biology (GER) 4
- BYS 219 Genetics 4
- BYS 321 General Microbiology 4
- BYS 340 Cellular, Molecular, & Devel. Biology 4
- BYS 490 Senior Seminar 2
- BYS 300+electives 10

**Chemistry Courses:**
- CH 101, 105 Intro. to Chemistry (GER) 4
- CH 121, 125 General & Inorganic 3-4
- CH 113 Elementary Organic 2

**Physics Courses:**
- CH 331, 335 Organic Chemistry 3
- CH 301 Elementary Biochemistry & 3
- CH 480 Selected Topics in Chemistry OR 1
- CH 361, 362 General Biochemistry & Lab 4
- PH 101, 102 General Physics I & II 8 (GER)
- PH 111, 114, 112, 115, & 113, 116 12
- PH 106 Exploring the Cosmos I 4 (GER)
- PH 107 Exploring the Cosmos II 4 (GER)

**Environmental Science Courses:**
- ES 101 Planetary & Atmosph. Science 4 (GER)
- ES 102 Planetary & Atmosph. Science 4 (GER)
- ES 312/BYS 312 Principles of Ecology 4
## General Science B.S. (6-12 Certification)

### First Year

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### Second Year

| EH 200 level 3 | EH 200 level 3 |
| HY 101 3       | HY 102 3       |
| BYS 219 4      | BYS 312 4      |
| PH 112, 115 4  | PH 113, 116 4  |
| CM 115 3       | Social Science 3 |
| MA 201 4       |               |
| 21            | 17 38         |

#### Summer

| CM 113 3 | CS 100,102,or 104 3 |
| 5        | 3 6                 |

### Third Year

| ED 301 1 | ED 308 3 |
| ED 305 3 | ED 309 3 |
| ED 306 3 | EDC 301 3 |
| ED 350 3 | BYS 300+elective 3 |
| BYS 321 4 | CH 361,362,or 301 3-4 |
| CH 331,335or 113 3-4 | CS 100,102,or 104 3 |
| 17-18 | 18-19 36-37 |

#### Summer

| ED 410 3 | Social Science 3 |
| ES 101 4 | ES 102 4 |
| 6       | 6 14          |

### Fourth Year

| ED 408 3 | ED 416 4 |
| BYS 340 3 | BYS 300+elective 3-4 |
| BYS 300+elective 3-4 | BYS 490 2 |
| PH 106 4 | PH 107 4 |
| EH 301 3 | Humanities/Fine Arts 3 |
| 17-18 | 16-17 |

### Fifth Year

| Internship 9 | Senior Seminar 1 |
|             | 10 |

#### Total Hours

| 169-172 |

### Program for General Science B.S. (6-12 Certification)

**Biology Courses:**
- BYS 119 - Principles of Biology (GER) 4
- BYS 120 - Organismal Biology (GER) 4
- BYS 219 - Genetics 4
- BYS 321 - General Microbiology 4
- CH 121, 125 Organic Chemistry
- CH 301 Elementary Biochemistry &
- CH 331, 335 Organic Chemistry
- CH 361, 362 General Biochemistry & Lab 4
BYS 340 Cellular, Molecular, & Devel. 4
Biology
BYS 490 Senior Seminar
BYS 300+electives
Chemistry Courses:
CH 101, 105 Intro. to Chemistry (GER) OR
CH 121, 125 General & Inorganic
CH 113 Elementary Organic OR

Physic Courses:
PH 101, 102 General Physics I & II 8 (GER) OR
PH 111, 114, 112, 115, & 113, 116 12
PH 106 Exploring the Cosmos I 4 (GER)
PH 107 Exploring the Cosmos II 4 (GER)

Environmental Science Courses:
ES 101 Planetary & Atmosp. Science 4(GER)
ES 102 Planetary & Atmosp. Science 4 (GER)
ES 312/BYS 312 Principles of Ecology 4

Math Courses:
MA 172, 201

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History (6-12 Certification)

College of Liberal Arts 198
Program for History Certification

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<td>HY 221-222 - American History</td>
<td>6 hours</td>
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<td>HY 225 - Alabama History</td>
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<td>HY 200 - elective</td>
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<td>HY 300 + electives</td>
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Note requirements for electives: 6 hours of American history beyond 221, 222. 6 hours of non-American history beyond 101, 102. 21 hours must be at the 300+ level.

Social Science-History (6-12 Certification)

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**Second Year**

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**Third Year**

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**Fourth Year**

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**Fifth Year**

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199 College of Liberal Arts
Program for Social Science-History Certification

History Courses:
- HY 101, 102- Western Civilization (GER) 6 hours
- HY 221-222-American History 6 hours
- HY 225-Alabama History 3 hours
- HY 200 elective 3 hours
- HY 300 + electives 9-12 hours
- HY 400 + elective 9 hours
- HY 490 -Research Seminar in History 3 hours

Other Social Science Courses:
- GEOG 6 hours
- ECON 142, 143 6 hours
- PSC 101, 102, 260 6 hours
- PY 101, 375 6 hours
- SOC 100, 200 6 hours

Note requirements for electives: 6 hours of American history beyond 221, 222. 6 hours of non-American history beyond 101, 102. 21 hours must be at the 300+ level

Mathematics B.A. (6-12 Certification)

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<td>MA 333</td>
<td>3</td>
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<tr>
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<td>MA 465</td>
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<td>MA 452</td>
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<td>ED 308</td>
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<td>Summer</td>
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<td>3</td>
<td>Humanities/Fine Arts</td>
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<tr>
<td>Fourth Year</td>
<td>MA 385</td>
<td>3</td>
<td>MA 500+elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MA 487</td>
<td>3</td>
<td>ED 416</td>
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<td>ED 408</td>
<td>3</td>
<td>FL 102</td>
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<td></td>
<td>Social Science</td>
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<td>ED 490</td>
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<td>ED 497</td>
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</table>

Total Hours 145

College of Liberal Arts 200
Program for Mathematics Certification (B.A.)

Mathematics Courses:
MA 171 - Calculus A 4 hours
MA 172 - Calculus B 4 hours
MA 201 - Calculus C 4 hours
MA 244 - Linear Algebra 3 hours
MA 330 - Foundations of Math 3 hours
MA 385 - Intro. to Probability 3 hours
MA 442 - Algebraic Struct. With App.1 3 hours
MA 452 - Intro. to Real Analysis 3 hours
MA 333 - Intro. to Geometry 3 hours
MA 365 - Math Modeling 3 hours
MA/ST 287 - Intro. to Math Statistics 3 hours
MA 500+ elective 2 hours
Total: 39 hours

Ancillary Courses:
PH 111, 114 - General Physics I 4 hours with Calculus
PH 112, 115 - General Physics II 4 hours with Calculus

Mathematics B.S. (6-12 Certification)

First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 171 4</td>
<td>MA 172 4</td>
</tr>
<tr>
<td>EH 101 3</td>
<td>EH 102 3</td>
</tr>
<tr>
<td>CS 104 3</td>
<td>PH 111 3</td>
</tr>
<tr>
<td>Fine Arts 3</td>
<td>PH 114 1</td>
</tr>
<tr>
<td>BYS 119 or 120 4</td>
<td>Social Science 2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

Second Year

| MA 201 4 | MA 330 3 |
| MA 244 3 | EH 200 elective 3 |
| PH 112, 115 4 | CM 113 3 |
| 14       | 12       |
|          | 26       |

Third Year

| MA 442 3 | MA 333 3 |
| MA 465 3 | MA 452 3 |
| ED 301 1 | ED 308 3 |
| ED 305 3 | ED 309 3 |
| ED 306 3 | EDC 301 3 |
| ED 350 2 |          |
| 16       | 15       |
|          | 36-37    |

Summer

| ED 410 3 | Humanities/Fine Arts 3 |
|          | 6                     |

Fourth Year

| MA 385 3 | MA 500+ elective 3 |
| MA 487 3 | ED 416 4           |
| ED 408 3 | FL 102 5           |
| HY 101 2 | HY 102 2           |
| 12       | 13       |
|          | 25       |

Fifth Year

| ED 490 1 |          |
| ED 497 2 |          |
|          | 10       |

Total Hours 201

10
145

College of Liberal Arts
Program for Mathematics Certification (B.S.)

Mathematics Courses:
- MA 171 - Calculus A 4 hours
- MA 172 - Calculus B 4 hours
- MA 201 - Calculus C 4 hours
- MA 244 - Linear Algebra 3 hours
- MA 330 - Foundations of Math 3 hours
- MA 385 - Intro. to Probability 3 hours
- MA 442 - Algebraic Struct. With App. I 3 hours
- MA 452 - Intro. to Real Analysis 3 hours
- MA 333 - Intro. to Geometry 3 hours
- MA 365 - Math Modeling 3 hours
- MA/ST 287 - Intro. to Math Statistics 3 hours
- MA 500+ elective 1 hour

Total: 39 hours

Ancillary Courses:
- CS 104 or 107 Computer Science 4 hours
- PH 111, 114 and 112, 115 Physics 8 hours

Physics B.S. (6-12 Certification)

First Year
- Fall
  - EH 101 3
  - CH 121, 125 4
  - MA 171 4
  - PH 110 2
  - 14

- Spring
  - EH 102 3
  - CJ 123, 236 4
  - MA 4
  - PH 111, 114 4
  - 15 29

Second Year
- Fall
  - PH 112, 115 4
  - EH 200 elective 3
  - HY 101 3
  - MA 201 4
  - 14

- Spring
  - PH 113, 116 4
  - EH 200 elective 3
  - HY 102 3
  - BYS 119 4
  - MA 324 3
  - 17 31

Third Year
- Fall
  - PH 106 4
  - PH 137 4
  - ED 301 1
  - ED 305 3
  - ED 306 3
  - ED 350 2
  - 18

- Spring
  - PH 107 4
  - BYS 120 4
  - ED 308 3
  - ED 309 3
  - EDC 301 2
  - 17 35

Summer
- ED 410 3

Fourth Year
- Fall
  - PH 351 3
  - CM 113 3
  - ED 408 3
  - Social Science 3
  - Fine Arts 2
  - 15

- Spring
  - PH 409 3
  - EH 301 3
  - ED 416 4
  - Social Science 3
  - CS 107 4
  - 17 32

Fifth Year
- Fall
  - ED 490 1

- Spring
  - ED 497 2
  - 10

Total Hours 140
Program of Study for Physics

Physics Courses:
- PH 110 - Frontiers in Science: 3 hours
- PH 111, 114 - Physics with Calculus I: 4 hours
- PH 112, 115 - Physics with Calculus II: 4 hours
- PH 113, 116 - Physics with Calculus III: 4 hours
- PH 106 - Exploring the Cosmos I: 4 hours
- PH 107 - Exploring the Cosmos II: 4 hours
- PH 337 - Electronics: 4 hours
- PH 351 - Introduction to Modern Physics: 3 hours
- PH 449 - Physics Practicum: 3 hours
Total: 33 hours

Ancillary Courses:
- MA 171, 172, 201 - Calculus: 12 hours
- EH 301 - Technical Writing: 3 hours
- CS 107 - Computer Science: 3 hours
- BYS 119 - Principles of Biology: 4 hours
- BYS 120 - Organismal Biology: 4 hours
- MA 324 - Differential Equations: 3 hours
Total: 29 hours

MIDDLE/JUNIOR HIGH SCHOOL ENDORSEMENT

Under the State of Alabama plan, there are five levels of certification of teachers, namely: P-3, K-6, 4-8, 6-12, and P-12. UAH offers all options except P-3. The curriculum in middle/junior high school education is an endorsement that can be added to either an Alabama Class B Elementary or Class B Secondary program. Students may, at their option, add certification in the middle school, with additional coursework and an additional internship. This program is designed to prepare teachers especially trained in dealing with youngsters undergoing the developmental changes of late childhood, puberty, and early adolescence. The emphasis will be on preparing academic generalists rather than specialists in subject fields.

For a person certified for grades K-6 under the new standards, adding middle school endorsement would also permit teaching in grades 7 and 8 in the teaching field(s) for which the person has completed the requirements as otherwise outlined in this catalog. Students with a major in elementary education (K-6 certification) must meet the following additional requirements: (1) ED 416 Middle and High School Methods Block, (2) the second area of study must be extended to 27-30 approved hours in a single subject area, (3) additional internship in grades 4-8.

For a person with high school certification, adding middle school endorsement would also permit teaching in grades 4-5 in the teaching field(s) for which the person has completed the requirements. Additional requirements for students enrolled in the high school program (6-12) and seeking middle school endorsement are as follows: (1) ED 375 - Teaching Reading in the Elementary School, (2) additional internship in grades 4-8.

STUDENTS SHOULD SEEK COUNSELING AS EARLY AS POSSIBLE. Advisors will be assigned in both professional education and in the teaching fields. The student will earn a B.A. or B.S. depending on the chosen field(s). Upon successful completion of the program the student will be recommended for the Alabama Class B Middle/Junior High School Certificate and will be qualified to teach in grades 4-8.

MIDDLE SCHOOL (4-8) ENDORSEMENTS OFFERED

- Biology
- Chemistry
- English Language Arts
- Foreign Languages
- General Science
- History
- Math
- Physics
- Social Sciences
P-12 CERTIFICATION

Programs are available in art and in music leading to Alabama Class B Certification for grades P-12. There is one program available in art studio and two programs in music education (instrumental, and vocal/choral). These programs are also devoted to providing a broad liberal base of studies. Preparation in the arts has traditionally been rigorous and extensive and these programs are no exception. Students should expect to take more than the minimum of 128 hours required for graduation. Early counseling with advisors is strongly recommended.

An Illustrative Plan for Completing the B. A. with a Major in Art Studio P-12 Art Certification

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>EH 101</td>
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<tr>
<td>Math level I</td>
<td>3</td>
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<td>HY 102</td>
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<td>BYS 119 or 120</td>
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<td>Lab Science</td>
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<td>CM 113</td>
<td>3</td>
<td>Social Science</td>
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<td>ARS 140</td>
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<td>ARS 230</td>
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<td>ED 306</td>
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<td>EDC 301</td>
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<tr>
<th>Fifth Year</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>ED 490</td>
<td>1</td>
<td></td>
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<tr>
<td>ED 499</td>
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<tr>
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<tr>
<td>Total Hours</td>
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College of Liberal Arts 204
Program for P-12 Art Certification

ARS 123 Two-dimensional Design & Color
ARS 140 Three-dimensional Design
ARS 160 Introduction to Drawing (GER)
ARS 230 Introduction to Graphic Design
ARS 250 (Photography) or ARS 260 (Drawing)
ARS 240 (Sculpture), 270 (Painting), or ARS 280 (Printmaking)
ARH 100 Art History (GER)

ARS 123 3
ARS 140 3
ARS 160 (3)
ARS 230 3
ARS 250 or ARS 260 3
ARS 240 or ARS 270 or ARS 280 (6)
ARH 100 (3)

Total: 39 hours beyond the GER

An Illustrative Plan for Completing a B.A. in with a Major in Vocal/Instrumental Music
P-12 Music Certification
The Music Education Emphasis (in addition to Music Core)

**MUSIC CORE**

<table>
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<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tr>
<td>Principal Instrument</td>
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<tr>
<td>Upper level elective</td>
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<tr>
<td>Music Theory I-III (MU 201, 202, 301)</td>
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<tr>
<td>Musicianship Skills I-III (MU 203, 204, 303)</td>
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<tr>
<td>Introduction to Music Literature (MU 100)</td>
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<tr>
<td>Music History I and II (MU 311, 312)</td>
<td>6</td>
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<tr>
<td>Conducting (MU 325)</td>
<td>2</td>
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<tr>
<td>Ensembles</td>
<td>4 x 1</td>
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<tr>
<td>Introduction to Music Technology</td>
<td>1</td>
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<tr>
<td><strong>TOTAL CREDIT HOURS</strong></td>
<td><strong>40</strong></td>
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<td><strong>UPPER LEVEL</strong></td>
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</table>

**TOTAL MUSIC HOURS:** 65

**TOTAL HOURS:** 65 hrs. Music + 54 hrs. GER + 32 hrs. Education = 151 hrs.

**NOTE:** Students should consult the Education Department for advisement and refer to pages 240-241 in this catalog.

Education (ED)

111 Career Exploration

Educational and vocational planning. Lab Fee: $10.

115 Effective Reading and Study Skills

Developmental course focusing on acquisition of strategies to expand an individual’s ability to read and study materials encountered in higher education. Effective reading and study strategies which incorporate reading, writing, and listening skills are taught and applied, using college texts and related readings.

301 Introduction to Education Practicum

Initial practicum experience designed to provide the opportunity to explore the role of the classroom teacher in today's diverse school settings. The five-day observation will be integral to the content and objectives of ED 305, 306, and 308, and will provide a foundation for the coursework and activities. Required for all students, including transfer students, students adding an endorsement, and certification-only student.
305 Foundations of Education in the United States 3 hrs.
Survey of social, cultural, historical, and philosophical foundations of education; interrelationships of society and education, effects of social change and influences of social-cultural values upon education; educational ideas and processes as they attempt to shape curricula. The perennial search for the meaning of education, perceived not merely as schooling, but as a process of enculturation and socialization. A five-day observation, integral to the content and objectives of the course, is included as a requirement. Permission of Education Department required for registration. School-based practicum required.

306 Human Development 3 hrs.
Overview of human development stressing continuity from conception to adulthood. Practical applications for teachers and parents. School-based practicum required. (May be taken concurrently with ED 305.)

308 Educational Psychology 3 hrs.
Psychological principles basic to an understanding of the learner, the learning process, and the learning situation. School-based practicum required. Prerequisites: ED 305, and 306.

309 Group Processes and Classroom Management 2 hrs.
Major principles of group dynamics and their effective use in education. Informal group counseling experiences for better understanding of self and others as an integral part of the course methodology. School-based practicum required. Prerequisites: ED 305, and 306.

325 The Sociology of Education 3 hrs.
Sociological approach to the study of education as a social institution; its structure, function and role in contemporary life. Prerequisite: SOC 100 or approval of instructor. (Same as SOC 325.)

350 Technology in the Classroom 3 hrs.
Introduces prospective teachers to current state of the art in educational technology. Designed as a laboratory course providing extensive hands-on experiences with microcomputers and other emerging technology. Emphasis is on enabling the student to effectively integrate technology into instructional settings.

411 Guidance for Teachers 3 hrs.
Sociological, psychological, and philosophical bases for guidance in schools.

456 Mental Health in the School 3 hrs.
Dynamics of behavior, recognition of minor maladjustments, criteria for referral, and classroom practices supporting good mental health. Prerequisite: ED 308 or junior standing.

467 Tests and Measurements 3 hrs.
Survey of standardized and teacher-made evaluation instruments.

500 Special Problems in Education 3 hrs.
Independent study, special projects, and special in-service programs. Prerequisite: senior standing.

502 Environmental Education 3 hrs.
General nature of ecological life systems, relationships of humankind and environment, major conservation problems facing the world today, exploration of alternate solutions and the tasks for educators.

549 Audiovisual Instruction 3 hrs.
Audiovisual media in teaching and the selection, use, and maintenance of audiovisual materials in educational programs.
### Elementary Education

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>215</td>
<td>Physical Education for the Elementary Teacher</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Basic understanding of body alignment, developmental exercises and movement exploration activities for physical education in elementary grades. Study of student needs to provide proper equipment, facilities, and leadership for the overall program.</td>
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</tr>
<tr>
<td>231</td>
<td>Teaching the Young Child</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Total pattern of child development, curriculum, learning, methods, and guidance for the child from two to nine years of age.</td>
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<tr>
<td>360</td>
<td>Diagnostic and Prescriptive Teaching</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Strengths and deficiencies of student in academic area and a program to enhance strengths and remedy weaknesses. Group and individual processes. Prerequisites: ED 308, junior standing and admission to the Teacher Education Program. School-based practicum required.</td>
<td></td>
</tr>
<tr>
<td>371</td>
<td>Teaching Elementary Language Arts</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Introduction to current practices in language arts instruction with emphasis on the development of an integrated curriculum using children's literature as a foundation. Includes appropriate techniques for the teaching of grammar, spelling, and handwriting. Prerequisite: admission to the Teacher Education Program. School-based practicum required. To be taken concurrently with ED 375.</td>
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</tr>
<tr>
<td>372</td>
<td>Teaching Elementary Social Studies</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Teaching social studies in grades K-6. Helping beginning teachers acquire background skills in organizing and teaching units of work. Prerequisite: admission to the teacher education program. School-based practicum required.</td>
<td></td>
</tr>
<tr>
<td>373</td>
<td>Teaching Elementary Science and Health</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Integrates concepts from reflective practice with elementary science teaching. Opportunity to refine teaching skills in the planning, implementation, and evaluation of science lessons and units of instruction. Prerequisite: admission to the Teacher Education Program. School-based practicum required. To be taken concurrently with ED 374.</td>
<td></td>
</tr>
<tr>
<td>374</td>
<td>Teaching Elementary Mathematics</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Overview of the mathematics concepts and skills taught in grades K-6 with an emphasis on the principles, methods, and materials used in the teaching and evaluation of elementary school mathematics. Focuses on the attitudes and behaviors of students and teachers in the actual planning and implementation of mathematics instruction for an elementary school classroom. Prerequisite: admission to the Teacher Education Program. School-based practicum required. To be taken concurrently with ED 373.</td>
<td></td>
</tr>
<tr>
<td>375</td>
<td>Teaching Elementary Reading</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Introduction to the basic principles of reading instruction in the elementary grades including theoretical bases for instruction, methods of instruction, materials, and assessment of individual needs. Prerequisite: admission to the Teacher Education Program. School-based practicum required. To be taken concurrently with ED 371.</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>Literature for Children and Adolescents</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Relationship between developmental stages and literature that young people find relevant at various stages of growth. Understanding and appreciation of interdependence of experience and literature. Knowledge of the literature and critical assessment including use of library resources in teaching reading. School-based practicum required.</td>
<td></td>
</tr>
<tr>
<td>408</td>
<td>Teaching Reading in the Content Area</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Provides knowledge of certain basic developmental and remedial reading skills, practices, and concepts. Extends those learned in previous, more fundamental, reading courses and shows how to apply fundamental skill and knowledge to the classroom. This will include adapting fundamentals of reading instruction to the various subject-matter areas (i.e., the sciences, social studies, English, etc.). Survey of special reading programs such as remedial reading and reading instruction as practiced in special education. Prerequisite: admission to Teacher Education Program. School-based practicum required.</td>
<td></td>
</tr>
</tbody>
</table>
490 Senior Seminar in Education 1 hr.
Provides for reflection and discussion of the student teaching experiences in light of current trends and problems in education. To be taken concurrently with student teaching.

492 Observation and Participation in Teaching 3-6 hrs.
Selected observation and participation in elementary schools. For students in curricula designed for both elementary and secondary schools and for experienced teachers. Prerequisites: ED 305, 306, 308, 309, three methods courses or equivalent approved courses, and an approved application for student teaching.

493 Elementary School Internship 9 hrs.
Focuses on apprenticeship training in a natural teaching-learning environment. During the assignment the role of the student teacher will vary from that of being an interested observer to that of being responsible for the day-to-day teaching and learning activities within an assigned classroom. The student teacher is expected to assimilate university training and on-site activities in order to synthesize methods and strategies for future professional use. A minimum of 100 clock hours of actual teaching is required. This corresponds to the State Department of Education requirement for a total of 20 teaching days of which at least 15 must be consecutive. Prerequisites: ED 305, 306, 308, 309, 350, 360, 371, 372, 373, 374, 375, 408, and EDC 301. (Exceptions may be possible with permission of the department chair.) ED 490 is to be taken concurrently with student teaching. Internship includes a lower and an upper elementary assignment.

494 Elementary School Internship 3 hrs.
Essentially the same as ED 493. However, it will require a minimum of 100 total clock hours, including a minimum of some 30 hours of responsible teaching. It is to be used by persons seeking dual certification or by post-graduate students seeking additional areas of endorsement. Prerequisite: permission of the department chair.

Collaborative Teacher - Special Education (EDC)

301 Teaching the Exceptional Child (Survey Part I) 3 hrs.
Examines special education laws and methodology used in teaching special education students. Focus primarily on those students with mild learning disabilities. Also examine requirements needed in the regular classroom for special teachers. School-based practicum required. Prerequisites: ED 305, 306.

302 Introduction to Low Incidence Populations (Survey Part II) 3 hrs.
Examines low incidence populations, their growth and developmental patterns in relationship to average patterns. Adaptations, assistive technologies, and medical adaptations available for such student. Develops objectives and task analysis to adapt the regular classroom to an inclusive setting. School-based practicum required. Prerequisite: EDC 301.

311 Instructional Strategies: Dimensions of Learning for K-12 Students 3 hrs.
Develops an in-depth understanding of various disabilities and their impact on curriculum development and classroom management techniques. Students learn how to select and develop strategies to meet the instructional needs of the various disabilities in today's classrooms. School-based practicum required. Prerequisites: EDC 301.

321 Collaborative Consultation (Parents, Teachers, Teams) 3 hrs.
Examination of classroom management techniques as well as system problems and solutions within traditional education settings N-12 and team teaching. Focuses on description and rationale behind collaboration, including communication skills, group work, problem solving, and team teaching. Students will participate as members of a collaborative team during the practicum. School-based practicum required. Prerequisites: EDC 301.

331 Critical Issues in Education: Behavioral, Medical, and Legal Issues 3 hrs.
Provides an in-depth discussion and evaluation of current issues in special education such
as litigation, legislation, personnel preparation, and research. School-based practicum required. Prerequisites: EDC 301.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>341</td>
<td>Transition of K-12 Students</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

Examines student transition during school implementation of programming transition into society. Also looks at functional and vocation knowledge and skills. Examines and discusses educational programs along with public and private transitional agencies. School-based practicum required. Prerequisites: EDC 301.

**Middle and High School Education**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>388</td>
<td>Teaching Middle and High School Subjects</td>
<td>2 hrs.</td>
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</tbody>
</table>

Building of curricula, methods of teaching, and classroom communication skills. (Major area of teaching to be designated.) Prerequisite: admission to Teacher Education Program. School-based practicum required.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>408</td>
<td>Teaching Reading in the Content Area</td>
<td>3 hrs.</td>
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</tbody>
</table>

Provides knowledge of certain basic developmental and remedial reading skills, practices, and concepts. Extends those learned in previous, more fundamental, reading courses and shows how to apply fundamental skill and knowledge to the classroom. This will include adapting fundamentals of reading instruction to the various subject-matter areas (i.e., the sciences, social studies, English, etc.). Survey of special reading programs such as remedial reading and reading instruction as practiced in special education. Prerequisite: admission to Teacher Education Program. School-based practicum required.

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<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>410</td>
<td>Foundations of Education Evaluation</td>
<td>3 hrs.</td>
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</table>

Measurement process with emphasis on its relationship to problems of educational evaluation. Evaluation as an integral part of overall educational planning in addition to its use in measurement and evaluation of academic achievement. Prerequisite: admission to the Teacher Education Program.

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<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>414</td>
<td>Teaching Secondary Science and Mathematics</td>
<td>2 hrs.</td>
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</tbody>
</table>

Focuses on teaching knowledge and skills necessary for the secondary mathematics and science classroom. Planning, facilitating and assessing mathematics and science learning; implementing manipulatives and laboratory activities; current topics related to principles and methods of secondary science and mathematics. School-based practicum required. Prerequisite: admission to the Teacher Education Program.

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<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>415</td>
<td>Teaching Secondary Humanities and Social Sciences</td>
<td>2 hrs.</td>
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</tbody>
</table>

Focuses on knowledge and skills necessary for teaching the humanities and social sciences in secondary schools. Planning, facilitating, and assessing learning in the teaching field (English, history, art, etc.); opportunities for collaboration and integration of content; current topics related to principles of learning and effective methods in classroom. School-based practicum required. Prerequisite: admission to the Teacher Education Program.

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<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>416</td>
<td>Middle and Secondary Methods Block</td>
<td>4 hrs.</td>
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</tbody>
</table>

The methods course provides background for middle school and secondary teaching from the perspective of theory, research, and practice. It is designed to provide an introduction to and practice in ways in which to engage students in learning in the humanities, mathematics, science, and social studies in middle and secondary classrooms. Topics include constructivism, planning, instructional strategies, and student assessment within and across the specific content areas. Applications will include microteaching and school-based experiences in area schools.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>490</td>
<td>Senior Seminar in Education</td>
<td>1 hr.</td>
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</table>

Provides for reflection and discussion of student teaching experiences in light of current trends and problems in education. To be taken concurrently with student teaching.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>495</td>
<td>Middle School Internship</td>
<td>9 hrs.</td>
</tr>
</tbody>
</table>

Focuses on apprenticeship training in a natural teaching-learning environment. During
the assignment the role of the student teacher/intern will vary from that of being an
interested observer to that of being responsible for the day-to-day teaching and learning
activities within an assigned classroom. The student teacher/intern is expected to
assimilate university training and on-site activities in order to synthesize methods and
strategies for future professional use. A minimum of 100 clock hours of actual teaching
and some 300 hours overall is required. This corresponds to the State Department of
Education requirement for 20 total teaching days of which at least 15 must be consecutive.
Prerequisites: all required professional education courses should be complete before
admission to the program.

496 Middle School Internship 3 hrs.
Essentially the same as ED 495. However, it will require a minimum of 100 total clock
hours, including a minimum of 30 hours of responsible teaching. It is to be used by
persons seeking dual certification or by post-graduate students seeking additional areas of
endorsement. Prerequisite: permission of the department chair.

497 High School Internship 9 hrs.
Students have an opportunity to work with master teachers in authentic teaching-learning
environment. The role of student teacher will vary from that of observer to full-time
instructor responsible for the day-to-day teaching and learning activities within an assigned
classroom. Students are expected to synthesize university instruction and on-site activities
in a professional manner. A minimum of 100 clock hours of actual teaching and at least
300 hours overall is required. This corresponds to the State Department of Education
requirement for 20 total teaching days of which at least 15 must be consecutive.
Prerequisites: ED 305, 306, 308, 309, 408, 410, 416, and EDC 301, and
approved application for student teaching. ED 490 is to be taken concurrently with student
teaching. Internship includes a middle and a high school assignment.

498 High School Internship 3 hrs
Essentially the same as ED 497. However, it will require a minimum of 100 total clock
hours, including a minimum of some 30 hours of responsible teaching. It is to be used by
persons seeking dual certification or by post-graduate students seeking additional areas of
endorsement. Prerequisite: permission of the department chair.

Other Internships

499 P-12 Internship (Art, Music) 9 hrs.
Supervised teaching experience in local schools. A minimum of 100 clock hours of actual
teaching and some 300 hours overall is required. Concurrent conferences arranged as
needed. Prerequisite: an approved application for student teaching. ED 490 is to be taken
concurrently with student teaching.

English Department
222 Morton Hall
Telephone: (256) 824-6320
Email: eh@uah.edu

Professors Mebane Neff (Chair); Associate Professors Bollinger, Early, Moore, Nelson, Norman,
Schenker, Szilagyi; Associate Professor Emeritus Munson; Assistant Professors Bell, Dillard,
Price, Walker, Youmans; Lecturers Bradburn, Lavan, Onega, Singer, Singh.

The Department of English offers courses to fulfill requirements for the major and minor in
English at the bachelor's degree level. It also offers a program leading to teacher certification, a
cognate option in technical writing, and writing courses at a variety of levels, including English
as a second language (ESL). A Master of Arts degree in English is described in the Graduate
Catalog.
DECLARING THE MAJOR

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Morton Hall, Room 222) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

English Major

Curriculum One (for students not seeking teacher certification)

Sophomore Survey (as described in GER) 6
Shakespeare (EH 360) 3
American literature (EH 330, 331, 339, 430, 431, 530, 532, 533) 3
Literature before 1800 (EH 380, 381, 450, 460, 470, 492, 551, 571, 572) 6
Literature after 1800 (EH 330, 331, 390, 391, 418, 421, 430, 431, 493, 520, 522, 533, 592) 6
Electives (Includes EH and EHL courses) 12

Semester Hours 36

Curriculum Two: English / Language Arts (for students seeking teacher certification)

Sophomore Survey (as described in GER) 6
Shakespeare (EH 360) 3
Structure of Modern English (EH 307) 3
Composition Studies for Teachers (EH 400) 3
American literature (EH 330, 331, 339, 430, 431, 530, 532, 533) 3
Literature before 1800 (EH 380, 381, 450, 460, 470, 492, 551, 571, 572) 3
Literature after 1800 (EH 330, 331, 390, 391, 418, 421, 430, 431, 493, 520, 522, 533, 592) 3
Literature elective (must be 300 level or above) 3
One course in creative writing (EH 310, 311, or 412) may serve as the literature elective.

Speech and Communication (CM 113 and 231) 6
Communication Arts Elective (CM 309, 310, or 315) 3
Drama and Theatre (CM 122 and 221) 6
Journalism and Media Writing (CM 205 and 305) 6

Semester Hours 48

The following further requirements and conditions apply to both curriculum one and curriculum two.

1. One course devoted entirely to the novel.
2. Two courses (6 semester hours) in 400- or 500-level courses.
3. For transfer students, 12 semester hours in upper-level English courses (numbered 300 or above) at UAH.
4. No more than one course in creative writing may count toward the major. Exceptions must be approved by the department chair.
English Minor

A minor in English requires 21 semester hours above freshman composition courses; 12 semester hours must be upper level (numbered 300 or above), including at least 3 semester hours at the 400- or 500-level. Half of the upper-level requirement (6 semester hours) must be taken at UAH. Please note: courses in technical and business writing may not be used in the minor without special approval by the department chair.

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sophomore Survey (as described in GER)</td>
<td>6</td>
</tr>
<tr>
<td>Shakespeare (EH 360)</td>
<td>3</td>
</tr>
<tr>
<td>Courses numbered 300, 400, or 500</td>
<td>6</td>
</tr>
<tr>
<td>Courses numbered 400 or 500</td>
<td>3</td>
</tr>
<tr>
<td>EH elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Cognate Studies in Technical Writing

This unique cognate is available for students with majors in any school. Preparation for a career in the field of technical writing should combine intensive training in writing with practical experience and fundamental technical skills. The 21-hour cognate studies curriculum brings together all three. All students must take EH 301 (Technical Writing), EH 302 (Technical Editing), and EH 320 (Practicum in Writing) in sequence. Students with non-technical majors should plan early to take courses in technical or scientific fields. Students with technical majors should consult the Business and Technical Writing Director for current requirements. A typical program for a non-technical major is as follows:

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Writing (EH 301)</td>
<td>3</td>
</tr>
<tr>
<td>Technical Editing (EH 302)</td>
<td>3</td>
</tr>
<tr>
<td>Practicum in Writing (EH 320)</td>
<td>3</td>
</tr>
<tr>
<td>Directed elective (e.g. CM 305, EHL 307, and others)</td>
<td>3</td>
</tr>
<tr>
<td>Technical courses approved by Director</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>21</td>
</tr>
</tbody>
</table>

English for Second Area of Study

Students majoring in elementary education may select English as their second area of study. This area consists of a minimum of eighteen hours beyond the freshman composition requirement (EH 101 and 102) and the sophomore literature requirement. These hours must be in courses numbered 300 or above and must be selected from the courses listed below with the approval of a faculty advisor in the Education Department and the chair of the English Department.

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>American literature</td>
<td>3</td>
</tr>
<tr>
<td>(EH 330, 331, 339, 430, 431, 530, 532, 533)</td>
<td></td>
</tr>
<tr>
<td>Shakespeare (EH 360)</td>
<td>3</td>
</tr>
<tr>
<td>Structure of Modern English (EH 307)</td>
<td>3</td>
</tr>
<tr>
<td>Literature before 1800 (EH 380, 381, 450, 460, 470, 492, 551, 571, 572)</td>
<td>3</td>
</tr>
<tr>
<td>Literature after 1800 (EH 330, 331, 390, 391, 418, 421, 430, 431, 493, 520, 522, 532, 533, 592)</td>
<td>3</td>
</tr>
<tr>
<td>Composition Studies for Teachers (EH 400)</td>
<td>3</td>
</tr>
<tr>
<td>One 3-hour course in creative writing (EH 310, 311, or 412) may be substituted for any course in the pre-1800 or post-1800 categories.</td>
<td>3</td>
</tr>
</tbody>
</table>
An Illustrative Plan for Completing the B.A. Degree  
With a Major in English

The following is one possible four-year program of study for an English major who is not seeking teacher certification. A possible sequence for English / Language Arts may be found in the Department of Education section of this catalog. Please note that the number of free electives listed below suggests that students could elect two majors, rather than a major and a minor.

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fall</th>
<th></th>
<th>Spring</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>EH 101</td>
<td>3</td>
<td>EH 102</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Fine arts</td>
<td>3</td>
<td>Humanities or fine arts</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Foreign language</td>
<td>5</td>
<td>Foreign language</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Math</td>
<td>3</td>
<td>Social science</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Natural science</td>
<td>4</td>
<td>Natural science</td>
<td>4</td>
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<tr>
<td></td>
<td></td>
<td>18</td>
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<td>18</td>
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<td></td>
<td></td>
<td>18</td>
<td></td>
<td>36</td>
</tr>
<tr>
<td>Second Year</td>
<td>Humanities or fine arts</td>
<td>3</td>
<td>Sophomore Literature</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social science</td>
<td>3</td>
<td>Social science</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>HY 101</td>
<td>3</td>
<td>HY 102</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Sophomore literature</td>
<td>3</td>
<td>Social science</td>
<td>3</td>
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<tr>
<td></td>
<td>Minor</td>
<td>2</td>
<td>Minor</td>
<td>2</td>
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<td>15</td>
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<td>15</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Third Year</td>
<td>EH 360</td>
<td>3</td>
<td>American literature*</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Literature after 1800*</td>
<td>3</td>
<td>Literature before 1800*</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Literature before 1800*</td>
<td>3</td>
<td>Minor</td>
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<td></td>
<td>Minor</td>
<td>3</td>
<td>Free elective</td>
<td>2</td>
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<td></td>
<td>Free elective</td>
<td>2</td>
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<td>15</td>
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<td></td>
<td></td>
<td>15</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Fourth Year</td>
<td>English elective</td>
<td>3</td>
<td>English elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>English elective</td>
<td>3</td>
<td>English elective</td>
<td>3</td>
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<td>Minor</td>
<td>3</td>
<td>Minor</td>
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<td>Minor</td>
<td>3</td>
<td>Free elective</td>
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<td>18</td>
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<td>33</td>
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<td>129</td>
</tr>
</tbody>
</table>

English (EH)

003 Basic Writing  
Emphasis on intensive review of paragraph and essay writing; individualized review of sentence-level basics. Placement: ACT/SAT English score or class performance. Grading scale: S, NC (No credit).

101 Freshman Composition  

102 Freshman Composition  
105 Honors English Seminar 3 hrs.
Interpretive and comparative readings in texts of enduring intellectual, esthetic, and ethical importance; critical and analytic writing and research. Prerequisite: formal admission to the University Honors Program.

Courses below are open to students who have completed 6 hours of freshman composition, with exceptions as indicated.

205 Survey of English Literature 3 hrs.
Anglo-Saxon period through Milton.

206 Survey of English Literature 3 hrs.
Restoration through twentieth century.

230 Survey of American Literature 3 hrs.
Survey of writers, genres, and periods from the European discovery to the present day.

240 World Literature I 3 hrs.
Selected major contributions with focus on western civilization; Homer to the Renaissance.

241 World Literature II 3 hrs.
Selected major contributions with focus on western civilization; Enlightenment to the present.

242 Mythology 3 hrs.
Archetypal, metaphorical, and historical significance of deities and myths.

250 Honors World Literature Seminar I: 3 hrs.
Major texts from the ancient world to 1700. Prerequisite: EH 105 or admission to Honors Program.

251 Honors World Literature Seminar II: 3 hrs.
Major texts from 1700 to the present. Prerequisite: EH 105 or admission to Honors Program.

Courses below are open to students who have completed the general education requirement in literature, with exceptions as indicated.

310 Fiction Writing 3 hrs.
Practice in writing of fiction from conception to revision. Prerequisites: GER literature requirement and approval of instructor.

311 Poetry Writing 3 hrs.
Practice in writing of poetry from conception to revision. Prerequisites: 6 hours of sophomore literature or permission of instructor.

330 American Literature through the Civil War 3 hrs.
Selected authors, forms, and issues.

331 American Literature from the Civil War to the Present 3 hrs.
Selected authors, forms, and issues.

339 Special Studies in American Literature and Culture 3 hrs.
Topics announced in advance.

340 Special Topics in Literature 3 hrs.
Theme, writer, or historical movement to be announced in advance.

360 Shakespeare 3 hrs.
Renaissance background and at least six plays, including history, comedy, and major tragedies.

380 Restoration and Early Eighteenth Century 3 hrs.
Poetry, drama, and various emergent prose forms in the early modern period, 1660-1744, with attention to cultural contexts.

381 Later Eighteenth Century 3 hrs.
Poetry, drama, the novel, and other emergent prose forms in the early modern period, 1744-1799, with attention to cultural contexts.
390 Romantic Poetry and Prose 3 hrs.
Poetry and prose (excluding the novel), 1780-1832. Emphasis may vary.

391 Victorian Poetry and Prose 3 hrs.
Poetry and prose (excluding the novel), 1832-1901. Emphasis may vary.

400 Composition Studies for Teachers 3 hrs.
Introduction to effective strategies for the teaching of writing. Strategies include creating and implementing writing prompts, fostering writing as process, working with grammar in context, investigating response strategies for teachers and students, and developing and implementing assessment rubrics. Prerequisite: junior standing.

412 Special Topic in Creative Writing 3 hrs.
A creative writing workshop class in a selected topic. Prerequisites: 6 hours of sophomore literature or permission of instructor.

418 Representative Texts by Women Writers 3 hrs.
Focus on women's contribution to the literary tradition.

421 Modern Drama 3 hrs.
New movements in drama from Ibsen to the present.

430 The American Novel 3 hrs.
The American novel from the beginning through James.

431 The American Novel 3 hrs.
The American novel from James to the present.

450 Chaucer 3 hrs.
Emphasis on the Canterbury Tales and Troilus and Crisseyd.

460 Sixteenth-Century Poetry and Prose 3 hrs.
Works chosen from the following: More, Wyatt, Sidney, Spenser, and others.

470 Milton 3 hrs.
Milton's minor poems, selected prose, and the major poems Paradise Lost, Paradise Regained, and Samson Agonistes. Recommended prerequisite: one upper level English course.

492 The Early English Novel 3 hrs.
Emergence and development of the genre as evident in representative eighteenth-century texts.

493 The Victorian Novel 3 hrs.
Dickens through Hardy: critical reading of representative novels accompanied by historical survey of major trends.

499 Senior Research Project 3 hrs.
Individual investigation into significant literary issues under direct supervision of instructor. For seniors in the Honors Program and senior majors. Prerequisite: instructor's approval of a project prospectus.

The following advanced undergraduate courses are suggested for seniors; others should request permission from an advisor or the instructor of the course under consideration.

500 Literary Criticism and Theory 3 hrs.
Major texts and approaches from Plato to the present.

510 Advanced Fiction Writing 3 hrs.
Workshop in advanced fiction writing. Prerequisite: approval of instructor.

511 Poetry Writing 3 hrs.
Workshop in advanced poetry writing. Prerequisite: EH 311 or approval of instructor.

520 Modern Poetry 3 hrs.
American and British poetry from the 1890's to the present: Yeats, Pound, Eliot, Frost, Stevens, and others. Poets will be studied against the background of the social, political, and technological revolutions that characterize the modern world.

522 Modern Novel 3 hrs.
Considers responses to the experience of modernity; focus on English and American but in different years; texts will also be drawn from Continental, Latin American, Asian, or African traditions.
525 Literature and Technology 3 hrs.
Considers the relation between technology and culture as it has been understood since the classical period through a broad range of literary texts.

530 Special Studies in American Literature 3 hrs.
Topics announced in advance.

532 Literature of the American South 3 hrs.
Selected figures and movements from colonization to the present.

533 William Faulkner 3 hrs.
Biography, background, and critical study of the major novels.

540 Special Studies in English Literature 1-3 hrs.
Topics announced in advance.

551 Middle English Literature 3 hrs.
Emphasis on literature of later medieval England, excluding Chaucer, chosen from the Gawain poet, Piers Plowman, romance, drama, religious meditation, the short poem, and Margery Kempe.

571 Renaissance Drama 3 hrs.
Major plays of the sixteenth and early seventeenth centuries, including Marlowe, Jonson, and others. Excludes Shakespeare.

572 Seventeenth-Century Poetry 3 hrs.
Emphasis on major figures (Donne, Jonson, Herbert) their followers, and major themes and genres of the period. Excludes Milton.

592 The Literature of Transition 3 hrs.
Considers literature in all genres, including intellectual and philosophic works, from 1890-1915 to explore the transition from Victorianism(s) to Modernism.

Linguistics and English Language Studies

The department offers a variety of courses related to General Linguistics, English Language, Grammar, and the Teaching of English to Speakers of Other Languages (TESOL). For those who are interested in the Teaching of English to Speakers of Other Languages (TESOL), the department offers a certificate in TESOL in conjunction with the M.A. degree and an independent TESOL certificate at the graduate level. Interested undergraduates may take courses which would be helpful should they eventually want to go on for the TESOL certificate and M.A. degree. Such students should consult with the department chair or the director of the TESOL Program.

Linguistics and English Language Studies (EHL)

307 Linguistic Structure of Modern English 3 hrs.
Introduction to the history of English, with an examination of the development of regional and ethnic dialects as expressions of cultural diversity in America; basics of language acquisition and development; analysis and description of the grammatical systems, including major aspects of the phonetic, phonological, morphological, syntactic, and semantic components of Modern English; and an overview of Standard American English, including clarity of enunciation and expression. Emphasis is on analysis and practical application of grammar. Prerequisite: Successful completion of basic English requirements or approval of instructor.

Survey of phonology, morphology, and syntax, language universal and typology, history of English and other major world languages, topics in psycho- and socio-linguistics such as language acquisition, situational language change, and the study of regional and ethnic varieties as they reflect and construct the linguistic and cultural diversity of the United States.
In-depth study of English syntax within contemporary theoretical paradigms. Comparisons between modern syntactic analyses and traditional methods, comparisons between Standard American English and regional and ethnic varieties, the inevitable historical changes in English grammar, and pedagogical contexts/teaching issues. Prerequisite: EHL 307 or 505 recommended but not required.

508 History of the English Language: Applied English Linguistics III 3 hrs.
History of English from the pre-Anglo-Saxon period to the contemporary period, focusing on analysis and description of the grammatical systems, including major aspects of the phonetic, phonological, morphological, syntactic, and semantic components of Old English, Middle English, and Modern English; overview of language acquisition and development as they relate to language change; analysis of mechanisms of language change; development of regional and ethnic dialects as expressions of cultural diversity in American and other former colonies of England; historical events that have influenced and surrounded the language. Prerequisite: EHL 307 or 505 (or the equivalent) is recommended.

509 Special Topics in Applied English Linguistics 3 hrs.
Special topics in linguistics. Focus and emphasis of topics announced in advance. Some topics may meet the English M.A. language requirements; consult Department Chair.

English Technical and Business Writing(EH)

300 Strategies for Business Writing 3 hrs.
Practical business writing with emphasis on rhetoric, organization, and research. Prerequisites: 6 hours of freshman composition; junior standing; open to all students in the School of Administrative Science or by permission of the Department of English. Does not count toward English minor. Lab Fee: $40.

301 Technical Writing 3 hrs.
Practical writing, especially technical or scientific reports and proposals, with emphasis on organization, research, and presentation. Prerequisites: EH 101 and junior standing; EH 102 recommended. Counts as elective in English major. Does not count toward English minor except for Cognate Studies in Technical Writing. Lab Fee: $40.

302 Technical Editing 4 hrs.
Clarifying, expanding, reducing, and rewriting technical reports and other documents created by others. Emphasis on elements of style and usage, revision, proofreading, and application of rhetorical techniques to the work of engineers, scientists, and technicians. Prerequisites: EH 300 or EH 301 or CM 301. Qualifies as elective in English major. Does not count toward English minor except for Cognate Studies in Technical Writing. Does not count toward certification in secondary education. Offered spring semester only. Lab Fee: $40.

320 Practicum in Writing 1-3 hrs.
Writing and editing under the supervision of professionals. May be repeated up to three separate terms for no more than 3 hours total credit. Prerequisites: EH 301, 302, enrollment for Cognate Studies in Technical Writing, permission of the Director of Business and Technical Writing, and a successful interview with the participating technical supervisor. Enrollment requires advance planning. Does not count toward English minor except for Cognate Studies in Technical Writing.

Explores the relationships between common practices in technical communication and the theories that legitimize those practices. Introduces students to research and theories about fundamental issues in technical communication which may then become the basis for further graduate study in technical communication. Prerequisites: advanced undergraduate standing; EH 301 and 302 are strongly recommended.

502 Problems in Technical Editing 3 hrs.
Advanced study of research and practice in common problems of technical editing.
including documentation standards, document design, and management of complex editorial projects. Involves collaborative project with professional writers in industry. Prerequisites: EH 302 or 501.

**English as a Second Language (ESL)**

The English Department offers courses in English as a Second Language (ESL) for those non-native speakers of English who need to improve their English language skills. ESL 101 and 102 are designed primarily to assist students to improve their oral production, aural comprehension, and vocabulary; ESL 103 and 104 are designed to assist students in improving their reading comprehension and composition skills. Placement tests are given prior to the commencement of terms; non-native speakers of English are advised to contact the Office of Admissions and Records or the English Department for time and place of testing.

**100 ESL Spoken English I**

<table>
<thead>
<tr>
<th>3 hrs.</th>
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<tbody>
<tr>
<td>Introduction to the listening/speaking activities needed for university study in the U.S. Course work emphasizes acquisition of listening comprehension and improved speaking proficiency. Course materials are academically focused. Attention given to increasing comprehensibility of students' spoken English. Prerequisite: Beginning to advanced beginning English ability as determined by placement on the ELPT. Grading scale: A, B, C, D, NC (No Credit)</td>
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</table>

**101 ESL Listening/Speaking II**

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<th>3 hrs.</th>
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<tr>
<td>Intermediate listening and speaking, emphasizing refinement of listening comprehension and speaking proficiency. Course materials are academically focused. Students give both individual and group presentations. They will be acculturated to the linguistic expectations of the U.S. academic discourse community. Prerequisite: ESL 100 or intermediate English ability as determined by placement on the ELPT. Grading scale: A, B, C, D, NC (No Credit)</td>
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</table>

**102 ESL Listening/Speaking III**

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<th>3 hrs.</th>
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<tr>
<td>Advanced listening and speaking, emphasizing mastery of listening comprehension and speaking proficiency. Course materials are academically focused. Students give individual presentations, lead discussions, and participate in debates. They will learn to meet the linguistic expectations of the U.S. academic discourse community. Prerequisite: ESL 101 or advanced English ability as determined by placement on the ELPT. Grading scale: A, B, C, D, NC (No Credit)</td>
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</table>

**103 ESL Composition I**

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<th>3 hrs.</th>
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<tbody>
<tr>
<td>Basic composition designed to further reading and writing proficiency of non-native speakers. Emphasis is placed on writing as a process. Instruction and practice in critical reading and in planning and writing several rhetorical modes. Students will increase writing fluency, learn focused strategies for editing and revision of compositions, and learn vocabulary acquisition strategies. Prerequisite: Mid-beginning to mid-intermediate ESL composition skills as determined by previous coursework or placement on the ELPT. Grading scale: A, B, C, D, NC (No Credit)</td>
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</table>

**104 ESL Composition II**

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<th>3 hrs.</th>
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<tbody>
<tr>
<td>Intermediate to advanced composition designed to improve the reading and writing proficiency of non-native speakers. Emphasis is placed on writing as a process. Instruction and practice in critical reading and in planning and writing in several sophisticated rhetorical modes. Students will increase writing fluency, practice focused strategies for editing and revision of compositions, and further vocabulary acquisition. Prerequisite: Mid-beginning to mid-intermediate ESL composition skills as determined by previous coursework or placement on the ELPT. Grading scale: A, B, C, D, NC (No Credit)</td>
</tr>
</tbody>
</table>
Foreign Languages and Literatures Department
308 Morton Hall
Telephone: (256) 824-6300
Email: fll@email.uah.edu

Professor Goebel; Professor Emeritus Penot; Associate Professors Buksa, Maier, Meister and Nielsen (Chair); Assistant Professors Abernethy and Gyasi.

The acquisition of a second language, and through it an understanding of another country's literature and culture, is a rich academic experience for all students, particularly for liberal arts students. Because our foreign language courses are designed to teach the effective use of both oral and written foreign languages as well as to provide knowledge about culture and literature, students in all majors will benefit their personal, academic, business, and professional lives through the study of foreign languages. In fact, in today's world of global markets, political interdependence, and international scientific collaborations, knowledge of foreign cultures enhances one's career opportunities and contributions as a citizen.

French, German, Greek, Japanese*, Latin*, Russian, Spanish

The Department of Foreign Languages and Literatures offers the B.A. in Foreign Languages. A student may choose a focus language of French, German, Russian, or Spanish, and may also choose to concentrate in Foreign Languages and International Trade (in cooperation with the College of Administrative Science, and Departments of History and Political Science)

*Japanese, Greek, and Latin courses can be taken to satisfy the language requirements or as electives.

General Education Requirements and Placement Procedures

Ten semester hours of credit in one foreign language are required for the B.A., unless the student can demonstrate a competence at a level more advanced than the beginning 101 course. The introductory sequence begins in the fall and continues in the spring semester so that students can complete the 10-hour general education requirements in one academic year.

Native and quasi-native speakers of foreign language may not take introductory and intermediate courses, nor the first advanced conversation course in that language. Students in this category must make an appointment with the appropriate language coordinator to take a departmental placement examination. They must still take a minimum of three additional hours of course work to complete General Education Requirements.

Placement Procedures

Students with a prior knowledge of French, German or Spanish may demonstrate competence at an advanced level in five ways: 1) performance on a computer based placement test, 2) high school coursework, 3) CLEP examination, 4) AP examination, and 5) native language experience.

Placement test. The Department of Foreign Languages & Literatures administers a computer-based placement test. The test may be scheduled by phoning the Department or by visiting the language lab located in Morton Hall, Room 300.

High school experience. Students who studied a foreign language in high school will be placed according to the following scale:
Minimum grade of C required for a unit to be counted.

If an interval of two years or more occurs between study of a language in high school and continuation of that language in college, placement levels may be adjusted downward to entry level.

**CLEP Examination.** Students with a prior knowledge of French, German or Spanish may take the CLEP examination for the equivalent of FL101 and FL102. Irrespective of the resultant placement, the student will have to take a minimum of three additional hours of course work to fulfill the language requirement. The test is administered by the UAH Testing Services, located in the Administrative Science Building, Room 226, and must be taken prior to enrollment in foreign language classes. Tests are given once each semester and monthly during the summer, see Testing Services for dates. Interested students should contact the respective foreign language coordinator for further information. By taking the CLEP test, a student may receive credit hours with no quality points depending on placement level and score. Since there is no CLEP test for Russian, students of that language may take a special departmental test under the same conditions as the CLEP examination. See the Russian language coordinator.

**Advanced Placement Examination.** The Foreign Language Department will award credit to students who have earned a score of three or higher on Advanced Placement (AP) Program examinations of the College Entrance Examination Board according to the following scale:

- Score of 3: 10 hours credit (i.e. through 102, 5 hours each course)
- Score of 4: 13 hours credit (through 200)
- Score of 5: 16 hours credit (through 301)

The credit thus awarded will be recorded without grades or quality points and will not therefore, be included in the calculation of the grade point average.

Moreover, regardless of the student's AP score, he or she will be required to complete successfully one additional course (3 credit hours) of the appropriate language.

**Native Language Experience.** Native and quasi-native speakers of foreign language may not take introductory and intermediate courses, nor the first advanced conversation course in that language. Students in this category must make an appointment with the appropriate language coordinator to take a departmental placement examination. Those planning to major or minor in the language may earn up to sixteen (16) hours of credit with no grade or quality points.

**Description of the Foreign Language Major**

The major is comprised of 11 courses of which nine will be taught in the focus language (French, German, Russian, Spanish) and two (FL 204 and FL 410) will utilize English for in-class discussions.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL 101</td>
<td>Comparative Languages and Cultures in Practices</td>
<td></td>
</tr>
<tr>
<td>FL 102</td>
<td>Communicating in a Second Language and Culture:</td>
<td></td>
</tr>
<tr>
<td>FL 200</td>
<td>Introductory Foreign Language I &amp; II</td>
<td>10</td>
</tr>
<tr>
<td>FL 204</td>
<td>Further Explorations in a Second Language and Culture:</td>
<td></td>
</tr>
<tr>
<td>FL 301</td>
<td>Intermediate Foreign Language</td>
<td>3</td>
</tr>
<tr>
<td>FL 302</td>
<td>International Cinema</td>
<td>3</td>
</tr>
<tr>
<td>FL 301</td>
<td>Conversation</td>
<td>3</td>
</tr>
<tr>
<td>FL 302</td>
<td>Composition</td>
<td>3</td>
</tr>
</tbody>
</table>
FL 303  Foreign Language for Life and Professions  3 hours
FL 304  Culture  3 hours
FL 305  Introduction to Literature  3 hours
FL 404  Texts & Contexts: Seminar in Literature  3 hours
FL 410  International Internship:
        Comparative Languages and Cultures in Practice  3 hours
TOTAL  37 hours

Additional Foreign Language Programs

Foreign Language and International Trade
Foreign Language majors interested in enhancing their preparation for participation in the
global economy may wish to consider the cognate in international trade, which combines courses
in business with a study of world history and international politics. The Foreign Language and
International Trade Program includes the following courses. No minor is required for students
who major in foreign languages with the international trade concentration.

FL 101 and FL 102  Comparative Languages and Cultures in Practices
Communicating in a Second Language and Culture:

  Introductory Foreign Language I & II  10 hours
  FL 200  Further Explorations in a Second Language and Culture:
  FL 204  Intermediate Foreign Language  3 hours
  FL 301  International Cinema  3 hours
  FL 302  Conversation  3 hours
  FL 303  Composition  3 hours
  FL 304  Foreign Language for Life and Professions  3 hours
  FL 305  Culture  3 hours
  FL 404  Introduction to Literature  3 hours
  FL 404  Texts & Contexts: Seminar in Literature  3 hours
  FL 410  International Internship:
        Comparative Languages and Cultures in Practice  3 hours
  ECN 142  Principles of Macroeconomics  3 hours
  MGT 301  Managing Organizations  3 hours
  MKT 301  Principles of Marketing  3 hours
  MGT 450  International Business  3 hours
  or MKT 415  International Marketing  3 hours
  PSC 102  Comparative Politics and Foreign Governments  3 hours
  PSC 260  Introduction to International Relations  3 hours
  HY 392  Europe since 1815  3 hours
One course from the following:
  HY 374  Foreign Relations of the US Since 1920  3 hours
  HY 391  Europe, 1500-1815  3 hours
  HY 478  Europe in the Nineteenth Century  3 hours
  HY 479  Europe in the Twentieth Century  3 hours
One course from the following:
  PSC 340  Governments and Politics in Industrializing & Post
          Industrial Countries  3 hours
  PSC 341  Government and Politics of Modernizing Countries  3 hours
  PSC 464  American Foreign Policy  3 hours
TOTAL  64 hours
Foreign Language Minor

Foreign language minors are offered in French, German, Russian, and Spanish. Foreign language majors are permitted to minor in a second foreign language. The Foreign Language Minor Program is comprised of seven courses.

FL 101 and FL 102  Comparative Languages and Cultures in Practices
FL 200  Introductory Foreign Language I & II 10 hours
FL 301  Conversation
FL 302  Composition
FL 305  Introduction to Literature

One course from the following:
FL 303  Foreign Language for Life and Professions
FL 304  Culture
FL 404  Texts & Contexts: Seminar in Literature

TOTAL 25 hours

Certificate in Business Language

Students who are interested in pursuing a career in international business, but who do not plan to fulfill all the requirements of a foreign language major, may obtain a Certificate in Business Language (CBL) by maintaining a 2.0 grade point average in four of the following courses:

Certificate in Business Language

Students who are interested in pursuing a career in international business, but who do not plan to fulfill all the requirements of a foreign language major, may obtain a Certificate in Business Language (CBL) by maintaining a 2.0 grade point average in four of the following courses:

FL 301  Conversation
FL 302  Composition
FL 303  Foreign Language for Life and Professions
FL 304  Culture
FL 410  International Internship

Supporting Minors and Cognates for Foreign Language Majors

Foreign Language majors may select any minor or approved cognate offered within the University of Alabama in Huntsville. However, certain minors may enhance the student's opportunities for certain career choices. Three of these are a minor in international business, a cognate in international studies, as well as the teacher certification designation. Information for these supporting groups of coursework follows.

Minor in International Business

Students in the College of Liberal Arts who are interested in pursuing a career in international business may wish to combine a foreign language major with a minor in international business through the College of Administrative Science. For more information on the international business minor, consult the catalogue pages for the College of Administrative Science. For such a minor, ECN 142 and ECN 143 count in the general education requirement, and in no case may the Administrative Science courses included in a student's program of study exceed 25 percent of the student's program. A minor in international business includes the following courses:

ECN 142  Principles of Macroeconomics 3 hours
ECN 143  Principles of Microeconomics 3 hours
ACC 211  Financial Accounting 3 hours
ACC 212  Management Accounting 3 hours
MSC 287*  Business Statistics I 3 hours
FIN 301  Principles of Finance 3 hours
FIN 454  International Economics and Finance 3 hours
Cognate in International Studies

Foreign Language majors interested in pursuing a career with the US Government, Foreign Service, or other international organizations may wish to choose a cognate, drawn from several related disciplines with international focus, in lieu of a minor. A cognate in international studies includes the following courses:

**Three of the following courses:**
- **EH 240** World Literature I
- **EH 241** World Literature II
- **EH 250** Honors World Literature Seminar I
- **EH 251** Honors World Literature Seminar II
- **FL 204** International Cinema
- **HY 202** Current World Issues in History
- **PSC 102** Comparative Politics and Foreign Governments
- **PSC 260** Introduction to International Relations
- **SOC 200** Introduction to Anthropology

**Four of the following courses:**
- **BYS 331** (ES 331) Global Climate Change and Infectious Diseases
- **FL 410** International Internship: Comparative Languages and Cultures in Practice
- **HY 373** Foreign Relations of the US to 1920
- **HY 374** Foreign Relations of the US since 1920
- **HY 478** Europe in the Nineteenth Century
- **HY 479** Europe in the Twentieth Century
- **MU 410** Music in Western Civilization
- **PHL 302** Modern Philosophy
- **PHL 314** Philosophy of Eastern and Western Religions
- **PHL 332 (PSC 332)** Modern Political Philosophy
- **PSC 340** Government and Politics of Industrializing & Post Industrial Countries
- **PSC 341** Government and Politics of Modernizing Countries
- **PSC 464** American Foreign Policy
- **SOC 315** Cultural Change

**TOTAL** 21 hours

**Foreign Language Teacher Education and Certification**

Students seeking state teacher certification in elementary or secondary education may choose to pursue foreign language study. Those majoring in elementary education may utilize a foreign language concentration (French, German, Russian, or Spanish) for a cognate area (i.e., second area of study). The cognate area in foreign languages includes the following courses:

- **FL 101 and FL 102** Comparative Languages and Cultures in Practice
  - Communicating in a Second Language and Culture: Introductory Foreign Language I & II 10 hours
- **FL 200** Further Explorations in a Second Language and Culture:
  - Intermediate Foreign Language 3 hours
Students seeking state teacher certification in middle/junior high school education or high school education, and whose primary field is foreign language, must conform to the requirements of a foreign language major. For a second teaching field, students are required to complete the cognate area. Education students are advised to see the Department of Education's catalog pages, and to consult the teacher certification officer in the UAH Department of Education.

One Possible Schedule of Courses for a Foreign Language Major

Students interested in majoring in a foreign language might take the following schedule of courses:

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td></td>
<td>FL 101</td>
<td>FL 102</td>
</tr>
<tr>
<td></td>
<td>EH 101</td>
<td>EH 102</td>
</tr>
<tr>
<td></td>
<td>Fine Arts</td>
<td>Humanities or Fine Arts</td>
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<tr>
<td></td>
<td>Natural Science</td>
<td>Social Science</td>
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<td></td>
<td>Natural Science</td>
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<td>18</td>
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<td>15</td>
<td>33</td>
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</tbody>
</table>

| Second Year | FL 200 | 3 | FL 204 | 3 |
|            | Math    | 3 |        |   |
|            | Humanities or Fine Arts | 3 | FL 301 | 3 |
|            | HY 101  | 3 | HY 102 | 3 |
|            | Sophomore Literature | 3 | Social Science | 2 |
|            | Social Science | 3 |        |   |
|            | 18 | 15 | 33 |   |

| Third Year | FL 302 | 3 | FL 303 | 3 |
|           | FL 304 | 3 | FL 305 | 3 |
|           | Social Science | 3 | Minor | 3 |
|           | Minor | 3 | Minor | 3 |
|           | Minor | 3 | Free Elective | 2 |
|           | Free Elective | 2 |        |   |
|           | 18 | 15 | 33 |   |

| Fourth Year | FL 404 | 3 | FL 410 | 3 |
|            | Minor | 3 | Minor | 3 |
|            | Minor | 3 | Free Elective | 3 |
|            | Free Elective | 3 | Free Elective | 3 |
|            | Free Elective | 2 |        |   |
|            | 15 | 15 | 30 | 129 |

The following courses will be offered in the fall semester: FL 101, FL 200, FL 302, FL 304 and FL 404.
The following courses will be offered in the spring semester: FL 102, FL 204, FL 301, FL 303, FL 305 and FL 410.

College of Liberal Arts 224
Foreign Languages (FL)

101 Communicating in a Second Language and Culture:  
Introductory Foreign Language I (Available in French, German, Greek, Japanese, Latin, Russian, and Spanish)  
This is the first course in the introductory foreign language sequence; no previous foreign language study is expected, and no prerequisite is required. Students will actively practice and be tested on all four language skills (listening, speaking, including correct pronunciation of the foreign language, reading and writing) within culturally authentic contexts. Students will begin the process of learning to communicate and function in a second language and culture. Class is conducted in the target language. Language laboratory attendance is required. Lab Fee $50 (except for Greek and Latin)

102 Communicating in a Second Language and Culture:  
Introductory Foreign Language II (Available in French, German, Greek, Japanese, Latin, Russian, and Spanish)  
This is the second course in the introductory foreign language sequence. Students will actively practice and be tested on all four language skills (listening, speaking, including correct pronunciation of the foreign language, reading, and writing) within culturally authentic contexts. Students will continue the process of learning to communicate and function in a second language and culture. Prerequisites: FL 101 (or the equivalent or placement by examination). Lab Fee $50 (except for Greek and Latin)

200 Further Explorations in a Second Language and Culture:  
Intermediate Foreign Language II (Available in French, German, Greek, Japanese, Latin, Russian, and Spanish)  
Students will continue to practice and be tested on all four language skills (listening, speaking, including correct pronunciation of the foreign language, reading and writing) within culturally authentic contexts. Students will continue the process of learning to communicate and function in a second language and culture. To broaden and intensify their knowledge of the second language and culture, students will read representative samples of foreign language literature and other publications (such as newspaper and magazine articles, business and personal correspondence and commercial documents). Upon completion of this course, students will be prepared to move to advanced (300-level) study of the foreign language, culture and literature. Class is conducted in the target language. Language laboratory attendance is required. Prerequisites: FL 101 and 102 (or the equivalent or placement by examination). Lab Fee $30 (except for Greek and Latin)

204 International Cinema (Taught in English)  
Students will view, discuss, and analyze approximately eight to ten foreign language films centered on a theme, that will change from year-to-year (for example, gender issues, family, religion, children and society, the arts). Multicultural and cross-cultural issues will be highlighted. No prerequisite is required. Class is conducted in English.

Foreign Languages (FL)

301 Conversation (Available in French, German, Russian, and Spanish)  
Given that oral skill development and writing skill development complement each other, students will continue to practice and be tested on all four language skills (listening, speaking, reading and writing) within culturally authentic contexts, but with emphasis on oral skills (listening and speaking). Readings and materials of topical interest (such as newspaper and magazine articles, comic strips, advertisements, political propaganda, brochures, songs and films) will serve as the basis for oral presentations, dialogues, discussion, debate and oral questions. Class is conducted in the target language. Prerequisites: FL 200 (or the equivalent or placement by examination).

302 Composition (Available in French, German, Russian, and Spanish)  
Given that writing skill development and oral skill development complement each other, students will continue to practice and be tested on all four language skills (writing, reading, listening and speaking) within culturally authentic contexts with emphasis on
Students will study and practice writing various types of compositions (such as description, narration, exposition, definition, analysis and classification, comparison and contrast, cause and effect, persuasion, summary, research paper and business and persona correspondence), including related grammar and vocabulary. Class is conducted in the target language. Prerequisites: FL 200 (or the equivalent or placement by examination).

303 Foreign Language for Life and Professions (Available in French, German, Russian, and Spanish) 3 hours
This course is designed to prepare students for content-specific applications of the second language in various contexts, such as: 1) business and technology, 2) government and law enforcement, and 3) health professions. Class is conducted in the target language. Prerequisites: FL 200 (or the equivalent or placement by examination).

304 Culture (Available in French, German, Russian, and Spanish) 3 hours
This course focuses on the artistic, historical, intellectual, political and social life of the culture(s) where the foreign language is used, so that the US student can gain greater insight into the development of the foreign culture(s) and civilization(s). Class is conducted in the target language. Prerequisites: FL 200 (or the equivalent or placement by examination).

305 Introduction to Literature (Available in French, German, Russian, and Spanish) 3 hours
In this panoramic course, students will study representative texts, trends and movements in the foreign language literature from its beginnings through the contemporary period. Class is conducted in the target language. Prerequisites: FL 200, 301 or 302 (or the equivalent or placement by examination or permission of the instructor).

404 Texts and Contexts: Seminar in Literature (Available in French, German, Russian, and Spanish) 3 hours
This course will provide students with the opportunity for in-depth study of a specific author, genre or topic (for example, women writers, poetry, narrative and memory in the construction of national identity). This course may be repeated for credit with permission of the instructor. Class is conducted in the target language. Prerequisites: FL 200, 301 or 302 (or the equivalent or placement by examination or permission of the instructor).

410 International Internship: Comparative Languages & Cultures in Practice
3 - 6 hours
(Taught in English) The Huntsville area provides many opportunities for students to combine classroom study with work in a wide range of government, international, business, educational and private organizations. The experience will enable students to use their second language skills, as well as to develop interdisciplinary, multicultural and cross-cultural knowledge. Students will work in an off-campus (or when feasible, overseas) organization and meet with faculty and other students to report on their work and compare and analyze experiences. The course combines practical experience with discussion of the theoretical, historical and cultural ramifications of foreign language study. Class is conducted in English. At least three (3) credit hours are required for majors. Prerequisites: FL 200 and 303 (or the equivalent or placement by examination or permission of the instructor).

499 Independent Studies (Available in French, German, Russian, and Spanish) 3 hours
Independent study and/or study abroad under the supervision of an instructor. Prerequisites: FL 200 (or the equivalent or placement by examination) and permission of the instructor.
Health and Physical Education Program
Associate Director: Michelle Keene
108 Spragins Hall
Telephone (256) 824-6007
Email: keenem@cepo.conted.uah.edu

Activity Courses
Fitness, active participation, and good health habits are essential in modern society. Through health and physical education courses (HPE 100 through 199), the student has the opportunity to improve fitness, learn skills, and participate in a variety of activities, as well as gaining a conceptual knowledge of healthful practices. These courses carry one or two semester hours credit, and no more than six hours may be counted toward graduation. In the College of Science no more than four hours may be counted towards graduation. A varsity athlete will not receive credit counting toward graduation when enrolled in a regular activity course in that sport. Courses may not be repeated for credit except for varsity sports credit. Letter grades of A through NC are given, based primarily on a student's improvement in skill rather than on the level of ability.

Professional Training Courses
These courses (HPE 200 through 500) provide professional training in aspects of health, physical education or related fields. Many of these courses meet certification standards with certificates awarded upon satisfactory completion. They require both skills and academic training. The regular grading system (A through F) and other academic standards apply to such courses.

Health and Physical Education (HPE)

Activity Courses
100 Aerobics I. Lab Fee: $20.
101 Aerobics II. Lab Fee: $20.
102 Step Aerobics I. Lab Fee: $20.
103 Step Aerobics II. Lab Fee: $20.
104 Kardio Kickbox. Lab Fee: $20.
106 H20Bics. Lab Fee: $20.
107 Bootcamp Fitness. Lab Fee: $20.
110 Jogging for Fitness. Lab Fee: $10.
111 Butts & Guts Workout. Lab Fee $20.
112 Fithall Conditioning. Lab Fee. $20.
113 Body Sculpting. Lab Fee: $20.
117 Weight Training I. Lab Fee: $20.
118 Weight Training II. Lab Fee: $20.
119 Weight Training III. Lab Fee: $20.
120 Beginning Swimming. Lab Fee: $20.
122 Advanced Swimming. Lab Fee: $20.
123 Deep Water Workout I. Lab Fee: $20
126 Water Power. Lab Fee: $20.
130 Beginning Karate. Lab Fee: $20.
132 Advanced Karate. Lab Fee: $20.
133 Aikido. Lab Fee: $10.
134 Beginning T’ai Chi. Lab Fee: $10.
135 Intermediate T'ai Chi. Lab Fee: $10.
136 Yoga. Lab Fee: $10.
137 Judo/Jujitsu.
138 Intermediate Yoga.
140 Beginning Ballroom Dance. Lab Fee: $10.
142 Swing Dance. Lab Fee: $10.
143 Latin Dance. Lab Fee: $10.
144 Country Western Dance. Lab Fee: $10.
145 Line Dance. Lab Fee: $10.
146 Jazz Dance. Lab Fee: $10.
150 Beginning Racquetball. Lab Fee: $20.
152 Advanced Racquetball. Lab Fee: $20.
153 Beginning Tennis. Lab Fee: $10.
154 Intermediate Tennis. Lab Fee: $10.
155 Advanced Tennis. Lab Fee: $10.
156 Golf I. Lab Fee: $80.
157 Golf II. Lab Fee: $80.
162 Hang Gliding Fundamentals. Lab Fee: $60.
163 Basic Sailing. Lab Fee: $40.
164 Sailboat Cruising. Lab Fee: $40.
165 In-Line Skating. Lab Fee: $30
166 Rappelling.
168 Fencing. Lab Fee: $35.
169 Basketball. Lab Fee: $10.
170 Beginning Volleyball. Lab Fee: $10.
174 Billiards. Lab Fee: $30.
175 Beginning Bowling. Lab Fee: $30.
176 Advanced Bowling. Lab Fee: $30.
180 Advanced Cheerleading I. Lab Fee: $10.
181 Advanced Cheerleading II. Lab Fee: $10.
(Section 01 will be offered for men; Section 02 for women.)
183 Advanced Sports-Soccer. Lab Fee: $10.
(Section 01 will be offered for men; Section 02 for women.)
184 Peak Performance Training. Lab Fee: $10.
185 Women's Soccer Training. Lab Fee: $10.
186 Advanced Sports-Tennis. Lab Fee: $10.
187 Elite Tennis Training. Lab Fee: $10.
189 Fitness Training. Lab Fee: $10.
192 Advanced Softball Strategies. Lab Fee: $10.
195 Elite Running. Lab Fee: $10.
199 Special Topics in Health & Physical Education. Lab Fee: Variable. 1-3 hrs.
Professional Courses

200 Contemporary Nutrition 2 hrs.

201 The LEARN Program/Wt. Control. Lab Fee: $20.
Presents a multitude of effective skills and current information and research to help successfully lose weight, manage stress, and achieve balance for a happier, healthier, more productive life. Lab Fee: $20.

205 First Aid & CPR.
Learn how to recognize, respond, and act appropriately in the event of an emergency. Lab Fee: $20.

210 Beginning Athletic Training 3 hrs.
Knowledge and techniques necessary to prevent and/or care for the common athletic injuries. For coaches, athletes, and those working in recreation, physical education, or athletics. Lab Fee: $20.

220 Basic Scuba 2 hrs.
Basic skills, theories, techniques, and fundamentals of scuba-diving introduced, practiced, and refined. Open water diving. Scuba certification upon successful completion of course. Student must provide mask, fins, and snorkel. Cost of open water dives not included in lab fee. Prerequisite: Instructor approval. Lab Fee: $110.

221 Advanced Scuba 1 hr.
Presents skills and knowledge for deep diving (80+ feet). Limited visibility diving, and advanced navigation techniques. Earn YMCA advanced open water certification. Cost of open water dives not included in lab fee. Prerequisites: Open water certification, minimum of 6 logged dives. Lab Fee: $20.

223 Lifeguard Training 2 hrs.
Certification as an American Red Cross approved lifeguard upon successful completion of classroom and in-water instruction and testing. First aid and CPR for the professional rescuer certifications included as well. Prerequisite: Satisfactory completion of swim skills test. Lab Fee: $100.

224 Water Safety Instructor 3 hrs.
Techniques for teaching infant and pre-school aquatics. The American Red Cross Learn to Swim Program, and Basic Water and Emergency Water Safety courses. Includes pre-test and instructor candidate training course. Lab Fee: $115.

230 Private Pilot Ground School 3 hrs.
Prepares student for FAA Private Pilot written examination. Provides student with necessary knowledge to progress into primary pilot flight training. Kit must be purchased.

231 Instrument Airplane (IFR) Rating Ground School 3 hrs.
Provides student with knowledge needed for instrument flight instruction and training. Prepares student for FAA Instrument Flying Examination. Prerequisite: FAA Private Pilot Rating. Kit must be purchased.

240 Basketball Officiating 2 hrs.
Techniques, mechanics, and rules involved in officiating basketball for certification as an Alabama high school official. Experience and skill necessary to officiate basketball on elementary, secondary, and recreational levels. Lab Fee: $10

241 Football Officiating 2 hrs.
Techniques, mechanics, and rules involved in officiating football for certification as an Alabama high school official. Experience and skills necessary to officiate football on elementary, secondary, and recreational levels. Lab Fee: $10.

242 Baseball and Softball Officiating 2 hrs.
Baseball and softball officiating techniques, mechanics, and rules for certification as an Alabama high school baseball official and an Amateur Softball Association umpire. Experience and skills necessary to officiate baseball and softball on various levels. Lab Fee: $10.
243 Soccer Officiating  
Techniques, mechanics, and rules involved in the officiating of soccer. Experience and skills necessary to officiate soccer on elementary, secondary, and recreational levels. Lab Fee: $10.

300 Nutrition for Fitness and Sport  
Explore the theoretical and applied nutritional sciences as they relate to fitness and sport. Develop skills applicable to solving nutritional problems in exercising populations.

311 Advanced Athletic Training  
Advanced studies in the profession of sports medicine. Topics include care and prevention of injury, legal concerns, administration of sports medicine, and physiology of injury and exercise. Lab Fee: $20.

312 Athletic Training Practicum  
Planned supervised 80-hour work experience with a physical education, athletic, or leisure service program. Written reports, a major project, and final oral report are required. Lab Fee: $20.

450 Exercise Physiology Internship  
Designed to provide practical experience and understanding of wellness/fitness programs including implementation and supervision of group and individual exercise programs, health education projects and administrative duties.

History Department
409 Roberts Hall
Telephone: (256) 824-6310
Email: history@uah.edu

Professors Boucher (Chair), Dunar, Ellis, Gerberding, Williams; Professor Emeritae Shields; Associate Professors Severn, Waring; Assistant Professors Martin, Shuck.

The Department of History offers the B.A. and M.A. degrees in history and a minor in history. The M.A. degree program is described in the Graduate Catalog.

History Major
A student majoring in history must include in the academic program a minimum of 33 semester hours in history beyond HY 101-102 (GER). The U.S. survey courses, HY 221-222 are required. A student is required to take an additional 3 semester hours of sophomore work, but may take no more than a total of 12 semester hours in 200-level work including HY 221-222. A history major must take a minimum of 21 semester hours in courses numbered 300 or above; 9 semester hours must be 400-level courses, and must include HY 490. A history major is required to take a minimum of 6 semester hours in American history beyond HY 221 and 222 and a minimum of 6 semester hours in non-American history excluding HY 101-102 (GER). Students are encouraged to complete as many upper division courses as possible before enrolling in HY 490.

A student majoring in history will find a variety of programs of study enabling one to develop depth and breadth in history and some related areas from the other humanities, the social sciences, mathematics, and the natural sciences. Counseling is available in the History Department for programs of study including the following: graduate school preparation, general, preprofessional and prelaw preparation, international studies, secondary school teaching, and the fine arts.
Students are advised to declare a major officially and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program either by meeting with the departmental chair (Roberts Hall, Room 409) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

History Minor
A student interested in establishing a history minor should include appropriate history courses involving a minimum of 21 semester hours beyond HY 101-102 (GER) and including 12 semester hours in courses numbered 300 or above. The minor program must have the approval of the History Department chair. Appropriate history courses may also form a part of an area of cognate studies with other disciplines to support another major program. Such a program must be approved by the student's major department and must meet the requirement of a minimum of 12 upper-division semester hours, of which 9 hours must be in history.

History for Second Area of Study
Students majoring in elementary education may select history as their second area of study. Major requirements can be found in the Education section of the catalog. Preliminary counseling is available in the Department of Education.

Advanced Placement Credit
Elective credit will be given to AP American History students who have earned a score of 4 on Advanced Placement (AP) Program examinations of the College Entrance Examination Board. This credit may be used in substitution for HY 221 and HY 222 at UAH. Under no circumstances may AP American History be used as a substitute for HY 101 and/or HY 102. Credit for the AP European History course (1470-Present) will be awarded to students who earn a score of 4 on the AP examination, and this credit may be used as a substitute for HY 102 only. A maximum of 3 hours credit will be granted for this examination. In order to fulfill GER requirements, such students will still have to take HY 101 or its equivalent as approved by the department.

Transfer Credit
With the exception of those community colleges covered within the Alabama Articulation and General Studies agreement, only in exceptional circumstances will the History Department accept transfer credit for non-interactive telecommunications courses or correspondence courses in HY 101, 102, 221, or 222. Students who wish to receive such credit should petition the department chair.

CLEP/Departmental Examination Credit
A student who makes a B or better on the CLEP examination for Western Civilization (HY 101 and/or HY 102) or U.S. History (HY 221 and/or HY 222) may petition the History Department requesting an essay examination on the subject for which credit is desired. The petition will not be reviewed until a satisfactory CLEP score has been reported. After consultation with a faculty member designated by the department chair, the student may take an essay examination. If he or she also receives B or better on the essay, credit will be granted for the appropriate course(s).
An Illustrative Plan for Completing the B.A. Degree
With a Major in History*

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td><strong>Freshman</strong></td>
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<tr>
<td>EH 101 3</td>
<td>EH 102 3</td>
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<tr>
<td>HY 101 3</td>
<td>HY 102 3</td>
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<tr>
<td>Foreign Language 5</td>
<td>Foreign Language 5</td>
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<tr>
<td>Humanities and Fine Arts 3</td>
<td>Math 3</td>
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<tr>
<td>Humanities and Fine Arts 14</td>
<td>Fine Arts 3</td>
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<tr>
<td><strong>Sophomore</strong></td>
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<tr>
<td>EH 200 level sequence 3</td>
<td>EH 200 level sequence 3</td>
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<tr>
<td>HY 221 3</td>
<td>HY 222 3</td>
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<tr>
<td>Humanities and Fine Arts 3</td>
<td>Social and Behavioral Science 3</td>
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<tr>
<td>Social and Behavioral Science 4</td>
<td>Natural Science 4</td>
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<tr>
<td>Natural Science 16</td>
<td>Behavioral Science 16</td>
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<tr>
<td><strong>Junior</strong></td>
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<tr>
<td>HY 200 level class 3</td>
<td>HY 300+ 3</td>
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<tr>
<td>Social and Behavioral Science 3</td>
<td>Social and Behavioral Science 3</td>
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<tr>
<td>Natural Science 4</td>
<td>Behavioral Science 4</td>
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<td>Additional Requirement 3</td>
<td>Minor course 3</td>
</tr>
<tr>
<td>HY 300 level class 2</td>
<td>Minor course 3</td>
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<td></td>
<td>HY 300+ 2</td>
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<td>18</td>
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<tr>
<td><strong>Senior</strong></td>
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<tr>
<td>HY 300+ 3</td>
<td>HY 400+ 3</td>
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<td>HY 400+ 3</td>
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<td>Minor Course 2</td>
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<td>15</td>
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<tr>
<td><strong>Total Hours</strong></td>
<td>130</td>
</tr>
</tbody>
</table>

*This plan is provided as one example of many ways a student may schedule coursework to complete a B.A. degree with a major in History. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.

History (HY)

101 Origins and Development of the Contemporary World, Part I
Major western civilizations to 1500. Taught every semester.

102 Origins and Development of the Contemporary World, Part II
Major western civilizations since 1500. Taught every semester.

Courses below are open to all students other than beginning freshmen, with exceptions as indicated.

202 Current World Issues in History
Selected topics in world history during the twentieth century designed to foster a historical awareness of present day problems.
221 The United States to 1877
Discovery of America through the Civil War and Reconstruction.
3 hrs.

222 The United States Since 1877
United States from the end of the Civil War era to the present.
3 hrs.

225 History of Alabama
The state's past from colonial times to the present with emphasis on its place in United States history.
3 hrs.

229 Survey of Ancient Times
Ancient Near East, Greece, and Rome. Prerequisites: HY 101-102 or approval of instructor.
3 hrs.

230 The Rise of Medieval Civilizations
Survey of the origins and development of medieval society in the West, with attention given to Byzantium and the Islamic world as well as to the Latin west. Prerequisites: HY 101 and 102 or permission of instructor.
3 hrs.

Courses listed below are open to students who have completed 9 semester hours in history or have junior standing.

318 Constitutional History of the United States
Growth and development of the American constitutional system with emphasis on those aspects which relate to the fundamental structure of American government and social order.
3 hrs.

326 Colonial America
Political, social, economic, and religious developments in the North American colonies, 1607-1783.
3 hrs.

329 Imperial Rome
Roman Empire from the Principate to the barbarian invasions.
3 hrs.

341 Modern France
Political, economic, social, and cultural developments from the opening of the reign of Louis XIV to the post-de Gaulle era of the Fifth Republic. Prerequisites: HY 101-102.
3 hrs.

343 Modern Germany
German history from mid-nineteenth century to the present, emphasizing the connections between Germany's internal politics and its role in international affairs. Includes reunification and its consequences.
3 hrs.

347 English History to 1660
English history and society from Anglo-Saxon times to the Restoration with attention to the origins and evolution of governmental and legal institutions such as monarchy, common law, parliament, and the judiciary. Prerequisites: HY 101 and 102.
3 hrs.

348 English History since 1660
Impact of revolution, industrialization and war on English society, the expansion of English liberties, and the development of the cabinet, political parties, the empire and the welfare state. Prerequisites: HY 101 and 102.
3 hrs.

364 The Westward Movement in American History since 1803
Pioneering society, Indian relations, land policies, expansion, and politics of the trans-Mississippi frontier.
3 hrs.

365 American Labor History
American labor relations from colonial times but concentrating on post-Civil War topics.
3 hrs.

366 African-Americans in Twentieth Century America
Interrelationship of the African-American and the industrial-urban environment of the United States.
3 hrs.

367 Women in U.S. History
Women in the United States from the colonial period to the present.
3 hrs.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>369</td>
<td>Social and Cultural History of the United States to 1865</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Major themes in the development of American culture and society from the colonial period to the Civil War era.</td>
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<tr>
<td>370</td>
<td>Social and Cultural History of the United States since 1865</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Major themes in American culture and society since the Civil War.</td>
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<tr>
<td>373</td>
<td>Foreign Relations of the U. S. to 1920</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>American foreign relations from the Revolutionary era through World War I. American territorial and commercial expansion, imperialism, and emergence as a world power.</td>
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<tr>
<td>374</td>
<td>Foreign Relations of the U. S. since 1920</td>
<td>3 hrs.</td>
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<td>United States as a world power. American involvement in World War II, Vietnam, and the Cold War, and the growth of American presence in Asia, Latin America, and the Middle East.</td>
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<tr>
<td>375</td>
<td>Imperial Russia</td>
<td>3 hrs.</td>
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<td>Survey of the social, political and cultural history of Russia from its beginnings to 1917, with particular emphasis on the imperial period of the 18th and 19th centuries. Major themes include the evolution of the Russian state, state-society relations, and the multiethnic nature of the empire.</td>
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<tr>
<td>376</td>
<td>Soviet Russia</td>
<td>3 hrs.</td>
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<td></td>
<td>Russian history from the collapse of autocracy to the collapse of communism with special emphasis on the revolutions of 1917, the formation and evolution of the Soviet state in the 1920s and 30s, and the successes and failures of the post-1945 era. Prerequisites: HY 101 and 102.</td>
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<tr>
<td>380</td>
<td>China since 1600</td>
<td>3 hrs.</td>
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<td>Survey of Chinese history from the late Ming Dynasty through Mao's Communist regime. Focus on political culture, Confucianism, Maoism, relations with the West, women, and society.</td>
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<tr>
<td>391</td>
<td>Europe, 1500-1789</td>
<td>3 hrs.</td>
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<td></td>
<td>Examination of the economic, scientific, social, political, and cultural developments in Europe from the Renaissance to the French Revolution.</td>
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<tr>
<td>392</td>
<td>Europe Since 1789</td>
<td>3 hrs.</td>
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<td>Europe from the French Revolution to the present.</td>
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<tr>
<td>399</td>
<td>Special Topics in History</td>
<td>3 hrs.</td>
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<td></td>
<td>Intensive examination of particular problems, periods, or topics in history.</td>
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</table>

Courses listed below are open to students who have completed 12 semester hours in history or have senior standing.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>413</td>
<td>The Old South</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Southern society, economics, politics and culture concentrating on the nineteenth century south through Reconstruction.</td>
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<tr>
<td>414</td>
<td>The New South</td>
<td>3 hrs.</td>
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<td></td>
<td>Post-reconstruction South emphasizing the economic, social, and political readjustments made during the twentieth century.</td>
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<tr>
<td>424</td>
<td>The Atlantic World</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Comparative survey of the western European colonial empires from 1450 to 1763, emphasizing the cultural interactions of African, Amerindian and European peoples in the Americas. This course meets the requirements for either American or non-American credit in the history major.</td>
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<tr>
<td>427</td>
<td>The Age of the American Revolution</td>
<td>3 hrs.</td>
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<td></td>
<td>Politics, society, economy, culture, and international conflicts from 1754 through the Revolutionary War to 1815.</td>
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<tr>
<td>428</td>
<td>The Republic in Crisis</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Political, social, and economic changes in the United States and its sections from 1815 through the Civil War and Reconstruction.</td>
<td></td>
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</tbody>
</table>
437 The Rise of Modern America 3 hrs.
Economic and social changes, imperialism, and the growth in government in the United States from 1877 to the 1920s.

438 Modern America 3 hrs.
American society, politics, economics, and foreign affairs from the end of World War I to the origins of the Cold War.

439 Recent America 3 hrs.
Contemporary America from the 1950s to the present, analyzing both domestic and foreign affairs.

473 The High Middle Ages 3 hrs.
Political, economic, and cultural features of Europe when medieval civilization was at its height.

474 The Renaissance and Reformation 3 hrs.
Selected topics in the Italian Renaissance and European Reformation.

475 Crisis in Europe, 1560-1660 3 hrs.
Europe in an age of anxiety, religious wars, political upheaval, witch-hunts, and the early scientific revolution.

476 Absolutism and Enlightenment, 1660-1763 3 hrs.
Europe from Louis XIV to the Peace of Paris, an age of political stability and intellectual innovation.

477 The French Revolution and Napoleon 3 hrs.
European ideas, institutions, and events from the beginning of the French Revolution to the demise of the Napoleonic Empire.

478 Europe in the Nineteenth Century 3 hrs.
Major political, social, economic, and intellectual developments in Europe from the Congress of Vienna to World War I.

479 Europe in the Twentieth Century 3 hrs.
Major developments in Europe from 1914 to the present, including the two World Wars and post-war reconstruction.

490 Research Seminar in History 3 hrs.
Historiography, research and writing, and recent interpretations in the field of history. Required of all history majors. Taught once annually.

Music Department
206 Roberts Hall
Telephone: (256) 824-6436
Email: music@email.uah.edu

Professor Emeritus Boyer; Associate Professors Sanders, Sneed, Whatley; Assistant Professors Smith, Bowyer; Adjunct Lecturers Regni, I. Weaver, P. Weaver.

The University of Alabama in Huntsville is an accredited member of the National Association of Schools of Music. The Department of Music seeks, as one of its principal goals, to provide for music majors a program of superior quality, one which will enable students to begin their musical careers upon graduation, or to pursue studies at the graduate level. It is also a suitable program of study for those who have not established specific professional aspirations, but who desire the benefits of a broad liberal arts education.

Students are advised to officially declare a major and to obtain and Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Roberts Hall, Room 206) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

The curriculum for music majors is designed to provide students with knowledge of their musical heritage and the great masterworks of music literature, a foundation in theoretical studies...
and musicianship skills sufficient to allow them to interact with music in an intelligent and competent way, and performance experiences that develop musical skills and artistic sensitivity. Additional curricular offerings provide music education students with knowledge of the appropriate materials, teaching strategies and organizational skills necessary to become successful music educators. Music technology courses provide students with computer-based skills for creating and teaching music.

All the department's programs are strongly based in the liberal arts, in the belief that a broad general education is an appropriate preparation for both the well-rounded musician and the educated individual.

Courses for the General Student (Non-Music Majors)

The following courses and ensembles are open to all university students; some require little or no musical experience. Upper-level credit is available for some courses. Students may also receive studio instruction (private lessons) in voice and in nearly every musical instrument.

- **MU 100** Introduction to Music Literature
- **MU 101** Introduction to Music Theory
- **MUE 106** Introduction to Music Technology
- **MUA 390** UAH Choir
- **MUA 191/391** Chamber Choir
- **MUA 192** Tenor-Bass Chorale
- **MUA 193/393** Women's Choir
- **MUA 196** Chamber Ensembles
- **MUA 398** Jazz Ensemble
- **MUA 399** UAH Wind Ensemble

Music Major with Emphasis in Liberal Arts, Performance, or Technology

The major in music, with emphasis in liberal arts, performance, or technology, is a degree program of 128 credit hours. Students with dual interests and abilities will find many opportunities for combining the music major with other disciplines.

Music Major with Emphasis in Music Education

The emphasis in music education is a 151 credit hour degree program built upon a broad liberal arts base. The course of study integrates music and professional education courses to develop a superior music teacher, certified to teach at all levels P-12 (Class B Professional Teacher's Certificate) with strength in either vocal or instrumental music. Students must demonstrate throughout their course of study competencies in both performance and teaching. Because of the demands of this program, there is little opportunity to elect courses other than those required and outlined below. With additional study of the principal instrument and a senior recital performance, music education students are eligible to receive a special performance certificate. Faculty approval is required.

Bachelor of Arts in Music

Students wishing to pursue a music major should have pre-college training in their principal performing instrument or voice and have ability to read music fluently. Basic keyboard ability is helpful but not mandatory.

Entering freshmen and transferring students are required to take a placement examination in rudiments (scales, keys, intervals, triads, general notation), music reading and performance (principal instrument or voice). Deficiencies may be removed through remedial instruction.

I. General Education Requirements 54 hrs.

GER for the B.A. degree are listed at the beginning of the College of Liberal Arts section of the catalog. The student should include MU 100 and 201 to fulfill the fine arts options. Music education students must include at least one course in political science for the social science requirement, and CM 113; other music majors should choose at least one course in philosophy. Students pursuing majors or minors in engineering or computer science should consult the
catalog sections for those departments to determine appropriate science and mathematics requirements.

II. Major

The first component of the degree plan consists of a Music Core, the set of courses that is included in every Bachelor of Arts degree in Music. The Music Core will serve as the basic major in music for those students who select the Liberal Arts Emphasis, which also includes a minor in a discipline other than music, 54 General Education hours, and elective hours to total 128 hours. As a second degree option, those students who choose the Performance Emphasis select, along with the Music Core, an additional 21 hours of music coursework, 13 hours of electives, plus 54 General Education hours. A third degree option is designed for those students who wish to become certified to teach music in the public schools (N-12 certification in either Choral/Vocal or Instrumental music). Those students select the Music Core plus an additional 25 hours of music and professional music education courses, 32 hours of courses within the Department of Education, and 54 General Education hours. Finally, those students who wish to pursue the Music Technology Emphasis select the Music Core plus an additional 22 hours of music technology, electrical engineering and computer engineering courses, 12 hours of electives, and 54 General Education hours.

The Music Core (Liberal Arts Emphasis)

- Principal Instrument: 10
- Upper level elective: 2
- Music Theory (MU 201, 202, 301): 9
- Musicianship Skills (MU 203, 204, 303): 3
- Introduction to Music Literature (MU 100): 3
- Music History I and II (MU 311, 312): 6
- Conducting (MU 325): 2
- Ensembles (MUA 39X): 4
- Introduction to Music Technology (MU 106): 1

TOTAL CREDIT HOURS: 40
UPPER LEVEL: 22
TOTAL MUSIC HOURS: 40
TOTAL HOURS: 40 hrs. Music + 54 hrs. GER + Minor + Electives = 128

The Performance Emphasis (in addition to Music Core)

**MUSIC CORE**

- Principal Instrument: 10
- Upper level elective: 2
- Music Theory I-III (MU 201, 202, 301): 9
- Musicianship Skills I-III (MU 203, 204, 303): 3
- Introduction to Music Literature (MU 100): 3
- Music History I and II (MU 311, 312): 6
- Conducting (MU 325): 2
- Ensembles (MUA 39X): 4

**PERFORMANCE EMPHASIS**

- 8 Semesters @2hrs.: 16
- Upper level elective: 2
- Music Theory IV (MU 302): 3
- Musicianship Skills IV (MU 304): 1
- 20th Century Materials (MU 401): 2
- Advanced Conducting (MU 425): 2
- Ensembles (MUA 39X) (4 x 1): 4
- Piano proficiency* (MUA 139): 1

TOTAL CREDIT HOURS: 40
UPPER LEVEL: 22

TOTAL MUSIC HOURS: 61
### The Education Emphasis (in addition to Music Core)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td><strong>MUSIC CORE</strong></td>
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<tr>
<td>Principal Instrument</td>
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<tr>
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</tr>
<tr>
<td>Music Theory I-III (MU 201, 202, 301)</td>
<td>9</td>
</tr>
<tr>
<td>Musicianship Skills I-III (MU 203, 204, 303)</td>
<td>3</td>
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<tr>
<td>Introduction to Music Literature (MU 100)</td>
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<tr>
<td>Music History I and II (MU 311, 312)</td>
<td>6</td>
</tr>
<tr>
<td>Conducting (MU 325)</td>
<td>2</td>
</tr>
<tr>
<td>Ensembles (MUA 39X)</td>
<td>(4 x 1)</td>
</tr>
<tr>
<td>Introduction to Music Technology (MU 106)</td>
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**TOTAL CREDIT HOURS**: 40

**UPPER LEVEL**: 22

**TOTAL MUSIC HOURS**: 65

**TOTAL HOURS**: 65 hrs. Music + 54 hrs. GER + 32 hrs. Education = 151 hrs.

### The Technology Emphasis (in addition to Music Core)

<table>
<thead>
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<tr>
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<td>Upper level elective</td>
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<td>Music History I and II (MU 311, 312)</td>
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<td>Conducting (MU 325)</td>
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<tr>
<td>Ensembles (MUA 39X)</td>
<td>(4 x 1)</td>
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<td>Introduction to Music Technology (MU 106)</td>
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</table>

**TOTAL CREDIT HOURS**: 40

**UPPER LEVEL**: 22

**TOTAL MUSIC/EE/CPE HOURS**: 62


*For the Emphasis in Performance and Education, students must pass a piano competency examination. In the case of the Emphasis in Education, the piano competency examination must be passed before internship. ED 490 must be taken concurrently with internship.*

### Music Minor

Students may select music as a supportive minor to their major discipline. Generally 23-24 hours of music are necessary (11 hours upper-level), including the following courses:

- Studio Instruction
- Introduction to Music Technology
- Music Theory I-III

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Musicianship Skills I-III
Introduction to Music Literature (include in GER)
History of Music II
Ensemble (300 level)

Music Technology Minor
Students may select music technology as a supportive minor for computer engineering, electrical engineering and computer science. The music technology minor includes the following courses:
- Ensembles
- Studio Inst. in Music Tech
- Intro to Music Literature
- Music Theory I
- Musicianship Skills I
- Music Theory II
- Musicianship Skills II
- Intro to Music Technology
- Music Technology
- Internship in Music Tech

Music for Second Area of Study
Students majoring in elementary education may select music as their second area of study. See major requirements in Education section. 17 hours in music are required:

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<tr>
<td>MU 203 Musicianship Skills I</td>
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</tr>
<tr>
<td>MU 312 Music History II</td>
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</tr>
<tr>
<td>MUE 326 Teaching Gen. Music in Elementary School</td>
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<tr>
<td>Ensembles (at 300 level)</td>
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An Illustrative Plan for Completing the B.A. Degree with a Major in Music and a Liberal Arts Emphasis

First Year
<table>
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</tr>
<tr>
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<td>1.5</td>
</tr>
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<td>MU 100 or MU 101</td>
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</tr>
<tr>
<td>MU 106</td>
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Second Year
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### Third Year

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### Fourth Year

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<td>Minor</td>
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### Total Hours

128

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**An Illustrative Plan for Completing the B.A. Degree with a Major in Music and a Music Education Emphasis**

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<td>MU 106</td>
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### Second Year

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### Third Year

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### Fourth Year

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<td>CM 113</td>
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240
### Fifth Year

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### An Illustrative Plan for Completing the B.A. Degree with a Major in Music and a Performance Emphasis

#### First Year

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<tbody>
<tr>
<td>Principal Instrument</td>
<td>2</td>
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<td>MU 201</td>
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</tr>
<tr>
<td>MU 106</td>
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<td>MU 203</td>
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<td>EH 101</td>
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#### Second Year

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#### Third Year

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#### Fourth Year

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An Illustrative Plan for Completing the B.A. Degree with a Major in Music and a Music Technology Emphasis

### First Year

<table>
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<tbody>
<tr>
<td>Ensemble</td>
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<td>Principal Instrument</td>
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<td>MU 100 or MU 101</td>
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<td>MU 106</td>
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<td>EH 101</td>
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<td>HY 101</td>
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### Second Year

<table>
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### Third Year

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### Fourth Year

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</table>

**Total Hours: 128**

**Music (MU)**

100 **Introduction to Music Literature**  
Basic music appreciation. Exploration of ideas and issues in various types of western music through reading, listening, and discussion.  

101 **Introduction to Music Theory**  
Basic music presented in a practical way for students who have little or no musical training. Mechanical aspects of music—clefs, notation, scales, intervals, and rhythm, with some aural skills, and practice in writing and harmonizing melodies. For students who expect to major or minor in music, this course may not be taken for degree credit.  

106 **Introduction to Music Technology**  
Introduction to computer sound options, with an overview of computer-assisted instruction in music, an introduction to music sequencing and digital audio software, and an in-depth tutorial in music notation.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>Theory of Music I</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Fundamentals of basic musicianship through practical as well as theoretical studies. Development of skills in written harmony and analysis. Appropriate Musicianship Skills (e.g. MU 203) to be taken concurrently throughout theory program. Prerequisite: approval of instructor or department chair.</td>
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<tr>
<td>202</td>
<td>Theory of Music II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Continuation of MU 201. Prerequisites: MU 201 and 203.</td>
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<tr>
<td>203</td>
<td>Musicianship Skills I</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>To be taken concurrently with MU 201 and designed to complement written studies. Exercises in sight singing using solfege, numbers or other systems. Basic conducting patterns, rhythmic execution and melodic, harmonic, and rhythmic dictation. Prerequisite: approval of instructor or department chair.</td>
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</tr>
<tr>
<td>204</td>
<td>Musicianship Skills II</td>
<td>1 hr.</td>
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<tr>
<td></td>
<td>Continuation of MU 203. Prerequisites: MU 201 and 203.</td>
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<tr>
<td>301</td>
<td>Theory of Music III</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Continuation of studies on a more advanced basis than MU 201-202. Prerequisites: MU 202 and 204.</td>
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</tr>
<tr>
<td>302</td>
<td>Theory of Music IV</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Musical forms and analysis. Prerequisites: MU 301 and 303.</td>
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</tr>
<tr>
<td>303</td>
<td>Musicianship Skills III</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>Continuation of MU 204. Prerequisites: MU 202 and 204.</td>
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</tr>
<tr>
<td>304</td>
<td>Musicianship Skills IV</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>Continuation of MU 204. Prerequisites: MU 202 and 204.</td>
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</tr>
<tr>
<td>306</td>
<td>Music Technology</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>An exploration of music technology hardware and software, including an overview of acoustics, MIDI and digital audio data structures, and an introduction to multimedia authoring. Prerequisites: MU 106 and EE 100.</td>
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</tr>
<tr>
<td>310</td>
<td>American Music</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Designed for the non-music major. Important aspects of American musical art are presented, including the colonial period, folksong and European influences, jazz, Broadway and film scores. The contemporary period, beginning with Charles Ives, is also covered. Offered upon demand.</td>
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</tr>
<tr>
<td>311</td>
<td>History of Music I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Development of music as an art in western civilization to 1750. Representative musical works and style. Understanding of musical concepts in view of their historical background. Prerequisites: MU 100 and 301, or approval of instructor.</td>
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</tr>
<tr>
<td>312</td>
<td>History of Music II</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Music as an art in western civilization from 1750 to the present. Formal and stylistic problems through representative works and an understanding of musical concepts in light of their historical and general cultural context. Prerequisites: MU 100 and 301, or approval of the instructor.</td>
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</tr>
<tr>
<td>314</td>
<td>Biographical Survey</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Life and work of great composers. Variable topics. Prerequisites: MU 302 and 311 or 312. Offered upon demand.</td>
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<tr>
<td>315</td>
<td>History of Music in Liturgy</td>
<td>3 hrs.</td>
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<td></td>
<td>Beginning with pagan, eastern and Hebraic sources, music in liturgical worship is traced to the present. Choral and organ music is studied for its practical usage and artistic value. Special attention is given to monumental works from the Medieval, Renaissance, Baroque, Classical, Romantic and Contemporary periods. Prerequisites: Junior standing, MU 100 and 201.</td>
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<tr>
<td>320</td>
<td>Piano Pedagogy</td>
<td>2 hrs.</td>
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<tr>
<td></td>
<td>Materials, techniques, and practices in teaching beginners and students through lower advanced grades of piano. Practical experience. Prerequisite: approval of instructor. Offered upon demand.</td>
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</tr>
</tbody>
</table>
321 Piano Technology 1 hr.
Development of keyboard instruments, use of equal-temperament tuning, and minor piano action regulation and repair. Prerequisite: Ability to read music and familiarity with keyboard. Offered upon demand.

322 Diction for Singers 1 hr.
Intended as an overview for vocal and choral students who wish to learn the diction requirements for singing in Latin, Italian, German, French and English. Prerequisite: MUA 111 or permission of the instructor.

325 Conducting 2 hrs.
Basic techniques of choral and instrumental conducting. Prerequisites: MU 301 or approval of instructor.

401 Twentieth Century Materials and Techniques 2 hrs.
Systems of tonal organization, compositional procedures, terminology, and analytical methods that relate to music since 1900. Prerequisites: MU 303 and 312 or approval of instructor.

406 Internship in Music Technology 3 hrs.
An internship of eight hours per week working in the music technology industry. Prerequisite: MU 306.

410 Music in Western Civilization 3 hrs.
Major musical masterpieces and personalities, with some emphasis on the effects of social, economic and political events on the evolution of musical style, form and performance media. Visual and literary arts are referenced and included in the readings, study and discussion. Prerequisites: MU 100, Junior standing or permission of instructor. Offered upon demand.

411 Musicum Practicum 1 hr.
Courses of study and activity developed by the student and submitted to music faculty for approval. Projects to reinforce learning and performance experiences. May be repeated, but no more than two hours count toward degree requirements.

412 Church Music Practicum 0 hr.
Forty hours working with selected professional church musicians in the community. An internship providing hands-on experiences in real church situations. Supervised by music faculty. Prerequisites: Senior standing, MU 315 and MU 415. Offered upon demand.

415 Church Music Methods 2 hrs.
A practical approach preparing the church musician in choral and organ methods, liturgical planning, pastoral relations, and professional standards and goals. Prerequisites: MU 302 and MUE 428. Offered upon demand.

416 Orchestration 2 hrs.
Instruments of the band and orchestra, their ranges, transpositions, and capabilities. Practical experience in arranging for instruments. Prerequisite: MU 302.

420 Piano Literature 2 hrs.
Music for string keyboard instruments from the pre-pianoforte period to the present. Representative works from all periods. Prerequisites: MU 302, 304, 312 or approval of instructor. Offered upon demand.

425 Advanced Conducting 2 hrs.
Review of basic conducting patterns. Emphasis on communication as the role of the conductor. Detailed score preparation. Prerequisite: MU 325.

510 Concert Band Literature and Conducting Critique 3 hrs.
Literature for concert band and wind ensemble. Variety of music (type, style, and difficulty) as well as in-depth study of a few scores by each student for critiques of rehearsal and conducting techniques. Prerequisite: MU 425; or approval of instructor. Offered upon demand.

511 Master Class in Piano Literature and Pedagogy 2 hrs.
Topic of course varies. Examination of selected forms. Offered upon demand.
Studio Instruction In Vocal and Instrumental Music (MUA)

Students must fill out a "Request for Studio Instruction" in the Music Department prior to each semester they are enrolled. Transfer students who plan to take studio instruction for music credit must demonstrate their level of proficiency to the instructor before registration. Instruction varies from 30 to 50 minutes weekly.

Generally, students not intending to major in music should enroll in MUA 111, 121, 131, 141, 151, 161, 171, or 181; however, advanced students may enroll in MUA 211, 221, et cetera, with permission of the instructor. A special studio instruction fee is charged (see Fees). Students enrolled in studio music at the 100 level should enroll for the subsequent number each semester, i.e. 111-112-113-114, et cetera.

For those students enrolled at the 200 and 400 levels, advancement to the next level of studio instruction (i.e. from 231 to 232 or 242 to 243) is based on performance before a faculty jury. The jury may retain students at any level until proper achievement is reached for advancement or completion of degree performance competencies. The instructor's grade may be raised or lowered to reflect jury performance. Non-majors may enroll in 100-level studio instruction as long as the instructor agrees that satisfactory progress is made; no jury is necessary.

Students taking studio instruction must attend performances, the monthly student recital program and special performance classes. A student may be excused only with written permission of the department chair.

As a part of studio instruction, students enrolled as full-time music majors must attend at least eight approved concerts a semester; other enrolled students must attend four.

Prerequisites. Prerequisites for each studio course include approval of the instructor and the previous level of instruction.

Numbering System. Courses which have numbers beginning with 2 or 4 are generally for music majors' principal instrument, although other advanced students may enroll for these courses through departmental audition. Courses beginning with 1 are for non-majors, minors and music majors' secondary instrument.

111-119 Studio Instruction in Voice
   For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.
   1 hr.

211-214 Studio Instruction in Voice
   For music majors' principal instrument. Studio instruction fee: $90.
   1.5 hr.

215-219 Studio Instruction in Voice
   For music majors' principal instrument. Studio instruction fee: $90.
   2 hrs.

411-419 Studio Instruction in Voice
   For music majors' principal instrument. Studio instruction fee: $90.
   2 hrs.

121-129 Studio Instruction in Organ
   For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.
   1 hr.

221-224 Studio Instruction in Organ
   For music majors' principal instrument. Studio instruction fee: $90.
   1.5 hr.

225-229 Studio Instruction in Organ
   For music majors' principal instrument. Studio instruction fee: $90.
   2 hrs.

421-429 Studio Instruction in Organ
   For music majors' principal instrument. Studio instruction fee: $90.
   2 hrs.

130 Piano Class
   Techniques of performance, note reading, and basic musicianship.
   1 hr.

131-138 Studio Instruction in Piano
   For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.
   1 hr.

139 Piano Proficiency for Music Majors
   Designed to assist the music major in preparation for the piano proficiency exam. It will
provide basic instruction in harmonization, familiarity with scales and chord structures, transposition, and elementary score reading. Credit by examination is available.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>231-234</td>
<td>Studio Instruction in Piano</td>
<td>1.5 hr</td>
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<tr>
<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>235-239</td>
<td>Studio Instruction in Piano</td>
<td>2 hrs.</td>
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<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>431-439</td>
<td>Studio Instruction in Piano</td>
<td>2 hrs.</td>
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<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>141-149</td>
<td>Studio Instruction in Guitar</td>
<td>1 hr.</td>
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<td></td>
<td>For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.</td>
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<tr>
<td>241-244</td>
<td>Studio Instruction in Guitar</td>
<td>1.5 hr</td>
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<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>244-249</td>
<td>Studio Instruction in Guitar</td>
<td>2 hrs.</td>
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<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>441-449</td>
<td>Studio Instruction in Guitar</td>
<td>2 hrs.</td>
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<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>151-157</td>
<td>Studio Instruction in Strings</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.</td>
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<tr>
<td>158, 159</td>
<td>Class Instruction in Strings</td>
<td>1 hr.</td>
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<tr>
<td></td>
<td>For secondary instrument, instrumental music education students. Studio instruction fee: $70.</td>
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<tr>
<td>251-254</td>
<td>Studio Instruction in Strings</td>
<td>1.5 hr</td>
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<tr>
<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>255-259</td>
<td>Studio Instruction in Strings</td>
<td>2 hrs.</td>
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<tr>
<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>451-459</td>
<td>Studio Instruction in Strings</td>
<td>1.5 hr</td>
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<tr>
<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>161-167</td>
<td>Studio Instruction in Woodwinds</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.</td>
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<tr>
<td>168, 169</td>
<td>Class Instruction in Woodwinds</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>For secondary instrument, instrumental music education students. Studio instruction fee: $70.</td>
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<tr>
<td>261-264</td>
<td>Studio Instruction in Woodwinds</td>
<td>1.5 hr</td>
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<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>265-269</td>
<td>Studio Instruction in Woodwinds</td>
<td>2 hrs.</td>
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<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>461-469</td>
<td>Studio Instruction in Woodwinds</td>
<td>2 hrs.</td>
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<tr>
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<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>171-177</td>
<td>Studio Instruction in Brass</td>
<td>1 hr.</td>
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<tr>
<td></td>
<td>For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.</td>
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<tr>
<td>178-179</td>
<td>Class Instruction in Brass</td>
<td>1 hr.</td>
</tr>
<tr>
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<td>For secondary instrument, instrumental music education students. Studio instruction fee: $70.</td>
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<tr>
<td>271-274</td>
<td>Studio Instruction in Brass</td>
<td>1.5 hr</td>
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<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>275-279</td>
<td>Studio Instruction in Brass</td>
<td>2 hrs.</td>
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<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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<tr>
<td>471-479</td>
<td>Studio Instruction in Brass</td>
<td>2 hrs.</td>
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<td></td>
<td>For music majors' principal instrument. Studio instruction fee: $90.</td>
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</table>
181-188 Studio Instruction in Percussion 1 hr.
For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.

189 Class Instruction in Percussion 1 hr.
For secondary instrument, instrumental music education students. Studio instruction fee: $70.

281-284 Studio Instruction in Percussion 1.5 hr.
For music majors' principal instrument. Studio instruction fee: $90.

285-289 Studio Instruction in Percussion 2 hrs.
For music majors' principal instrument. Studio instruction fee: $90.

481-489 Studio Instruction in Percussion 2 hrs.
For music majors' principal instrument. Studio instruction fee: $90.

401-403 Studio Instruction in Music Technology 1 hr.
Three-semester sequence for students enrolled in music technology majors and minors. Students will create individual projects in MIDI, sound creation and editing, and multimedia. Prerequisite: MU 306 and permission of instructor.

Ensembles (MUA)
The UAH music ensembles are open to all students; some ensembles require an audition. Ensemble participation is essential for all music majors and minors, and an appropriate ensemble must be selected each semester a music major is enrolled for degree requirements.

390 UAH Choir 1 hr.
Mixed voices singing the serious choral repertoire. Open to all students by audition. Required attendance at rehearsals and performances.

191, 391 Chamber Choir 1 hr.
Solo-ensemble performance specializing in early and contemporary music. Required attendance at rehearsals and performances.

192 Tenor-Bass Chorale 1 hr.
A non-auditioned choir for tenor and bass voices. Classical and popular music are included in the repertoire. Required attendance at rehearsals and performances.

193, 393 Women's Choir 1 hr.
A non-auditioned choir for soprano and alto ranges. Classical, folk, and popular music are the components of this repertoire. Required attendance at rehearsals and performances.

195, 395 Huntsville Symphony Orchestra 1 hr.
An orchestra of seventy-five players with international guest artists. Performance of major symphonic, operatic, and choral literature. By audition with the conductor. Required attendance at rehearsals and performances.

196, 396 Chamber Ensembles 1 hr.
Discussion, evaluation and performance of literature available for selected small ensembles. Piano trios, quartets, quintets, string quartets, woodwind, brass, percussion and vocal ensembles. Prerequisite: Approval of instructor.

398 Jazz Ensemble 1 hr.
Open to all students by audition with the director. Provides the participant with opportunities to perform a wide variety of jazz styles in varied settings. Required attendance at rehearsals and performances.

399 UAH Wind Ensemble 1 hr.
Preparation of the finest literature for wind ensemble and concert band. Open to all students by audition with the conductor. Required attendance at rehearsals and performances.
Music Education (MUE)

215 Music for the Young Child
3 hrs.
For elementary and special education teachers, recreational therapists, church school, or prospective teachers not trained in music. Preparation to teach children ages 3-12 through experience in singing, reading, planning, and presentation. Elementary education majors using music as their second area of study must select MUE 326 rather than MUE 215 for their GER. Offered upon demand.

326 Teaching General Music in Elementary Schools
3 hrs.
Materials and methods. Emphasis on developing teaching competencies. Prerequisites: MU 302, MUE 200 or permission of instructor.

327 Teaching General Music in Secondary Schools
3 hrs.
Materials and methods. Emphasis on developing teaching competencies. Prerequisites: MU 302, MUE 200 or permission of instructor.

428 Vocal/Choral Methods for Secondary Schools
2 hrs.
Includes basic principles of breathing, posture, and resonance. Diction guidelines for Latin, Italian, German, and French; repertoire for both vocal and choral students; organizational methods for leading choral programs; rehearsal techniques; classroom management skills. Prerequisites: MUE 326, 327, MU 425, or permission of instructor.

429 Organizing and Directing Instrumental Groups in Secondary School
2 hrs.
Repertoire, procedures for administering and teaching school bands, orchestras and instrumental ensembles. Prerequisites: MUE 326, 327, 425 or permission of instructor.

520 Arts in the Elementary School Curriculum
3 hrs.
Interdisciplinary approach to teaching the arts in elementary school, including music, movement, theater, and the visual arts. Practical experiences in playing instruments (percussion), moving, drawing, creating, singing, working in clay, play-acting and pantomime. Methodology for integrating the arts through active participation. Offered upon demand.

521 Philosophical Principles of Music Education
3 hr.
Philosophical base of music education, its justification in the public school curriculum, and criteria for determining its objectives. Application of aesthetic theory to analysis and evaluation of music. Offered upon demand.

Philosophy Department
322 Morton Hall
Telephone (256) 824-6555
Email: philos@uah.edu

Professor Martine (Chair); Associate Professors Cling, Rochowiak; Assistant Professors Heikes, Mackintosh, Wilkerson.

The world of ordinary experience is founded upon a great number of presuppositions about the nature and extent of knowledge, the character of reality, and the foundations of value. These interconnected presuppositions, though seldom exposed to critical reflection, form the basis for our judgments and actions in every area of human concern. The essential task of philosophy is to move beyond an uncritical acceptance of these presuppositions toward a reflective appraisal of the effect they have upon one’s understanding of self and the world around one. By examining traditional philosophical positions as well as the ideas of influential contemporary thinkers, courses in philosophy offer students the opportunity to develop informed and responsible positions of their own.
Philosophy Major

Students majoring in philosophy must complete a minimum of 30 semester hours in philosophy with at least 21 hours at the 300-level or above. The following courses are required of all philosophy majors: PHL 201, 202, 301, 302, 395, and at least one course at the 400-level. Philosophy majors must also complete a minor consisting of a minimum of 18 hours in a single discipline (with other requirements as specified by the minor department) or a minimum of 21 semester hours in a cognate area of closely related courses approved by the Philosophy Department, with 12 of these hours at the 300-level or above.

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Morton Hall, Room 322) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

Philosophy Minor

Students minoring in philosophy must complete at least 21 semester hours in philosophy including PHL 201 and 202. Recommendations concerning which courses might best complement a student's major and related interests are available from the philosophy faculty upon request. Appropriate philosophy courses may also be used as part of a program of cognate studies with other disciplines. Such a program must include at least 12 semester hours in courses numbered 300 or above.

An Illustrative Plan for Completing the B.A. Degree

With a Major in Philosophy*

The following is one possible four-year program of study for a Philosophy major. (It is intended only to demonstrate that a Philosophy major can easily be completed within four years of matriculation. It should not be taken to be a recommended curriculum.) Many students majoring in Philosophy opt to do a second major in a related area of study and the following scheme also shows that doing so is readily possible. The many free electives sketched below could be used to turn the minor area of study into a second major.

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td></td>
<td>EH 101</td>
<td>EH 102</td>
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<td></td>
<td>PHL 101</td>
<td>PHL 202</td>
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<td></td>
<td>HY 101</td>
<td>HY 102</td>
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<td>Math</td>
<td>Social Science</td>
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<td>Natural Science</td>
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<tr>
<td>Second Year</td>
<td>PHL 201</td>
<td>Sophomore Literature</td>
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<td>Foreign Lang.</td>
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<td>Sophomore Literature</td>
<td>Social science</td>
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<td>Fine Arts</td>
<td>PHL Elective</td>
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<td>Third Year</td>
<td>PHL 301</td>
<td>PHL 302</td>
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<td>PHL Elective</td>
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<td>Free Elective</td>
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<td>30</td>
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College of Liberal Arts
### Philosophy (PHL)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHL 395</td>
<td>PHL 4*</td>
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<td>PHL Elective</td>
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<tr>
<td>Free Elective</td>
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</tr>
<tr>
<td></td>
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<td>15</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>129</td>
</tr>
</tbody>
</table>

*This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a major in Philosophy. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.*

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHL 101</td>
<td>Being, Knowledge, and Value</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Introduction to philosophical reflection focusing upon central problems in each of the major branches of the western tradition: metaphysics, epistemology and axiology.</td>
<td></td>
</tr>
<tr>
<td>PHL 201</td>
<td>Introduction to Logic</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Methodology of correct formal and informal reasoning.</td>
<td></td>
</tr>
<tr>
<td>PHL 202</td>
<td>Introduction to Ethics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Major ethical positions in both classical and modern thought. The course will include a consideration of case studies drawn from practical contexts in engineering, medicine and other areas.</td>
<td></td>
</tr>
<tr>
<td>PHL 301</td>
<td>Ancient Philosophy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Survey of classical philosophy from the Pre-Socratics through Aristotle. Prerequisite: PHL 101 or permission of instructor.</td>
<td></td>
</tr>
<tr>
<td>PHL 302</td>
<td>Modern Philosophy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Survey of the British and Continental traditions from Descartes through Kant. Prerequisite: PHL 101 or permission of instructor.</td>
<td></td>
</tr>
<tr>
<td>PHL 303</td>
<td>Contemporary Philosophy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Examination of some of the most important trends in late nineteenth and twentieth century thought. Prerequisite: PHL 101 or permission of instructor.</td>
<td></td>
</tr>
<tr>
<td>PHL 310</td>
<td>Philosophy of Art</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Major aesthetic theories of the western tradition, with emphasis on the relation between artistic and discursive expression. Prerequisite: PHL 101 or permission of instructor.</td>
<td></td>
</tr>
<tr>
<td>PHL 311</td>
<td>Philosophy of Science</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Critical assessment of the historical and logical foundations of the natural and theoretical sciences. Prerequisite: PHL 101 or permission of instructor.</td>
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<tr>
<td>PHL 312</td>
<td>American Philosophy</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Survey of American thought with emphasis upon the development of pragmatism in the work of Peirce, James, and Dewey. Prerequisite: PHL 101 or permission of instructor.</td>
<td></td>
</tr>
<tr>
<td>PHL 314</td>
<td>Philosophy of Eastern and Western Religions</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Philosophical examination of eastern and western religious thought. Central tenets of some of the following traditions will be discussed: Buddhism, Christianity, Confucianism, Hinduism, Islam, Judaism, Taoism. Topics include: the roles of reason and faith in the religious life, proofs for the existence of God, the nature of God or the Absolute, mysticism, religious accounts of human nature or the self. Prerequisite: PHL 101 or permission of instructor.</td>
<td></td>
</tr>
<tr>
<td>PHL 315</td>
<td>Biomedical Ethics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Introduces basic concepts of biomedical ethics; fosters careful reflective thought about the challenging value questions raised by advances in biology, medicine, and medical technologies. Prerequisite: PHL 101 or 202.</td>
<td></td>
</tr>
</tbody>
</table>
Computation and Cognition  3 hrs.
From philosophers to computer and brain scientists, cognition has become a central area of philosophical and scientific inquiry. This course examines the various models, theories, and arguments generated by this research. Prerequisite: PHL 101 or permission of instructor.

Symbolic Logic  3 hrs.
Symbolic deductive logic, including propositional calculus (truth-functional logic), predicate calculus (propositional functions and quantification), and the logic of relations. Prerequisite: PHL 201.

Classical Political Philosophy  3 hrs.
(Formerly PHL 316) Careful analysis of the roots of political inquiry in selected works of ancient and medieval political philosophers such as Socrates, Plato, Aristotle, Cicero, Augustine and Aquinas. Major themes include the search for the just social order, the proper relationship between the citizen and the state, and other fundamental concepts of western political institutions. (Same as PSC 330.)

Modern Political Philosophy  3 hrs.
(Formerly PHL 317) Critical examination of the philosophical foundations for modern politics that emerged from the 15th through the 19th century in western Europe. Major themes and theorists include the concepts of individual rights, property, representation, majority rule, limited government, and revolution discussed in selected writings of Machiavelli, Hobbes, Locke, Rousseau, and J.S. Mill among others. (Same as PSC 332.)

Feminist Philosophy  3 hrs.
Philosophical examination of the status of women in contemporary society, dealing with basic issues in feminist epistemology, the debate between essentialist and constructionist views on the nature of femininity, and the intersections of gender issues with other forms of oppression. May also cover issues in feminist political theory and feminist ethics. Prerequisite: PHL 101 or permission of instructor.

Selected Topics in the History of Philosophy  3 hrs.
Intensive examination of particular problems, periods, or movements in the history of philosophy. Prerequisite: Determination in accordance with course content.

Junior Research Seminar  3 hrs.
Intensive examination of selected topics leading to the preparation of a substantial philosophical paper. Required of all majors. May be taken twice for credit. Prerequisites: 6 hours of PHL not including PHL 201.

Directed Study in Philosophy  1-3 hrs.
Independent study in an area of philosophy selected in consultation with faculty advisor. Prerequisite: Approval of department chair.

Metaphysics  3 hrs.
Critical examination of traditional and contemporary responses to questions about the nature of reality, the relation between determinate and indeterminate being, being and becoming, the infinite and the finite. Prerequisite: 6 hours of PHL not including PHL 201.

Epistemology  3 hrs.
Investigation of fundamental problems of knowledge such as the relation of knowledge and belief, truth, certainty and skepticism, perception, logic, explanation, and justification. Prerequisite: 6 hours of PHL not including PHL 201.

Advanced Moral Philosophy  3 hrs.
Critical examination of significant works in moral and political philosophy focusing on such issues as the relationship between morality and human nature, the individual and the state, and the consequences of actions. Prerequisites: 6 hours of PHL not including PHL 201.
The Department of Political Science offers the Bachelor of Arts in political science and the Master of Arts in public affairs.

Political science is the study of government, governance, politics, and the state. The major sub-fields of the discipline include political theory and philosophy, international relations, foreign governments and comparative politics, public law, research methods, public policy, and American politics. The latter includes national, state, and local political institutions and processes, federalism, and intergovernmental relations.

General Education Requirements
PSC 101 (American Government), PSC 102 (Comparative Politics and Foreign Governments), and PSC 260 (Introduction to International Relations) are the courses that may be used to fulfill General Education Requirements (GER).

Political Science Major
Students wishing to major in political science must complete a minimum of 33 semester hours in political science, including:
PSC 101 - American Government
PSC 102 - Comparative Politics and Foreign Governments
PSC 103 - State and Local Government
PSC 260 - Introduction to International Relations
PSC 330 - Classical Political Philosophy or
PSC 332 - Modern Political Philosophy
PSC 484 - Senior Seminar in Political Science (during the junior or senior year)

In addition, each political science major must complete AHS 300 (Statistical Analysis).

Students with a major in political science must choose either a minor from another discipline or 21 hours of cognate studies involving courses from two or more disciplines, of which 12 hours must be in upper level courses with a minimum of 6 hours from each discipline.

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate a Program of Study either by meeting with the departmental chair (Morton Hall, Room 250) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216). Transfer students are advised to consult with the chair of the department before scheduling courses.

Guidelines for curriculum planning in political science are available in the department office. These guidelines are designed to consider such intellectual and vocational interests as prelaw training, international studies, public service, and preparation for graduate study.

Political Science Minor
The student choosing a minor in political science must take 21 hours of course work including PSC 101, 102 and 484 (during the junior or senior year).
Second Area of Study for Elementary Education Majors

PSC 101 - American Government
PSC 102 - Comparative Politics and Foreign Governments
PSC 103 - State and Local Government
PSC 484 - Senior Seminar
6 additional hours of political science

Internship Programs
The Department of Political Science has an internship option for students in political science and public affairs. Internships bridge the gap between learning experience and entry into professional life. Normally, students must have junior status or above to be considered for this option.

An Illustrative Plan for Completing the B.A. Degree With a Major in Political Science*

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<thead>
<tr>
<th>Freshman</th>
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<th>Spring</th>
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<td>PSC 103</td>
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<td>FL 101</td>
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<td>PSC 260</td>
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<td>EH 206 or 241 or 230 or 251</td>
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<td>PSC 484</td>
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253 College of Liberal Arts
This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a major in Political Science. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.

### Political Science (PSC)

#### 101 American Government
3 hrs.
Introductory examination of American government and politics.

#### 102 Comparative Politics and Foreign Governments
3 hrs.
Survey of government and politics in industrializing, post-industrial, and modernizing countries.

#### 103 State and Local Government
3 hrs.
Introduction to state and local governments in America. Examination of different governmental forms and their impact on public policies.

#### 260 Introduction to International Relations
3 hrs.
Examination of the basic factors underlying the conduct of international relations, focusing on the forces affecting the change and direction of the present state system. Special attention is given to the forces affecting war and peace. Prerequisite: PSC 101.

#### 280 Special Topics I
3 hrs.
Selected topics in local, state, national and world politics. Prerequisite: permission of chair.

#### 302 The American Congress
3 hrs.
Examination of the organization and role of the Congress, its leadership, internal processes, and relationship with other parts of the American political system. Prerequisite: PSC 101.

#### 304 American Presidency
3 hrs.
Role of the president in the American political system. Special emphasis on internal functioning of executive branch of government through analysis of structure and techniques of the national administration. Prerequisite: PSC 101.

#### 306 American Federalism
3 hrs.
Examination of the theory and practice of American federalism with emphasis on the constitutional framework, intergovernmental relations and the changing roles of state and local governments. Prerequisite: PSC 101.

#### 309 Political Parties and Interest Groups
3 hrs.
Reviews the roles of two major "linkage" institutions in U.S. politics. Considers the organizational features of these institutions and their impact on the electoral and policy-making processes. Prerequisite: PSC 101.

#### 310 Elections and Public Opinion
3 hrs.
Consideration of American elections and public opinion with focus on national elections. Changing patterns and methods of influencing public opinion are examined. Prerequisite: PSC 101.

#### 330 Classical Political Philosophy
3 hrs.
Careful analysis of the roots of political inquiry in selected works of ancient and medieval political philosophers such as Socrates, Plato, Aristotle, Cicero, Augustine and Aquinas. Major themes include the search for the just social order, the proper relationship between the citizen and the state, and other fundamental concepts of western political institutions. Prerequisite: 9 hours of PSC, PHL and/or HY. (Same as PHL 330.)

#### 332 Modern Political Philosophy
3 hrs.
Critical examination of the philosophical foundations for modern politics that emerged from the 15th through the 19th century in western Europe. Major themes and theorists include the concepts of individual rights, property, representation, majority rule, limited government, and revolution discussed in selected writings of Machiavelli, Hobbes, Locke, Rousseau, and J.S. Mill among others. Prerequisite: 9 hours of PSC, PHL and/or HY. (Same as PHL 332.)
334 American Political Thought 3 hrs.
In-depth study of theorists, concepts, and forces that have shaped American political values from the founding of the republic to the present. Major themes include the relationship between liberty and equality, rights and democracy, and industrialization and the public good. Prerequisite: PSC 101.

340 Government and Politics of Industrializing & Post Industrial Countries 3 hrs.
Examination of selected advanced industrialized countries and countries that have significant influence on the developed world. Themes will vary but will generally include presidential and parliamentary forms of democracy, political parties and mass participation, and the role of the government in the economy. Prerequisite: PSC 101; 102 recommended.

341 Government and Politics of Modernizing Countries 3 hrs.
Examination of selected nations in Latin America, Asia, the Middle East, and Africa which are undergoing political and economic modernization. Themes will vary but will generally include the role of democracy in development, political institutionalization, and the roles of religion and ethnicity. Prerequisite: PSC 101; 102 recommended.

351 Introduction to American Legal Systems 3 hrs.
Structure, jurisdiction, procedures, and impact of the courts in administration of justice. Focus on the roles of the major participants in the legal system. Both criminal and civil justice topics are covered. Prerequisite: PSC 101; 102 recommended.

412 Public Administration 3 hrs.
Examination of public agencies and their relationships with legislative and elected executive officials. National, state, and local case studies are utilized to illustrate administrative problems including leadership, decision making, communications, and staff-line conflict. Prerequisite: PSC 101.

416 Alabama & Southern Politics 3 hrs.
Surveys the government and politics of Alabama and provides an overview of the political culture in the American South. Prerequisite: PSC 101.

418 Urban Politics 3 hrs.
Examination of urban politics in America with attention given to urban problems, urban environment, governmental forms, power structures, and policy outputs. Prerequisite: PSC 101, 103; PSC 306 recommended.

436 Political Ideologies 3 hrs.
Critical examination of the nature of modern ideologies. Among the major ideologies studied will be important examples of conservatism, liberalism, socialism, communism, and fascism in theory and practice. Prerequisite: PSC 101.

438 Contemporary Political Thought 3 hrs.
Systematic study of recent and current thinking on issues and problems of politics, social theory and ethics. Prerequisites: 9 hours PSC, PHL, and/or HY.

452 American Constitutional Law 3 hrs.
Policy-making role of the Supreme Court in the American political system through analysis of leading cases in interpreting the constitution. Prerequisite: PSC 101; 351 recommended.

454 Civil Liberties 3 hrs.
Judicial interpretations of contemporary questions involving rights of individuals and limits of freedom of action in American society. Prerequisite: PSC 101; 351 and/or HY 318 recommended.

464 American Foreign Policy 3 hrs.
Institutions, processes, interests and personalities affecting the formation of American foreign policy. Prerequisite: PSC 101; 102 recommended.

468 United States National Security Policy 3 hrs.
Examination of the substance and decision making processes behind the national security policies of the United States. Includes a discussion of the historical rationale of the policy as well as the current military, economic, technological, and social challenges confronting the country. Prerequisite: PSC 101; 102, 260 recommended.
480  **Advanced Topics in Political Science**  3 hrs.
Selected topics in local, state, national and world politics. May be repeated for up to 6 hours credit. Prerequisite: permission of the department chair.

484  **Senior Seminar in Political Science**  3 hrs.
Advanced examination into the subfields of political science offered by the department. May be repeated with different faculty for up to 6 hours credit. Prerequisites: PSC 101, advanced status in political science and permission of the department chair.

495  **Internship in Government**  1-6 hrs.
Undergraduates may receive from 1 to 6 hours of academic credit for an internship with local, state, or federal governmental agencies. Students must attend internship seminars, keep a log of activities, and submit a report on their internship.

500  **The American Polity**  3 hrs.
A comprehensive and intensive review of the foundations, institutions, and dynamics of the American polity and the relationship of these forces to the making of public policy. Junior or senior standing and permission of the department chair.

501  **Approaches to Public Policy**  3 hrs.
An introduction to the study of public policy in the United States, including analysis of the various decision-making and process models. Permission of the department chair.

510  **Public Management Profession: Theory and Practice**  3 hrs.
Introduction to public management as a field of study and practice. Review of basic literature. Emphasis on ethics in public service. Prerequisite: Junior or senior standing and permission of the department chair.

580  **Special Topics in Political Science**  1-3 hrs.
Selected topics in local, state, national and world politics.

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**Psychology Department**

335 Morton Hall
Telephone: (256) 824-6191
Email: psychol@uah.edu

Professor Kirkpatrick; Associate Professor Carpenter (Chair); Assistant Professors Eaton, Neuschatz, Pettibone, Torres.

The Department of Psychology offers the B.A. and M.A. degrees in psychology. Psychology is an exciting and interesting scientific field that concerns why people think and behave the way they do. It is a tremendously varied field and a discipline with a bright and promising future. Though relatively young, psychology is an expansive discipline that incorporates topics from other disciplines such as biology, business, engineering, and education. Studying psychology requires students to solve problems, reason verbally and quantitatively, organize material, think critically, communicate clearly, and work effectively with others. At UAH, the psychology department is small and very student-centered. Students may take courses in clinical, experimental, social, developmental, cognitive, perceptual, biological, engineering, industrial, and animal psychology. In particular, students are required to gain an appreciation of the methods and tools used by psychologists to perform research. Our capstone course in supervised research allows majors to demonstrate those skills working with individual faculty members.

**Psychology Major**

The program of study for a psychology major includes 35 hours of psychology with at least 26 hours that numbered 300 or above. In addition, the psychology major must be accompanied by a minor that meets the requirements designated by the selected discipline. Course work required for the major is specified below in **Curriculum for Majors**. Students planning to
major in psychology are advised to 1) read and follow prerequisite requirements (see Prerequisites), and 2) complete PY 101, PY 102, AHS 300, and PY 302 no later than the sophomore year.

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Morton Hall, Room 335) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

Psychology Minor
A minor in psychology consists of 21 hours of psychology courses of which 15 hours must be numbered 300 or above. Course work required for the minor is specified below in Curriculum for Minors.

Psychology for Students Seeking Teacher Certification
Students desiring certification should obtain preliminary academic counseling in the Department of Education. A student majoring in elementary education may choose psychology as the second area of study. Course work required for a second area of study for elementary education majors is specified below in Second Area of Study for Elementary Education Majors. Certification requirements can be found in the Department of Education section. Curricula which include teacher certification may require more than the minimum total of 128 hours for the degree.

Prerequisites
All psychology courses numbered 200 and above require satisfactory completion of PY 101 and some require PY 102. Prior to enrollment in PY 302, a student must complete AHS 300, Statistical Analysis. PY 302 should be taken prior to enrollment in any Group A courses. Preferably, courses numbered 400 or 500 should not be taken prior to the senior year; in no case should a student enroll in these courses until the last semester of the junior year.

Curriculum for Majors
Required:
- PY 101-102 General Psychology I and II
- AHS 300 Statistical Analysis
- PY 302* Experimental Psychology
- PY 498 Human Research I
- Two courses from Group A (See below)
- Two courses from Group B (See below)
- Elective
- Elective

* AHS 300 is a prerequisite for PY 302.

Group A:
- PY 314 - Learning
- PY 316 - Perception
- PY 380 - Cognition
- PY 436 - Biological Psychology

Group B:
- PY 301 - Personality
- PY 315 - Developmental Psychology
- PY 375 - Social Psychology
- PY 433 - Abnormal & Health Psychology for the Human Services Professions
Curriculum for Minors
- PY 101-102 General Psychology I and II
- One course from Group A (See above)
- One course from Group B (See above)
- Additional coursework 200-level and above

Curricula for Students Seeking Teacher Certification

Second Area of Study for Elementary Education Majors
- PY 101-102 General Psychology I and II
- PY 314 or 380 Learning or Cognition
- PY 315 Developmental Psychology
- PY 375 Social Psychology
- PY 301 or 433 Personality or Abnormal and Health Psychology for the Human Services Professions

Social Science Composite for Secondary Education Majors
- Students planning to teach psychology in secondary schools will need to complete the Social Science Composite which includes courses in history, psychology, sociology, political science, and economics. The psychology courses included in this composite are PY 101, PY 102, and PY 375. Students seeking certification in secondary education should contact the Education Department for specific requirements.

Dr. Daniel G. Hays Memorial Scholarship
- A departmental scholarship was established in memory of Dr. Daniel G. Hays, former Associate Professor of Psychology at UAH. This psychology scholarship may be awarded to undergraduate or graduate students enrolled in the College of Liberal Arts who require financial assistance. Students must have earned a high school diploma or college degree and demonstrated leadership potential, along with participation in community and professional activities, which may include those in the field of psychology.

Dr. Robert E. James Endowed Scholarship
- A departmental scholarship awarded to one or more full-time psychology major(s) who have completed a minimum of six credit hours of introductory psychology classes at UAH, or who are currently enrolled in the second course at UAH. Award is based on academic merit, citizenship, and leadership, with regard to demonstrated financial need as a secondary consideration.

An Illustrative Plan for Completing the B.A. Degree
With a Major in Psychology*

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Fall</th>
<th>Spring</th>
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| Sophomore         | Foreign Language      | 5                     |
|                   | EH 205, 240, or 250   | 3                     |
|                   | Elective              | 3                     |
|                   | AHS 300               | 4                     |
|                   |                       | 15                    |

| College of Liberal Arts | 258 |

*For the Human Services Professions
**Junior**

<table>
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<th>Course</th>
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**Senior**

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<td>PY Elective</td>
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<td>PY 500</td>
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<td>Elective</td>
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<td>Minor</td>
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</table>

*This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a major in Psychology. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.*

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**Psychology (PY)**

101 **General Psychology I**

This course may be applied to the G.E.R. Introduction to methods and research findings in the field. Topics include historical perspectives, learning, memory, cognition, language, the biological and social basis of behavior, sensation, perception, human development, personality theories, and abnormal behavior. Students are encouraged to participate in approved experiential activities. These activities include participating in research studies, attending lectures, reading psychological literature, and viewing videos. All activities are designed to illustrate the development, testing, and validation of psychological knowledge. Credit for PY 101 may be obtained by either Advanced Placement or the College Level Examination Program (CLEP).

102 **General Psychology II**

Introduction to applied topics in psychology, such as statistical analysis, counseling, human factors, health psychology, and industrial and organizational psychology. Career opportunities are discussed. Students are encouraged to engage in approved experiential activities such as participating in current research studies, attending lectures, reading psychological literature, and viewing videos. All experiences are designed to illustrate the development, testing, and validation of psychological knowledge. Prerequisite: PY 101.

201 **Life-Span Development**

This course may be applied to the G.E.R. Examination of the psychological, social, and physical factors that affect human behavior and development from conception to death. The student is encouraged to participate in approved experiential activities, including participating in research studies, attending lectures, reading psychological literature, and viewing videos. All activities are designed to illustrate the development, testing, and validation of psychological knowledge. Prerequisite: PY 101.

207 **Psychology of Personal Adjustment**

Application of basic principles in psychology to origin and resolution of personal conflicts. The student is encouraged to engage in approved experiential activities such as acting as participants in current research studies or laboratories, attending lectures, and viewing videos designed to illustrate the development, testing and validation of psychological knowledge. Prerequisites: PY 101 and 102.
301 Personality
Examination of various theories of personality with possible implications for research. Prerequisites: PY 101, 102 or written permission of the instructor.

302 Experimental Psychology
Design and execution of experiments in psychology. Data analysis and manuscript preparation. Prerequisites: PY 101, 102 and AHS 300. Lab Fee: $30.

310 Child Psychology
The process of development in the human organism. Research, practical, and theoretical orientation used to explore developmental issues and processes will be examined. Prerequisite: PY 101.

311 Individual Differences: Tests and Measurements
Individually unique patterns of behavior such as intelligence and personality are discussed. Both social and biological influences are examined. Aspects of psychological testing and evaluation are included. Prerequisites: PY 101, 102, and AHS 300.

314 Learning
Analysis of learning principles from simple relationships with animals to the complexities of human language and problem solving. Prerequisites: PY 101, 102, or written permission of the instructor; 3 hrs. PY 300-level or above. PY 302 strongly recommended.

315 Developmental Psychology
Cognitive, psychoanalytic, ethological, behavioral, and humanistic theories of development. Prerequisites: PY 101 and 102 or written permission of the instructor. PY 310 recommended.

316 Perception
Examines sensory systems and elements of perception. Topics include vision research, audition, chemical senses, and body sensations. Prerequisites: PY 101, 102 or written permission of the instructor, 3 hrs. PY 300-level or above. PY 302 strongly recommended.

330 Psychology of Nonverbal Communication
Investigates processes of nonverbal communication such as body language, gestures and paralinguistics through empirical studies and naturalistic observation. Prerequisites: PY 101 or 3 hrs. CM. AHS 300 strongly recommended. (Same as CM 330.)

375 Social Psychology
Examination of the social influences on both individual and group behavior. Topics may include attitudes, group processes, intergroup conflict, interpersonal attraction, aggression, altruism, and impression formation. Prerequisite: SOC 100 or PY 101. (Same as SOC 375.)

380 Cognition
Information processing: how information is acquired, encoded, organized, stored, and retrieved. This process will be applied to specific areas of psychology such as language, learning, or personality. Prerequisites: PY 101, 102, or written permission of the instructor; 3 hrs. PY 300-level or above. PY 302 strongly recommended.

Courses listed below are open to students who are seniors or those enrolled in the last semester of their junior year.

402 Industrial and Organizational Psychology
Application of basic principles of learning, motivation, and perception to typical industrial and organizational problems. Prerequisite: Senior/graduate standing. (Same as ISE 402.)

403 Human Factors Psychology
Human performance in human-technology-environment systems. Includes consideration of human capabilities and limitations as related to controls and displays, and the role of human cognition in decision making and training effectiveness. Prerequisite: Senior/graduate standing. (Same as ISE 403.)
405 Psychopharmacology 3 hrs.
Introduction to drug classification and action with emphasis on physiological and psychological interactions. Prerequisites: 9 hours PY or BYS. (Same as BYS 405.)

420 Social Topics 3 hrs.
Pre-announced special areas in seminar discussion, laboratory work, or practicum. May be taken twice for credit.

422 Individual Research 3 hrs.
With advice of instructor, design and execution of original experiment in psychology. Prerequisites: 15 hours PY and approval of instructor. May be taken twice for credit.

426 History and Systems in Psychology 3 hrs.
Survey of psychological theory and experimentation regarding human behavior and mental processes from ancient times to the present. Prerequisites: 9 hrs. PY 300-level or above.

433 Abnormal and Health Psychology for the Human Services Professions 3 hrs.
Survey of major psychological approaches to conceptualizing abnormal behavior, with discussion of present diagnostic categories of psychological disorders. Prerequisites: PY 101 and 102. PY 301 strongly recommended.

436 Biological Psychology 3 hrs.
Neural and endocrinological systems underlying behavior. Prerequisites (either a or b): (a) 15 hrs. of PY or approval of instructor; (b) BYS 119 and BYS 120 and 6 hours of PY or approval of instructor. (Same as BYS 436.)

437 Psychobiology of Stress and Illness 3 hrs.
Overview of physiological stress responses and their influence on health behavior and illness. Prerequisite: 9 hours PY or BYS. (Same as BYS 437.)

490 Readings in Psychology 3 hrs.
Supervised in-depth readings in area of particular interest to student. Prerequisites: 12 hrs. PY 300-level or above and approval of instructor. May be taken twice for credit.

491 Special Topic in Psychology 1 hr.
Pre-announced special areas in seminar discussion, laboratory work, or practicum. Prerequisites: 9 hours PY 300-level or above. May be taken twice for credit.

492 Special Topic in Psychology 2 hrs.
Pre-announced special areas in seminar discussion, laboratory work, or practicum. Prerequisites: 9 hours PY 300-level or above. May be taken twice for credit.

498 Human Research I 3 hrs.
Capstone course for the PY major. Human behavior observation and/or experimentation. Students engage in data collection and analysis, and report their findings in a research paper and an oral presentation. Prerequisites: PY 302; 9 hours PY 300-level or above and senior/graduate standing. Lab Fee: $30. (Offered Fall Semester only)

499 Human Research II 3 hrs.
Continuation of PY 498. Prerequisite: PY 499 and approval of instructor. Lab Fee: $30. (Offered Spring Semester only)

502 Industrial and Organizational Psychology 3 hrs.
Application of basic principles of learning, motivation, and perception to typical industrial and organizational problems. Prerequisite: Senior/graduate standing. (Same as ISE 502.)

503 Human Factors Psychology 3 hrs.
Human performance in human-technology-environment systems. Includes consideration of human capabilities and limitations as related to controls and displays, and the role of human cognition in decision making and training effectiveness. Prerequisite: Senior/graduate standing. (Same as ISE 503.)

505 Psychopharmacology 3 hrs.
Introduction to drug classification and action with emphasis on physiological and psychological interactions. Prerequisites: 9 hours PY or BYS. (Same as BYS 505.)
520  **Special Topics**  3 hrs.
Pre-announced special areas in seminar discussion, laboratory work, or practicum. May be taken twice for credit.

530  **Psychometrics**  3 hrs.
History and development of psychological testing with special emphasis given to both theory and process of effective evaluation. Prerequisites: 15 hours PY or graduate standing and permission of instructor.

535  **Theories of Abnormal Psychology**  3 hrs.
Selected disorders such as depression, anxiety disorders, and personality disorders from different theoretical orientations with emphasis on cognitive behavioral theory. Prerequisites: PY 433 or approval of instructor and senior/graduate standing.

536  **Psychobiology of Stress and Illness**  3 hrs.
Overview of physiological stress responses and their influence on health behavior and illness. Prerequisite: 9 hours PY or BYS. (Same as BYS 536.)

540  **Animal Behavior**  3 hrs.
Examines the experimental and theoretical foundations of the study of animal behavior. Animal behavior will be discussed in terms of immediate mechanisms, development, survival value, and evolution. Some emphasis will be placed on the relevance of animal behavior to human behavior and on the importance of understanding behavior in context. Prerequisites: PY 101, 102, & 103 or BYS 119, 120, & 4 additional hours in BYS. (Same as BYS 540.)

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**Sociology Department**

344 Morton Hall
Telephone: (256) 824-6190
Email: soc@uah.edu

Associate Professors: Colclough (Chair), Finley, Sitaraman; Assistant Professors Berbrier, Brunsma.

The Department of Sociology offers the B.A. with a major in sociology, a minor in sociology and sociology as a second area of study or cognate.

**Sociology Major**

In addition to the General Education Requirements (GER) for the B.A., students who major in sociology must complete 34 hours of sociology courses including:

- SOC 100 Introduction to Sociology
- AHS 300 Statistical Analysis
- SOC 300 Research Methods
- SOC 465 Sociological Theory

A minimum of 21 hours must be taken in courses numbered 300 or above.

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Morton Hall, Room 344) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

Suggested courses for students planning careers in business include: SOC 439 (Complex Organizations), SOC 455 (Sociology of Work and Occupations), SOC 330 (Race and Ethnicity), SOC 315 (Cultural Change), SOC 350 (Class, Status, and Power), and SOC 230 (Mass media in America).
Suggested courses for students planning careers in social services include: SOC 106 (Marriage and Family), SOC 306 (Gender Roles), SOC 330 (Race and Ethnicity), SOC 350 (Class, Status, and Power), SOC 319 (Deviance and Social Control), SOC 375 (Social Psychology), and SOC 102 (Social Problems).

For those requiring a general curriculum in sociology and/or those planning to attend graduate school in the field, a combination of both micro and macro courses is advised.

**Sociology Minor**

A student developing a minor in sociology with a major in another discipline must complete 21 hours of sociology courses including SOC 100. A minimum of 12 hours should be in courses numbered 300 or above. Sociology courses may also be used in conjunction with courses from other disciplines to form a cognate area of study. Such a program should be developed with the advice of the sociology faculty and approved by the chair of the student's major department.

**Sociology for a Second Area of Study**

Students majoring in elementary education may select sociology as their second area of study. See major requirement in the Education section. To meet university requirements, students must complete a minimum of 18 hours in sociology, 12 of which must be above the 300-level in sociology. Courses should be chosen with the help of the education advisor and approval of the chair of the Department of Sociology. The recommended program is:

1. SOC 100 Introduction to Sociology
2. SOC 102 Social Problems or SOC 106 Marriage and Family
3. SOC 325 Sociology of Education
4. 3 additional courses in sociology at the level of 300 or above

(The following courses are especially useful for teachers: SOC 306, SOC 310, SOC 311, SOC 330, SOC 350, SOC 375)

**An Illustrative Plan for Completing the B.A. Degree With a Major in Sociology**

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Fall</th>
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<th>Spring</th>
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<tbody>
<tr>
<td></td>
<td>SOC 101</td>
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<td>SOC any level</td>
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<td>EH 101</td>
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<td>EH 102</td>
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<td></td>
<td>Mathematics</td>
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<td>Natural Science</td>
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<td>Foreign Language</td>
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<td>Humanities/Fine Arts</td>
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<tr>
<td>Sophomore</td>
<td>SOC any level</td>
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<td>SOC any level</td>
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<td></td>
<td>EH Lit</td>
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<td>HY101</td>
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<td></td>
<td>Minor</td>
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<td>Fine Arts</td>
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<td>Natural Science</td>
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<td>Social Science</td>
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<td>Junior</td>
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<td>SOC 300 or above</td>
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<td>Social Science</td>
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<td>Humanities/Fine Arts</td>
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<td>SOC 300 or above</td>
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<td>Social Science</td>
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</table>
Senior  SOC 300 or above  3  SOC 300 or above  3  
SOC 465  3  Elective  9  
Minor  6  Minor  6  
Elective  3  
15  18  33  
Total Hours  130  

*This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a major in Sociology. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.

Sociology (SOC)

100  Introduction to Sociology  3 hrs.  
Perspective methods, concepts, and general findings of the sociologist. Historical and conceptual development of sociology.

The following lower-division sociology courses listed below are open to students who have completed SOC 100.

102  Analysis of Social Problems  3 hrs.  
Sociological interpretation of contemporary social problems as they relate to significant trends in complex societies.

106  Marriage and Family  3 hrs.  
The family as a social institution, its structure and function in contemporary societies, dating, marital interaction, life cycle, and socialization process.

200  Introduction to Anthropology  3 hrs.  
Origin and development of human ways of life with emphasis on cross-cultural variations in human behavior, belief systems, social institutions, and cultural change.

230  Mass Media in America: Theory and Criticism  3 hrs.  
Mass communication theory, history of American mass media, and criticism of contemporary forms and functions of mass media of communication in the United States. (Same as CM 230.)

300-level sociology courses are open to students who have taken SOC 100.

300  Research Methods  3 hrs.  
Broad and balanced background in various types of social research methods. Fundamental logic and specific techniques in conducting research. Prerequisite: AHS 300. Lab Fee: $40.

301  Qualitative Methods  3 hrs.  
Explores the variety of qualitative approaches to theory development in sociology, including interviewing, participant observation, and content analysis, among others.

306  Gender Roles  3 hrs.  
Social and sexual roles, their interrelationships, and articulation with societal institutions and agencies. Social upheaval that is both cause and effect of sex-role changes in societies in transition.

310  Sociology of Childhood  3 hrs.  
Environmental influences on socialization of infants and children. Various family roles, school, peer group, and culture as they affect the growing child.

311  Life Span Development  3 hrs.  
Major social influences on human development, change, continuity, and discontinuity from birth to old age. Turning points and role throughout life span. Prerequisite: SOC 310.
### 315 Cultural Change
3 hrs.
Critically explore the processes of modernization and globalization and their impact on cultures, economies, and environments of developing societies. Topics include history and theories of development and case studies that examine the linkages among gender, class, culture, and development.

### 319 Deviance and Social Control
3 hrs.
Examines several approaches to studying deviant behavior and its social control, with emphasis on the social construction of deviance and societal reactions to it. The focus is generally on deviation and control in the U.S.

### 325 The Sociology of Education
3 hrs.
Education as a social institution; its structure, function, and role in contemporary life. (Same as ED 325.)

### 330 Race and Ethnicity
3 hrs.
Among other issues, examines the historical relationship between race, ethnicity, and economic class/opportunity; and the social construction of ethnicity and race. The emphasis is on race and ethnicity in the U.S. with some discussion of international issues.

### 340 Special Topics
1-3 hrs.
Nontraditional topics of current sociological interest. Title of course and number of credit hours when offered, will appear in course schedule along with prerequisites necessary for admission to course. May be taken more than once for credit as long as subtitles differ.

### 345 Social Gerontology
3 hrs.
Theoretical and empirical approach to human aging process with its various social and cultural aspects. Major problems and issues in aging and current programs designed to meet needs of the elderly.

### 350 Class, Status, and Power
3 hrs.
Theoretical questions and frameworks for understanding social stratification. Comparison of different types of stratification systems across time and in different societies.

### 375 Social Psychology
3 hrs.
Fundamental principles of group processes, social influence, and group structure. Development of group solidarity, cohesion, intergroup conflict and cooperation, communication, leadership, opinion, propaganda, and suggestion. Prerequisite: SOC 100 or PY 101,102. (Same as PY 375.)

### 380 The Sociology of Science and Technology
3 hrs.
Survey of the social forces that shape the nature and direction of science and technology. Involves a critical look at modern science and technology. Prerequisite: SOC 100 helpful but not required.

### 382 Political Sociology
3 hrs.
Examination of concepts, theories, and research findings related to the structure of political institution in society and its relation to other social institutions. Stratification, correlates, bases, legitimization, and change of power in society. Prerequisite: SOC 100 or PSC 101. (Same as PSC 382.)

### 390 Readings and Individual Research
3 hrs.
Supervised readings or in-depth research or both in area of specialized interest to student or instructor. Permission of instructor. May be taken twice for credit with advisor's approval.
The department recommends that 400-level courses be reserved for junior or senior standing or by permission of instructor.

439 Complex Organization in Industrial Society 3 hrs.
Mainstream and critical sociological theories for understanding complex organization in industrial societies. Specific areas covered include: historical development, structure and processes, contradictions and conflict, and alternative forms. Prerequisite: Senior or graduate standing/permission of instructor. (Same as PSC 639.)

440 Sociology of Religion 3 hrs.
Among other issues, examines sociological theories of religion, religious organization, religion and social change, and new religious movements, with emphasis on religion in the U.S.

450 Sociology of Health 3 hrs.
Survey of sociological issues relating to the recovery from illness and the maintenance of physical and mental health. Critical look at health care delivery systems and the need for social support systems in society.

455 Sociology of Work and Occupations 3 hrs.
Contemporary work situations and experiences. Alienation in work, impact of technological change and bureaucratization, primary work groups and work culture, professionalization, unionization, workers' self-management experiments, and work-leisure relationship.

460 Feminist Theory 3 hrs.
Examines the perspectives of various interdisciplinary feminist theories and the impact of the epistemological and methodological issues they bring to the field of sociology. (Same as WS 460.)

465 Sociological Theory 3 hrs.
Development of discipline of sociology in terms of major trends of sociological theory, past and present, and major theoretical problem areas. Nature of sociological theory in relation to other disciplines.

MINORS ONLY
The College of Liberal Arts oversees several programs that can be selected by students as a minor in their Program of Study. These programs are described below.

Classical Studies
Dr. Richard Gerberding, Director
410 Roberts Hall
Telephone (256) 824-6310
Email: gerberdingr@email.uah.edu

Classical studies is a program designed to impart an academic familiarity with the languages, history, and culture of ancient Mediterranean society. Its program of study includes various courses taught by several departments within the College of Liberal Arts, arranged so as to fulfill a student's requirements for an academic minor.

Classical Studies Minor
Classical studies differs from other departments' study of the art, history, philosophy, literature, or politics of the classical period by its requirement that the student command a reasonable facility in an ancient language. The point at which a student begins the university-level study of that language will determine the total number of hours required for the minor. If a student begins the language with a course numbered 200 or above, the minor requires the completion of at least 21 credit hours from the following courses. If the student begins with a language course numbered in the 100s, the requirement is 27 hours. For all students, at least 9 of the credit hours must be earned in courses numbered 300 or above, 12 from courses in the same
classical language regardless of language placement level, and 9 from courses in subjects other than that language.

Requirements:
21 hours total (27 hours if language placement is not at 200-level or above)
12 hours in one classical language (regardless of placement level)
9 hours in classes numbered 300 or above
9 hours in classes other than the language.

Classical Studies Courses
- CL 100 - (Art History 100. Survey Ancient to Medieval)
- CL 101 - (Latin 101. Elementary Latin I)
- CL 102 - (Latin 102. Elementary Latin II)
- CL 201 - (Latin 201, Intermediate Latin I)
- CL 202 - (Latin 202, Intermediate Latin II)
- CL 229 - (History 229. Survey of Ancient Times)
- CL 242 - (English 242. Mythology)
- CL 301 - (Philosophy 301. Ancient Philosophy)
- CL 302 - (Art History 301. Ancient Greek Art)
- CL 305 - (Art History 305. Ancient Roman Art)
- CL 329 - (History 329. Imperial Rome)
- CL 330 - (Philosophy 330/Political Science 330. Classical Political Philosophy)
- CL 340 - (Special Topics. Selected special-topics course offered in English, Art History, Philosophy, Foreign Languages and Literatures, or History)
- CL 399 - (Independent Study approved by the director. This may include Latin 399 or an independent study in another discipline.)

Women's Studies Program
344 Morton Hall
(256) 824-6210
Dr. Sandra Carpenter, Director

The Women's Studies program brings together courses and faculty from several colleges of the university to provide an interdisciplinary experience leading to a minor in Women's Studies. As an area of scholarship, the principal focus is on the contributions, perspectives, and experiences of women in all areas of human endeavor. These include the status, portrayal, or achievements of women in areas such as art, history, science, business, engineering, and medicine. While the courses included as Women's Studies courses may be offered in various departments, the minor organizes these courses in a coherent structure such that the sum of the experiences provides a more comprehensive insight into the discipline of Women's Studies than the individual courses provide on their own.

Women's Studies Minor
A minor in Women's Studies consists of 21 semester hours, including three required courses (WS 200, SOC 306, and PHL 335), three core courses, and one elective as shown in the following table. Note that 12 of the 21 semester hours must be at the 300-level or higher. A student interested in minoring in Women's Studies should contact the director of the program for advising.

1. Required courses (9 hrs.)
   - WS 200 - Introduction to Women's Studies
   - SOC 306 - Sociology of Gender
   - PHL 335 - Feminist Philosophy
2. Core Courses - 3 courses required from the following three discipline areas (9 hrs.)

Notes:
1. No more than 6 hours within a single subject area.
2. No more than two of the courses applied to the minor can be from the student's major field of study. No course can be counted toward both a major and minor. WS 340 (Special Topics) or WS 499 (Independent Study) may count as core courses in various subject areas if these courses carry 3 hours credit.

Humanities:
CM 416 - Women Orators
EH 418 - Women Writers
FH 409 - Gender and Representation
HY 367 - Women in U.S. History
Approved Special Topics courses may count toward the minor. Examples within this area include:
EH 540 - Special Topics: African American Writers

Social Sciences:
CM 340 - Gender and Communication
SOC 106 - Marriage and Family
Approved Special Topics courses may count toward the minor. Examples within this area include:
PY 420 - Special Topics: Psychology of Women

Health, Sciences, Business and Technology
MGT 462 - Government Regulation of Employment Relations
NUR 325 - Human Sexuality
NUR 390/500 - Perspectives on Women's Health

3. Elective Course - 1 course from the following (3 hrs.)

ARH 309 - Contemporary Art/Issues
BYS 318 - Vertebrate Reproduction
CM 250 - Interpersonal Communication
CM/PY 330 - Psychology of Non-Verbal Communication
CM 340 - Special Topics: Contemporary Black Rhetoric
EH 331 - American Literature from the Civil War to the Present
EH 391 - Victorian Prose and Poetry
EH 593 - Victorian Novel
EH 500 - Literary Criticism and Theory
HY 365 - American Labor History
PHL 202 - Introduction to Ethics
PHL 303 - Contemporary Philosophy
PSC 438 - Contemporary Political Thought
PY 310 - Child Psychology
PY/SOC 375 - Social Psychology
PY/BYS 536 - Psychobiology of Stress and Illness
SOC 200 - Introduction to Anthropology
SOC 315 - Cultural Change
WS 340 - Special Topics (1-2 credit hours)
WS 499 - Independent Study (1-2 credit hours)

Approved Special Topics courses may count toward the minor. Examples within this area include: FH 399 - Special Topics in French: French Cinema

College of Liberal Arts 268
New courses may be added to this list when approved for inclusion by the Women's Studies Program Advisory Committee. The Women's Studies section for each semester's schedule of classes lists the courses that may be counted toward the minor. Also see our website at www.uah.edu/womensstudies/schedules.html. For descriptions of courses other than those with the WS prefix, see listings of individual departments.

**Women's Studies Courses (WS)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>200</td>
<td>Introduction to Women's Studies</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Focusing on gender as a fundamental category of meaning, introduces methods and approaches to Women's Studies in a variety of disciplines, examining the pervasive and often unacknowledged ways that gender changes our social institutions, individual knowledge, and interpersonal relationships.</td>
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</tr>
<tr>
<td>340</td>
<td>Special Topics</td>
<td>1-3 hrs.</td>
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<tr>
<td></td>
<td>Pre-announced special areas addressed in seminar format, laboratory work, or practicum. May be taken twice for credit. Prerequisite: WS 200.</td>
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<tr>
<td>499</td>
<td>Independent Study</td>
<td>1-3 hrs.</td>
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<tr>
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<td>Readings and/or individual research in an area of specialized interest to both student and instructor. Prerequisite: WS 200 and permission of instructor.</td>
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</table>
Dean: C. Fay Raines, B.S.N., M.S.N., Ph.D., Professor
Associate Dean: Marsha Dowell, B.S.N., M.S.N., Ph.D., Associate Professor

Professor Raines; Clinical Professor Williamson; Associate Professors Dowell, Tanner, Warren;
Clinical Associate Professor Brookman, Cobb; Assistant Professors Hays, Johnson, Shadoin,
South; Clinical Assistant Professors Bonilla, Foote, George, Hendricks, McLeod, Newman,
Redmon, Reisenwitz, Sebring, Showalter, Spearman, Stanfield, Wade, Weed.

The College of Nursing offers the Bachelor of Science in Nursing, the Master of Science in Nursing, and a Post-Master’s Family Nurse Practitioner Certificate. The faculty of the College of Nursing believe that a baccalaureate education in nursing provides the basis for entry into professional nursing practice. The baccalaureate graduate is prepared as a generalist capable of functioning in a variety of roles and health care systems. Registered nurse students have an opportunity to synthesize prior nursing experience with new knowledge. The baccalaureate program is composed of a two-year upper division major, that builds on two years of science, liberal arts, and humanities. A broad array of knowledge and experience essential in the preparation of the professional nurse at the baccalaureate level is provided in all upper division coursework and clinical experiences. Consistent with the philosophy of progressive learning, students focus on health promotion, illness prevention, and adaptation with clients experiencing varying degrees of health. Health promotion, maintenance and restoration are emphasized throughout the program.

The faculty believe that nursing is both an art and a science focusing on health for individuals, families and communities. The baccalaureate program is designed to prepare professional nurses to use expert communication skills as they establish a relationship based on respect and the uniqueness of the individual; critical thinking skills in the diagnosis and treatment of human responses to health and illness, and therapeutic interventions designed to assist in achievement of optimal health.

Throughout the curriculum, students are guided to utilize and build upon the theory base for nursing practice. The undergraduate program is designed to contribute to the personal and intellectual development of students and to assist them in preparing for continued education and successful professional careers. Students engage in classroom learning and clinical experiences that focus on the current health needs of diverse populations.
The College of Nursing is dedicated to excellence in teaching, practice, scholarship, and service. Faculty have the responsibility to educate students of nursing as well as to provide continuing education, to engage in scholarly activities that will develop and extend the discipline of nursing, and to provide service to the nursing profession, the community, and the academic environment in which nursing study resides.

Accreditation
The Bachelor of Science in Nursing (BSN) and the Master of Science in Nursing (MSN) programs offered by the College of Nursing are accredited by the Commission on Collegiate Nursing Education (CCNE) and the National League for Nursing Accrediting Commission (NLNAC). The undergraduate program is also approved by the Alabama Board of Nursing.

Mission
The fundamental purpose of the College of Nursing is to prepare nurses at the baccalaureate and master’s level who are critical thinkers and life-long learners, and are able to practice as caring professionals in a variety of health care delivery systems. As the only institution offering both undergraduate and graduate nursing programs in north Alabama, the college is also a regional center for research activities in nursing. In addition, the college is committed to providing educational services for and in collaboration with agencies for professional nursing development. Educational offerings and faculty practice are both services to community clients and means of improving health care and delivery systems. In order to meet its obligations in teaching, research, scholarly activities, practice and service, the college maintains high quality faculty who are excellent teachers and expert practitioners who add to the body of nursing knowledge.

Degrees and Certificates Offered
The College of Nursing offers bachelor’s and master’s degree programs, as well as a post-master’s family nurse practitioner certificate program. The bachelor’s program includes a track for students who are completing their initial nursing education as well as a track for students currently licensed as registered nurses.

Bachelor’s Degree
The College of Nursing offers the Bachelor of Science in Nursing degree. Classes are offered during the day and evening. The undergraduate program prepares graduates to assume entry-level positions in a variety of health care settings. The program is divided into two components, the lower and upper divisions. Lower division courses provide a broad background in general education, and form the foundation for the professional nursing component of the program. Upper division courses provide the theoretical and practical basis for nursing practice in an increasingly complex health care system. In addition to focusing on essentials of nursing in the hospital, the curriculum also emphasizes community based and primary care. Opportunities to provide care to diverse clients are provided. Use of technology is integrated throughout the program. The program prepares graduates for professional positions immediately after graduation and provides a firm foundation for graduate study.

Bachelor’s Degree for Registered Nurses
Registered nurses who have previously earned diplomas or associate degrees in nursing are admitted to the undergraduate program to meet requirements for the Bachelor of Science in Nursing degree. Prospective students are encouraged to plan their programs of study with advisors in the College of Nursing Office of Student Affairs prior to enrolling in either lower or upper division courses. In recognition of the multiple commitments of registered nurse students, classes are usually offered one day a week. Whenever possible, clinical experiences are arranged at flexible times and at sites convenient to students. Classes are offered on campus and may also be offered at off campus sites. The program for registered nurse students offers opportunities for full- and part-time study. Students who enroll in the full-time option may complete the nursing
component of the program in one calendar year.

The college awards 32 semester hours of validated nursing credit to each registered nurse upon successful completion of NUR 410--Transition into Professional Roles. Additionally, students who are interested in earning the MSN degree may elect to take up to 9 semester hours of selected graduate coursework while completing the BSN degree. Those courses are not repeated if the student is admitted to the MSN program at UAH. Please note that enrollment in graduate courses does not ensure or imply admission to the School of Graduate Studies nor into the College of Nursing master's program at UAH.

More detailed information about opportunities for undergraduate students and registered nurse students may be obtained from the College of Nursing Office of Student Affairs (256) 824-6742.

Master's Degree
The Master of Science in Nursing degree is awarded upon successful completion of one of four tracks at the master's level. Students have the opportunity to become family nurse practitioners, acute care nurse practitioners, adult health nurse specialists, or nursing administrators in a variety of roles including case manager. The curriculum for all tracks builds on core content in theory and research. Additional courses such as health policy, case management, advanced health assessment, pathophysiology and pharmacology are used to strengthen knowledge and practice skills in the appropriate area of study. Practice sites for clinical courses are individually arranged with the student. Classes are usually offered one day per week and may be offered both on campus and at off-campus sites.

Students who successfully complete their program of study are eligible to sit for the national certification examination in their area of expertise.

Post-Master's Certificate
Students already possessing a master's degree in nursing have the opportunity to pursue a family nurse practitioner certificate. Classes for these courses are typically arranged on weekends to allow for full-time employment. Students are admitted to the certificate program on a full-time basis to complete the requirements in one year.

More detailed information about opportunities for students seeking graduate degrees and certification may be obtained from the College of Nursing Office of Student Affairs (256) 824-6742.

Distance Learning
The mission of the College is to provide excellence in teaching, research and service while providing unique opportunities and creative, flexible programs for students, faculty and the community. Distance learning and the use of other new educational technologies are part of the future in the continuing mission.

The College of Nursing offers the RN to BSN courses via interactive television (IITS) to sites in north Alabama. These offerings allow students at distant geographical sites to actively participate in class and clinical learning activities. For further information and class offerings, contact the College of Nursing Office of Student Affairs (256) 824-6742.

Computer Literacy
The College of Nursing acknowledges that health care delivery systems are evolving at an accelerated rate and becoming increasingly reliant on computer technology. Computer literacy is rapidly becoming a basic communication skill. Prior to enrolling in nursing courses, it is suggested that students familiarize themselves with basic computer skills. Students should be able to use a computer to log on to their email account to communicate with other students and faculty. They should be able to log on to the Internet to access class content. Ability to use a word processing program and perform Internet searches for health care related materials are also suggested skills.

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Facilities
The College of Nursing utilizes the facilities and resources of the entire university, the community, and health care agencies. The college is housed in a four-story building centrally located on the UAH campus. Classrooms equipped with current educational technology as well as the Learning Resource Center assist students to learn in multiple ways.

The College of Nursing offers a wide diversity of clinical sites for student experiences. The college has contracts with over 600 health related agencies in Alabama and surrounding states. Madison County has two general hospitals with a licensed capacity of 1,013 beds, a county health department, and numerous skilled nursing homes and home health care agencies. The University of Alabama in Birmingham School of Medicine-Huntsville site also serves as a clinical site for students in the College of Nursing.

Huntsville Hospital System, the largest general hospital in the northern part of Alabama, is the regional medical center for north Alabama and south central Tennessee. The hospital offers comprehensive emergency treatment facilities and the only newborn intensive care unit in north Alabama. Crestwood Hospital is a private general hospital fully equipped to handle most diagnostic and surgical procedures. Rural health clinics across Alabama are also used for student experiences. Other hospitals, clinics, and physicians' offices are also cooperating agencies.

Transportation
Clinical learning experiences are varied in settings and are located within Huntsville and surrounding communities. Students are expected to travel to and from all clinical experiences. Students are responsible for providing their own transportation and carrying appropriate insurance. The College of Nursing is not liable for any traffic violations or auto mishaps during student commutes.

Service and Scholarship
In addition to its teaching mission of providing quality education for students, the College of Nursing provides continuing education for nurses. Educational programs may be offered at the College of Nursing or at individual health care agencies. The faculty and students of the college are committed to the provision of services for the people of Huntsville and surrounding communities. These activities are focused on the improvement of health and healthy behaviors and include such activities as health fairs and screenings.

Faculty and students also conduct and disseminate research to address issues in health care from health policy initiatives and the delivery of services to specific clinical problems. Faculty are also active in the provision of consultative services to a variety of health care agencies and educational institutions.

Advising and Assistance
The focus of advising in the College of Nursing is to assist students to successfully progress toward their educational objectives. The baccalaureate degree program is divided into two components: the lower division and the upper division. All pre-admission and lower division students are advised in the College of Nursing Office of Student Affairs, located on the second floor of the Nursing Building. All students, including registered nurse students, planning to apply for transfer admission from other institutions are also encouraged to meet regularly with a nursing advisor. Advisors in the Nursing Office of Student Affairs assist students to define and develop realistic educational and career plans. In addition, they monitor progress toward educational and career goals, approve all designated educational transactions such as schedules, drop/adds, withdrawals, and they maintain advising records for each student. A nursing advisor's signature is required for registration. Advisors also refer students to other campus resources when needed.

Students admitted to the upper division are assigned a faculty member who assists them throughout the remainder of the academic program. Faculty advisors assist students in completing a plan of study for their upper division work and provide guidance for future employment or educational endeavors.
Admission Policies

Admission as a Freshman

Entering UAH freshmen interested in nursing as a career must meet the general entrance requirements of the university. Each lower division student interested in nursing as a career is advised in the College of Nursing Office of Student Affairs. Students enrolled in the lower division of the college should meet with an advisor in planning a program of study. The program of study will ensure that each student registers for the correct prerequisite courses for the upper division major. Students must meet with a nursing advisor each semester prior to registration. Students must complete all lower division prerequisites prior to enrolling in the upper division of nursing. For information and assistance, call the College of Nursing Office of Student Affairs (256) 824-6742.

Admission into the upper division nursing major is competitive. A separate application for the upper division of the nursing major must be submitted by published dates, on forms provided by the College of Nursing. Each year's junior class is selected from all applicants who meet the minimum requirements. Once admitted to the upper division, each student will be assigned a faculty advisor in the College of Nursing.

Admission as a Transfer Student

All transfer students seeking admission to UAH should read and follow the Admissions Information section of this catalog. Specific UAH courses that satisfy admission requirements are listed under the Baccalaureate Program of Studies later in this section of the catalog. All transfer students are encouraged to complete courses equivalent to those listed in that summary.

Students transferring from Alabama two-year colleges should also follow the general studies curriculum approved by the Articulation and General Studies Committee (AGSC). A copy of this curriculum is available in the UAH Office of Admissions. Articulation requirements, as they relate to the nursing major, are provided below:

Area I. Written Composition (6 semester hours).
Area II. Humanities and Fine Arts (12 semester hours). Requirements include a minimum of 3 semester hours in literature, 3 semester hours in the arts, and the remaining semester hours from either the humanities or arts. Disciplines in the humanities include, but are not limited to, philosophy, religious studies, speech, foreign languages, art, music, theater, and dance. As part of the general studies curriculum, students must complete a 6 semester hour sequence in either literature or history.
Area III. Natural Sciences and Mathematics (11 semester hours). Requirements include a minimum of 3 semester hours in mathematics at the precalculus level or higher. Students transferring to the nursing major must complete a course in inorganic chemistry (including lab) and an additional science course with a lab in either biology, chemistry or physics.
Area IV. History, Social, and Behavioral Sciences (12 semester hours). Requirements include a minimum of 3 semester hours in history and at least 6 semester hours from among other disciplines in the social and behavioral sciences. Disciplines include, but are not limited to, anthropology, economics, geography, political science, psychology, and sociology. For students transferring to the nursing major, one of these courses must be in psychology. As part of the general studies curriculum, students must complete a 6 semester hour sequence in either history or literature.
Area V. Pre-Professional, Major and Elective Courses (19-23 semester hours). Students entering the nursing major must complete 6-8 semester hours in human anatomy and physiology (with lab) and 3-4 semester hours in microbiology (with lab). Students entering the nursing major at UAH must also complete a minimum of 3 semester hours in statistics, 3 semester hours in human growth and development and elective hours to meet the 19 hour minimum in Area V.

The specific credit for work completed at other institutions and applied to the courses for admission to the College of Nursing is determined by the College of Nursing Office of Student Affairs. Courses taken at community or junior colleges may satisfy lower division prerequisite
course requirements; courses taken at other four year institutions may meet prerequisite and upper division course requirements.

Admission to the Upper Division

The upper division of the nursing curriculum is composed of professional nursing courses. In order to be considered for admission to the upper division nursing major, students enrolled at UAH must complete a separate application form, which is available through the College of Nursing Office of Student Affairs. Transfer students must first apply to UAH through the Office of Admissions and then complete the separate application available through the College of Nursing Office of Student Affairs. All applications must be submitted by published deadlines.

1. Applicants for admission to the upper division for non-registered nurses is competitive. Each year's junior class is selected from applicants who meet the minimum requirements:
   a) Minimum grade of "C" on all required prerequisite coursework
   b) Completion of all lower division course requirements with a minimum of 59-60 hours of credit
   c) Status of good academic standing.

   Additionally, students who have earned 30 semester hours of coursework at UAH by the end of the fall semester prior to the fall for which they are applying, and whose prerequisite GPA is higher than 2.75 qualify for priority admission consideration. An application for the upper division nursing major must be completed and submitted to the College of Nursing Office of Student Affairs by March 1 preceding the fall semester for which admission is sought. Applications received after March 1 will be considered on a space available basis. Applications are available from the College of Nursing Office of Student Affairs. Students are admitted once each year for fall semester. Students who wish to be considered for scholarships should apply prior to February 1.

2. Admission to the upper division nursing major for registered nurse students is selective. Each year's class is selected from students who meet minimum requirements:
   a) Minimum grade of "C" on all required prerequisite coursework
   b) Completion of all lower division course requirements with a minimum of 59-60 hours of credit
   c) Graduation from an associate degree nursing program or a diploma program in nursing
   d) Status of good academic standing.

   An application to the upper division nursing major for registered nurse students must be completed and submitted to the College of Nursing Office of Student Affairs by March 1. Applications received after the deadline will be considered on a space available basis. Students who wish to be considered for scholarships should apply prior to February 1.

Requirements for Enrollment for Admitted Students

1. Evidence of CPR (cardiopulmonary resuscitation) certification must be received by the College of Nursing Office of Student Affairs by published deadlines. Certification must be maintained until graduation. Re-certification documentation must be received by the College of Nursing Office of the Associate Dean by published deadlines for each subsequent year.

2. All unlicensed students must pay for required professional liability insurance by published deadlines. Unlicensed students are included in a policy available through the College of Nursing and students will receive information about the amount and method of payment in early summer. Liability insurance must remain current until graduation.

3. All registered nurse students must individually obtain and present evidence of current professional liability insurance. The insurance must remain current until graduation.

4. Registered nurse students must submit proof of a current license in the state of Alabama. If a student is permitted to meet course clinical requirements in a state other than Alabama, the student must be licensed in that state, as well as in Alabama. Registered nurse students will not be allowed to continue in the program if any nursing license is placed on probation.
suspending, or revoking. Licensure must be maintained throughout the program.

5. Recent graduates of associate degree or diploma nursing programs who are not yet licensed will be permitted to complete lower division coursework, but will not be admitted to the upper division clinical component of the program until they are licensed.

6. Perform essential functions. Students must be able to perform each of the following essential functions with or without reasonable accommodations:
   a. Critical thinking ability sufficient for clinical judgement. Examples (not all inclusive) of necessary activities include identifying cause-effect relationships in clinical and classroom situations; predicting outcomes based on plans of care for clients across the lifespan; synthesizing theory and applying it to client care situations; analyzing and synthesizing information to support or defend a position; calculating prescribed drugs; and making safe judgements.
   b. Interpersonal abilities sufficient to interact with peers and faculty. Examples (not all inclusive) include the ability to function in groups and to establish rapport/therapeutic relationships with clients.
   c. Communication abilities sufficient for clear interaction with others in English in verbal and written form. Examples (not all inclusive) include expressing ideas/thoughts in a dynamic reciprocal process of transmitting information, perceptions, thoughts, and ideas in classroom and clinical settings. Other specific situations include explaining treatment procedures, initiating health teaching, and documenting and interpreting nursing actions and client responses.
   d. Mobility/gross motor abilities sufficient to move from room to room and maneuver in small spaces. Examples (not all inclusive) include moving around in clients' rooms, work spaces and treatment areas; administering cardiopulmonary procedures; assisting in ambulation; lifting and transferring clients (lifting a minimum of 50 pounds); and having sufficient mobility and stamina to function in clinical settings for sustained periods of time.
   e. Fine motor skills and manual dexterity sufficient to provide safe and effective care. Examples (not all inclusive) include completing examinations/evaluations by writing, typing or demonstration and calibrating and using equipment.
   f. Auditory ability sufficient to monitor and assess health needs. Examples (not all inclusive) include hearing basic conversation; monitoring alarms, emergency signals and auscultatory sounds; and hearing cries for help.
   g. Visual abilities sufficient to monitor and assess health needs. Examples (not all inclusive) include reading documents such as patient charts and laboratory reports; reading calibrations on syringes, sphygmomanometers, and thermometers, and equipment outputs such as waves, printouts, and digital readings; and accurately observing client behaviors such as color changes and nonverbal communication.
   h. Tactile abilities sufficient for physical assessment. Examples (not all inclusive) include performing palpation, percussion, temperature changes, complete physical examinations and other activities related to therapeutic interventions.

These essential functions are not intended to be a complete listing of all nursing behaviors, but they are a sampling of the types of abilities needed by nursing students to meet program objectives and requirements. The College or its affiliated agencies may identify additional critical behaviors or abilities.

Health Requirements

The clinical experiences of nursing students require a health screening program. The following steps are required as part of admission and enrollment in the upper division nursing major:

1. Each student is required to have a health examination by a physician or a certified nurse practitioner. Reports of the results of this examination must be submitted on forms provided by the College of Nursing and must be received by the College of Nursing Office of Student Affairs by published deadlines. Individual clinical agencies may require additional documentation for specific health requirements which must be met by the students.

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2. Each student must be immunized for Hepatitis B. Certification that the series of injections has begun or results of a recent titer must be received by the College of Nursing Office of Student Affairs by published deadlines. Immunizations and titers are at the expense of the student.

3. Each student is required to be immunized against measles. Documentation of current immunization for measles or results of a recent titer must be received by the College of Nursing Office of Student Affairs by the published deadlines. Immunizations and titers are at the expense of the student.

4. Each student is required to be tested for tuberculosis. Evidence of the annual testing or results of a recent chest x-ray are required. Testing expenses are the responsibility of the student. Documentation of the test results must be received by the College of Nursing Office of Student Affairs by published deadlines.

5. Documentation of current health insurance must be received by the College of Nursing Office of Student Affairs by the published deadlines. Hospitals and health agencies provide emergency treatment to students for injury or illness occurring in the course of program requirements in their agencies. Such treatment will be at the expense of the student. Students are required to maintain health insurance throughout the program.

Financial Aid
The University Financial Aid Office, located in the University Center, provides financial aid information and assists students in meeting individual needs.

Upper Division Progression and Graduation Requirements
All students must meet UAH requirements for progression and graduation. In addition, there are the following requirements for the College of Nursing:

1. An overall C (2.0) average on all courses taken at UAH is required for graduation.

2. A grade of C or above must be earned in all required nursing courses. A student who receives a grade below C in a required nursing course may repeat the course only once. The following are required nursing courses for non-licensed students: NUR 302, 303, 304, 305, 306, 307, 308, 310, 401, 402, 403, 404, 405, 406, and 407. Required courses for registered nurse students are: NUR 303, 307, 410, 411, 412, 413.

3. A student who receives two grades below C in required nursing courses, in either the same course or in separate courses, at any time during the program will not be permitted to continue in the College of Nursing. This requirement also applies to non-admitted students who are enrolled in non-clinical courses with NUR prefixes prior to admission to the upper division nursing major. Students who earn two or more grades below C and wish to continue their nursing education may apply for readmission to the College of Nursing. Readmission request letters are written to the College of Nursing, Director of Student Affairs. Readmitted students who subsequently earn another grade below C in any nursing course will be permanently dismissed from the program.

4. Students must meet standards of professional conduct as described in the American Nurses Association Code of Ethics for Nurses and standards of student behavior as described in the UAH handbook.

5. Throughout the program, students must meet health and other requirements as identified in the Enrollment Requirements section above, as well as requirements specified in clinical agency contracts.

6. Registered nurse students must maintain an active and unencumbered Alabama license throughout the program. Clinical experiences in states other than Alabama require an active license in that state as well as in Alabama. Registered nurse students will not be allowed to continue in the program if any nursing license is placed on probation, suspended, or revoked. Students must notify the College of Nursing if there is a change in license status.

7. Any requests for exceptions to progression and graduation requirements must be addressed in writing to the Associate Dean.
Responsibility to Clinical Agencies

Students are responsible for complying with policies and procedures required by clinical agencies. Failure to meet this requirement may lead to exclusion from required clinical educational experiences and prevent completion of the program.

Baccalaureate Program of Studies

Students completing the lower division of the program at UAH should follow the program of study outlined below. Transfer students should follow the program of study approved by the Articulation and General Studies Committee and presented under Admission as a Transfer Student. Transfer students are encouraged to complete courses equivalent to those listed below:

Written Composition (6 semester hours)
   English Composition EH 101, 102

Humanities and Fine Arts (12 semester hours)
   Literature (3-6 semester hours) Students must complete a 6 semester hour sequence in either literature or history with a minimum of 3 semester hours in the other discipline.
   Philosophy (3 semester hours) PHL 101-Being, Knowledge and Value; PHL 201-Introduction to Logic; or PHL 202-Introduction to Ethics
   Elective in Humanities and Fine Arts (3-6 semester hours)

Natural Sciences and Mathematics (23 semester hours)
   Precalculus Mathematics (3 semester hours) MA 119
   General Biology (4 semester hours) BYS 119
   Chemistry (4 semester hours) CH 101, 105
   Microbiology (4 semester hours) BYS 214/221
   Anatomy and Physiology I and II (8 semester hours) BYS 313/314

History, Social and Behavioral Sciences (19 semester hours)
   Introduction to Sociology (3 semester hours) SOC 100
   General Psychology (3 semester hours) PY 101
   History (3-6 semester hours) Students must complete a 6 semester hour sequence in either history or literature with a minimum of 3 semester hours in the other discipline.
   Statistics (4 semester hours) AHS 300
   Human Growth and Development (3 semester hours) ED 306 or PY 201
   Elective History, Social and Behavioral Sciences (3-6 semester hours)

The following Upper Division courses are required for a baccalaureate degree in nursing. Please note that curricular changes may be made in the coming year. Contact the College of Nursing Office of Student Affairs for the most current information.

Nursing and Health Promotion (NUR 302)
Health Assessment (NUR 303)
Applied Pathophysiology Across the Lifespan (NUR 304)
Nursing Process for Mental Health and Illness (NUR 305)
Ethical and Legal Aspects of Health Care (NUR 306)
Scholarly Inquiry in Nursing (NUR 307)
Nursing Care of Adults with Alterations in Health I (NUR 308)
Professional Practice in Nursing I (NUR 310)
Nursing Care of Adults with Alterations in Health II (NUR 401)
Population Based Health Care (NUR 402)
Family Centered Parent-Infant Nursing (NUR 403)
Family Centered Nursing Care of Children (NUR 404)
Community Health Nursing (NUR 405)
Leadership and Management in Nursing (NUR 406)
Professional Practice in Nursing II (NUR 407)
Nursing Elective (3 semester hours)
Free Elective at 300-level or above (3 semester hours)
Total semester hours to graduate with a BSN 129

For Registered Nurse Students:
Health Assessment (NUR 303)
Scholarly Inquiry in Nursing (NUR 307)
Transition into Professional Roles (NUR 410)
Theoretical Applications in Nursing Practice (NUR 411)
Caring for Families, Aggregates and Populations (NUR 412)
Nursing Leadership in Professional Practice (NUR 413)
Electives at 300-level or above (9 semester hours)
Total semester hours to graduate with a BSN 129

Nursing (NUR)
302 Nursing and Health Promotion 3 hrs.
Focus on nursing, health, and wellness across the life span. Emphasis on health promotion and prevention of illness. Strategies to optimize health are presented. Perceptions and beliefs related to health, illness, disease, and cultural diversity are explored as are mechanisms for promoting health through politics and the health care delivery system. Open to admitted upper division students only. Lab Fee: $30. Fall.

303 Health Assessment 3 hrs.
Focus on holistic health assessment of culturally diverse clients across the lifespan. Communication and psychomotor skills are developed in clinical laboratory settings. Prerequisite: Successful completion of Anatomy and Physiology sequence. Lab Fee: $90. Fall. Spring for registered nurse students.

304 Applied Pathophysiology Across the Lifespan 3 hrs.
Application of anatomy and physiology to specific pathophysiological processes within a nursing framework. Prerequisite: Successful completion of Anatomy and Physiology sequence. Lab Fee: $30. Fall.

305 Nursing Process for Mental Health and Illness 6 hrs.
Nursing process and promotion of mental health across the lifespan including restoration of mental health. Clinical laboratory experiences provide opportunities for application of individual and group interventions in a variety of settings. Pre or co-requisite: NUR 302, 303, 304, 310. Lab Fee: $180. Spring.

306 Ethical and Legal Aspects of Health Care 3 hrs.
Ethical and legal dilemmas related to health care are explored, focusing on issues impacting individuals, families, and society. Traditional and contemporary ethical philosophies are discussed in terms of society's values. Concepts of autonomy, veracity, fidelity, beneficence, justice, and advocacy are explored in relation to ethical decision-making. Models for ethical decision-making will be used to analyze ethical and legal dilemmas. Basic legal concepts related to contemporary health care are presented. Open to all university students. Lab Fee: $30. Spring.

307 Scholarly Inquiry in Nursing 3 hrs.
Focuses on the various modes of inquiry used in the development of nursing science. Emphasis on the critical examination of nursing research including methodologies, utilization, and theoretical bases. Prerequisite: Successful completion of undergraduate statistics course. Lab Fee: $30. Spring. Fall for registered nurse students.
308 Nursing Care of Adults with Alterations in Health I 6 hrs.

310 Professional Practice in Nursing I 4 hrs.
Provides a foundation for professional nursing practice. Professional nursing practice, professional accountability, and clinical skills of nursing practice are addressed, with special emphasis on the development of interpersonal and psychomotor skills basic to professional nursing. College laboratory and clinical experiences are included. Open to admitted upper division students only. Lab Fee: $120. Fall.

324 Health Care and the Law 3 hrs.
Designed to integrate pertinent aspects of health care law into the study and/or practice of health care. Elective, open to all university students. Lab Fee: $30.

325 Human Sexuality 3 hrs.
Theory and issues related to human sexuality in health and illness. Emphasis on both theory and values; clarification of human sexuality issues. Prerequisite: sophomore standing. Elective, open to all university students. Lab Fee: $30.

332 Nursing Care of Perioperative Client 3 hrs.
The role of the nurse in providing nursing care for clients experiencing surgical intervention. The nursing process provides the framework for promoting quality perioperative nursing care for clients and their families. Elective. Prerequisite: junior standing. Lab Fee: $30.

334 Death and Dying 3 hrs.
Influence of death and dying upon attitudes and thinking gleaned from historical, cultural, philosophical, and scientific perspectives. Intimate reactions and beliefs concerning death and identifying coping resources. Elective, open to all university students. Lab Fee: $30.

337 Nursing as a Political Force 3 hrs.
Overview of the legislative process and legislation relative to health care issues. The role of the professional nurse in the political climate is explored. Elective, open to all university students. Lab Fee: $30.

338 Drug and Substance Abuse 3 hrs.
Issues arising from intentional or inadvertent abuse or misuse of drugs and food; legal and physical implications of such behavior. Emphasis is placed on theories of causation and treatment of methodologies. Elective, open to all university students. Lab Fee: $30.

339 Introduction to Computers in Nursing 3 hrs.
Provides experience in the use of basic and versatile software programs which have wide applicability within nursing practice and within the students' educational process. Elective, open to all university students. Lab Fee: $30.

390 Independent Study 1-4 hrs.
Individualized independent study of specific nursing problem under sponsorship of a nursing faculty member with special preparation in the field. Elective. Lab Fee: $10, $20, $30, or $40. Fall, Spring, Summer.

401 Nursing Care of Adults with Alterations in Health II 6 hrs.
Nursing process applied to clients experiencing alterations in health requiring complex and collaborative nursing management. Clinical experiences in the acute care environment. Prerequisites: NUR 302, 303, 304, 305, 308, 310. Lab Fee: $180. Fall.

402 Population Based Health Care 3 hrs.
Promotion of health, prevention of disease in at-risk aggregate populations. Examines complex problems and health care policy. Open to all university students. Lab Fee: $30. Fall.
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
<th>Lab Fee</th>
<th>Term</th>
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<tr>
<td>403</td>
<td>Family-Centered Parent-Infant Nursing</td>
<td>4 hrs.</td>
<td>Nursing process used to promote health and facilitate adaptation for childbearing families. Clinical experiences in hospital and community settings. Prerequisite: NUR 302, 303, 304, 305, 308, 310. Lab Fee: $120. Fall.</td>
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<tr>
<td>404</td>
<td>Family-Centered Nursing Care of Children</td>
<td>4 hrs.</td>
<td>Nursing process for promoting health and facilitating adaptation in childbearing families and care of children. Clinical experiences in selected agencies. Prerequisites: NUR 302, 303, 304, 305, 308, 310. Lab Fee: $120. Fall.</td>
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<td>406</td>
<td>Leadership and Management in Nursing</td>
<td>3 hrs.</td>
<td>Describes and analyzes selected theories of management and leadership in health care systems with focus on broadening students' knowledge base and skills as they relate to entry-level nursing management. Organization structures and dynamics as well as pertinent issues and trends are addressed. Prerequisites: NUR 401, 402, 403, 404; Pre- or co-requisites: NUR 405, 407. Lab Fee: $30. Spring.</td>
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<tr>
<td>407</td>
<td>Professional Practice in Nursing II</td>
<td>6 hrs.</td>
<td>Provides opportunities for professional nursing practice. Area of practice is determined jointly by student and faculty, guided by preceptor, and evaluated collaboratively by faculty and student. Seminars involve analyzing clinical experience utilizing the nursing process. Prerequisites: NUR 401, 402, 403, 404; pre- or co-requisites: NUR 405, 406. Lab Fee: $180. Spring.</td>
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<tr>
<td>410</td>
<td>Transition into Professional Roles</td>
<td>4 hrs.</td>
<td>For the registered nurse student, designed to synthesize previous experiences in nursing with selected theoretical knowledge. Examines the multi-dimensional role of the professional nurse in health systems. Through analysis of paradigm case(s) and development of a professional portfolio, the student evaluates his/her professional practice and develops goals designed to guide learning and professional development. Philosophical, social, political, legal, and ethical issues inherent in the practice of professional nursing in health systems. Thirty-two hours of nursing credit for prior learning will be conferred upon successful completion of this transition course. Lab Fee: $30. Fall.</td>
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<tr>
<td>411</td>
<td>Theoretical Applications in Nursing Practice</td>
<td>5 hrs.</td>
<td>Designed for registered nurse students to synthesize knowledge gained from previous nursing experience when analyzing issues and concepts that influence professional nursing practice. Theoretical concepts which influence critical thinking are applied to the nursing process. Analysis of normal processes and professional nursing responses to alterations in life processes across the lifespan are examined. Caring for diverse clients is emphasized. Ethical and legal issues which impact the care for client systems are examined when synthesizing theoretical and nursing practice issues. Open to students admitted to the upper division only. Pre- or co-requisite: NUR 410. Lab Fee: $50. Fall.</td>
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<tr>
<td>412</td>
<td>Caring for Aggregates, Families and Populations: Theoretical Applications</td>
<td>10 hrs.</td>
<td>Designed for registered nurse students to apply theoretical concepts related to primary, secondary, and tertiary care of aggregates. Emphasis is on application of the nursing process in promoting community health for at-risk aggregate populations. Clinical experiences are designed to meet the individual learning needs of the student in delivering and managing care of selected families with emphasis on the aggregate. Open to students admitted to the upper division only. Prerequisite: NUR 410; pre- or co-requisite: NUR 303, 307. Lab Fee: $180. Spring.</td>
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</table>
Nursing Leadership in Professional Practice 3 hrs.
Development and enhancement of leadership skills for the registered nurse student in a variety of culturally diverse health care systems. Exploration of theories related to organizational models, change, and critical thinking; leadership in directing and controlling care; ethical, legal, and political influences on leadership; and enhancing self-awareness of leadership styles. Students are provided opportunities to apply nursing leadership concepts through a case study experience and in a clinical practice setting by conducting a clinical project. Prerequisite: NUR 410. Lab Fee: $30. Summer.
College of Science
C207 Materials Science Building
Telephone: (256) 824-6605
Email: science@uah.edu
Web Site: www.uah.edu/HTML/Academics/Science

Dean: John D. Fix, B.S., M.A., Ph.D., Professor of Physics
Associate Dean: Debra M. Moriarity, B.S., Ph.D., Professor of Biological Sciences

The College of Science offers a broad spectrum of programs and intellectual experiences designed to meet various educational, vocational and professional goals. Students may plan programs of study leading to career opportunities in computational, mathematical, biological, and physical sciences or as background requirements for professional studies in medical fields, engineering and education. The College also offers a variety of courses which provide basic science support to other disciplines. Students receive assistance from the faculty in preparing and planning for advanced studies and in planning and carrying out research projects to enhance their course work. There are abundant opportunities for undergraduate students to engage in original scientific research, often resulting in a scientific publication and/or presentation at scientific meetings. By encouraging intellectual as well as technical development, the faculty seeks to introduce students to scientific inquiry as an orderly thought process.

The College of Science consists of six academic departments: Atmospheric Science, Biological Sciences, Chemistry, Computer Science, Mathematical Sciences, and Physics. Programs are administered by these six departments and the Office of the Dean. The Optical Science degree is administered through the Physics Department, and the Atmospheric Science Department awards only graduate degrees. Specific departmental degree requirements along with course descriptions are listed in the sections that follow.

Undergraduate Degrees and Study
The College of Science awards the Bachelor of Science and the Bachelor of Arts Degree. Majors are offered in biological sciences, chemistry, computer science, mathematics, mathematics education, optical science, and physics. Additionally, a certificate program in environmental science is offered to undergraduates majoring in sciences or mathematics and to individuals already holding degrees in a science discipline. Students may also combine a minor in atmospheric science with any of our majors.

Degree programs:
- Biological Sciences  B.S., B.A.
- Chemistry  B.S.
- Computer Science  B.S.
- Mathematics  B.S., B.A.
- Optical Science  B.S.
- Physics  B.S.

Science Major with Minor in Business Administration
Due to the increased need by the corporate world for employees who are not only scientists or mathematicians, but who have the background and training to move into managerial positions,
students majoring in the College of Science may choose a minor in business administration. Specific examples are given for some of the majors in the departmental sections that follow.

Graduate Degrees and Study

The College of Science offers graduate programs leading to the Master of Science degree in atmospheric science, biological sciences, chemistry, computer science, materials science, mathematics, and physics and to the Master of Arts degree in mathematics. Doctoral programs are offered in applied mathematics, atmospheric science, computer science, and physics. The Doctor of Philosophy degree in chemistry is available through a cooperative program with the University of Alabama, Tuscaloosa. Interdisciplinary programs offered through the Colleges of Science and Engineering provide the opportunity to earn a Doctor of Philosophy degree in Biotechnology Science and Engineering, Optical Science and Engineering, or Materials Science. A certificate in environmental science is available in conjunction with graduate degrees in science and mathematics. For graduate course offerings and programs, refer to the Graduate Catalog.

Student Advising

The College of Science has a full-time advisor who assists undergraduates in course selection and scheduling until such time that the student selects and declares their major, typically during the sophomore year. The student is then assigned to a faculty member in his or her major department who will continue to assist him or her in development of a program of study and in progress to graduation.

Junior Standing/64 Hour Transfer Limit

Once a student has achieved junior standing and has accumulated a total of 64 semester hours of credit from all sources (UAH plus all transfer), no additional credit may be transferred to UAH from a two-year institution. Exceptions to this policy must be approved prior to taking additional course work at the junior college. Requests for exceptions must be submitted in writing and approved by the chair of the UAH department where the course is taught, and by the dean of the UAH college in which the student is enrolled.

Health and Physical Education Courses

Students who major in the College may count up to four semester hours of health and physical education activity courses toward their requirements for graduation.

Requirements for Programs of Study Leading to the B.S. Degree

Candidates for a B.S. degree must satisfy the General Education Requirements set forth below, complete the requirements for a major in a program offered by one of the departments in the College of Science, and complete the requirements for either a minor or cognate studies (see disciplines for specific requirements). Students are required to have a C average overall, a C average in their major, and a C average in their minor or cognate studies for UAH courses. The major and minor averages will be calculated based on at least the courses listed in the Program of Study. Additional courses completed in the discipline may, but need not, be included in calculating these averages. Only courses which the student completes with a grade of D or better will count as satisfying degree requirements. A grade of C or better must be earned in some courses that are prerequisites for other courses in the discipline before continuing in the course sequence. Specific departmental requirements are listed in the course descriptions. Students are strongly encouraged to meet with the College of Science advisor to formulate a Program of Study as early as possible in their academic career.

General Education Requirements for B.S. Degree

<table>
<thead>
<tr>
<th>Area</th>
<th>Hours</th>
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<td>I</td>
<td>6</td>
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</tbody>
</table>

(Students in the Honors Program may substitute EH 105)
Area II
Humanities and Fine Arts (distributed as below).............................................................12
(No more than 6 semester hours can be counted in any one discipline.)
   Fine Arts (3 hrs.) ARH 100, 101, ARS 160, MU 100, 101, or CM 122
   Literature (3-6 hrs. *): EH 205-206, 205-241, 240-206, 240-241, 205-230,
      240-230, or 250-251 (Pairings indicate acceptable 2-course sequences.)
   Humanities and Fine Arts (3-6 hrs): CM 113 (required); additional hours
      as needed chosen from PHL 101, 202, WS 200, ARS 160, ARH 100,
      101, CM 122, MU 100, 101. Any 100 or 200 level course chosen from
      FH, GK, GN, JE, LN, RN or SH

*Students must complete a two-course sequence in either literature or history.

Area III
Natural Science and Mathematics......................................................................................11-12
Mathematics (3-4 hrs.): One course at Level I (precalculus with algebra) or higher.
   (Level I courses are MA 119 and 143. All B.S. degrees require completion
      of a level III calculus course. See disciplines for specific course requirements.)
Natural Science (8 hrs.): a two-course sequence in a laboratory natural science outside
   the major and minor. (See disciplines for specific requirements.)

Area IV
History, Social and Behavioral Sciences (distributed as below)........................................12
(No more than 6 hours can be counted in a single discipline.)
   History (3-6 hrs. *): HY 101-102, or HY 221-222.
   Social and Behavioral Sciences (6-9 hrs.): PSC 101, 102, 260, PY 101, 201,
      SOC 100, 106, 200, ECN 142, 143.

Area V
Preprofessional and elective courses.....................................................................................13-15
Science or engineering course outside the major and not counted in the minor
   requirements (3-4 hrs.): MA or CS majors must take a 4 hour laboratory science
      course (AST, ATS, BYS, CH, ES, PH) to meet this requirement. See individual
      majors for specific courses required.
Computer Science (3-4 hrs.): CS 100, 102, or higher. See majors for specific
   requirements.
Technical Writing (3 hrs.): EH 301
Electives (4-6 hrs.): (Level III MA must be taken here if not taken in Area III or in
   major or minor.)

Major Requirements for B.S. Degree: See specific disciplines - minimum 36 hours.

Minor Requirements for B.S. Degree: See specific disciplines - minimum 21 hours.

Cognate Requirements for B.S. Degree: See specific disciplines - minimum 21 hours.

Electives: Sufficient courses to meet the minimum 128 semester hour degree requirement and the
   required 39 semester hours of courses numbered 300 or above.

Residency Requirement: A minimum of 25 percent of the total degree requirements and 12 of
   the last 18 hours must be completed at UAH. Also, unless otherwise specified by the department
   involved, a minimum of 12 semester hours of upper level courses (numbered 300 or above) must
   be completed at UAH in a student's program, distributed as 6 hours in the major and 6 hours in
   the minor or cognate.
BS/MSM 4+1 Degree Program
Students in UAH's College of Science who have an interest in business are encouraged to consider the BS/MSM 4+1 Program. By following the outline of courses shown here, students can earn a minor in Business as part of their B.S. degree, and then earn their M.S.M. graduate business degree in just one year instead of two.

I. Area IV Courses
Economics - Taken as part of Area IV “History, Social and Behavioral Sciences” requirements
- ECN 142 Principles of Macroeconomics
- ECN 143 Principles of Microeconomics

II. Area V Courses
Calculus - Taken as part of Area V “Science or Engineering Course Outside the Major” if not taken in Area III or in the major or minor
Microcomputer Skills
Pre-MSM students must be proficient in the use of operating systems, word processing, spreadsheets, and presentation software. Deficiency in computer skills can be remedied by taking MIS 146 or a combination of the one-hour courses: MIS 102, 104, 106.

Statistics - Taken as part of Area V "Electives" requirement
- MSC 287 Business Statistics I
  (or MA 385 Introduction to Probability)
  (or ISE 390 Probability and Engineering Statistics I)
- MSC 288 Business Statistics II
  (or MA 487 Introduction to Mathematical Statistics)
  (or ISE 391 Probability and Engineering Statistics II)

III. Pre-MSM Minor (Science & Technology Business Minor)
Accounting
- ACC 211 Financial Accounting 3 hrs
- ACC 212 Managerial Accounting 3 hrs
Management
- BLS 211 Legal Environment of Business 3 hrs
- MGT 301 Managing Organizations 3 hrs
Marketing
- MKT 301 Principles of Marketing 3 hrs
Operations Management
- MSC 385 Production/Operations Management 2 hrs

TOTAL MINOR HOURS 18 hrs

Requirements for Programs of Study Leading to the B.A. Degree.
See the College of Liberal Arts section of the catalog for General Education Requirements for the B.A. degree.
The Atmospheric Science Department does not offer an undergraduate major. However, the atmospheric science minor, in conjunction with a physics, mathematics, computer science, or chemistry major, offers an excellent preparatory undergraduate program leading to the M.S. or Ph.D. professional degree in atmospheric science.

The minor in atmospheric science particularly serves as a complement to the physics major. Many university graduate programs in atmospheric science, including the UAH program, heavily recruit undergraduate physics majors into their programs. These students have the requisite background courses in mathematics and physics to excel in graduate atmospheric science courses of study.

Students selecting one of the several options available under the atmospheric science minor program can qualify for the "meteorologist" category when applying for GS rated jobs in various government agencies. Thus, the program offers the opportunity for its graduates to meet these well-defined criteria when seeking employment.

Requirements for a Minor in Atmospheric Science

A minor in atmospheric science includes ES 101, ATS 401, 451, plus at least 12 hours of advanced coursework selected from: ES 303, 305, 321, 331, ATS 411, 413, 414, 415, 420, 441, 451, 452, 454, 461. At least 3 hours of the selected advanced coursework must be at the 400-level.

Additionally, PH 111/114, 112/115, CH 121, 125, MA 171, 172, 201 are required ancillary courses for the minor. PH 113/116 and MA 244 and 324 are suggested but not required.

To prepare for graduate study of meteorology, the following courses are recommended: ES 101, ATS 420, 441, 451, 452, 454, 461. In addition, ATS 422, MA 244, and MA 324 are recommended.

The following list provides the course numbers and titles of the above requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 101</td>
<td>Planetary and Atmospheric Science I</td>
</tr>
<tr>
<td>ES 303</td>
<td>Classification and Physical Climate</td>
</tr>
<tr>
<td>ES 305</td>
<td>Hydrology</td>
</tr>
<tr>
<td>ES 321</td>
<td>Pollution Problems</td>
</tr>
<tr>
<td>ES 331</td>
<td>Climate Change and Infectious Disease</td>
</tr>
<tr>
<td>ATS 401</td>
<td>Survey of Atmospheric Science</td>
</tr>
<tr>
<td>ATS 411</td>
<td>Introduction to Geographical Information Systems (GIS)</td>
</tr>
<tr>
<td>ATS 413</td>
<td>GIS and Remote Sensing</td>
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<tr>
<td>ATS 414</td>
<td>Scale and Landscape in GIS</td>
</tr>
<tr>
<td>ATS 415</td>
<td>Advanced Topics in GIS</td>
</tr>
<tr>
<td>ATS 420</td>
<td>Introduction to Atmospheric Chemistry and Air Pollution</td>
</tr>
<tr>
<td>ATS 441</td>
<td>Atmospheric Thermodynamics and Cloud Physics</td>
</tr>
<tr>
<td>ATS 451</td>
<td>Atmospheric Fluid Dynamics I</td>
</tr>
<tr>
<td>ATS 452</td>
<td>Synoptic Meteorology</td>
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</tbody>
</table>
Atmospheric Science Track in Physics

The Physics Department offers an atmospheric science track which requires ATS 401, 441, 451, and 461. See the Physics Department section for a full description.

Atmospheric Sciences (ATS)

401 Survey of Atmospheric Science 3 hrs.
General survey of the field of atmospheric science. Quantitative examination of atmospheric physical properties including atmospheric composition, structure and dynamics. Detailed inspection of evolving atmospheric structures using real-time data systems. Topics include atmospheric thermodynamics, atmospheric dynamics, cloud physics, atmospheric radiation, and related topics in atmospheric remote sensing. Prerequisites: MA 172 and PH 112, or permission of instructor.

411 Introduction to Geographical Information Systems 3 hrs.
Introduces vector, raster and tabular concepts, emphasizing the vector approach. Topics include spatial relationships, map features, attributes, relational database, layers of data, data ingesting, digitizing from maps, projections, output, application and availability of public data sets. Prerequisite: Permission of instructor. (Same as ES 411.)

413 Geographical Information Systems and Remote Sensing 3 hrs.
Provides a hands-on approach to GIS and satellite remote sensing. Satellite data sets such as LANDSAT and AVHRR, coupled with GIS data sets, increase understanding of the earth system. Topics include satellite sensors, basic radiative transfer, orbits, raster formats, atmospheric correction, distortion, image corrections, rotations and mapping, spatial resolution, image interpretation, radiometric and geometric enhancement, multispectral transformations, and classifications. Prerequisite: ATS 411.

414 Scale and Landscape in GIS 3 hrs.
Understanding the role of scale in analysis of remote sensing data using GIS, focusing on analysis of landscape properties. Prerequisites: ES/ATS 411 and ES/ATS 413.

415 Advanced Topics in GIS 3 hrs.
Advanced special topics: visualization of GIS and remote sensing data, landscape characterization (pattern vs. process), multitemporal analysis, aggregation of data types, developing an integrated GIS environment for performing complex space-time modeling analyses, and land-atmosphere interactions. Prerequisites: ATS 411, 413. (Same as ES 415.)

420 Introduction to Atmospheric Chemistry and Air Pollution 3 hrs.
This self-contained introductory course in atmospheric chemistry and air pollution is designed to provide seniors and graduate students the basics of atmospheric chemistry and air pollution concepts. Topics include air pollutants, air-pollution meteorology, atmospheric gases and aerosols, and atmospheric processes. This course will also develop the necessary fundamentals for those wishing to take the advanced (600-level) courses in the atmospheric chemistry/air pollution study area. This course is cross-listed with ES 420/520 and ATS 520. ES 520 and ATS 520 will require a research project; ES/ATS 420 will not. Prerequisite: PH 112 and CH 121 or consent of instructor.

441 Atmospheric Thermodynamics and Cloud Physics 3 hrs.
General aspects of thermodynamic and cloud physical processes occurring within the atmosphere; atmospheric statics and stability, saturation point analysis, aerosols, nucleation, and the behavior/growth of cloud particles and hydrometers. Prerequisites: MA 324, PH 112. (Same as ES 441.)
451 Atmospheric Fluid Dynamics I 3 hrs.
Fluid dynamics in the atmosphere. Coriolis accelerations, scale analysis, and appropriate approximations of the complete governing equations. Numerical analysis and interpretation of weather phenomena. Prerequisites: MA 324, PH 112. (Same as ES 451.)

452 Synoptic Meteorology 3 hrs.
Analysis, interpretation, and forecasting synoptic-scale and mesoscale phenomena, including air masses, frontal systems, cyclones, anti-cyclones, tropical cyclones, and associated mesoscale phenomena. Emphasis on the use of remotely sensed data from satellites, radars, and profilers using state-of-the-art workstations. Prerequisites: ATS 441, 451. (Same as ES 452.)

454 Forecasting Mesoscale Processes 3 hrs.
Detection and forecasting of atmospheric mesoscale phenomena including the structure and evolution of clouds, precipitation (including floods), thunderstorms and severe weather. Includes basics on instruments used to detect mesoscale phenomena, most notably satellite and radar. Course material is based mainly on computerized modules and related exercises. Prerequisite: ATS 451. (Same as ES 454.)

461 Atmospheric Radiation I 3 hrs.
Fundamentals of terrestrial atmospheric radiation. Specific topics include: solar radiation at the top of the atmosphere, radiative transfer equation, gaseous absorption, scattering by molecules and particles, band models, transmittance along an inhomogeneous path, and microwave radiative transfer. Prerequisites: MA 324, PH 112. (Same as ES 461.)

Biological Sciences Department
142 Wilson Hall
Telephone: (256) 824-6260
Email: biology@uah.edu
Web Site: www.uah.edu/biology

Professors Campbell (Chair), Eley, Garstka, Lawton, Modlin, Moriarity; Associate Professor Johnson; Assistant Professors Boyd, Leahy, Magnuson, Ng; Hudson Teaching Fellow Stallsmith.

A student may elect a program leading to either a Bachelor of Arts or a Bachelor of Science degree. In most areas of biological interest, a Bachelor of Science degree is deemed more desirable; however, a Bachelor of Arts degree may be preferred in Programs of Study relating biological sciences to the humanities, social sciences, and economics. In either case, the biological sciences department is committed to high quality undergraduate instruction, with the ultimate goal to produce accomplished graduates who can pursue advanced degrees in the health or life sciences or who can develop meaningful careers in the biological sciences.

Biological Sciences Major
The biological sciences program is flexible and broad enough to permit the student to develop courses of study to meet a wide range of interests or career goals within the life sciences. Curricula are available for students who elect to pursue biochemistry, environmental science, exercise physiology, graduate preparatory, microbiology, molecular biology, premedical technology, pre-health professional, or secondary education programs. Examples of programs of study that fulfill the University's degree requirements and achieve diverse goals in the biological sciences are shown below. Any curriculum may be modified to fit individual aims with the approval of the biology faculty. It is strongly advised that the student electing a biological sciences major consult with a biology faculty member early in his/her academic career to formalize a plan of study (POS) to meet academic and career objectives in a timely manner. Normally, a POS should be developed before the junior year of study. It is strongly recommended that one be established before the completion of 85 semester hours of coursework.
A major in biological sciences requires a minimum of 36 semester hours of coursework in BYS and includes the following core courses:

a. Freshman year: BYS 119 and 120
b. Sophomore year: BYS 219
c. Junior year: BYS 340
d. Senior year: BYS 490
e. Area II GER: CM 113
f. Area V GER: CS 100, 102 or 103 (or other programming course), and EH 301

Additionally, it is expected that the student will take an appropriate structural biology and physiology course within the area of emphasis. A course in biochemistry within the major or a chemistry minor is also strongly recommended.

All B.S. degree programs in biological sciences must include 8 semester hours in another laboratory science outside of the major. Generally, this degree requirement is met by the coursework in a chemistry minor or the ancillary chemistry courses needed for support of the major. Some curricula within the major may require additional laboratory science coursework. One course of a Level III mathematics (calculus) is also required for a B.S. in biological sciences. If the student intends to pursue a course of study requiring more advanced mathematics background, MA 171 is recommended to meet this requirement. Otherwise, MA 145 may be used to meet this requirement. Biological sciences majors are also encouraged to take a course in statistics.

All BYS majors must have a minor or cognate studies included in their program of study.

**Biological Sciences Minor**

A minor in biological sciences includes BYS 119, 120, and 219, plus at least 9 hours of advanced coursework. The minor also includes one course selected from an area of anatomy and one course selected from an area of physiology or biochemistry.

Physiology/biochemistry options: BYS 301, 318, 361, 430, 535, 436, 519, 531, 532, 543 or 561.

BYS 313 and 314 taken together satisfy the distribution requirement.

Additionally, CH 101, 105, and 113 or equivalent are required ancillary courses for a biological sciences minor. A course in biochemistry (BYS or CH 301) supports the minor but is not required.

For a minor in the ACS biochemistry track, the following set of courses are recommended: BYS 119, 120, 219, 321, 340 or 543, and 519.

**Suggested curriculum for major in Biological Sciences and minor in Chemistry**

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>BYS 119</td>
<td>4</td>
<td>BYS 120</td>
</tr>
<tr>
<td>CH 121</td>
<td>3</td>
<td>CH 123</td>
</tr>
<tr>
<td>CH 125</td>
<td>1</td>
<td>CH 126</td>
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<tr>
<td>EH 101</td>
<td>3</td>
<td>EH 102</td>
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<tr>
<td>MA 145 or 171</td>
<td>3-4</td>
<td>MA 172 or</td>
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<tr>
<td></td>
<td>14-15</td>
<td>CS 100, 102, 104</td>
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<tr>
<td></td>
<td></td>
<td>14-15</td>
</tr>
<tr>
<td>Second Year</td>
<td>BYS 219 or</td>
<td>BYS 219 or</td>
</tr>
<tr>
<td>BYS elective</td>
<td>4</td>
<td>BYS elective</td>
</tr>
<tr>
<td>CH 223</td>
<td>3</td>
<td>HU/SS*</td>
</tr>
<tr>
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<td></td>
<td>3</td>
</tr>
</tbody>
</table>
EH (literature) 3  
EH (literature) or 
HU/SS* 3  
HY 101 3  
HY 102 or 
HU/SS* 3  
PH 101 or 
111 & 114 4  
17  
PH 102 or 112 & 115 4  
17  
34  

Third Year  
BYS 340 or 
BYS elective 4  
BYS elective 4  
CH 331 3  
CH 335 1  
CM 113 3  
AHS 300 or 
HU/SS* 3  
18  
BYS 340 or 
BYS elective 4  
BYS elective 4  
CH 332 3  
CH 336 1  
EH 301 3  
AHS 300 or 
HU/SS* 3-4  
18-19  
36-37  

Fourth Year  
BYS 490 or 
BYS elective 2-4  
BYS elective 3-4  
BYS/CH 361 3  
BYS/CH 362 1  
Elective 3  
HU/SS* 2  
15-18  
BYS 490 or 
BYS elective 2-4  
BYS elective 3-4  
Elective 3  
HU/SS* 2  
Total Hours 14-17  
29-35  
128+  

*Humanities or Social Sciences  

The following are examples of various curricular constructs that can be established to meet different academic and/or career interests and objectives. Each example is to be used merely as a guideline in creating a Program of Study (POS) to meet a particular goal. Strict adherence to the suggested curriculum is not obligatory to meet degree requirements within the major as long as the individual POS has been previously approved by the faculty advisor, departmental chair, and the dean of the College.

Example I  
B.S. or B.A. degree with a psychology minor (psychobiology program)  

| Semester Hours | 51  
|----------------|---  
| B.S. GER (for B.A. GER see Liberal Arts section) |  
| To include: |  
| Chemistry 101,105,113,301 (Area III and V) | 12  
| Physics (Area V) | 8  
| Computer Science 100,102,103 or another programming course (Area V) | 4  
| BYS core courses and biological sciences electives | 36 min.  
| Psychology 101,102,436 one psychology elective from Group B, and 9 hours upper level PY electives (302 strongly recommended) | 21  
| Electives as needed | 128 min.  
| Total Hours | 128+  

291  
College of Science
Example II
B.A. or B.S. degree for secondary education.

B.S. GER (for B.A. GER see Liberal Arts section)
To include:
- Chemistry 101, 105, 113, 301 (Area III and V) 12
- Physics (Area V) 8
- Computer Science 100, 102, 103 or another programming course (Area V) 3

BYS core courses and biological science electives including
BYS 312 36 min.
Professional education courses (See Education section) 33
Electives as needed 128 min.

Example III
B.S. degree with emphasis in biochemistry; chemistry minor.

B.S. GER
To include:
- Mathematics 171, 172 (Area III and V) 8
- Physics 111/114, 112/115 (Area III) 8
- Computer Science 100, 102, 103 or another programming course (Area V) 3

BYS core courses and 321, 361, 362, 363, 365, 519, 543 36 min.
Chemistry 121/125, 123/126, 223, 331/335, 332/336, 347 (345 desirable) 22
Electives as needed 128 min.

Example IV
B.S. degree, premedical, predental, preveterinary; chemistry minor.

B.S. GER
To include:
- Mathematics 171 (Area III and V) 4
- Physics 111/114, 112/115 or 101, 102 (Area III) 8
- Computer Science 100, 102, 103 or another programming course (Area V) 3

BYS core courses and 317, 361, 362, 363, 532 plus elective 36 min.
Chemistry 121/125, 123/126, 223, 331/335, 332/336 plus elective 21 min.
Electives as needed 128 min.

Example V
B.S. degree, microbiology emphasis with chemistry minor, preparatory for: (a) the National Registry Examination for Registered Microbiologists (American Academy of Microbiology); or (b) graduate study in microbiology.

B.S. GER
To include:
- Mathematics 145 or 171 (Area III and V) 3-4
- Physics 101, 102 or 111/114, 112/115 (Area III) 8
- Computer Science 100, 102, 103 or another programming course (Area V) 3

BYS core courses and 321, 421, 430, 521, 525, 535 43
Chemistry 121/125, 123/126, 223, 331/335, 332/336 plus elective 21
Electives as needed 128 min.
Example VI

B.S. degree, environmental biology emphasis, preparatory for graduate study in ecology or environmental science; chemistry minor.

B.S. GER
To include:
Mathematics 171 (Area III) 3-4
Physics 101, 102 or 111/114, 112/115 (Area III) 8
Computer Science 102 (Area V) 4
ES 101, 102 (Area V) 8
Statistics - AHS 300 (Area V) 4
BYS core courses and 321, 312, 378 and two from BYS 561, 562, 563 and 564 38-39
Chemistry 121/125, 123/126, 233, 331/335, 332, 361, 362 22
Electives as needed 128 min.

Example VII

B.S. degree, composite major in biological-environmental sciences. An additional 6 hours from advanced ES courses with this program qualifies students for an environmental science certificate. Students should also see the Environmental Science section of this catalog.

B.S. GER to include
Mathematics 145 or 171 (Area III) 3-4
Physics 101, 102 or 111/114, 112/115 (Area III) 8
Computer Science 102 (Area III) 4
Statistics - AHS 300 (Area III) 4
ECN or PSC recommended in Area IV 3-6
Chemistry - CH 121, 123, 125, 126, 223, 331, 332, 335 18
BYS core courses and 312, 321, 364 29
Environmental Science 101, 102, 303 or 411, 321, 331 17
Electives as needed from BYS 315, 317, 322, 378, 531, 561, 562, 563, 564, ES 305, 413, 414 128 min.

Example VIII

B.S. degree with emphasis in exercise physiology. Selected supporting coursework in cognate studies (minor) may be used to create an emphasis in sports medicine or athletic training. Additional coursework may be required for entry into physical therapy or medical programs.

Semester Hours
B.S. GER to include
Mathematics 145 or 171 (Area III) 3-4
Physics 101, 102 or 111/114, 112/115 (Area III) 8
Computer Science 100 or 102 (or another programming course) 4
BYS core courses and 313, 314, 401, 402 and 505 36
Chemistry 101, 105 4
Cognate studies (Athletic Trainer): CH 113, 301; HPE 200, 205, 210, 300, 311, and 312 or
Minor in specified discipline (e.g., CH, PY, etc.) 21-22
Electives as needed 128 min. 293 College of Science
Courses in Marine Sciences

Select courses in marine sciences, available through the Marine Environmental Sciences Consortium, may be taken for credit at UAH toward a biological sciences major or minor, a minor in marine sciences, or a Master of Science degree in biological sciences. Biological sciences majors electing a marine sciences minor generally would not take MS courses in the minor that were principally biologically oriented. Courses for which credit is not given for a biological sciences major or minor can be taken as electives. All programs of study that involve marine sciences courses must be approved by the MESC-UAH liaison officer.

Biological Sciences (BYS)

100 Introduction to Health Professions 1 hr.
Career options for undergraduate students interested in health professions. Basics of health-care delivery systems and terminology of health care. Primarily for freshmen and sophomores. No BYS major or minor credit.

119 Principles of Biology 4 hrs.
Introduction to biological principles with a focus on cellular mechanisms. One two-hour lab per week. Lab Fee: $40.

120 Organismal Biology 4 hrs.
Discussion of biological function with special emphasis on contrasting strategies employed by organisms in meeting similar biological needs. Prerequisite: BYS 119. One two-hour lab per week. Lab Fee: $40.

200 Dinosaur Biology 2 hrs.
Introduction to the major areas of scientific interest in dinosaur biology; origin of the dinosaurs, their size, thermal biology, behavior and functional anatomy, relationships, and extinction. Lecture, discussion, and laboratory. Field trips may be required.

214 Infection and Immunity 4 hrs.
Principles of microbiology with emphasis on infectious disease of humans; epidemiological and immunological aspects. No credit for students who have credit for BYS 321 or advanced microbiology courses. Recommended for students in the College of Nursing. Prerequisites: BYS 119, CH 101 or 121. Two 2-hour labs a week. Lab Fee: $50.

219 General Genetics 4 hrs.
Hereditary basis of all living organisms, including the study of (a) genes as the discrete nature of inheritance, (b) genes in organisms and (c) genes in populations. Mendelian principles and evolutionary processes. Includes replication, transcription and translation of DNA and RNA. Prerequisites: BYS 120, MA level I, and CH 101 or 121. Two 2-hour labs per week. Lab fee: $60.

238 Local Flora 2 hrs.
Laboratory course with basic taxonomical procedures and determination of local angiosperms, primarily dicots. Basics of classification techniques and process of speciation. Field trips required. Lab Fee: $30. Spring or Summer.

301 Elementary Biochemistry 3 hrs.
Biochemistry and energetics of living cells, metabolism, structure and function of carbohydrates, lipids, proteins and nucleic acid. Enzymes, coenzymes, vitamins, blood, endocrine glands, DNA synthesis and gene expression, nutrition, drugs and biochemistry of specialized tissues. Prerequisites: BYS 120 and CH 113 or 331. (Same as CH 301.) Spring.

312 Principles of Ecology 4 hrs.
Ecological principles controlling plant and animal populations. Development of ecosystems, communities, and habitats. Prerequisites: BYS 120, CH 121. One lab a week. Lab Fee: $40. Field trip required.

313 Anatomy and Physiology I 4 hrs.
Structure and function of the human body. Physiology and anatomy of major organs, organ systems, and their interactions. Not intended for students preparing for
professional schools or graduate study in physiology or development. Prerequisites: BYS 119 or 120 and 214, CH 101 and 105 (CH 113 recommended). One lab a week. Lab Fee: $50. Fall.

314 Anatomy and Physiology II 4 hrs.
Continuation of BYS 313 stressing structural and functional relationships of major organs, organ systems, and their interdependent regulation. Not intended for students preparing for professional schools or graduate study in physiology or development. Prerequisite: BYS 313. One lab a week. Lab Fee: $50. Spring.

315 Ichthyology 4 hrs.
Classification, anatomy, physiology, and ecology of freshwater and marine fishes. Emphasis on fishes of north Alabama. Laboratory and field trips required. Prerequisite: BYS 120. Lab Fee: $40.

317 Vertebrate Zoology 5 hrs.
Morphology of vertebrate animals. Relationship of organs and systems and their phylogenetic significance. Prerequisite: BYS 120. Two three-hour labs a week. Lab Fee: $50.

318 Vertebrate Reproduction 3 hrs.
General treatment of the major concepts and controversial areas of comparative vertebrate reproduction: ecological and evolutionary aspects, development of reproductive functions and sexual behavior, seasonal breeding and other topics of current interest. Prerequisite: BYS 120 or 313 or permission of instructor.

321 General Microbiology I 4 hrs.
Basic foundation in microbiology for 1) undergraduate biology majors and 2) premedical or pre-dental students majoring in other fields. Topics: structure, biochemistry, and genetics of microorganisms, control of microbial growth, and microorganisms as pathogens. Laboratory exercises focus on basic and diagnostic methods in microbiology, environmental factors controlling microbial growth and survival, and the characteristics of medically-important microorganisms. Prerequisites: BYS 120, CH 101 or CH 121. BYS 219 must be taken in parallel or as a prerequisite. Lab Fee: $50.

322 General Microbiology II 4 hrs.
Emphasizes the diversity of microorganisms in form, function, and ecology, and use of microorganisms in biotechnology. Laboratory exercises focus on culture and identification of environmentally important groups of microorganisms, microbial interrelationships, and the microbiology of soil, water, milk, and food. Prerequisites: BYS 219, 321. Lab Fee: $50.

331 Global Climate Change and Infectious Diseases 3 hrs.
Global warming trends and causes, greenhouse gases, impacts of climate change, causes of past climates, El Nino events, growing resistance of pathogens and vectors to drugs and insecticides, biodiversity global analysis of emerging and re-emerging diseases and their causes. Prerequisite: Junior standing or approval of instructor.

340 Basic Cellular, Molecular, & Developmental Biology 4 hrs.
Introduction to cellular and molecular biology with special emphasis on embryogenesis. Prerequisites: BYS 120, 219, and CH 113 or 331. One lab per week. Lab Fee: $50.

347 Biophysical Chemistry I 3 hrs.

348 Biophysical Chemistry II 3 hrs.
Viscosity, diffusion, sedimentation, electrophoresis, determination of molecular weight by osmotic pressure. Light scattering and photochemistry. Elementary IR, UV-VIS, ESR, NMR spectroscopy. Fluorescence. Optical rotation. Prerequisite: CH 347. (Same as CH 348.)
361 General Biochemistry 3 hrs.
Molecules that comprise living systems. Nomenclature, structure, properties, and functions in metabolism of amino acids, proteins, carbohydrates, lipids, and nucleic acids. Enzymatic properties and function, major catabolic pathways, their interrelations and control mechanisms. Glycolysis, Kreb's cycle, and oxidative phosphorylation. Prerequisites: BYS 120, CH 223, 332, and 335. (Same as CH 361.)

362 General Biochemistry Laboratory 1 hr.
Practical experience in isolation, qualitative identification, and quantitative estimation of biomolecules. Prerequisite or parallel: CH 361. Prerequisite: CH 223. One 3-hour lab a week. Lab Fee: $60. (Same as CH 362.)

363 General Biochemistry II 3 hrs.
A continuation of BYS 361 to include fatty acid and amino acid oxidation, biosynthesis of biomolecules, integration of metabolism, DNA and RNA metabolism, protein biosynthesis, and genes. Prerequisite: BYS 361. (Same as CH 363.)

364 Biogeography 3 hrs.
Principles of plant and animal distribution and dispersal, using the communities of North America as prime examples. Prerequisites: BYS 120; 312 recommended.

365 General Biochemistry Laboratory II 1 hr.
Experimental course illustrating the topics in BYS 363. Prerequisite: BYS 361 and BYS 362. Parallel BYS 363. Lab Fee: $40. (Same as CH 364.)

378 Invertebrate Zoology 5 hrs.
Invertebrate phyla emphasizing anatomy, morphology, physiology, embryology, ecology, and phylogenetic relationships. Prerequisite: BYS 120. Two 3-hour labs a week. Lab Fee: $50.

401 Exercise Physiology 4 hrs.
Basic human physiology as differentiated by the effects of exercise. Physiology of major systems of the body that may act as a limiting factor, or enhance the performance, of human movement. Prerequisites: BYS 313 and 314. BYS/CH 301 strongly recommended. One lab per week. Lab Fee: $50.

402 Kinesiology and Biomechanics 4 hrs.
A study of the structural and functional relationships of the human skeletal, muscular and neural systems as they relate to movement of the human body. Prerequisites: BYS 313 and 314. PH 101 recommended. One lab per week. Lab Fee: $50.

421 Introduction to Medical Microbiology 5 hrs.
Medically significant microorganisms and their relation to human diseases. Bacterial, fungal, parasitic, and viral agents and their properties, pathogenesis, and laboratory diagnosis. Prerequisites: BYS 321, BYS or CH 361, and BYS 430 recommended. Two 3-hour labs a week. Lab Fee: $50.

430 Immunology 4 hrs.
Basic course in immunology. Immunoglobulins, antigens, immune responses, complement, immediate and cell-mediated hypersensitivities, transplantation and tumor immunity. Prerequisites: BYS 219, 321 and BYS/CH 361 strongly recommended. One 3-hour lab a week. Lab Fee: $50.

436 Biological Psychology 3 hrs.
Functional analysis of neural and endocrine systems underlying behavior. Prerequisites: (either a or b): (a) 15 hrs. of PY or approval of instructor; (b) BYS 120 or BYS 313, and 6 hrs. of PY or approval of instructor. (Same as PY 436.)

464 Evolution 3 hrs.

490 Senior Seminar 2 hrs.
Student discussions, readings, and presentations of topical biological subjects using current scientific literature, monographs and journals. Capstone course emphasizing
refinement of oral and written communication skills and critical thinking. Pass/fail grading. Biological sciences major requirement, one seminar. Prerequisite: Senior standing and completion of other biology core courses.

491 Special Topics in Biological Sciences 1-4 hrs.
Directed readings and/or written reports on topics of interest to individual students carried out under supervision of an instructor. Permission of instructor required before registration.

492 Undergraduate Research 2-4 hrs.
For advanced-level biological sciences students with biological sciences GPA of 3.5 or above. Individual investigations into biological problems under direct supervision of instructor. Permission of instructor required before registration. May also be taken at the Marine Environmental Sciences Consortium, Dauphin Island, Alabama. Lab Fee: $30 for 2 hours, $40 for 3 hours, and $50 for 4 hours.

499H Undergraduate Honors Research and Thesis 2-4 hrs.
Individual investigations into biological problems under direct supervision of instructor. For honors students majoring in the biological sciences. Prerequisites: Approval of instructor, chair, and director of honors program; Senior standing. Lab Fee: $30 for 2 hours; $40 for 3 hours; and $50 for 4 hours.

Advanced Undergraduate–Graduate Courses

501 Gravitational Biology 3 hrs.
Basic studies of responses of plants and animals to microgravity. Emphasis on effects of low-gravity at the cellular level, including cell physiology, metabolism, structure, signal transduction mechanisms of gravity sensing, and issues of human gravitational physiology. Description of organisms and summary of biological space flight experiments. Prerequisites: BYS 120, 214 or 321, 301 or 361, and 340 recommended, or permission of instructor.

505 Psychopharmacology 3 hrs.
Introduction to drug classification and action with emphasis on physiological and psychology interactions. Prerequisite: 9 hrs. BYS or PY. (Same as PY 505.)

519 Gene Structure and Function 3 hrs.
Molecular basis for inheritance and gene expression. Advanced studies of replication, transcription, translation. Includes regulation of gene expression, gene cloning and recombinant DNA technology. Prerequisites: BYS 219 and BYS/CH 361.

521 Medical Mycology 4 hrs.
Basic studies of fungi and applied studies of various classes of fungi pathogenic to humans; reproduction, morphology, classification of disease states, pathogenesis, laboratory diagnosis, chemotherapy. Prerequisite: BYS 421, 430 or approval of instructor. Two 2-hour labs per week. Lab Fee: $40.

525 Medical Parasitology 4 hrs.
Basic and applied studies of the various classes of parasites pathogenic to humans and their laboratory identification. Arthropods and their relationship as vectors of parasites. Immunology and chemotherapy of parasitism. Prerequisite: BYS 321 or equivalent. Two 2-hour labs per week. Lab Fee: $30.

531 Plant Physiology 4 hrs.
General introduction to life processes of plants, including water relations, mineral utilization, metabolism, photosynthesis, digestion, respiration, assimilation, and growth as affected by growth hormones. Prerequisites: BYS 120, CH 113 or 331. One 3-hour lab a week. Lab Fee: $30.

532 Animal Physiology 4 hrs.
Basic course in organismal function. Membrane physiology and transport phenomena, muscle, nerve, synapse, and sensory receptor physiology. Physiology of respiration, heart, circulation, kidney, and endocrine system. Emphasis on regulation. One 3-hour lab session a week illustrating physiological principles discussed in lecture. Prerequisites: senior standing; BYS 317 and BYS/CH 301 or 361, or graduate standing. Lab Fee: $50.

297 College of Science
533 Endocrinology
Anatomy, physiology, and biochemistry of endocrine glands. Emphasis on regulation of hormone secretion, hormonal integration of physiological function, and mechanism of hormone action. Prerequisites: BYS 313 and 314 or 532, BYS/CH 361.

535 Microbial Physiology and Metabolism
Aspects of microbial physiology such as nutrition, growth, energy, and biosynthetic mechanisms of microorganisms. Prerequisite: BYS 321. Biochemistry recommended. One 3-hour lab a week. Lab Fee: $50.

536 Psychology of Stress and Illness
Overview of physiological stress responses and their influence on health, behavior, and illness. Prerequisite: 9 hrs. BYS or PY. (Same as PY 536.)

540 Animal Behavior
Examines the experimental and theoretical foundations of the study of animal behavior. Animal behavior will be discussed in terms of immediate mechanisms, development, survival value, and evolution. Some emphasis will be placed on the relevance of animal behavior to human behavior and on the importance of understanding behavior in context. Prerequisites: PY 101, 102 and 302 or BYS 119, 120 and 4 upper level hours in BYS.

543 Molecular Biology of the Cell
Cellular structure and function including mitosis, meiosis, cell cycle, and cell signaling. Discussion of biological techniques such as tissue culture, hybridoma and monoclonal antibody production, gene cloning and recombinant DNA, radiotracer methodology, and specialized microscopy. Prerequisites: BYS 120, 219, and 361 (may be taken concomitantly).

544 Developmental Biology
Gametogenesis and regulation of reproductive cycles, fertilization, cleavage, gastrulation and developmental mechanisms such as nuclear-cytoplasmic interactions and oocyte polarity in regulating gene expression during development, selective cell affinities, contact guidance, and embryonic inductions and fields. Selected morphogenesis of germ-layer derivatives discussed. Prerequisite: BYS 340 or 543.

545 Cellular and Developmental Biology Laboratory
Theory and practice of experimental techniques used in cellular, molecular and developmental biology. Prerequisite: BYS 543 and/or 544. Lab Fee: $50.

547 Biochemistry I
Structural chemistry and function of biomolecules, mechanisms of biochemical reactions, enzyme kinetics, and energy transfer. Prerequisite: CH or BYS 363. (Same as CH 561.)

548 Biochemistry II
Metabolism, biosynthesis of macromolecular precursors, storage, transmission, expression of genetic information, and molecular physiology. Prerequisite: CH 561 or BYS 547. (Same as CH 562.)

561 Physiological Ecology
Physiological and behavioral responses of organisms to natural changes in their chemical and physical environment. Prerequisite: BYS 312 or approval of instructor. BYS 361 or 532 recommended. Lab Fee: $30.

562 Community Ecology
Detailed consideration of ecological principles and concepts, as well as biotic and abiotic factors relative to development of plant communities and ecosystems. Prerequisites: BYS 312. One 3-hour lab a week. Lab Fee: $30. Field trips required.

563 Population Ecology
Distribution, population dynamics and behavior of animal populations in relation to environmental factors. Prerequisites: BYS 312. One 3-hour lab a week. Lab Fee: $30. Field trips required.

564 Limnology
Fresh-water environments and organisms exemplified by lakes, ponds, and streams in north Alabama. Prerequisites: BYS 312, 315 and/or 378 recommended.
Aquatic Arthropod Biology  
4 hrs.  
Systematics, physiology, ecology and importance of the crustacea, insecta and arachnida that inhabit freshwater and estuarine ecosystems. Particular attention will be given to those arthropods common to the aquatic systems in and around Alabama. Since all field trips are required, prospective students should consult with the instructor prior to registration. Prerequisite: BYS 378. Lab Fee: $40.

Marine Sciences (MS)  
Courses are offered only at the Marine Environmental Sciences Consortium Sea Lab at Dauphin Island, Alabama. The following courses can be included in a biological sciences major or minor:  

202 Marine Biology  
4 hrs.  
Survey of invertebrates, vertebrates, and marine plants as communities with local examples of groups. Examination of marshland, estuarine, beach, dune inlet and neritic habitats, and niches. Lectures, laboratory, and field work. Prerequisite: general biology.

304 Coastal Zone Management  
2 hrs.  
Examination of ecological features and physical management policies design for coastal communities and a review of the federal and state programs that impinge upon coastal ecological communities.

502 Marine Botany  
4 hrs.  

503 Marine Invertebrate Zoology  
4 hrs.  
Local examples of principal groups of marine invertebrates. Reproduction, distribution, taxonomy, systematics, and ecology. Lecture, laboratory, and field work. Opportunity to acquire collection of local fauna. Prerequisite: General biology.

505 Marine Vertebrate Zoology  
4 hrs.  

506 Marine Zoogeography  
4 hrs.  
Physical, chemical, and biological factors influencing distribution of marine organisms. Importance of continents, open oceans, and species competition on animal distribution. Zoogeographical patterns in Gulf of Mexico, western North Atlantic, and Caribbean regions. Prerequisite: 12 semester hours of biological sciences.

507 Physiology of Marine Animals  
4 hrs.  
Environmental adaptations of marine animals. Biochemical, osmotic, respiratory, and temperature responses of both invertebrates and fish. Prerequisite: 12 hours in biological sciences. Biochemistry recommended.

508 Marine Plankton  
4 hrs.  

509 Marine Ecology  
4 hrs.  
Bioenergetics, community structure, population dynamics, predation, competition, and speciation in marine ecosystems. Lecture, laboratory, and field work. Students admitted without previous marine courses. For engineers and other non-biologists interested in marine environment. Individual species as they relate to ecological principles exemplifying taxonomic and ecologic backgrounds. Prerequisites: Introductory ecology. Chemistry and physics recommended; marine invertebrate zoology or marine biology helpful.

510 Marsh Ecology  
4 hrs.  
Basic understanding of ecology of salt marsh. Habitat analysis, natural history studies, and population dynamics of selected vertebrates. Specific field problem terminated by a
technical paper assigned to each student. For advanced undergraduates and graduate students. Prerequisite: Introductory ecology.

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>511</td>
<td>Benthic Community Structure</td>
<td>4 hrs.</td>
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<tr>
<td></td>
<td>Patterns of benthic macroinvertebrate abundance and distribution along Alabama coastline. Field sampling, taxonomy, and data analysis in lectures and labs. Major taxa such as polychaetes and crustaceans. Prerequisite: Invertebrate zoology.</td>
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<tr>
<td>512</td>
<td>Fisheries Science</td>
<td>4 hrs.</td>
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<td></td>
<td>Principles and methods of marine fishery biology and their application to conservation. Lecture and laboratory work. Prerequisite: General biology.</td>
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<tr>
<td>513</td>
<td>Fisheries Economics</td>
<td>4 hrs.</td>
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<tr>
<td>515</td>
<td>Coastal Ornithology</td>
<td>4 hrs.</td>
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<td></td>
<td>Coastal and pelagic birds with emphasis on ecology, taxonomy, and distribution. Food habits, field identification, and population dynamics. Prerequisite: Introductory zoology.</td>
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<tr>
<td>525</td>
<td>Marine Biology for Teachers</td>
<td>4 hrs.</td>
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<tr>
<td>599</td>
<td>Research</td>
<td>1-4 hrs.</td>
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</tbody>
</table>

Enrollment by special arrangement in any subjects listed. Prerequisite: Arrangements with and approval of project supervisor and liaison officer. Students should note which semester to take special topics in a particular subject. Only Marine Science Program resident faculty are available for special topics both terms. Other instructors available only time listed for their courses.

The following courses cannot be taken for credit toward a biological sciences major or minor but can be used for a marine science minor.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>204</td>
<td>Commercial Marine Fisheries of Alabama</td>
<td>2 hrs.</td>
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<td>Biology, harvesting technology, and processing of commercially valuable fish and shellfish species of Alabama.</td>
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<tr>
<td>301</td>
<td>Marine Technical Methods I</td>
<td>2 hrs.</td>
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<td></td>
<td>Research equipment, methods, and techniques in marine science. Training in operation and field maintenance of major pieces of sampling gear. Prerequisite: Introductory biology, chemistry, or physics.</td>
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<tr>
<td>302</td>
<td>Marine Technical Methods II</td>
<td>2 hrs.</td>
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<td>Equipment and techniques in laboratory analysis of water and other marine samples. Emphasis on water quality parameters. Prerequisite: Introductory biology, chemistry, or physics.</td>
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<tr>
<td>303</td>
<td>Coastal Climatology</td>
<td>2 hrs.</td>
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<td>Physical factors that result in climactic conditions in and near coastal region. Emphasis on northern Gulf of Mexico.</td>
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<tr>
<td>501</td>
<td>Introduction to Oceanography</td>
<td>4 hrs.</td>
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<td>Physics, chemistry, biology, and geology of oceans. For graduate students and those preparing for graduate school or intending to enter marine sciences professionally. Prerequisites: College algebra, general physics, and general chemistry.</td>
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<tr>
<td>514</td>
<td>Estuarine Science</td>
<td>4 hrs.</td>
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<td>Physical, chemical, and biological parameters of estuarine ecosystems. Field experience and lecture material. Mobile Bay in detail. Prerequisite: Introductory zoology, chemistry, physics, or geology.</td>
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<tr>
<td>516</td>
<td>Scientific Data Management</td>
<td>2 hrs.</td>
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<td>Key techniques and principles in evaluating and expressing experimental data. Mapping, profiling, contouring, applied statistics, and graphical and tabular representation of results. Not a substitute for basic statistics courses.</td>
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</tbody>
</table>
520 Marine Geology 4 hrs.
Sampling techniques, laboratory analysis of sediments, application of research process to problems in identifying sedimentary environments, topography, sediments, and history of world oceans. Beneficial for understanding sedimentary substrate on or in which a large percentage of marine organisms live. Lecture, laboratory, and field work. Prerequisite: physical geology.

521 Recent Marine Sedimentation 4 hrs.
Investigations in properties of marine sediments, coastal sedimentary environments, continental margin sediments, reef and associated sediments, deep-sea sediments and marine geophysics. Erosional and depositional effects of waves and currents. Prerequisite: marine geology or oceanography.

522 Marine Paleoecology 4 hrs.
Principal marine fossil groups in gulf coastal plain sediments, their paleoecology, and paleogeography. Recent and ancient marine communities and individuals in them. Prerequisite: marine geology or advanced geology.

Chemistry Department
203-C Materials Science Building
Telephone: (256) 824-6153
Email: chem@uah.edu
Web Site: http://www.chemistry.uah.edu

Professors Baird (Chair), Gregory, Loo, Meehan, Setzer; Research Professor Harris; Professor Emeritus Riley; Associate Professor Weimer; Associate Research Professor Kaukler; Assistant Professors Gebauer, George, Scholz, Vekilov, Vogler; Assistant Research Professor Chen.

The academic program in chemistry at the University of Alabama in Huntsville has received the approval of the American Chemical Society in recognition of its strong faculty and excellent facilities for high quality undergraduate instruction. The Chemistry Department offers courses leading to the B.S. degree with a major in chemistry and supports undergraduate programs in other disciplines.

Six chemistry major curricula are offered which provide preparation for: (1) medical school, dental school, or veterinary school; (2) the Alabama Class B High School Teacher's Certificate; (3) graduate study in chemistry and/or employment as an industrial chemist; (4) general education in chemistry; (5) graduate study combining chemistry and physics; (6) employment as a biochemist or clinical chemist; and (7) chemical business.

Chemistry Major
Requirements for the chemistry major include:
1. The minimum total semester hours required for the B.S. is 128. Of these, at least 39 semester hours must be in courses numbered 300 or higher.
2. Mastery of elementary calculus by successful completion of MA 171 and 172.
4. Completion of the university's General Education Requirements (GER). For a chemistry major, the GER requirement (see note [a] below) consists of the following:

Area I
English 101, 102

Semester Hours
6
Area II
Literature  
Fine Arts  
CM 113  

Area III
Mathematics (MA 171) (See note [b] below)  
Laboratory Science (See note [c] below)  

Area IV
History, social and behavioral science  
(No more than 6 hours in a single discipline)  

Area V
Professional and elective courses  
CS 102, MA 172, EH 301 and one science or engineering course outside of major or minor  

15  
Total  
57  

Notes
[a] The section of the catalog dealing with the GER requirements for B.S. degree should also be consulted for details.  
[b] If the student's minor is mathematics, this requirement is waived.  

Additional Requirements:  
1. Completion of a minor consisting of at least 21 hours of course work in any subject other than chemistry. The course requirements for minors can be found in the sections of this catalog dealing with the various departments. An educationally compatible combination of courses from more than one department can be substituted for the minor. This is called Cognate Studies.  
2. Completion of sufficient electives to meet the overall minimum hour requirements for the degree.  
3. Completion of one of the six chemistry curricula shown below, or another developed in consultation with a Chemistry Department advisor. The student is allowed considerable flexibility in planning an individual program, but all course patterns that differ from those listed below require faculty approval.  

*Suggested four-year sequence for Biochemistry/Pre-Med Curriculum with Biology minor  

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<th>First Year</th>
<th>Fall</th>
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<th>Spring</th>
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<td>CH 123</td>
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<td>MA 171</td>
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</tbody>
</table>
### Third Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 347</td>
<td>3</td>
<td>CH 348</td>
</tr>
<tr>
<td>CH 345</td>
<td>1</td>
<td>CH 346</td>
</tr>
<tr>
<td>CH 361</td>
<td>3</td>
<td>CH 363</td>
</tr>
<tr>
<td>CH 362</td>
<td>1</td>
<td>CH 364</td>
</tr>
<tr>
<td>CS 102</td>
<td>3</td>
<td>CM 113</td>
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<td>GER</td>
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<td>GER</td>
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<tr>
<td>GER</td>
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</tbody>
</table>

**Total Hours:** 17

### Fourth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 421</td>
<td>4</td>
<td>CH 402</td>
</tr>
<tr>
<td>CH 401</td>
<td>3</td>
<td>BYS 340</td>
</tr>
<tr>
<td>BYS 321</td>
<td>4</td>
<td>CH 493</td>
</tr>
<tr>
<td>EH 301</td>
<td>2</td>
<td>Electives</td>
</tr>
</tbody>
</table>

**Total Hours:** 15

*Other minors are possible with the chemistry major. These are only suggested sequences of courses.*
Curriculum I  Biochemistry, Premedical, Predental Program (American Chemical Society approved)

The premedical program conforms to the requirements of most medical schools and contains sufficient chemistry to meet the requirements of a chemistry major. Prospective medical students should explore their areas of interest outside of the sciences and strive for maximum scholastic achievement. Students should consult with the Preprofessional Advisory Committee early in their college program and prepare to take the Medical College Aptitude Test during the spring of their junior year. (For alternative premedical curricula, see Chemistry Curriculum II and Biological Sciences Example IV.)

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education (See Areas I-V) ...........................................</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 335, 336, 345, 346, 347, 348, 361, 362, 363, 364, 401, 402, 421 ..................................................</td>
</tr>
<tr>
<td>Physics—PH 111, 114, 112, 115 ..................................................</td>
</tr>
<tr>
<td>Mathematics—MA 171, 172 ..................................................</td>
</tr>
<tr>
<td>Biological Sciences minor BYS 119, 120, 219, 321, 340, 519 or 543 or 547 ..................................................................</td>
</tr>
</tbody>
</table>

Curriculum II  General Chemistry, Premedical, Predental

General Education (See Areas I-V) ........................................... | 57 |
Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 335, 336, 361, 362, 345, 347, 401, 402, 421 .................................................. | 35 |
Physics—PH 111, 114, 112, 115 .................................................. | Area III |
Mathematics—MA 171, 172 .................................................. | Areas III and V |

Curriculum III Class B High School Teacher's Certificate

B.S. degree with major in chemistry. This plan meets the requirements for an Alabama Class B High School Teacher's Certificate.

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education (See Areas I-V) ...........................................</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 315, 331, 332, 335, 336, 361, 362, 347, and 401 ..................................................</td>
</tr>
<tr>
<td>Physics—PH 111, 114, 112, 115 ..................................................</td>
</tr>
<tr>
<td>Mathematics—MA 171, 172 ..................................................</td>
</tr>
<tr>
<td>Biological sciences (minimum requirements) ...................................</td>
</tr>
<tr>
<td>Professional education courses (See Education Dept. section of catalog.) ..................................................</td>
</tr>
</tbody>
</table>

NOTES:
1. This curriculum may require more than the minimum total of 128 hours.
2. Students pursuing this curriculum should consult with the Department of Education early in their program. Education students are required to pass an exit examination in their teaching field in order to graduate and be recommended for certification.
**Curriculum IV Graduate Preparatory Program**  
This curriculum is approved by the American Chemical Society's Committee on Professional Training. It is designed for a student who plans to do graduate work or desires an industrial position that requires a strong chemical background.

<table>
<thead>
<tr>
<th>Module</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education (Areas I-V)</td>
<td>57</td>
</tr>
<tr>
<td>Chemistry - CH 121, 123, 125, 126, 223, 331, 332, 335, 336, 341, 342, 343, 345, 346, 361, 362, 401, 402, 421, 493</td>
<td>45</td>
</tr>
<tr>
<td>Physics - PH 111, 114, 112, 115</td>
<td>Area III</td>
</tr>
<tr>
<td>Mathematics - MA 171, 172</td>
<td>Areas III and V</td>
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<td>Mathematics Minor - MA 201, 244, 324, and 385 or 415 or 465</td>
<td>13</td>
</tr>
</tbody>
</table>

**Curriculum V General Education Curriculum**  
General education curriculum with a chemistry major.

<table>
<thead>
<tr>
<th>Module</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education (Areas I-V)</td>
<td>7</td>
</tr>
<tr>
<td>Chemistry - CH 121, 123, 125, 126, 223, 331, 332, 335, 336, 341, 342, 343, 345, 346, 401, and 421</td>
<td>39</td>
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<tr>
<td>Physics - PH 111, 114, 112, 115, 113, 116</td>
<td>12</td>
</tr>
<tr>
<td>Mathematics - MA 171, 172, 201, 244, and 324</td>
<td>18</td>
</tr>
</tbody>
</table>

**Curriculum VI Chemical Physics Curriculum**  
Chemistry-physics program appropriate for pregraduate education.

<table>
<thead>
<tr>
<th>Module</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education (Areas I-V)</td>
<td>57</td>
</tr>
<tr>
<td>Chemistry - CH 121, 123, 125, 126, 223, 331, 332, 335, 336, 341, 342, 343, 345, 346, 401, and 421</td>
<td>36</td>
</tr>
<tr>
<td>Physics - PH 111, 112, 114, 115</td>
<td>Area III</td>
</tr>
<tr>
<td>Physics Minor - PH 110, 113, 116, 305, 301, 431, 451, 499</td>
<td>21</td>
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<tr>
<td>Mathematics - MA 171, 172</td>
<td>Areas II and V</td>
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</tbody>
</table>

**Curriculum VII Chemical Business Curriculum**  
This curriculum is designed to prepare a student to perform business functions in the chemical or pharmaceuticals industry.

<table>
<thead>
<tr>
<th>Module</th>
<th>Semester Hours</th>
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</thead>
<tbody>
<tr>
<td>General Education (Areas I-V)</td>
<td>58</td>
</tr>
<tr>
<td>Area IV should include ECN 142 and ECN 143</td>
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</tr>
<tr>
<td>Chemistry - CH 121, 123, 125, 126, 223, 331, 332, 335, 336, 345, 346, 347, 348, 361, 362, 401, 402, and 421</td>
<td>39</td>
</tr>
<tr>
<td>Physics - PH 111, 114, 112, 115, 113, 116</td>
<td>Area III</td>
</tr>
<tr>
<td>Mathematics - MA 171, 172, 201</td>
<td>Areas III and V</td>
</tr>
<tr>
<td>Business Minor - ACC 211, ACC 212, BLS 211, MGT 301, MKT 301, MGT 450, and MSC 385</td>
<td>21</td>
</tr>
<tr>
<td>Statistics - MSC 287 or MA 385 or ISE 390 and MSC 288 or MA 487 or ISE 391</td>
<td>Area V</td>
</tr>
<tr>
<td>Microcomputers - MIS 146 (or MIS 102, 104, and 106)</td>
<td>3</td>
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</tbody>
</table>

Students interested in the pharmaceuticals industry may wish to take CH 363 and CH 364 and/or one or more courses in biology. A student can satisfy the statistics requirement and add a second minor in mathematics simply by electing the sequence MA 171, 172, 201, 244, 385, and 487.
Notes applying to all curricula above:

(a) Credit may be obtained for Chemistry 121, 123, 125, and 126 by making a satisfactory score on the CLEP examination. This examination is offered at various times during the year through the Office of Testing Services. Students pursuing credit by examination should consult the Chemistry Department before taking the examination. Credit is also granted to a student who submits a score of 3 or higher on the Advanced Placement Programs of the College Entrance Examination Board.

(b) Transfer students wishing to major in chemistry must complete at least 9 semester hours of chemistry at the level of 300 or above at UAH. Courses in organic chemistry completed at the junior college level may be used to satisfy prerequisite requirements for upper level chemistry courses at UAH but do not count toward the upper level (300+) hour requirements of the major.

(c) No credit toward the chemistry major is given for CH 101, 105, or any mathematics course numbered lower than MA 171. A student requiring these courses should understand that the total credit hours of course work required to meet all the degree requirements may exceed the minimum of 128 hours required for the B.S. degree.

(d) Unless attention is given to the sequence in which courses are scheduled, chemistry majors may experience difficulty in completing the required courses within a four year-period. Students should plan to complete all the mathematics and physics courses required by their chosen curriculum before the fall semester of their junior year.

Chemistry Minors

Course sequences for students wishing to minor in chemistry require at least 21 hours of chemistry including 6 or more hours numbered 300 or above. Courses in organic chemistry completed at the junior college level may be used to satisfy hour and prerequisite requirements for upper level chemistry courses at UAH but do not count toward the 300-level requirements of the minor. Approved sequences are shown below. Others are subject to Chemistry Department approval.

1. CH 121, 125, 123, 126, 223, 331, 332, 335, 336, and 361 for premedical and predental students.
2. CH 121, 125, 123, 126, 223, 331, 332, 335, 361, 362 for some biology and medical technology majors.
3. CH 121, 125, 123, 126, 331, 332, 335, 341, 342, 343 for physics and mathematics majors.
4. CH 121, 123, 125, 126, 223, 331, 332, 335, 347 for biology majors taking BYS 361 and 362.

Chemistry (CH)

101 Introduction to Chemistry 3 hrs.
Properties of solids, liquids, gases, and solutions, atomic theory and bonding, concentration concepts, and physical and chemical properties of the more common elements and their compounds. CH 101 does not count toward the chemistry major or minor. Chemistry majors or minors taking CH 101 get elective credit only. CH 101 may be used with CH 105 and CH 113 to fulfill the laboratory science requirement of the GER. No placement examination is required for enrollment in CH 101. The student may opt to take CH 101 even if he has achieved a satisfactory score on the placement examination for enrollment in CH 121. Prerequisite or parallel: MA 119 or mathematics Level II placement. Parallel: CH 105.

105 Introductory Chemistry Laboratory 1 hr.
Laboratory fundamentals and basic chemical principles. A student enrolled in a B.S. degree program who plans to take CH 121 and CH 125 and has had chemistry laboratory experience may be exempt from CH 105 by permission of Chemistry Department chair. CH 105 may not be counted toward the chemistry major or minor. Chemistry majors or minors receive only elective credit. Parallel: CH 101. Lab Fee: $40.

113 Elementary Organic Chemistry 4 hrs.
Nomenclature, structure, functional groups, and properties of organic compounds. Recommended for nursing majors, some biology minors, and as a sequence to CH 101 and
105 for an 8-hour laboratory science requirement for non-science majors. Not open to chemistry majors and minors. Laboratory included. Prerequisite: CH 101, 105; equivalent or placement examination. Lab Fee: $40.

121 General and Inorganic Chemistry I 3 hrs.
For science and engineering majors. Properties of gases, liquids, solids, and solutions. Nature of the chemical bond, kinetics, chemical equilibrium, electrochemistry, thermochemistry. Chemical properties of elements, their periodic groups, and their compounds. Prerequisites or parallel: CH 101 or placement test and MA 119 or placement Level II mathematics; parallel: CH 125.

123 General and Inorganic Chemistry II 3 hrs.
Continuation of 121 with in-depth study of topics listed. Prerequisite: CH 121. Parallel: CH 126.

125 General and Inorganic Chemistry Laboratory I 1 hr.
Complements the lecture material for CH 121. Includes the determination of chemical and physical properties of materials, synthesis and characterization, and introduction to spectroscopy. Parallel: CH 121. Lab Fee: $40.

126 General and Inorganic Chemistry Laboratory II 1 hr.
Complements the lecture material of CH 123. Includes an introduction to qualitative and quantitative analytical techniques. Parallel: CH 123. Lab Fee: $40.

223 Quantitative Analysis 3 hrs.
Background in fundamental quantitative analytical chemistry with an introduction to instrumentation. Data treatment, ionic equilibria, elementary electrochemical, spectrochemical, gravimetric, and volumetric techniques. Laboratory included. Lab Fee: $50. Prerequisite: CH 126.

301 Elementary Biochemistry 3 hrs.
Biochemistry and energetics of living cells, metabolism, structure and function of carbohydrates, lipids, proteins and nucleic acid. Enzymes, coenzymes, vitamins, blood, endocrine glands, DNA synthesis and gene expression, nutrition, drugs and biochemistry of specialized tissues. Prerequisites: BYS 120 and CH 113 or 331. No credit given to chemistry majors or minors. Credit in CH 361 precludes credit in CH 301. (Same as BYS 301.) Spring.

315 Chemical Demonstrations 2 hrs.
Designed for elementary and secondary education majors involving development and presentation of demonstrations which illustrate important and exciting chemical principles. Prerequisites: CH 113 or 223 or permission of the instructor. Lab Fee: $30.

331 Organic Chemistry I 3 hrs.
Chemistry of organic compounds. Synthetic methods, theory, and reaction mechanisms. Prerequisites: CH 123, 126; CH 223 recommended.

332 Organic Chemistry II 3 hrs.
Continuation of CH 331. Prerequisite: CH 331.

335 Organic Chemistry Laboratory I 1 hr.
Techniques of organic chemistry including synthesis, separation, and identification of organic compounds with use of chemical and spectroscopic methods. Prerequisite or parallel: CH 331. Lab Fee: $50.

336 Organic Chemistry Laboratory II 1 hr.
Continuation of CH 335. Prerequisite: CH 335. Prerequisite or parallel: CH 332. Lab Fee: $50.

337 Organic Chemistry Laboratory III 2 hrs.
Advanced organic chemistry laboratory treating reactions and techniques not covered in CH 335 and 336. Pursuit of a special open-ended problem by each student. Prerequisite: CH 336 and approval of instructor. Lab Fee: $60.

341 Physical Chemistry I 3 hrs.
Theory of classical thermodynamics and its application to the chemistry of solid, liquids, gases, and solutions. Prerequisites: CH 123, MA 201 and PH 112. Credit in CH 341 precludes credit in CH 347.
342 Physical Chemistry II
Kinetic theory of gases, theory and formulation of rate equations, mechanisms of chemical reactions, electrochemistry, and surface processes. Prerequisite: CH 341. Credit in CH 342 precludes credit in CH 348.

343 Introduction to Quantum Chemistry
Quantum mechanical treatment of atoms, molecules, and spectroscopy. Prerequisites: CH 341, PH 113, and MA 324.

345 Experimental Physical Chemistry I
Laboratory and computer investigations into physical chemistry. Prerequisite: CH 223; Pre or parallel: CH 341 or 347. Lab Fee: $50.

346 Experimental Physical Chemistry II
Laboratory investigations into thermodynamics, kinetics and spectroscopy. Prerequisite: CH 345 or CHE 295; Parallel CH 342 or 348. Lab Fee: $50.

347 Biophysical Chemistry I

348 Biophysical Chemistry II
Viscosity, diffusion, sedimentation, electrophoresis, determination of molecular weight by osmotic pressure. Light scattering and photochemistry. Elementary IR, UV-VIS, ESR, NMR spectroscopy. Fluorescence. Optical rotation. Prerequisite: CH 347. (Same as BYS 348.)

361 General Biochemistry I
Molecules that comprise living systems. Nomenclature, structure, properties, and functions in metabolism of amino acids, proteins, carbohydrates, lipids, and nucleic acids. Enzymatic properties and function; major catabolic pathways, their interrelations and control mechanisms. Glycolysis, Kreb's cycle, and oxidative phosphorylation. Prerequisites: BYS 120, CH 223, 332, and 335. (Same as BYS 361.)

362 General Biochemistry Laboratory I
Practical experience in isolation, qualitative identification, and quantitative estimation of biomolecules. Prerequisite or parallel: CH 361. Prerequisite: CH 223. One 3-hour lab a week. Lab Fee: $60. (Same as BYS 362.)

363 General Biochemistry II
A continuation of CH 361 to include fatty acid and amino acid oxidation, biosynthesis of biomolecules, integration of metabolism, DNA and RNA metabolism, protein biosynthesis, and genes. Prerequisite: CH 361. (Same as BYS 363.)

364 General Biochemistry Laboratory II
Experimental course illustrating the topics in CH 363. Prerequisites: CH 361 and CH 362. Parallel CH 363. Lab Fee: $50. (Same as BYS 365.)

401 Inorganic Chemistry
Fundamental topics in inorganic chemistry. Atomic structure, chemical bonding, periodic relationships, acid-base theories, nonaqueous solvents, and reaction mechanisms. Prerequisite or parallel: CH 342 or 348.

402 Inorganic Chemistry Laboratory
Laboratory techniques of inorganic chemistry including synthesis, purification, isolation, and identification of inorganic compounds. Prerequisite: CH 401. Lab Fee: $60.

421 Instrumental analysis
Introduction to modern analytical instrumentation including IR, UV and atomic absorption spectrophotometers, nuclear magnetic resonance, electroanalytical equipment, and gas and liquid chromatographs. Lecture and laboratory. Prerequisite or parallel: CH 346. Lab Fee: $60.
480 Selected Topics in Chemistry 1-3 hrs.
Special offerings to students in areas of interest not covered in present curriculum. Prerequisite: senior standing and approval of instructor.

491, 492, 493 Introduction to Chemical Research 1-3 hrs.
Personalized programs to round out the undergraduate curriculum of students with various goals. Prerequisite or parallel: CH 345 and senior standing. Approval of supervising faculty member and chemistry chair required. Registration utilizes last digit of course number to designate semester-hour credit. Student normally may elect only up to 6 hours. Lab Fee: $40 for CH 492, $50 for CH 493. No lab fee for CH 491.

Computer Science Department
300 Technology Hall
Telephone: (256) 824-6088
Email: info@cs.uah.edu
Web Site: http://www.cs.uah.edu/

Professors Amin, Graves, Ranganath, Richards (Chair); Professors Emeriti Davis, Johannes, Shiva; Associate Professors Delugach, Li, Newman, Rochowiak; Assistant Professors Cox, Etzkorn, Graham, Hart, Weisskopf; Lecturers Robinson, Seo, Vinz; Adjunct Professor Kavi.

The computer science program at UAH prepares students to contribute to the rapidly advancing world of computational technology. Our program combines mathematical foundations with laboratory experiences to build a base of practical knowledge that provides the graduate with a knowledge of fundamentals combined with effective computing skills. The faculty are dedicated teachers who are also actively involved in advancing the state-of-the-art of computing. They provide up-to-date knowledge of the latest techniques in computer science delivered in a highly effective way. The program meets national standards for excellence and has been fully accredited by the Computer Science Accreditation Board (CSAB) since 1989.

The Computer Science Department is located in the newly renovated Technology Hall and has excellent classroom, laboratory, and student facilities. Ready access is provided to several modern, networked PC and Sun laboratories within the department. The campus fiber backbone supports easy Internet and world wide web access. Additional PC laboratories are also distributed across the campus. The department has a microcomputing laboratory for instruction in logic design and computer architecture.

Extensive laboratory work is required in almost every course. Computing laboratory fees are associated with most computer science classes. In order to accommodate student needs, lab scheduling is flexible.

Important notes regarding a computer science major
• A mathematics minor is required of all computer science majors.
• In order to graduate with a degree in computer science, a minimum GPA of 2.0 must be obtained both in the computer science major and the mathematics minor areas taken at UAH.
• A student must meet all requirements of the College of Science and the university as well as the requirements stated in this section.
• A transfer student must complete a minimum of 18 hours of CS courses at UAH in order to obtain a degree in computer science.

Introductory Sequence
The introductory sequence for computer science majors and minors is CS 121, 221, 321. This sequence replaces the previous sequences 107-207 and 104-204-304. CS 102 or equivalent college-level programming course is a prerequisite for CS 121. Students who have already
started one of the older sequences have until the end of the 2001-2002 academic year to complete the sequence as scheduled. Students who are unable to complete the sequence in this timeframe should consult an advisor for assistance.

**Course Requirements for a B.S. Degree in Computer Science**

The minimum number of hours required for a B.S. degree with a major in computer science is 128 distributed as shown below. AP credit may be used to replace certain required courses.

**General Education Requirements (Areas I-V)**

<table>
<thead>
<tr>
<th>Area</th>
<th>Requirement</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>English Composition</td>
<td>6 hrs.</td>
</tr>
<tr>
<td>II</td>
<td>Literature, Fine Arts, Humanities</td>
<td>12 hrs.</td>
</tr>
<tr>
<td></td>
<td>Must include CM 113 and at least one literature</td>
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</tr>
<tr>
<td>III</td>
<td>Laboratory Sciences</td>
<td>8 hrs.</td>
</tr>
<tr>
<td></td>
<td>Must include MA 171* and one of the following sequences:</td>
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</tr>
<tr>
<td></td>
<td>PH 111/114-112/115; CH 121/125-123/126; or BYS 119-120</td>
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</tr>
<tr>
<td>IV</td>
<td>History, Social and Behavioral Sciences</td>
<td>12 hrs.</td>
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<tr>
<td></td>
<td>Must include at least one history; no more than 6 hours in one discipline</td>
<td></td>
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<tr>
<td>V</td>
<td>Preprofessional and Elective Courses</td>
<td>16 hrs.</td>
</tr>
<tr>
<td></td>
<td>Must include CS 102 (or equivalent), EH 301, a 4-hour laboratory science**</td>
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</tr>
<tr>
<td></td>
<td>and electives, including MA 119 or 121 if required by placement.</td>
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</tr>
</tbody>
</table>

*Math and computer science courses from the major and minor may also be used to satisfy general education requirements, but the hours cannot be counted twice.

**For Computer Science, laboratory science courses must be chosen from courses that can be applied toward a major in the department where they are taught.

For further information about distribution requirements and specific courses that satisfy the categories above, see the College of Science General Education Requirements.

**Computer Science Major**

CS Core: CS 105, 121, 214, 221, 308, 309, 317, 321, 413 (or 513), 490, 499, 524: 34 hrs.

CS Electives (6 hours at 300-level or above, 6 hours at 400-level or above): 12 hrs.

Mathematics Minor

MA 171, 172, 201, 244, 385, and one of 324, 415 or 442: 21 hrs.

Technical Elective

To be chosen from a list available in the CS Department: 3 hrs.

General Electives

To bring the total number of hrs. to 128: 128 hrs.

**Computer Science Minors**

The department offers two minors which are described below. The request for a minor should be initiated in the student's major department.

**Computer Science Minor** (Suitable for students with a major in a technical field): CS 105, 121, 214, 221, 317, 321 and two CS electives,* one at the 300-level or higher and one at the 400-level or higher.

Select CS 490 and 513 as electives, if considering seeking M.S. in computer science.

**Computer Languages and Systems Minor** (Suitable for students with non-technical majors and minimal mathematics background): CS 102, 105, 121, 221, 321 and three CS electives,* two at the 300-level or higher and one at the 400-level or higher.

*Students must observe prerequisites when choosing elective courses.
### A TYPICAL FOUR YEAR PROGRAM FOR COMPUTER SCIENCE MAJORS

<table>
<thead>
<tr>
<th>FRESHMAN FALL</th>
<th>CS 102</th>
<th>3</th>
<th>CS 105</th>
<th>1</th>
<th>MA 171</th>
<th>4</th>
<th>HIST/SOC SCI</th>
<th>3</th>
<th>(AREA IV)</th>
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<th>(AREA IV)</th>
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<thead>
<tr>
<th>SOPHOMORE</th>
<th>CS 214</th>
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<th>CS 221</th>
<th>3</th>
<th>MA 201</th>
<th>4</th>
<th>LAB SCIENCE</th>
<th>4</th>
<th>LIT/FA (AREA II)</th>
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<thead>
<tr>
<th>JUNIOR</th>
<th>CS 309</th>
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<th>CS 317</th>
<th>3</th>
<th>CS ELECTIVE</th>
<th>3</th>
<th>CS 413 OR 513</th>
<th>3</th>
<th>MA 385</th>
<th>3</th>
<th>MA 324 OR 3</th>
<th>3</th>
<th>LAB SCIENCE</th>
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**Total Hours** 128

### LIT/FA: LITERATURE AND FINE ARTS

**HIST/SOC SCI: HISTORY, SOCIAL AND BEHAVIORAL SCIENCE**

**Computer Science (CS)**

100 **Introduction to Computers and Programming** 3 hrs.

101 **Processing Information on the Personal Computer** 3 hrs.
Fundamentals of computer usage with a focus on the processing of information. Topics include the operating system, introduction to elementary hardware, electronic storage and retrieval of information, INTERNET access, word processing, database fundamentals, and presentation graphics. Students will learn to access libraries and will get hands-on experience in producing documents which incorporate graphics, tables, charts, etc. Lab Fee: $40.
102 Introduction to C Programming
Program design and implementation in the C programming language. Basic program
structure, data types, control structures, and file organization. System libraries,
input/output features. Lab Fee: $40. No credit for students who have received credit for
CS 107, 207 or 312. Cannot be counted toward a CS major.

103 Introduction to Programming using Java
Program design and implementation in the Java programming language, using hands-on
programming assignments, class demonstrations and lectures. Problem analysis and some
testing techniques. Basic features of program structure, data types, control structures,
methods and file organization. Java's built-in class libraries, input/output features. Lab fee:
$50. Does not count toward CS major.

105 Computer Science Seminar – Ethics and Professionalism
Covers issues associated with the ethical use of computers in the current information
age. Ethics, professionalism, software piracy, copyrighting software, ethical standards
and the impact of computers on society will be covered. Familiarization with the local
computing environment will also be covered.

121 Computer Science I
Review of hardware and software components of computer systems. Review of problem
solving techniques and algorithm development. Principles of software design,
implementation, and testing. Introduction to object oriented design and the C++
programming language. Extensive programming assignments to provide experience in the
application of design and implementation principles. Lab fee $40. Prerequisite: CS 102
or other college-level programming course, MA 119. Corequisite: MA 121.

207 Computer Science II – Data Structures
Continuation of CS 107, with emphasis on advanced features of the C programming
language, including pointers and recursion. Introduction to elementary data structures
including linked lists, stacks, queues, and simple binary trees. Basic sort and search
algorithms. Practical experience in the design and implementation of larger programs.
Laboratory provides structured demonstrations of the applications of design and
implementation principles. Offered for the last time Fall 2001. Lab Fee: $40.
Prerequisites: CS 107 or 121 and MA 171.

214 Introduction to Discrete Structures
Review of set algebra including mappings and relations. Algebraic structures including
semigroups and groups. Elements of theory of directed and undirected graphs; Boolean
algebra and propositional logic and applications of these structures to various areas of
computer science. Lab Fee: $40. Prerequisites: CS 121 and MA 171.

221 Computer Science II: Data Structures
Continuation of CS 121 with emphasis on advanced features of the C++ programming
language, including pointers, recursion, classes, inheritance, and polymorphism.
Introduction to fundamental data structures including linked lists, stacks, queues, and
binary search trees. Basic sorting and searching algorithms. Practical experience in the
design, development, and documentation of significant object-oriented programs. Lab fee
$50. Prerequisites: CS 121, MA 121. Corequisite MA 171.

304 Applied Object-Oriented programming in C++
Writing substantial object-oriented programs in C++, including their documentation and
testing. Advanced data structures (e.g., balanced trees, hash tables). Comparison with other
object-oriented languages, notably JAVA. Offered for the last time Fall 2001. Lab Fee: $40.
Prerequisite: CS 204 or 306 or proficiency in another object-oriented programming
language.
306 Concurrent Programming Using JAVA 3 hrs.
Introduces the concept of concurrency and shows how the object-oriented programming paradigm can be used to design and build multithreaded programs. Introduction to JAVA syntax; use of the language to develop World Wide Web applications. Lab Fee: $40. Prerequisites: Two semesters of instruction in a structured programming language such as C, C++, Pascal, or a year's experience programming in such a language. (Cannot be taken if CS 104, 204 have been taken.)

307 Object-Oriented Programming in C++ 3 hrs.
Emphasis upon object-oriented concepts and design in developing student programs in C++. Comparison with other object-oriented languages. Inheritance. Lab Fee: $40. Prerequisites: CS 207 or 221. (Cannot be taken if CS 104, 204, 304 sequence is taken.)

308 Computer Organization and Assembly Language Programming 3 hrs.
Computer hardware organization; representation of numbers and characters; memory and memory addressing techniques. Functions of central processing unit; instruction representation and execution. Overview of software systems: loaders, assemblers, compilers, interpreters, operating systems. Functional description of input/output and mass storage devices. Structure and operation of assemblers. Programming experience in a representative assembly language. Lab Fee: $50. Prerequisite: CS 204 or 207 or 221.

309 Switching Theory 3 hrs.
Boolean algebra, Boolean function minimization techniques, design and analysis of combinational circuits, design and analysis of sequential circuits, asynchronous circuits, timing and loading problems, designing with integrated circuits. A lab section must be scheduled for this course. Lab Fee: $50. Prerequisite: CS 214.

311 Advanced Software Development using COBOL 3 hrs.
Business systems and data-processing procedures and impact of data-processing methods on economic structure of business. User communications, file design, report control, documentation. Data bases, information collection, planning and control, and systems design concepts. COBOL. Lab Fee: $40. Prerequisite: CS 207 or 204 or 221.

314 Data Organization and File Processing 3 hrs.
Introduction to file structures, databases, and database management systems. Review of data structures: binary trees, B-trees, B* -Trees, and AVL Trees. Algorithms for traversing and balancing trees. Basic concepts and algorithms for inverted lists, multilists, index sequential, and hierarchical structures. Sequential and random access methods including record and file I/O. Lab Fee: $40. Prerequisite: CS 204 or 207 or 221.

317 Introduction to Design and Analysis of Algorithms 3 hrs.
Introduction to complexity analysis of algorithms with emphasis on efficient methods for searching, sorting, finding spanning trees and shortest paths in graphs. Basic algorithm design techniques such as divide & conquer, dynamic programming, and backtracking. Introduction to the classification of problems; i.e. NP, intractable, and unsolvable. Lab Fee: $40. Prerequisites: MA 244, CS 204 or 207 or 221 and 214.

321 Introduction to Object-Oriented Programming in Java 3 hrs.
Writing substantial object-oriented programs in Java, including their design, documentation and testing. Advanced data structures (e.g., balanced trees, hash tables). Graphical interface programming using the Java abstract windowing toolkit (awt). Comparison with other object-oriented languages, notably C++. Lab fee: $50. Prerequisite: CS 221 or proficiency in another object-oriented programming language.

330 Symbolic Programming with LISP and PROLOG 3 hrs.
Use of the LISP language. Computing with symbolic expressions; e.g. algebraic expressions, logical expressions, patterns, graphs, and computer programs themselves. Building and controlling abstractions. Object oriented programming, prototyping. Introduction to PROLOG. Lab Fee: $40. Prerequisite: CS 204 or 207 or 221.
350 Software Design and Development Using Ada
Introduction to the syntax and semantics of Ada, comparison to the Pascal language, data encapsulation, data abstraction, recursive data structures, parallel tasks, Ada program design languages. Introduction to Ada program support environments and concepts of correct software system design and development using Ada. Lab Fee: $40. Prerequisite: CS 317.

390 UNIX Programming
Strategies for the design and development of systems and programs in the UNIX environment. UNIX operating system fundamental concepts including file and terminal I/O, processes, interprocess communication and signals. Pattern searching, filter and pipes. Shell programming, including control flow and interrupt handling. Program and system development tools awk, C, make, sed, yacc, and others. Lab Fee: $40. Prerequisite: CS 204 or 207 or 221.

403 Introduction to Formal Languages and Automata Theory
Introduction to concepts and formalisms of formal languages and automata theory. Includes fundamental mathematical concepts, grammars and corresponding automata, and deterministic parsing of programming languages. Lab Fee: $40. Prerequisite: CS 317.

413 Introduction to Digital Computer Design
Logic design of functional digital units, design of computer subsystems: register transfer, bus structure, timing and control. Design of processor, memory, arithmetic, and I/O units. A lab section must be scheduled for this course. CS 513 is an acceptable substitute for CS 413. Lab Fee: $50. Prerequisites: CS 308, 309.

470 Introduction to Computer Networks
ISO reference model for interconnection; physical, data link, network and transport layer protocols; local area networks; TCP/IP and applications. Lab Fee: $40. Prerequisite: CS 309, 317.

487 Database Systems
Introduction to the basic concepts of database management systems with a focus on relational and object-oriented systems. Database design including semantic models and normalization. Design issues including query languages, internal storage, recovery, concurrency, security, integrity, and query optimization. Lab Fee: $40. Prerequisite: Senior standing or permission of instructor.

490 Introduction to Operating Systems
History and principles of operating systems. Emphasis on fundamental concepts of process management, memory management, I/O management, and file systems. Topics include process states, threads, CPU scheduling, concurrent processing, virtual memory, disk scheduling. Brief overview of modern operating systems including multiprocessor, distributed, and real time systems. Contemporary operating systems such as UNIX and Windows NT will be used as examples. Students will be assigned substantial programming projects. Lab Fee: $40. Prerequisite: CS 413 or CS 513; CPE 302.

495 Selected Topics in Undergraduate Computer Science
Covers selected areas of computer science. Prerequisites: To be arranged with the instructor. Lab Fee: $40.

499 Senior Project: Team Software Development
A combination of lectures on proven software engineering approaches, and team working sessions. Each student will participate in a sizable, complex software development project based on a team approach. Each team will be required to provide oral and written documentation on their work. Lab Fee: $40. Prerequisite: CS 317.

524 Programming Languages
Principles of modern programming language features and design. Imperative vs. declarative language styles. General purpose language features, e.g. operators, expressions, recursion, object-orientation. Special purpose language features, e.g., support for graphical interfaces, concurrency, non-determinism. Relationship of language
design and implementation. Formal grammars, BNF notation. Brief history of programming languages. Lab Fee: $40. Prerequisites: CS 317 and proficiency in a modern programming language.

526 Program Translation and Compiler Construction 3 hrs.
Language representation; grammar classification; lexical analysis technique and tools; parsing technique and tools; compile-time and run-time symbol table design; code generation and optimization; error diagnostics. Compiler writing tools. Lab fee: $40. Prerequisite: CS 524; CS 403 recommended.

530 Expert Systems and Heuristic Programming 3 hrs.
Expert system concepts and their architectures. Languages and tools for knowledge engineering. Heuristic versus algorithmic methods, treatment of heuristics as used in expert systems, and heuristic programming techniques. Class and individual projects to illustrate concepts. Lab Fee: $40. Prerequisites: CS 317, 524.

537 Introduction to Neural Networks 3 hrs.
Introduction to neural networks, covering the most prominent neural network models. Hands-on experience with neural networks through an individual or group project. Lab Fee: $40. Prerequisite: CS 550.

545 Introduction to Computer Graphics 3 hrs.
Introduction to the underlying theory and mechanics of computer graphics. Brief historical perspective, progressing through extended discussion on topics such as display hardware technology, 2D raster operations, 2D and 3D geometric transformations, and 3D projection and viewing techniques. A significant number of programming projects are assigned. Lab Fee: $40. Prerequisites: CS 207, 304 or 221 (or proficiency with the C/C++ programming language), MA 244.

548 Human-Computer Interaction 3 hrs.
Introduction to human-computer interaction and principles of graphical user interface design. Examination of interactive environments including windowing systems development tools, multimedia, and visual programming interfaces. Lab Fee: $40. Prerequisite: CS 545.

550 Ada Program Support Environments 3 hrs.
A study of advanced development concepts and support tools centered around Ada as the implementation language. Design and implementation concepts as part of the software life cycle. Lab Fee: $40. Prerequisite: CS 350 or equivalent introductory course in Ada.

551 Object Oriented Software Development 3 hrs.
Object oriented methods and design concepts, languages and systems for object oriented development, object oriented programming environments, application of object oriented techniques. Lab Fee: $40. Prerequisite: CS 207 or 304 or 321.

552 Advanced Object-Oriented Design and Development 3 hrs.
Introduces “design patterns” as elements of reusable object-oriented software development and advanced C++ programming and techniques, concepts and styles to realize and make object-oriented designs more reusable, extendible and simple. Lab Fee: $40. Prerequisite: CS 304 or 307 or 321.

553 Client/Server Computing 3 hrs.
Client/server computing is a software development paradigm that requires an understanding of object-oriented software technologies, World Wide Web technologies, networking, and standardized middleware such as CORBA and DCOM. Covers both conceptual and practical aspects of the subject, presents fundamental concepts of distributed object computing, multithreading, and the DCOM and CORBA architectures. Students learn to apply the concepts in the development of practical distributed programs. JAVA and techniques for developing Web-enabled software applications are introduced. Lab Fee: $40. Prerequisite: CS 304 or CS 307 or 321.

555 Theory of Program Development 3 hrs.
Propositional and predicate calculi, reasoning about programs, weakest precondition, program development, developing invariants, efficiency consideration, and program documentation. Lab Fee: $40. Prerequisite: CS 204, 207 or 221, and CS 317 and 524.
586 Microprocessor Architecture

590 Programming Environments with UNIX
Advanced strategies for the design and development of systems and programs in the UNIX environment. Emphasis on automated tool and system development using UNIX tools. Parallel and supercomputer issues as treated by UNIX and C. Advanced shell concepts and programming including control flow and interrupt handling. Process and interprocess communications. Lab Fee: $40. Prerequisite: CS 390 or two years experience in UNIX.

595 Selected Topics in Computer Science
Special topics requested by students. Prerequisites: Approval and consent of instructor.

Environmental Science Program

Professors Christy, Lawton, Modlin, Perkey, Welch; Research Professor Essenwanger; Associate Professors Han, Knupp, Christopher.

Environmental science courses are taken for several purposes: as a minor, to earn an environmental science certificate, as part of a composite major, and as electives. The certificate program is designed to prepare scientists, mathematicians, and engineers to solve problems relating to man's interaction with the natural environment. The certificate is a supplement to the bachelor's degree and signifies that the holder has broadened his or her perception of the physical and organic environment by studying the entire spectrum of natural science (atmosphere, biosphere, hydrosphere, and lithosphere), and by specializing in environmental aspects of his field.

Many courses necessary to earn the certificate are automatically taken as part of the student's major or GER. Other required courses can be taken as electives, permitting the fully prepared bachelor's candidate to complete requirements for a degree and the certificate with the usual number of credit hours required for the bachelor's degree alone.

Composite Major in Environmental and Biological Sciences

B.S. GER to include:
Mathematics–MA 145 or 171 3-4
Physics–PH 101, 102 or 111/114, 112/115 8
Computer Science - CS 102 4
Statistics - AHS 300 4
ECN or PSC recommended in Area IV 3-6
Chemistry–CH 121, 123, 125, 126, 223, 331, 332, 335 18
Biological Sciences–BYS core courses and 312, 321, 364 29
Environmental Science - ES 101, 102, 303 or 411, 321, 331 17
Electives as needed selected from
BYS 315, 322, 317, 378, 531, 561, 562 563, 564, ES 305, 401, 413, 414 51

Total 128 min.
Requirements for the Environmental Science Certificate

Basic science courses (unless exempted by advanced placement and/or testing in each case):
BYS 119, 120; CH 121, 123, 125, 126; ES 101, 102; PH 111, 112; two basic courses in statistics and/or computer science.

Environmental certificate core courses:
- ES/BYS 312 Principles of Ecology
- ES 321 Pollution Problems
- ES 521 Environmental Data Analysis (or other approved course)

Advanced level specialization (9 hours required in courses in student's major or area of interest chosen from the following):
- BYS 526 Microbial Ecology
- BYS 561 Physiological Ecology
- BYS 562 Community Ecology
- BYS 563 Population Ecology
- BYS 564 Limnology
- MS 502 Marine Geology
- MS 509 Marine Ecology
- MS 510 Marsh Ecology
- CH 526 Environmental Chemistry
- ISE 427 Management Systems Analysis
- ISE 524 Introduction to Ergonomics: Work Development
- CE 476 Water Quality Control Processes
- CE 549 Introduction to Environmental Engineering
- CE 550 Environmental Control
- CE 559 Selected Topics in Civil Engineering
- ES 303 Climatology
- ES 305 Hydrology
- ES 331 Global Climate Change and Infectious Diseases
- ES 593 Directed Studies in Environmental Science
- ES 401 Survey of Atmospheric Science
- ES 411 Introduction to Geographical Information Systems
- ES 413 Geographical Information Systems and Remote Sensing
- ES 414 Scale and Landscape in GIS
- ES 415 Advanced Topics in GIS
- ES 420 Introduction to Atmospheric Chemistry and Air Pollution
- ES 441 Atmospheric Thermodynamics and Cloud Physics
- ES 451 Atmospheric Fluid Dynamics I
- ES 452 Synoptic Meteorology
- ES 454 Forecasting Mesoscale Process
- ES 461 Atmospheric Radiation I

Requirements for a Minor in Environmental Science

A student in any area of study may build a minor in environmental science with approval of the advisor in the major department and the Environmental Science Coordinator. A minimum of 21 semester hours is required for the minor.

The following are suggested environmental science tracks:

Environmental Biology Track:
- BYS 119, 120 to fulfill the natural science requirement
- BYS 321 as an elective
- ES 312, 321, 331, 561, and one from ES 562, 563, 564 or BYS 509, 510
Atmospheric Science Track:
ES 101, 103, (303 or 321), 401, 441, 451, 461

Geographic Information Systems Track
Any 3 ES courses (i.e. ES 303, 312, 321, 331) and 411, 413, 414, 415.

Environmental Science (ES)

100 Introduction to Space Science
1 hr.
Introduction to a variety of space science subjects. Included are lectures on space physiology, computer systems, materials science, robotics in space, thermodynamics, astrophysics, and solar physics. Laboratory experiments and simulated missions. Offered in cooperation with the Alabama Space and Rocket Center and is open only to students enrolled in Space Academy II.

101 Planetary and Atmospheric Science I
4 hrs.
Introduction to earth's atmosphere and climate system. Structure and interaction of the components of this system. Natural and human-induced changes in these components, including the greenhouse effect, ozone depletion, air pollution, acid rain, biodiversity, and climate.

102 Planetary and Atmospheric Science II
4 hrs.
Introduction to physical geology. Minerals and rocks, geologic time, mountain building, seismic and earth's interior, continental drift and plate tectonics, weathering and erosion. Lab Fee: $40. Fall, Spring.

103 The Atmosphere and its Properties
Weather systems; severe weather; hurricanes; weather forecasting. Interpretation of current conventional surface-based, satellite, and radar weather observations. Lab Fee: $40. Prerequisite: ES 101. Fall, Spring.

202 Physical Geology
3 hrs.
Igneous processes, minerals, rocks, rock alterations and sediments, tectonic processes and continental evolution; soil classification, climate; fluvial, desert and glaciation landforms; river flooding, coastal hazards, geologic aspects of waste disposal and environmental hazards. Prerequisites: ES 102, CH 101. Offered upon demand.

303 Classification and Physical Causes of Climates
3 hrs.
Basic atmospheric structure and physical processes, climate history and climate change, microclimates, topoclimates. Prerequisites: ES 101, MA 119 or approval of instructor. Offered upon demand.

305 Hydrology
3 hrs.
Movement and behavior of surface and groundwater, interaction with geological structures, hydrologic prediction, contamination and purification of groundwater. Prerequisite: ES 102 or 202. Offered upon demand.

312 Principles of Ecology
4 hrs.
Ecological principles controlling plant and animal populations. Development of ecosystems, communities and habitats. One 4 hour lab a week. Field trips required. Lab Fee: $40. Prerequisites: BYS 120. (Same as BYS 312.) Spring.

321 Pollution Problems
3 hrs.
Quantitative descriptions of environmental conditions, regulations, and abatement technology. Specific pollution problems with air, water, noise, and radiation; assessment of environmental impacts of development or construction projects. Prerequisites: sophomore standing and approval of instructor. Fall.

331 Global Climate Change and Infectious Diseases
3 hrs.
Global warming trends and causes, greenhouse gases, impacts of climate change, causes of past climates, El Nino events, growing resistance of pathogens and vectors to drugs and insecticides, biodiversity global analysis of emerging and re-emerging diseases and their causes. Prerequisite: Junior standing or approval of instructor. (Same as BYS 331.)

401 Survey of Atmospheric Science
3 hrs.
General survey of the field of atmospheric science. Quantitative examination of atmospheric physical properties including atmospheric composition, structure and dynamics. Detailed inspection of evolving atmospheric structures using real-time data.
systems. Topics include atmospheric thermodynamics, atmospheric dynamics, cloud physics, atmospheric radiation, and related topics in atmospheric remote sensing. Prerequisites: MA 172 and PH 112, or permission of instructor.

411 Introduction to Geographical Information Systems 3 hrs.
Introduces vector, raster and tabular concepts, emphasizing the vector approach. Topics include: spatial relationships, map features, attributes, relational database, layers of data, data ingesting, digitizing from maps, projections, output, applications and availability of public data sets. (Same as ATS 411.) Fall.

413 Geographical Information Systems and Remote Sensing 3 hrs.
Hands-on approach to GIS and satellite remote sensing. Popular satellite data sets such as LANDSAT and AVHRR is coupled with GIS data sets to increase understanding of the earth system. Topics include satellite sensors, basic radiative transfer, orbits, raster formats, atmospheric correction, distortion, image corrections, rotations and mapping, spatial resolution, image interpretation, radiometric and geometric enhancement, multispectral transformations, and classifications. Prerequisites: ATS 411. (Same as ATS 413.) Spring.

414 Scale and Landscape in GIS 3 hrs.
Relationship of scale processes in the interpretation of remote sensing and GIS applications. Topics include those associated with multiple representations of remote sensing data, analysis techniques for integrating multiple sets of remote sensing and auxiliary data at different scales, and geostatistics. Prerequisites: ATS 411, 413. (Same as ATS 414.) Fall.

415 Advanced Topics in GIS 3 hrs.
Advanced special topics: visualization of GIS and remote sensing data, landscape characterization (pattern vs. process), multitemporal analysis, aggregation of data types, developing an integrated GIS environment for performing complex space-time modeling analyses, and land-atmosphere interactions. Prerequisites: ATS 411, 413 (Same as ATS 415.)

420 Introduction to Atmospheric Chemistry and Air Pollution 3 hrs.
This self-contained introductory course in atmospheric chemistry and air pollution is designed to provide seniors and graduate students the basics of atmospheric chemistry and air pollution concepts. Topics include air pollutants, air-pollution meteorology, atmospheric gases and aerosols, and atmospheric processes. This course will also develop the necessary fundamentals for those wishing to take the advanced (600-level) courses in the atmospheric chemistry/air pollution study area. This course is cross-listed with ATS 420/520 and ES 520. ES 520 and ATS 520 will require a research project; ES/ATS 420 will not. Prerequisite: PH 112 and CH 121 or consent of instructor.

441 Atmospheric Thermodynamics and Cloud Physics 3 hrs.
General aspects of thermodynamic and cloud physical processes occurring within the atmosphere; atmospheric statics and stability, saturation point analysis, aerosols, nucleation, and the behavior/growth of cloud particles and hydrometers. Prerequisites: MA 324, PH 112. (Same as ATS 441.)

451 Atmospheric Fluid Dynamics I 3 hrs.
Fluid dynamics in the atmosphere. Coriolis accelerations, scale analysis, and appropriate approximations of the complete governing equations. Numerical analysis and interpretation of weather phenomena. Prerequisites: MA 324, PH 112. (Same as ATS 451.)

452 Synoptic Meteorology 3 hrs.
Analysis, interpretation, and forecasting synoptic-scale and mesoscale phenomena, including air masses, frontal systems, cyclones, anti-cyclones, tropical cyclones, and associated mesoscale phenomena. Emphasis on the use of remotely sensed data from satellites, radars, and profilers using state-of-the-art workstations. Prerequisites: ATS 441, 451. (Same as ATS 452.)
Forecasting Mesoscale Processes 3 hrs.
Detection and forecasting of atmospheric mesoscale phenomena including the structure and evolution of clouds, precipitation (including floods), thunderstorms and severe weather. Includes basics on instruments used to detect mesoscale phenomena, most notably satellite and radar. Course material is based mainly on computerized modules and related exercises. Prerequisite: ATS 451. (Same as ATS 454.)

Atmospheric Radiation I 3 hrs.
Fundamentals of terrestrial atmospheric radiation. Specific topics include: solar radiation at the top of the atmosphere, radiative transfer equation, gaseous absorption, scattering by molecules and particles, band models, transmittance along an inhomogeneous path, and microwave radiative transfer. Prerequisites: MA 324, PH 112. (Same as ATS 461.)

Selected Topics in Environmental Science 1-3 hrs.
Special offerings to students in areas of interest not covered in present curriculum. Prerequisite: Approval of instructor. Lab Fee: $40. All terms.

Mathematical Sciences Department
205 Madison Hall
Telephone: (256) 824-6470
Email: math@uah.edu
Web Site: http://www.math.uah.edu

Professors Chang, Friedman, Gibson, Li, Morales, Siegrist (Chair); Slater; Associate Professors Ames, Dow (Research), Epperson, Howell, Huang, Kunin, Zhang; Associate Professor Emeritus Forte; Assistant Professors Ravindran, Steele; Lecturers Arrington, O'Dell, Presson.

The mathematical sciences faculty offers courses in mathematics and statistics for a Bachelor of Arts or Bachelor of Science degree in mathematics, a Bachelor of Arts or Bachelor of Science degree in mathematics with an Alabama Class B Teacher's Certificate, and a minor or second major in mathematics for students majoring in other areas of study. Courses also satisfy individual needs to supplement other areas of study and to satisfy general education requirements (GER).

General Education Requirements
Students who are not planning to continue in mathematics but who need 3 to 9 hours to satisfy GER should make their choice from the sequence MA 117, 119, 143, 145, 244, ST 281, MA 333, and 385 beginning with the course indicated by their placement level.

Students who plan to continue in mathematics and need 3 to 9 hours to satisfy GER should make their choice from the sequence MA 119, 121, 171, 172, 201, 244, beginning with the course indicated by their placement level.

Placement
No student may enroll in his or her first MA course at UAH before determination of his placement level. Students are placed at the appropriate level according to their high school mathematics background, their ACT scores in mathematics, their previous college credit (if any), or a placement test.

Students with various placement levels must begin their MA courses for credit as follows: Level I—MA 117 or 119; Level II—MA 121 or 143; Level III—MA 145 or 171. No more than 6 hours credit is awarded at Level I and II, and no more than 4 hours credit is awarded at Level III.

Mathematics Major
All majors in mathematics must include MA 171, 172, 201, 244, 330, 385, 442, and 452 (basic core – 27 semester hours). Only MA courses numbered 171 or above may be included in a mathematics major, and an overall average of C is required for all UAH MA or ST courses that
are included in a mathematics major. Information on other MA course requirements are given in Curricula I and II below. Students who think that substitutions in those curricula can produce a program better suited to their needs should consult their faculty advisor about the feasibility of such substitutions. All MA electives must be approved by the student's faculty advisor prior to registering for the courses. Majors in mathematics must also include CS 121, PH/111, 112, 114, and 115.

Mathematics Minor or Second Major

Students majoring in other academic areas who wish to minor in mathematics may select, in consultation with and approval of the mathematical sciences faculty, at least 21 semester hours of appropriate courses in mathematics, including 6 semester hours in courses numbered 300 or above. Only MA courses numbered 171 or above may be included in a mathematics minor, and an overall average of C is required for all UAH MA or ST that are included in a mathematics minor. A typical mathematics minor consists of MA 171, 172, 201, 244, and two approved MA courses numbered above 300. All minors must include MA 171 and 172.

Students majoring in other academic areas who wish to obtain a more solid background in mathematics than is provided by a minor may pursue a second major in mathematics rather than a minor in mathematics. The courses required for the second major are used to replace the minor courses and some of the free electives in the requirements for programs of study leading to a B.A. or B.S. degree.

Curriculum I

B.A. or B.S. degree with a major in mathematics

<table>
<thead>
<tr>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>Mathematics—MA basic core, MA 324, 465, and 9 hours of electives numbered 300 or above, including at least one 500 level course, preapproved by student's mathematics advisor</td>
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<tr>
<td>Computer Science—CS 102 and 121</td>
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<tr>
<td>Physics—PH 111, 112, 114, 115</td>
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<tr>
<td>Minor</td>
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<tr>
<td>General Education Requirements and Electives (to total 128 semester hours)</td>
</tr>
<tr>
<td>(GER for the B.A. degree are listed in the College of Liberal Arts section. GER for the B.S. degree are listed in the College of Science section.)</td>
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Curriculum II

B.A. or B.S. degree with a major in mathematics that meets requirements for an Alabama Class B Middle/Junior High School Teacher's Certificate or an Alabama Class B High School Teacher's Certificate.

<table>
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<tr>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>Mathematics—MA basic core, MA 333, 465, MA/ST 487 and one 500 level course, preapproved by student's mathematics advisor</td>
</tr>
<tr>
<td>Computer Science—CS 102 and 121</td>
</tr>
<tr>
<td>Physics—PH 111, 112, 114, 115</td>
</tr>
<tr>
<td>Professional education courses (Consult Education Dept. section of catalog)</td>
</tr>
<tr>
<td>General Education Requirements and electives</td>
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</tbody>
</table>

Notes:
1. See Education Department section for general education requirements and professional education courses.
2. Students pursuing this curriculum should consult with the Education Department early in their program. Education students are required to pass an exit examination in their teaching field in order to graduate and be recommended for certification.
3. Students who elect this curriculum may not be adequately prepared for graduate study in mathematics.
4. This curriculum may require more than the minimum total of 128 hours.

Appropriate Minors for Mathematics Major
A student who majors in mathematics must have a minor. The student is strongly encouraged to select a minor in science or engineering. Typically, such a student minors in computer science, physics, chemistry, or engineering, but other options are available. Any minor must include at least 21 hours in one discipline, with a minimum of 6 hours at 300-level or above. All courses in a minor must be approved by the department concerned and the student's mathematics faculty advisor.

The following is a sample of a Four Year Plan for a B.S. Degree in Mathematics

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Fall</th>
<th></th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 171</td>
<td>4 hrs.</td>
<td></td>
<td>MA 172</td>
</tr>
<tr>
<td>EH 101</td>
<td>4 hrs.</td>
<td></td>
<td>EH 102</td>
</tr>
<tr>
<td>CS 102</td>
<td>3 hrs.</td>
<td></td>
<td>PH 111</td>
</tr>
<tr>
<td>GER</td>
<td>3 hrs.</td>
<td></td>
<td>PH 114</td>
</tr>
<tr>
<td>GER</td>
<td>3 hrs.</td>
<td></td>
<td>HY 101</td>
</tr>
<tr>
<td></td>
<td>16 hrs.</td>
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</tbody>
</table>

| Sophomore | | | |
|-----------|---|---|---|---|---|
| MA 201    | 4 hrs. | | MA 330   | 3 hrs. |
| MA 244    | 3 hrs. | | MA 324   | 3 hrs. |
| PH 112    | 3 hrs. | | EH 206   | 3 hrs. |
| PH 115    | 1 hr.  | | CH 121   | 3 hrs. |
| EH 205    | 3 hrs. | | CH 125   | 1 hr. |
| CS 121    | 3 hrs. | | Minor Course | 3 hrs. |
|          | 17 hrs. | |        | 16 hrs. |

| Junior | | | |
|--------|---|---|---|---|---|
| MA 442 | 3 hrs. | | MA 452 | 3 hrs. |
| MA 465 | 3 hrs. | | MA 3xx or 4xx level 3 hrs | 3 hrs. |
| GER    | 3 hrs. | | Minor Courses | 7 hrs. |
| Minor Courses | 2 hrs. | | Elective or GER | 3 hrs |
|        | 16 hrs. | |        | 16 hrs |

| Senior | | | |
|--------|---|---|---|---|---|
| MA 4xx level | 3 hrs. | | MA 5xx level | 3 hrs. |
| MA 4xx level | 3 hrs. | | Minor Courses | 6 hrs. |
| Minor Course | 3 hrs. | | Elective or GER | 8 hrs. |
| Elective or GER | 2 hrs. | | | |
|        | 16 hrs | |        | 17 hrs. |

Mathematics (MA)
NOTE:
1. No student may receive more than 6 hours credit for MA courses numbered below 150 or more than 3 hours credit for MA courses numbered below 120.
2. Students with deficiencies of high school algebra or high school geometry credit must remove these deficiencies before enrollment in MA courses numbered 100 or above.
3. No student may enroll in his or her first MA course at UAH before determination of a placement level.
004 Basic Algebra
For students with a deficiency in high school credit in algebra or who need an algebra review.

033 High School Geometry
For students with a deficiency in high school credit in geometry. Prerequisite: Basic algebra.

117 Mathematics with Applications I
Algebra review, functions and graphs, linear models, mathematics of finance, systems of linear equations, matrices, linear programming. No credit given to students who have received credit for another MA course.

119 Precalculus I
Should be taken only by students who are going on to the calculus sequence (MA 171, 172). Real number systems, exponents, radicals, factoring, absolute value, inequalities, function notation, functions, inverse functions, graphing techniques, polynomial and rational functions, operations with complex numbers, conic sections, and theory of equations. No credit given to students who have successfully completed an MA course numbered above 119 or who place at Level II or above. Prerequisite: Level I placement or removal of mathematics deficiencies.

121 Precalculus II
Should be taken only by students who are going on to the calculus sequence (MA 171, 172). Exponential and logarithmic functions, trigonometric functions of angles and real numbers, graphing trigonometric functions, inverse trigonometric functions, solving trigonometric equations, verifying identities, laws of sines and cosines, vectors, trigonometric form of complex numbers, DeMoivre's theorem, summation notation, arithmetic and geometric sequences and series. No credit given to students who have successfully completed MA 121 or who place at Level III. Prerequisite: Level I placement or MA 119 with a grade of C or better.

143 Finite Mathematics
Linear models, matrix theory, linear programming, graphical and simplex methods of solving systems, sets, counting, probability, decision theory and algebra review. No credit given to students who have successfully completed MA 121 or a higher level MA course or who place at Level III. Prerequisite: Level I placement.

145 Mathematics with Applications II
Exponential and logarithmic functions, continuity, differentiation, applications of the derivative, integration, the fundamental theorem of calculus, applications of the integral. No credit given to students who have already received credit for a calculus course. Prerequisite: MA 117 or 119 with a grade of C or better.

171 Calculus A
Limits, derivatives, applications of the derivative, definite and indefinite integrals, exponential and logarithmic functions, and inverse functions. Prerequisite: Level III placement or MA 121 with a grade of C or better. Lab fee: $10.

172 Calculus B
Techniques of integration, applications of the integral, polar coordinates, sequences, series, and conic sections. Prerequisite: MA 171 with a grade of C or better. Lab fee: $10.

201 Calculus C
Vectors, vector-valued functions, partial derivatives, multiple integrals, vector fields, line and surface integrals. Prerequisite: MA 172 with a grade of C or better. Lab fee: $10.

244 Introduction to Linear Algebra
No credit given to students who have successfully completed either MA 442 or MA 452. Such students must substitute MA 544. Systems of linear equations, matrices, matrix operations, determinants, vector spaces, bases, dimension of a vector space, inner product, Gram-Schmidt process, linear transformations, change of basis, similar matrices, eigenvalues and eigenvectors, diagonalization, symmetric matrices, and applications. Prerequisite: MA 172 or MA 143, 145. Lab fee: $10.
324 Introduction to Differential Equations
Elementary introduction to differential equations: first-order differential equations, Euler's numerical method, basic theory of higher-order linear differential equations, equations with constant coefficients, Cauchy-Euler equations, variation of parameters, the Laplace transform, introduction to linear systems of differential equations. Prerequisite: MA 201 and 244 (corequisite).

330 Foundations of Mathematics
Symbolic logic and methods of proof, set theory, combinations and permutations (equivalence) relations and functions, mathematical induction and recurrence relations, cardinality (finite, countably infinite, and uncountable sets), and decimal representation of the rational and real numbers. Prerequisites: MA 172 and either MA 201 or MA 244.

333 Introduction to Geometry
Axiomatic development of geometry. Introduction to non-Euclidean geometries with emphasis in elliptic and hyperbolic geometries. Selected topics in Euclidean geometry. Prerequisite: MA 244 or approval of instructor.

385 Introduction to Probability
No credit given to students who have successfully completed MA 585. Finite probability spaces, conditional probability, random variables, expectations, variances, covariances, introduction to binomial, Poisson, uniform, exponential, and normal distributions. Prerequisites: MA 145 or 172, and one MA course at the 200-level or above.

415 Introduction to Numerical Methods
Derivation and analysis of approximate methods for the solution of nonlinear equations, interpolation and integration of functions, and techniques for the solution of systems of linear equations and for approximating solutions of elementary differential equations. Emphasis is placed on obtaining an intuitive understanding of both the problem at hand and the numerical method used to solve it. Prerequisites: MA 244, 201, CS 107 or 121, and one MA course at the 300-level. Lab fee: $40.

442 Algebraic Structures with Applications
Mappings, binary operations, equivalence relations, groups and subgroups, Lagrange's theorem, homomorphisms and isomorphisms, normal subgroups and quotient groups, rings, fields, ordered integral domains, fields of quotients, error correcting codes, linear codes, and decoding. Prerequisites: MA 244 and either MA 330 or MA 385.

452 Introduction to Real Analysis
Sequences, limits, continuity, differentiation of functions of one real variable, Riemann integration, uniform convergence, sequences and series of functions, power series, and Taylor series. Prerequisite: MA 330 and 442, or approval of instructor.

460 Introduction to Fourier Analysis
Brief development of trigonometric and exponential Fourier series, derivation of the classical Fourier transform from Fourier series, classical properties of Fourier transforms, transforms of functions, convolution, elementary development of the delta function, transforms of periodic functions, use of transforms to solve systems, introduction to the discrete transform and/or multidimensional transforms, as time permits. Prerequisites: MA 244, 324.

465 Introduction to Mathematical Modeling
Applying mathematics by formulating, analyzing, and criticizing mathematical models of various phenomena. Examples will be chosen from the physical, biological, and social sciences. Emphasizes development and use of simple mathematical models by having students study general modeling principles and case studies (some open-ended) drawn from various sources. Prerequisites: MA 244, 324.

487 Introduction to Mathematical Statistics
Brief review of basic probability theory, sampling distributions, estimation, hypothesis testing, correlation and regression. Prerequisites: MA 201 and either MA 385 or ISE 190. Lab Fee: $40. (Same as ST 487.)

490 Selected Topics in Undergraduate Mathematics
Requested undergraduate topics. Prerequisite: Approval of instructor.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>499</td>
<td>Mathematics Project</td>
<td>1 hr.</td>
<td>Individualized special projects in mathematics and its applications for superior undergraduate students. No credit allowed toward a major or minor in mathematics. S/U grading. Prerequisite: approval of department chair.</td>
<td></td>
</tr>
<tr>
<td>502</td>
<td>Introduction to Real Analysis</td>
<td>3 hrs.</td>
<td>(See MA 452)</td>
<td></td>
</tr>
<tr>
<td>503</td>
<td>Introduction to Complex Analysis</td>
<td>3 hrs.</td>
<td>Complex algebra, analytic functions, Cauchy-Riemann equations, exponential, trigonometric, and logarithmic functions, integration, Cauchy integral theorem, Morera's theorem, Liouville's theorem, maximum modulus theorem, residue theory, Taylor and Laurent series, and applications. Prerequisite: MA 452 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>504</td>
<td>Intermediate Differential Equations</td>
<td>3 hrs.</td>
<td>Elementary introduction to more advanced topics in differential equations: linear systems of differential equations, nonlinear autonomous systems, critical points, Liapunov's method, limit cycles, Poincare-Bendixson theorem, power series solutions, Frobenius series solutions. Prerequisites: MA 244, 324.</td>
<td></td>
</tr>
<tr>
<td>506</td>
<td>Methods of Partial Differential Equations</td>
<td>3 hrs.</td>
<td>Survey of theory and methods for solving elementary partial differential equations. No credit given to students who have successfully completed MA 526. Topics include first-order equations and the method of characteristics, second-order equations, reduction to canonical form, the wave equation, the heat equation, Laplace's equation, separation of variables, and Fourier series. Prerequisites: MA 324, 244.</td>
<td></td>
</tr>
<tr>
<td>508</td>
<td>Applied Linear Algebra</td>
<td>3 hrs.</td>
<td>Solving systems of equations, finding inverses of matrices, determinants, vector spaces, linear transformations, eigenvalues and eigenvectors, normal matrices, canonical forms of matrices, applications to systems of linear differential equations, and use of computer software such as MATLAB. No credit given to students who have successfully completed MA 544. Prerequisites: MA 244, 324.</td>
<td></td>
</tr>
<tr>
<td>515</td>
<td>Introduction to Numerical Analysis</td>
<td>3 hrs.</td>
<td>Rigorous analysis and derivation of numerical methods for: the approximate solution of nonlinear equations; interpolation and integration of functions; approximating solutions of ordinary differential equations. Prerequisites: MA 201, 244, 324, CS 107 or CS 121, plus one 500-level (or higher) MA course, or graduate standing in the Department of Mathematical Sciences. Lab Fee: $40.</td>
<td></td>
</tr>
<tr>
<td>524</td>
<td>Dynamical Systems I</td>
<td>3 hrs.</td>
<td>Scalar autonomous equations; existence, uniqueness, stability, elementary bifurcations; planar autonomous equations; general properties and geometry, conservative systems, elementary bifurcations linear systems, reduction to canonical forms, stability and instability from linearization. Liapunov functions, center manifolds, Hopf bifurcation. Prerequisites: MA 244, 324, 452.</td>
<td></td>
</tr>
<tr>
<td>526</td>
<td>Partial Differential Equations I</td>
<td>3 hrs.</td>
<td>Introduction to the theory for solving partial differential equations. No graduate credit given to students who have completed MA 506 for graduate credit. Topics include second-order equations, reduction to canonical form, well-posedness, the classical equations (wave, heat, and Laplace's) in one and several dimensions, separation of variables, Fourier series, general eigenfunction expansions, Sturm-Liouville theory, first-order linear and quasilinear equations, and shocks. Prerequisites: MA 502, one other 500-level MA course. (MA 506 is NOT a prerequisite.)</td>
<td></td>
</tr>
<tr>
<td>538</td>
<td>Metric Spaces with Applications</td>
<td>3 hrs.</td>
<td>Metric spaces, continuous functions, compactness, connectedness, completeness, Arzela-Ascoli theorem, Stone-Weierstrass theorem, Hilbert spaces, contraction mappings, applications to existence and uniqueness of solutions of differential and integral equations. Prerequisites: MA 502 and at least one other MA course at the 500-level or above.</td>
<td></td>
</tr>
</tbody>
</table>
Combinatorial Enumeration 3 hrs.
Counting, pigeonhole principle, permutations and combinations, generating functions, principle of inclusion and exclusion, Polya's theory of counting. Prerequisite: MA 442 or approval of instructor.

Algebra 3 hrs.
Topics from group theory and ring theory: subgroups, normal subgroups, quotient groups, homomorphisms, isomorphism theorems, ideals, principal ideal domains, Euclidean domains, fields, extension fields, elements of Galois theory. Prerequisite: MA 442 or approval of instructor.

Linear Algebra 3 hrs.
Vector spaces, bases, linear transformations, matrices, determinants, eigenvalues, similarity, Jordan canonical forms, dual spaces, bilinear forms, quadratic forms, orthogonal and unitary transformations. Prerequisites: MA 244 and 442.

Intermediate Fourier Analysis 3 hrs.
Brief review of classical Fourier analysis, Parseval's equality, Gaussian test functions. Introduction to generalized functions, the generalized transform, the generalized derivative, sequences and series of generalized functions, regular periodic arrays of delta functions, sampling, the discrete transform, the fast Fourier transform (other topics as time and interest permit). Prerequisites: MA 244, 324, acquaintance with classical Fourier analysis (such as covered in MA 460.).

Intermediate Mathematical Modeling 3 hrs.
Designed for beginning graduate students. No prior experience in formal mathematical modeling is required. In-depth discussion of some types of models from physics, the life sciences, and/or the social sciences, with formulation, analysis, and criticism of the models. Process of and factors involved in formulating a model is of prime importance. Content is divided into approximately one-half deterministic modeling and one-half stochastic modeling. Prerequisites: MA 244, 324, 385, one MA course at 400-level or above, and CS 107, 121 or equivalent.

Probability 3 hrs.
Probability theory and its applications. Independent trials, discrete and continuous random variables, law of large numbers, basic distributions, sums of independent random variables, sequences of random variables, central limit theorem, and convergence in distribution. Prerequisites: MA 201 and one of MA 385, ISE 390, MA/ST 487, or approval of instructor.

Selected Topics in Mathematics 3 hrs.
Requested selected topics.

Statistics (ST)

Elements of Statistical Analysis I 3 hrs.
Descriptive statistics, fundamentals of probability theory, fundamentals of statistical inference, including estimation and hypothesis testing, and use of a typical statistical package such as MINITAB. Prerequisite: MA 172 or 151. Student cannot receive credit for more than one of ST 281, MSC 287, or AHS 300. Lab Fee: $40.

Introduction to Mathematical Statistics 3 hrs.
Brief review of basic probability theory, sampling distributions, estimation, hypothesis testing, experimental design, correlation and regression, analysis of variance, and nonparametric statistics. Prerequisites: MA 201 and either MA 385 or ISE 390. Lab Fee: $40. (Same as MA 487.)

Optical Science Program
Professors Dimmock, Gregory, Hillman (Chair); Professor Emeriti Barr, Duthie; Associate Professor Geary; Assistant Professor Pakhomov; Associate Research Professor Smith; Assistant Research Professor Sanghadasa.

College of Science 326
Optical Science Major

Optics is a multidisciplinary field that requires knowledge in both the physical sciences and engineering. The B.S. degree in optical science consists of a major in optics (with background courses in physics) a minor in mathematics and additional technical courses in areas such as computer science. The program produces professionals who are able to move immediately into government or private industry and work in many of the areas of optics such as optical system analysis and design, image processing, optical sensors, laser development and holography. Optical science graduates are also well prepared for graduate work in optics, physics or related fields.

Optical science majors receive a strong exposure to geometrical and physical optics, then select from a range of contemporary electives such as electro-optics, lasers, polarimetry, and radiometry. An advanced series of laboratories taken in the senior year provides exposure to contemporary equipment and modern optical techniques.

The following table shows the curriculum requirements and a typical Program of Study. No grade lower than D may be counted toward the requirements for graduation as listed in the Program of Study. In addition, the university has certain minimum GPA requirements in major subjects, minor/cognate subjects, and overall. See the Academic Information section of this catalog for details of these important requirements. Students are encouraged to file a Program of Study, in consultation with their faculty advisor, at the earliest opportunity.

Curriculum for B.S. Degree in Optical Science

1. General Education Requirements (Consult the College of Science section for details)

| Area I: English Composition | 6 |
| Area II: Literature, Fine Arts and Humanities (Must include CM 113) | 12 |
| Area III: Mathematics and Laboratory Science (Includes PH 111, 112, 114, 115) | 12 |
| Area IV: History, Social & Behavioral Sciences | 12 |
| Area V: Technical electives: CS 102 and 121 or engineering equivalent, EH 301 | 11 |
| TOTAL | 53 |

2. Major Courses

| PH 111 General Physics w/Calculus I | Area III GER |
| PH 112 General Physics w/Calculus II | Area III GER |
| PH 113 General Physics w/Calculus III | 3 |
| PH 114 General Physics Lab I | Area III GER |
| PH 115 General Physics Lab II | Area III GER |
| PH 116 General Physics Lab III | 1 |
| PH 205 Mathematical Methods for Physics | 4 |
| PH 337 Electronics | 4 |
| OPT 341 Geometrical Optics | 3 |
| OPT 342 Physical Optics | 3 |
| OPT 411 Geometrical Optics Lab | 2 |
| OPT 412 Physical Optics Lab | 2 |
| PH 431 Intermed. Electricity & Magnetism I | 3 |
| PH 432 Intermed. Electricity & Magnetism II | 3 |
| OPT 441 Optical Systems | 3 |
| OPT 442 Interference & Diffraction | 3 |
| OPT 445 Introduction to Lasers | 3 |
PH 451 Quantum Physics I 3
OPE 456 Photonics Lab 2
PH 499 Physics Practicum 3

TOTAL 45

3. Mathematics Minor
MA 171 Calculus A 4
MA 172 Calculus B 4
MA 201 Calculus C 4
MA 244 Introduction to Linear Algebra 3
MA 324 Introduction to Differential Equations 3
MA 460 Introduction to Fourier Analysis 2

TOTAL 21

4. Technical Electives
Technical elective courses in chemistry, physics (e.g. PH 301, 305), mathematics, computer science or engineering. Must include two optics courses at 400-level or above. (See table below)

TOTAL REQUIRED 128

Typical Schedule for Full-Time Students

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH 101</td>
<td>3</td>
<td>EH 102</td>
</tr>
<tr>
<td>GER</td>
<td>3</td>
<td>GER</td>
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<tr>
<td>CS 102</td>
<td>4</td>
<td>CS 121</td>
</tr>
<tr>
<td>MA 171</td>
<td>4</td>
<td>MA 172</td>
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<tr>
<td>GER</td>
<td>2</td>
<td>PH 111</td>
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<tr>
<td>PH 111</td>
<td>16</td>
<td>PH 114</td>
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<thead>
<tr>
<th>Sophomore</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>PH 112</td>
<td>3</td>
<td>PH 113</td>
</tr>
<tr>
<td>PH 115</td>
<td>1</td>
<td>PH 116</td>
</tr>
<tr>
<td>Literature</td>
<td>3</td>
<td>GER</td>
</tr>
<tr>
<td>HY 101</td>
<td>3</td>
<td>GER</td>
</tr>
<tr>
<td>MA 201</td>
<td>4</td>
<td>MA 244</td>
</tr>
<tr>
<td>GER</td>
<td>3</td>
<td>PH 205</td>
</tr>
<tr>
<td></td>
<td>17</td>
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<table>
<thead>
<tr>
<th>Junior</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 431</td>
<td>3</td>
<td>PH 432</td>
</tr>
<tr>
<td>OPT 341</td>
<td>3</td>
<td>OPT 342</td>
</tr>
<tr>
<td>MA 324</td>
<td>3</td>
<td>MA 460</td>
</tr>
<tr>
<td>PH 451</td>
<td>3</td>
<td>(PH 305)</td>
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<tr>
<td>EH 301</td>
<td>2</td>
<td>CM 113</td>
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<table>
<thead>
<tr>
<th>Senior</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>OPT 441</td>
<td>3</td>
<td>OPT 442</td>
</tr>
<tr>
<td>OPT 411</td>
<td>2</td>
<td>OPT 412</td>
</tr>
<tr>
<td>OPT 4xx*</td>
<td>3</td>
<td>OPT 4xx*</td>
</tr>
</tbody>
</table>

College of Science 328
Elective 1
OPT 445 3
PH 499 2

Total Hours 16 29 126

*Select two from OPT 444, 446, 447, OPE 453, 454.
Courses in parentheses are suggested electives, especially for those considering entry into graduate school.

Minor

A minimum of 21 semester hours of course work is required for a minor in optical science. A request for the minor should be initiated by the department in which the student is majoring. The courses should include: OPT 341, 342, 411, 412, 441, 442, OPE 456, and PH 499.

Optical Science (OPT)

341 Geometrical Optics
Introduction to the concepts and principles of geometrical optics. Rays and wave fronts, Fermat's principle, Snell's law, dispersion, systems of plane mirrors and prisms, paraxial rays, paraxial design, thin lenses and thick lenses, introduction to aberrations and ray tracing. Prerequisite or parallel: PH 113. (Same as PH 341.) Fall.

342 Physical Optics
Electromagnetic waves, simple harmonic motion, superposition of waves, interference of light, Young's double slit experiment, diffraction gratings, diffraction, speed of light, light sources and their spectra, absorption and scattering, dispersion, polarization. Prerequisites: OPT 341, PH 205. (Same as PH 342.) Spring.

411 Geometrical Optics Laboratory
Introduction to optical laboratory techniques, focus and alignment with incoherent and coherent sources, the nodal slide, thin lenses, thick lenses, and lens systems, the effects of apertures and stops, reflection, refraction and dispersion, aberrations, elements of radiometry. Prerequisite: PH 116, OPT 341. Prerequisite or parallel: OPT 441. Lab Fee: $50. (Same as PH 411.) Fall.

412 Physical Optics Laboratory
Introduction to physical optics phenomena, Young's double slit experiment, Lloyd's mirror, Fresnel biper, Newton's rings, intensity distribution in fringe systems, Michelson interferometer, Fabry-Perot interferometer, Fresnel and Fraunhofer diffraction, diffraction by circular, rectangular and multiple openings, diffraction gratings. Prerequisite: PH 116, OPT 342, OPT 442 (may be taken in parallel) or EE 382. Lab Fee: $50. (Same as PH 412 and OPE 455.) Spring.

441 Optical Systems Design
Intermediate geometrical optics, first-order optics, linear transformations, paraxial optics, reflection and transmission at an interface, polarized light, Jones and Mueller calculi, matrix methods, ray tracing, apertures and stops, third order optics and aberrations. Prerequisite: OPT 342. (Same as PH 441, OPE 441 and EE 461.) Fall.

442 Interference and Diffraction
Two beam interference, multiple beam interference, optical testing, Fraunhofer diffraction, Fresnel diffraction, the Fourier transform, Fourier methods in optics, Coherence, Holography. Prerequisite: OPT 441 OR PH 431. (Same as PH 442, OPE 442 and EE 462.) Spring.
444 Optoelectronics 3 hrs.
Review of polarized light and the Jones and Mueller calculi. Propagation of light in birefringent material, modulation of light using electro-optic effect, Kerr effect, acousto-optic effect, and Faraday effect. Elements of photodetection and detectors, signal processing, and signal-to-noise. Design and analysis of beam scanners, optical rf-spectrum analyzer, optical sensors, and optical communication systems. Prerequisite: OPT 342. (Same as PH 544 and OPE 451.) Fall, odd years.

445 Introduction to Lasers 3 hrs.
Introduction to the concepts and principles of lasers. Stimulated emission, light amplification, optical pumping, optical resonator theory, cavity modes, gas lasers, solid state lasers, laser applications, gaussian beams, coherence, holography. Prerequisites: PH 432, PH 451. Spring, even years.

446 Radiometry, Detectors, and Sources 3 hrs.
Theory and practice of radiometry and photometry. Blackbody radiation and Lambertian sources. The propagation of radiant energy in free space and through optical systems. Detector classes, responsivity, bandwidth, and noise. Prerequisite: OPT 342. (Same as PH 546, OSE 546.) Spring.

447 Polarized Light 3 hrs.

Physics Department
201-C Optics Building
Telephone: (256) 824-2483
Email: physics@uah.edu
Web Site: http://www.uah.edu/physics

Professors Comfort, Dimmock, Emslie, Fix, F. Franz, J. Franz, Hillman (Chair), Horwitz, Gregory, Miller, Smalley; Takahashi; Professors Emeriti Barr, Chan, Duthie; Associate Professors Geary, Lieu, Pendleton, Sheldon; Assistant Professors Pakhomov, Zhang; Research Professor Paciesas; Associate Research Professor Smith; Assistant Research Professors Banish, Sanghadasa, Lecturer Strong.

The undergraduate program in physics is designed to provide the foundation necessary for either continued study in graduate school or for a terminal degree leading to professional employment. The physics program allows students the freedom to design their upper level curriculum to place increased emphasis on their personal interests. Areas of specialization include: optics, astrophysics, engineering physics, atmospheric science, secondary school teaching, and more.

Physics Major
All majors in physics must take the following courses: PH 110, 111-116, 301, 305, 306, 351, and 499. The introductory 100-level courses provide the basic physics foundations and are necessary prerequisites to the remaining upper level courses, both core and elective. Physics majors also choose 15 hours of 300- and 400-level courses, both lecture and laboratory, from science areas such as physics, optics, astrophysics, and atmospheric science, to complete their major requirements. The selected courses must be listed on a Program of Study and approved by the physics advisor, the Department of Physics, and the College of Science. Students are encouraged to file a Program of Study at the earliest opportunity.
An engineering physics option, requiring 30 hours of cognate engineering courses in lieu of the 15 hours of science courses, is also available. This cognate is approved jointly by the physics advisor and the College of Engineering.

All physics majors are required to minor in mathematics. Other curriculum requirements are specified below.

No grade lower than a D may be counted toward the requirements for graduation listed in the student’s Program of Study. In addition, the university has minimum GPA requirements in major subjects, minor/cognate subjects, and overall; see the Academic Information section of this catalog for details of these important requirements.

A typical curriculum for students interested in graduate study in physics should include the following courses: PH 110, 111-116, 301, 305, 306, 310, 311, 337, 351, 421, 431, 432, 451, 452, and 499. A four-year plan for students selecting this option is shown below.

Physics Minor

Students majoring in other academic areas who wish to minor in physics may select, in consultation with and approval of their physics faculty advisor and the College of Science, at least 21 hours of appropriate courses in physics, including PH 110-116, 499, and 3 semester hours in physics courses numbered 300 or above. An overall average of C is required for all UAH courses and in those courses constituting the physics minor. A minor with an emphasis in astronomy is also available and consists of PH 106, 107, 110, 111, 114, 371, and 499.

Curriculum

For a B.S. degree with a major in physics

<table>
<thead>
<tr>
<th>Semester Hours</th>
<th>GER (See specific requirements for College of Science)</th>
<th>Area I</th>
<th>Area II (CM 113 is required)</th>
<th>Area III (CH 121, 123, 125, 126 required)</th>
<th>Area IV</th>
<th>Area V (EH 301; CS 102, 103 or engineering equivalent, are required)</th>
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<td></td>
<td>51-57</td>
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<td>6</td>
<td>12</td>
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</table>

Physics Major—PH 110, 111-116, 301, 305, 306, 351, 499

plus additional 15 hours at 300-level or above

45

Mathematics Minor—MA 171, 172, 201, 244, 324, one

additional MA course at 400-level or above

21

Electives

As needed

Typical Four Year Program in Preparation for Graduate School (128 hours)

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>Freshman</td>
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<tr>
<td>EH 101</td>
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<td>EH 102</td>
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<tr>
<td>CH 121</td>
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<td>Sophomore</td>
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<tr>
<td>PH 112</td>
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<td>PH 113</td>
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<td>PH 115</td>
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<td>HY 101</td>
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<td>GER</td>
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<td>PH 305</td>
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College of Science
### Junior

- **PH 351** 3
- **GER** 3
- **PH 310** 2
- **MA 324** 3
- **CS 1xx** 4
- **PH 337** 2
- (or Sci Elect) 19

### Senior

- **PH 431** 3
- **PH 451** 3
- **CM 113** 3
- Elective 6
- Elective 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PH 301</td>
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<td>PH 306</td>
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<tr>
<td>PH 311</td>
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</tr>
<tr>
<td>MA 4xx</td>
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<td>EH 301</td>
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<td>PH 432</td>
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<td>PH 452</td>
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<td>PH 421</td>
<td>3</td>
</tr>
<tr>
<td>PH 499</td>
<td>3</td>
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<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
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<tr>
<td><strong>Total Hours</strong></td>
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</table>

### Astronomy (AST)

#### 100 Survey of Astronomy
- **3 hrs.**
  - One semester survey for non-majors; topics from visible phenomena in the sky to the latest astronomical discoveries; properties of planets, origin of the solar system, life cycle of stars, galaxies and quasars, origin of the universe, life in the universe.

#### 106 Exploring the Cosmos I
- **4 hrs.**
  - Introduction to astronomy and astrophysics with emphasis on quantitative aspects of physical phenomena occurring in the universe. The solar system, motion of the earth, seasons, the sun. Telescope systems and their uses, positional astronomy and navigation. Stellar structure and evolution. End products of stellar evolution, white dwarves, neutron stars, black holes. Laboratory included. AST 106 and 107 satisfy GER laboratory science requirements. Prerequisite: high school algebra and trigonometry. Lab Fee: $40. (Same as PH 106.) Fall.

#### 107 Exploring the Cosmos II
- **4 hrs.**
  - Continuation of AST 106. Galactic structure. Dynamics of the universe—cosmology. The moon and tides, planetary survey of solar system. Laboratory included. Prerequisite: AST 106. Lab Fee: $40. (Same as PH 107.) Spring.

#### 371 Introduction to Astrophysics
- **3 hrs.**
  - Description and general properties of astrophysical objects; radiation theory, spectral classification and the Hertzsprung-Russell diagram; determination of physical properties, luminosity classes, properties of solar and stellar atmospheres, the astronomical distance pyramid; introduction to cosmology. Prerequisites: PH 111, MA 201. (Same as PH 371.) Fall.

#### 471 Stellar Atmospheres and Interiors
- **3 hrs.**
  - Classification of stellar spectra; radiative transfer; stellar atmospheres; spectral line profiles; curve of growth. Equations of stellar structure; hydrostatic equilibrium and stability; theory of polytropes; structure of "real" main-sequence stars; stellar evolution; compact stellar objects (white dwarves, neutron stars, black holes). Prerequisite: AST 371. (Same as PH 471.) Spring, odd years.

#### 472 Galactic Structure and Cosmology
- **3 hrs.**
  - Galactic structure. Oort's constants and rotation curve; clustering and superclustering; special and general relativity; Friedmann cosmologies; observational tests; physics of the early Universe-Grand Unified Theories; symmetry breaking; inflationary models; relation to particle physics. (Same as PH 472.) Fall, odd years.
473 High Energy Astrophysics 3 hrs.
Observational techniques; radiation processes; physics of X-ray and gamma-ray sources; low-mass and high-mass X-ray binaries; cataclysmic variables; high-energy aspects of solar flares; gamma-ray bursts; origin and composition of cosmic rays; neutrino emission and detection. (Same as PH 473.) Spring, even years.

Physics (PH)
Prerequisites for physics courses listed may be waived by instructor or department chair for auditors or students with equivalent experience.

100 Conceptual Physics 4 hrs.
Survey for non-science majors as well as science majors seeking to improve their understanding of physics laws and their application. This course may not be combined with any other physics course to constitute a two-course sequence. Approach is conceptually based, with essentials and physical meaning of laws of nature being emphasized over a rigorous mathematical interpretation. Topics include development of experimental investigation; classical physics and the concepts of motion, force, energy, gravitation, electricity and magnetism, and light; modern physics and quantum mechanical revolution; as well as physics of everyday phenomena, and a few philosophical implications. Lab Fee: $40. Spring.

101 General Physics I 4 hrs.
Introductory non-calculus-based course, ideal for students preparing for the MCAT examination. Phenomenological in nature with emphasis on understanding basic ideas of physics and ability to apply these ideas to specific problems. Newtonian mechanics, conservation laws. Laboratory included. PH 101 and 102 satisfy laboratory science requirement. Prerequisite: high school algebra. Lab Fee: $40. Fall.

102 General Physics II 4 hrs.
Continuation of PH 101. Electrostatics, currents, magnetic phenomena, relativity, waves, quantum nature of matter. Laboratory included. Prerequisite: PH 101. Lab Fee: $40. Spring.

106 Exploring the Cosmos I 4 hrs.
Introduction to astronomy and astrophysics with emphasis on quantitative aspects of physical phenomena occurring in the universe. The solar system, motion of the earth, seasons, the sun. Telescope systems and their uses, positional astronomy and navigation. Stellar structure and evolution. End products of stellar evolution, white dwarves, neutron stars, black holes. Laboratory included. PH 106 and 107 satisfy GER laboratory science requirements. Prerequisite: high school algebra and trigonometry. Lab Fee: $40. (Same as AST 106.) Fall.

107 Exploring the Cosmos II 4 hrs.
Continuation of PH 106. Galactic structure. Dynamics of the universe–cosmology. The moon and tides, planetary survey of solar system. Laboratory included. Prerequisite: PH 106. Lab Fee: $40. (Same as AST 107.) Spring.

110 Frontiers in Science 3 hrs.
Introduction to the frontiers and problems facing modern physical science today. Includes modern cosmology, relativity, quantum theory. Prerequisite: MA 119/121 or high school equivalent. Corequisite: MA 171. Fall.

111 General Physics with Calculus I 3 hrs.
For science and engineering students. Phenomenological and quantitative in nature with emphasis on understanding basic ideas of physics and ability to apply these ideas to specific problems. Vectors, Newtonian mechanics, energy, simple harmonic motion, statics, fluids. PH 114 should be taken concurrently for credit as a laboratory science. Prerequisite: MA 171. All terms.

112 General Physics with Calculus II 3 hrs.
Continuation of PH 111. Heat and thermodynamics, basic electricity, electric and magnetic fields. PH 115 should be taken concurrently for credit as a laboratory science. Prerequisites: MA 172, C or better in PH 111. All terms.
113 General Physics with Calculus III
Continuation of PH 111 and 112. Wave motion, optics, relativity, quantum effects, atomic and nuclear structure, and elementary particles. PH 116 should be taken concurrently for credit as a laboratory science. Prerequisites: MA 201, C or better in PH 112. All terms.

114 General Physics Laboratory I
Laboratory instruction in support of material covered in PH 111. Use of computer-automated equipment emphasized. Prerequisite: PH 111 to be taken concurrently. Lab Fee: $40. All terms.

115 General Physics Laboratory II
Laboratory instruction in support of material covered in PH 112. Use of computer-automated equipment emphasized. Prerequisite: PH 112 to be taken concurrently. Lab Fee: $40. All terms.

116 General Physics Laboratory III
Laboratory instruction in support of material covered in PH 113. Use of computer-automated equipment emphasized. Prerequisite: PH 113 to be taken concurrently. Lab Fee: $40. All terms.

301 Intermediate Mechanics

305 Mathematical Methods in Physics
Application of analytical techniques to solve problems in physics. Complex exponentiation, Fourier series, matrix methods, differential equations and vector calculus applied to problems in mechanics, electricity and magnetism, optics, and thermodynamics. Prerequisite: PH 112. Spring.

306 Applied Physics
Application of physical principles to solutions of realistic problems using Mathematica. Error propagation, iterative techniques, approximations, data analysis/signal processing, numerical solutions to differential equations, and basic statistical manipulations applied to systems with many degrees of freedom, non-linear systems, rotational mechanics, advanced electric field solutions, heat transfer, scattering, and diffraction. Prerequisites: PH 305, CS 107 or equivalent, MA 244. Spring.

310 Intermediate Laboratory I
Experimental study of laws of mechanics, acoustics, fluids. Introduction to study of statistical methods. Lab Fee: $40. Fall.

311 Intermediate Laboratory II
Electronics instrumentation and circuits, electric fields, optics. Prerequisite: PH 310. Lab Fee: $40. Spring.

337 Electronics
Introductory course for all science students. Basic AC and DC circuits, operational amplifier circuits, transistor circuits, power supplies, digital logic and their use in laboratory instruments. Laboratory included. Prerequisite: PH 112. Lab Fee: $40. Fall, odd years.

341 Geometrical Optics
Introduction to the concepts and principles of geometrical optics. Rays and wave fronts, Fermat’s principle, Snell’s law, dispersion, systems of plane mirrors and prisms, paraxial rays, paraxial design, thin lenses and thick lenses, introduction to aberrations and ray tracing. Prerequisite or parallel: PH 113. (Same as OPT 341.) Fall.

342 Physical Optics
Electromagnetic waves, simple harmonic motion, superposition of waves, interference of light, Young’s double slit experiment, diffraction gratings, diffraction, speed of light, light sources and their spectra, absorption and scattering, dispersion, polarization. Prerequisite: PH 341. (Same as OPT 342.) Spring.
351 Introduction to Modern Physics  
Special relativity—length contraction, time dilation, simultaneity, relativistic dynamics.  
Kinetic theory. Quantum physics—wave packets, the uncertainty principle, Schrödinger's  
equation and solutions for simple systems, application to atomic, nuclear, and solid-state  
physics. Prerequisite: PH 305. Fall.

371 Introduction to Astrophysics  
Description and general properties of astrophysical objects; radiation theory, spectral  
classification and the Hertzsprung-Russell diagram; determination of physical properties,  
luminosity classes, properties of solar and stellar atmospheres, the astronomical distance  
pyramid; introduction to cosmology. Prerequisites: PH 113, MA 201. (Same as AST 371.)  
Fall.

411 Geometrical Optics Laboratory  
Introduction to optical laboratory techniques, focus and alignment with incoherent and  
coherent sources, the nodal slide, thin lenses, thick lenses, and lens systems, the effects of  
apertures and stops, reflection, refraction and dispersion, aberrations, elements of  
radiometry. Prerequisite: PH 116, OPT 341. Prerequisite or parallel: OPT 441. Lab Fee:  
$50. (Same as OPT 411.) Fall.

412 Physical Optics Laboratory  
Introduction to physical optics phenomena, Young's double slit experiment, Lloyd's  
mirror, Fresnel biprism, Newton's rings, intensity distribution in fringe systems, Michelson  
interferometer, Fabry-Perot interferometer, Fresnel and Fraunhofer diffraction,  
diffraction by circular, rectangular and multiple openings, diffraction gratings.  
Prerequisite: PH 116, 342; Prerequisite or parallel: OPT 442 or EE 382. Lab Fee: $50.  
(Same as OPT 412 and OPE 455.) Spring.

416 Senior Laboratory  
Advanced experimental techniques in various subfields of physics. Prerequisite: PH 311.  
Lab Fee: $40. Fall, Spring.

420 Senior Thesis  
Semi-original work performed under direction of faculty member. All terms.

421 Thermal and Statistical Physics  
States of model system, entropy and temperature, Boltzmann distribution, thermal  
radiation and Planck distribution, chemical potential and Gibbs distribution, ideal gas,  
Fermi and Bose gases, heat and work, semiconductor statistics, kinetic theory, propagation.  
Prerequisites: PH 431, 451, MA 201. Spring.

431 Intermediate Electricity and Magnetism I  
Basic concepts of electrostatics, electric potential theory, electric fields and currents, field  
of moving charge including relativistic treatment, magnetic fields, Maxwell's equations.  
Prerequisites: PH 305, MA 201. Prerequisite or parallel: MA 324. Fall.

432 Intermediate Electricity and Magnetism II  
Continuation of PH 431. Development of Maxwell's equations for time-varying fields,  
basic concepts of AC circuit theory, electric fields in matter, magnetic fields in matter,  
modern applications. Prerequisite: PH 431. Spring.

441 Optical Systems Design  
Intermediate geometrical optics, first-order optics, linear transformations, paraxial optics,  
reflection and transmission at an interface, polarized light, Jones and Mueller calculi,  
matrix methods, ray tracing, apertures and stops, third-order optics and aberrations.  
Prerequisite: PH 342. (Same as OPT 441, OPE 441, and EE 461.) Fall.

442 Interference and Diffraction  
Two beam interference, multiple beam interference, optical testing, Fraunhofer diffraction,  
Fresnel diffraction, the Fourier transform, Fourier methods in optics, coherence,  
holography. Prerequisite: PH 431 or 441. (Same as OPT 442, OPE 442, and EE 462.)  
Spring.

451 Introductory Quantum Mechanics I  
Waves and particles; Bohr's model of the atom; deBroglie waves, wave-packets and the
uncertainty principle; postulates of quantum mechanics; Schrödinger's equation; simple systems in one, two and three dimensions; the hydrogen atom. Prerequisites: PH 305, 351, MA 244, 324. (Same as PH 551, CH 553, and MTS 651.) Fall.

452 Introductory Quantum Mechanics II 3 hrs.
Angular momentum and spin; atomic structure and spectrum; time-independent perturbation theory, variational methods; time-dependent perturbation theory and interactions of light with matter; scattering theory; electronic structure of solids; relativistic quantum mechanics. Prerequisite: PH 451. (Same as PH 552, CH 554, and MTS 652.) Spring.

471 Stellar Atmospheres and Interiors 3 hrs.
Classification of stellar spectra; radiative transfer; stellar atmospheres; spectral line profiles; curve of growth. Equations of stellar structure; hydrostatic equilibrium and stability; theory of polytropes; structure of "real" main-sequence stars; stellar evolution; compact stellar objects (white dwarves, neutron stars, black holes). Prerequisite: PH 371. (Same as AST 471.) Spring, odd years.

472 Galactic Structure and Cosmology 3 hrs.
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473 High Energy Astrophysics 3 hrs.
Observational techniques; radiation processes; physics of X-ray and gamma-ray sources; low-mass and high-mass X-ray binaries; cataclysmic variables; high-energy aspects of solar flares; gamma-ray bursts; origin and composition of cosmic rays; neutrino emission and detection. (Same as AST 473.) Spring, even years.

499 Physics Practicum 3 hrs.
"Capstone" course designed to provide real-world research experience for graduating seniors. Students work individually with faculty members on projects. Required for all physics/optical science majors and minors. Prerequisite or parallel: All required courses on the POS must be taken prior to, or concurrently with, this course. All terms.
**Library**

333 Salmon Library  
Telephone: (256) 824-6540  
Email: library@email.uah.edu

---

**Dean:** Wilson Luquire, Ph.D.

Professor Luquire; Associate Professors Herring, Warren; Lecturers Coleman, Hulett, Mead, Moore.

Library research courses provide students with the skills necessary to complete their academic studies and to prepare for successful professional lives. The methods and materials covered in these classes will support students in a lifetime of research and learning.

Library research courses are offered as electives.

**Bibliography (BIB)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>100</td>
<td>Introduction to Library Research</td>
<td>2 hrs.</td>
<td>Introduces students to the organization and use of university libraries and their collections. Focuses on successful research techniques utilizing reference materials, indexes and abstracts, government documents, and computerized information sources. Includes practical applications of both traditional and computerized resources. Lab Fee: $10.</td>
</tr>
<tr>
<td>230</td>
<td>Library Research for Business and Economics</td>
<td>1 hr.</td>
<td>Library research methods and information sources in business and economics; the organization of the UAH Library, basic business and economics research materials, and introduction to basic sources of information about corporations and industries. Lab Fee: $10.</td>
</tr>
<tr>
<td>310</td>
<td>Library Research for Languages and Literature</td>
<td>2 hrs.</td>
<td>Library research methods in the subject areas of language and literature; reference and research materials. Lab Fee: $10.</td>
</tr>
<tr>
<td>360</td>
<td>Library Research in the Social Sciences</td>
<td>1 hr.</td>
<td>Origin and terminology of the social sciences; library research methods in the social sciences (communication, education, political science, psychology and sociology); reference and research materials. Lab Fee: $10.</td>
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</table>
445  Library Research in the Life and Health Sciences  2 hrs.
Library research methods in the life and health sciences; reference and research materials.
Lab Fee: $10.

499  Special Topics  2 hrs.
Topics of special interest in library research such as computer searching in specified
disciplines. May be taken for credit more than once so long as subtitles differ. Lab Fee:
$10.

545  Library Research in Life and Health Sciences  2 hrs.
(See BIB 445.)
The mission of the Division of Continuing Education is to administer special activities which respond to the University's internal and external needs by providing the highest quality opportunities for credit and non-credit program development. Such programs are designed to assist attendees to become more effective in their personal and professional lives by building on the strengths and expertise of the university's faculty, departments, and colleges. The Division serves to stimulate lifelong learning through identifying educational needs in the region and providing access to such curricula at different times and locations. This accountability is carried out through the departments of Professional Development; Health and Physical Education; Space Orientation for Professional Educators; and The Academy for Lifetime Learning. The offices of the Division of Continuing Education are located in Wilson Hall.

PROFESSIONAL DEVELOPMENT

Public and Customized Training

The Professional Development Department develops and presents professional training and educational activities in the areas of business, management, engineering technology, computer technology, foreign languages, and interior design. Programs are designed to allow an individual the choice of attending an individual course or courses of interest, or to complete a more structured certificate program leading to a Certificate of Professional Achievement. Courses are offered day and evening, to help accommodate the busiest of schedules. Four state-of-the-art computer labs offer one-student-per-computer and hands-on instruction in topic areas that meet the latest in industry needs.

Customized training activities are provided for individual or organizational clients in business, industry, and government. Programs can be developed and tailored to meet specific needs and offered at the client's site or on campus. Customized programs provide a cost-effective and convenient method of employee training structured in a format that creates a team environment and can assist in tackling on-the-job issues and projects.

Certificate programs and professional review series include:

C Programming
Cisco Certified Network Associate Review
Contract Management

Oracle Developer
Oracle 8 Core Path Certification Prep
Procurement Management
Fundamentals of Engineering Review
Interior Design
ISO9000-2000
Java Certification Review
Java Developer
Linux
Microsoft Certified Systems Engineer
Oracle Database Administrator

Professional Development coordinates the Listener's License program which allows participants who have or have not been previously admitted to the university to attend regular credit classes. Listeners are not required to take tests or satisfy attendance requirements. Participants pay an established course fee, and purchase a campus parking decal. (Some courses also have associated laboratory fees.) Listeners have library privileges while participating in the program. Only select courses are available through the Listener's License program and no academic or CEU credit is awarded. Students under disciplinary or academic suspension from any college or university are ineligible to register as listeners. A course taken as a Listener's License participant may not be petitioned for credit by examination. To determine which courses are available for Listener's License, call the Professional Development Office at 824-6372.

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Email: pratts@cepo.conted.uah.edu

Web Site: http://www.coned.uah.edu
FAX: (256) 824-6934

HEALTH AND PHYSICAL EDUCATION
The Health and Physical Education Department strives to teach individuals to improve their quality of life through educational and fitness activities. Beginning with preschool-age children and continuing to post-retirement adults, activities focus on incorporating physical fitness as a means of relaxation, reducing the risk of injury and illness, and providing the skills and
knowledge necessary to implement a healthy lifestyle.

Adult activities encompass a broad spectrum of recreational, physical, and educational opportunities. Courses include Golf, Sailing, Tai Chi, Yoga, Fencing, Ballroom Dance, Swing Dance, Contemporary Nutrition, the LEARN Program for Weight Control, Body Sculpting, Deep Water and Shallow Water Workout, and Tennis. American Red Cross Lifeguard Training and Water Safety Instructor classes are also available which lead to certification to work within the aquatic environment. The Exercise Physiology option of study available through UAH's Biology Department, with coursework in the Health and Physical Education Department, can also lead to certification as an athletic trainer or personal trainer.

Opportunities for youth exist as well. Swimming courses are offered during the spring and summer terms and follow the American Red Cross Learn to Swim and Infant and Preschool programs. During the summer, the Sports Academy is a great way to improve in a sport or learn a new one. Camps for both boys and girls are available in the following sports: basketball, baseball, softball, volleyball, hockey, soccer, tennis, and cheerleading.

For more information:
Michelle Keene, Associate Director
Spragins Hall, Room 108
Huntsville AL 35899-0650
Email: keenem@cepo.conted.uah.edu

Web Site: http://www.coned.uah.edu/hpe
FAX: (256) 824-6326

TRAINING AND MEETING FACILITIES

The Division of Continuing Education utilizes the auditoriums, training facilities, classrooms, and residential accommodations located on the UAH campus. In addition, the Division has its own computer training facilities equipped with three PC laboratories, Health and physical education activities are located in the University Fitness Center, an on-campus facility that contains an indoor pool, gymnasium, weight room, indoor track and aerobic area. Courses are also held in Spragins Hall, which maintains racquetball and tennis courts. Other continuing education activities are held at various locations throughout the community.

SPACE ORIENTATION OFFICE

The Space Orientation Department develops and conducts in-service, graduate credit programs that provide hands-on experience for elementary and secondary professional educators in the fields of science, mathematics, and social studies. In an effort to improve science education in the nation's schools, several of the programs acquaint educators with all dimensions of current developments in space science, including social and international implications. Programs include Exploring Space: The Classroom Connection (Huntsville); Exploring Space: The Capital Connection (Washington, DC); and Exploring Space: The Russian Connection (former Soviet Union).

For more information:
Dr. John Pottenger, Director
Ms. Dottie Jordan, Program Coordinator
Wilson Hall, Room 110
Huntsville AL 35899-0650
Email: pottenj@email.uah.edu
Email: jordand@cepo.conted.uah.edu

Web Site: http://www.coned.uah.edu/space.html
FAX: (256) 824-6760
THE ACADEMY FOR LIFETIME LEARNING, INC.

The Academy for Lifetime Learning, Inc. (The Academy) is a non-profit membership organization with a primary goal of advancing the social, educational, and cultural interests of its members. It is governed by a Board of Directors elected by the membership. The purpose of The Academy is to sponsor non-credit courses, forums, seminars, and other events to promote understanding and appreciation of subjects selected by its members. These activities are designed to satisfy members' interest in a cooperative and socially congenial manner.

The Academy curriculum includes a wide range of courses: Art, Computer, Creative Writing, Economics, Estate Planning, Foreign Languages, Foreign Policies, Government, Great Books, History, Investments, Law, Leisure, Literature, Medical Issues, Music, Nature Studies, Poetry, Politics, Psychology, Science, Space Exploration, and others! These courses are offered during fall, winter, and spring, and most meet one day a week for eight weeks for approximately 1.5 hours each class. Highly qualified volunteer instructors teach each course, and course activities require no tests or grades.

For more information: (256) 824-6959
Terri Pierce, Program Coordinator
110 Wilson Hall
Huntsville AL 35899-0650
Email: piercet@cepo.conted.uah.edu or Huntsvillian@aol.com

Web Site: http://www.ALLUAH.com
FAX: (256) 824-6760

REGISTRATION AND COURSE INFORMATION

Registration for Continuing Education is handled by the Division of Continuing Education's Business Office located in Wilson Hall, Room 124, or by calling (256) 824-6010 or 1-800-448-4031. Registration in non-credit courses does not require admission to UAH as a regular student.

Non-Credit Courses

Continuing Education Units (CEUs) are awarded to students who satisfactorily complete non-credit courses. One CEU is equal to 10 contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction. The Division of Continuing Education keeps a record of CEUs, and an official transcript may be obtained upon written request to the Continuing Education Business Office. A $4 fee is charged per transcript.
The University of Alabama in Huntsville

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Dr. Ed Richardson, State Superintendent of Education, Member, Ex Officio

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- John J. McMahon, Jr., Birmingham

Seventh
- Sandral Hullett, M.D., Eutaw
- John H. England, Jr., Tuscaloosa

Trustees Emeriti
- T. Massey Bedsole, Mobile
- Winton M. Blount, Montgomery
- Frank H. Bromberg, Jr., Birmingham
- John A. Caddell, Decatur
- Jack Edwards, Mobile
- Thomas S. Lawson, Montgomery
- James D. Loftin, Dothan
- John T. Oliver, Jasper
- Martha Simms Rambo, Huntsville
- Thomas E. Rast, Birmingham
- Yetta G. Samford, Opelika
- Maury D. Smith, Montgomery
- Ernest G. Williams, Tuscaloosa
- Cordell Wynn, Tuscaloosa
# The University of Alabama System Staff

<table>
<thead>
<tr>
<th>Position</th>
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<tbody>
<tr>
<td>Chancellor</td>
<td>Thomas C. Meredith</td>
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<tr>
<td>Vice Chancellor for Academic Affairs</td>
<td>Charles R. Nash</td>
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<tr>
<td>Vice Chancellor for Financial Affairs</td>
<td>Kent Kay</td>
</tr>
<tr>
<td>Vice Chancellor for Information Technology and Outreach</td>
<td>Charles M. Anderson</td>
</tr>
<tr>
<td>Executive Assistant to the Chancellor and Secretary of</td>
<td>John B. Hicks</td>
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<tr>
<td>the Board of Trustees</td>
<td>C. Glenn Powell</td>
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<tr>
<td>General Counsel</td>
<td>C. Glenn Powell</td>
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<td>General Auditor</td>
<td>Kent Kay</td>
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## UAH Administration

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<tr>
<td>President</td>
<td>J. Derald Morgan</td>
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<tr>
<td>Provost and Vice President for Academic Affairs</td>
<td>F. Frances Johnson</td>
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<tr>
<td>Vice President for Research</td>
<td>C. Michael Oliver</td>
</tr>
<tr>
<td>Interim Vice President for Student Affairs</td>
<td>Suzanne H. Norris</td>
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<tr>
<td>Vice President for Finance and Administration</td>
<td>Richard F. Modlin</td>
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<tr>
<td>Vice President for University Advancement</td>
<td>Richard H. Comfort</td>
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<tr>
<td>Associate Provost for Undergraduate Studies</td>
<td>Lee E. Williams</td>
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<tr>
<td>Dean, College of Administrative Science</td>
<td>John C. Gregory</td>
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<td>Dean of the Library</td>
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<td>Associate Vice President for Enrollment Services and</td>
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<td>Registrar</td>
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</tbody>
</table>

UAH Administration 344
ABERNETHY, SHARRON, B.A. (University of North Alabama), M.A., Ed.S., Ph.D. (University of Alabama, Tuscaloosa), Assistant Professor of Foreign Languages and Literatures, 1997. Email: abernes@uah.edu

ABUSHAGUR, MUSTAFA, B.Sc. (Tripoli University), M.Sc., Ph.D. (California Institute of Technology). Professor of Electrical Engineering, 1984.* Research Interests: Optical signal processing, computing, and metrology. Email: abushagu@ece.uah.edu

ADHAMI, REZA, B.S.E., M.S.E., Ph.D. (University of Alabama, Huntsville). Chair and Professor of Electrical Engineering, 1984.* Research Interests: Digital signal processing, digital image processing, pattern recognition, data compression, and digital communications. Email: adhami@ece.uah.edu

ALLEN, W. DAVID, B.A., M.A. (Eastern Illinois University), Ph.D. (University of Arkansas), Associate Professor of Economics, 1994* Research Interests: Labor and demographic economics, issues of time allocation, issues of marriage and divorce. Email: allend@uah.edu

ALSHIBLI, KHALID A., B.S., M.S. (Jordan University of Science and Technology), Ph.D. (University of Colorado). Assistant Research Professor of Civil and Environmental Engineering, 1998.* Research Interests: Experimental soil mechanics, constitutive modeling, geomechanics, behavior of granular materials under very low effective stresses, utilizing digital imaging techniques and computed tomography (CT) to study the internal fabric of geotechnical materials. Email: alshibli@eb.uah.edu

AMES, KAREN K., B.S. (Stanford University), Ph.D. (Cornell University). Associate Professor of Mathematical Sciences, 1990.* Research Interests: Partial differential equations, singular perturbation theory. Email: ames@math.uah.edu

AMIN, ASHOK T., B.S. (University of Baroda, India), M.S. (University of Tennessee), Ph.D. (Northwestern University). Professor of Computer Science, 1984.* Research Interests: Algorithms, graphs and networks, fault tolerant networks and systems. Email: aamin@cs.uah.edu

ANDERSON, MICHAEL D., B.S., M.S., Ph.D. (Iowa State University), Assistant Professor of Civil and Environmental Engineering, 1998*. Research Interests: Transportation and traffic engineering, intelligent transportation systems, urban planning, and applications of geographic information systems to transportation. Email: mikea@cee.uah.edu

ARRINGTON, ALLYSON, B.S., (Wofford College), M.A. (Wake Forest University). Lecturer of Mathematical Sciences, 2000. Research Interests: Hamiltonian Problems in Graph Theory. Email: arringto@math.uah.edu

AUÑÓN, JORGE I., B.S.E.S., M.S.E., Sc.D. (George Washington University). Dean, College of Engineering and Professor of Electrical and Computer Engineering, 1999*. Research Interests: Probability, random processes, signal processing, evoked potentials and biomedical, visual and auditory. Email: aunon@eb.uah.edu

BAIRD, JAMES K., B.S. (Yale University), M.A., Ph.D. (Harvard University). Chair and Professor of Chemistry, and Director, Joint Materials Science Doctoral Program. 1982.* Research Interests: Diffusion in solids, crystal growth, critical phenomena, shock waves and plasmas. Email: bairdj@uah.edu

BANISH, MICHAEL, B.S. (Westminster College, Utah), Ph.D. (University of Utah), Assistant Research Professor of Physics, 1998. Research Interests: Photothermal deflectometry, crystal growth furnace development, growth of organic nonlinear optical materials by effusive ampoule physical vapor transport. Email: banishm@uah.edu
BELL, DIANA, B.A. (Marshall University), M.A. (Northwestern State University), Ph.D. (Illinois State University). Assistant Professor of Communication Arts and English and Director of the Writing Center, 1996*. Research Interests: Issues of motivation, feminism, self-reflection as they relate to writing pedagogy. Email: belldec@uah.edu

BERBRIER, MITCH, B.C., B.A. (McGill University), M.A., Ph.D. (Indiana University). Assistant Professor of Sociology, 1996. Research Interests: Deaf, gay males, white supremacists. Email: berbrim@uah.edu

BERKOWITZ, DAVID, B.S. (Rutgers University, Camden), M.B.A. (University of Texas, Austin), Ph.D. (University of Alabama). Assistant Professor of Marketing, 1997*. Research Interests: New product diffusion and adoption, new product development, international marketing and international product management. Email: berkowd@uah.edu

BILLINGS, C. DAVID, B.S. (Southwest Missouri State University), Ph.D. (University of Missouri, Columbia). Dean, College of Administrative Science and Professor of Finance, 1981.* Research Interests: Business accreditation, business school outreach, academic/industrial partnerships, government financial management, systems analysis. Email: billind@uah.edu

BLACKMON, JAMES B., B.S. (California Institute of Technology), M.S., Ph.D. (University of California-Los Angeles). Research Professor of Mechanical and Aerospace Engineering, 2001. Research Interests: Propulsion systems, solar power systems, and space hardware development. Email: blackmoj@uah.edu

BOLLINGER, LAUREL A., B.A. (St. Olaf College), Ph.D. (Princeton University). Associate Professor of English, 1993.* Research Interests: American literature, gender studies. Email: bollinl@uah.edu

BONILLA, MARY, K., B.S. (Auburn University), B.S., M.S.N., C.R.N.P. (University of Alabama in Huntsville). Clinical Assistant Professor of Nursing, 1998. Research Interests: Obesity, Weight Loss, Diabetes Mellitus and Osteoporosis. Email: bonillam@uah.edu

BOUCHER, PHILIP P., B.A. (University of Hartford), M.A., Ph.D. (University of Connecticut). Chair and Distinguished Professor of History, 1974.* Research Interests: Colonial Americas, especially French. Email: boucherp@uah.edu

BOWER, MARK V., B.S.E., M.S.E., Ph.D. (University of Michigan), P.E. Assistant Dean, College of Engineering and Associate Professor of Mechanical Engineering, 1984.* Research Interests: Solid mechanics, composite materials, fracture mechanics, viscoelasticity, nonlinear elasticity. Email: mbower@eb.uah.edu

BOWYER, DONALD, B.A. (West Virginia Wesleyan College), M.A. (California State University, Northridge), Ph.D. (University of Northern Colorado), Instructor of Music, 1998. Research Interests: Music technology, jazz, low brass, creator of Dolphin Don's Music School. Email: bowyerd@uah.edu

BOYD, LYNN, B.A. (Wake Forest University), Ph.D. (University of Utah). Assistant Professor of Biological Sciences, 1998. Research Interests: Cell polarity in early development of caenorhabditis elegans, the role of the par-2 gene in cell polarization, proteins that interact with actin. Email: boydl@uah.edu

BOYKIN, TIMOTHY B., B.S.E.E. (Rice University), M.S.E.E., Ph.D. (Stanford University). Associate Professor of Electrical and Computer Engineering, 1992.* Research Interests: Theory and modeling of compound and quantum semiconductor devices; physics of nanoelectronic devices; solid state devices. Email: boykin@ece.uah.edu

BRADBURN, KAY F., B.A. (University of North Carolina, Greensboro), M.A. (University of Alabama, Huntsville). Lecturer in English, 1988. Research Interests: Writing editing, and public speaking. Email: bradbuk@uah.edu

Full Time Faculty 346
BROOKMAN, JANET S., R.N. (Lucy Webb Hayes School of Nursing, Washington, D.C.), B.S.N. (University of North Alabama), M.S.N., D.S.N. (University of Alabama, Birmingham). Clinical Associate Professor of Nursing, 1985.* Research Interests: Childbearing families, women’s health issues, distance education, teaching-learning in higher education. Email: brookmj@uah.edu

BRUNSMA, DAVID, B.A. (Goshen College), M.A., Ph.D. (University of Notre Dame), Assistant Professor of Sociology, 1998. Research Interests: Sociology of education, social networks, adolescent delinquency, and popular culture. Email: brunsmad@uah.edu

BRYSON, ROSCOE E., JR., B.B.A. (Memphis State University), M.B.A., Ph.D. (Georgia State University), C.P.A. Associate Professor of Accounting, 1976.* Research Interests: Accounting History. Email: brysong@uah.edu

BUKSA, IRENA, M.A. (University of Warsaw, Poland), D.A. (Syracuse University). Associate Professor of Slavic Languages, 1990. Research Interests: Russian/Slavic linguistics and 20th century Russian literature. Email: buksai@uah.edu

BURNETT, JOHN E., B.S. (University of New Mexico), M.A. (Claremont Graduate School), Ph.D. (University of Alabama, Tuscaloosa). Associate Dean, College of Administrative Science and Associate Professor of Finance, 1992.* Research Interest: Investments. Email: burnettj@uah.edu

CAMPBELL, P. SAMUEL, B.S. (Marietta College), M.S. (Ohio University), Ph.D. (Purdue University). Chair and Professor of Biological Sciences, 1973.* Research Interests: Reproductive physiology and development of the reproductive system, mechanism of estrogen action, environmental estrogenicity. Email: campbellp@uah.edu

CANNON, PAUL, N., B.A. (Columbia Christian College), M.P.A. (California State University), M.A., Ph.D. (University of Southern California). Assistant Professor of Political Science, 2000.* Research Interests: Public management, public organization theory, public policy analysis, interest groups, urban politics, American government, intergovernmental relations, the presidency, and policy methods. Email: cannonp@uah.edu

CARPENTER, SANDRA L., B.A. (California State University), Ph.D. (University of California). Chair and Associate Professor of Psychology, 1989.* Research Interests: Social, personality, and cognitive psychology, categorization of information about ourselves, information about other people, causes of anger and consequences of categorizations. Email: carpens@email.uah.edu

CERRO, RAMON L., B.S. (Universidad Del Litoral, Argentina), M.S., Ph.D. (University of California, Davis). Chair and Professor, Chemical and Materials Engineering, 1997*. Research Interests: Theoretical and experimental fluid mechanics, heat and mass transfer, physicochemical hydrodynamics, coating flows, drops and bubble dynamics. Email: rlc@eb.uah.edu

CHANG, MOU-HSIUNG, B.S. (Chung-Hsing University), M.S., Ph.D. (University of Rhode Island). Professor of Mathematical Sciences, 1974.* Research Interests: Stochastic differential equations, stochastic control, mathematical finance. Email: chang@math.uah.edu

CHEN, CHIEN P., B.S. (National Taiwan University), M.S., Ph.D. (Michigan State University). Professor of Chemical Engineering, 1986.* Research Interests: Multiphase flows, combustion, computational fluid dynamics, turbulent transport, micro-electronic packaging. Email: cchen@che.uah.edu

CHEN, Ll QING, B.S. (University of Science and Technology, China), M.S. (Fujian Institute of Research), Ph.D. (University of Pittsburgh). Assistant Research Professor of Chemistry, 1998. Research Interests: Crystal structures of proteins and nucleic acid, protein structures of biomedical interest, protein crystallography. Email: chenlq@uah.edu

CHITTUR, K. K., B.Tech. (Indian Institute of Technology, Bombay, India), Ph.D. (Rice University). Professor of Chemical Engineering, 1991.* Research Interests: Blood materials interactions through infrared spectroscopic (FT-IR/ATR) techniques, protein-surface interactions, biological process monitoring techniques. Email: kchittur@che.uah.edu

347 Full Time Faculty
CHRISTOPHER, SUNDAR A., B.E. (Madras University), M.S. (South Dakota School of Mines and Technology), Ph.D. (Colorado State University). Associate Professor of Atmospheric Science, 1997.* Research Interests: Satellite remote sensing, earth radiation budget. Email: sundar@atmos.uah.edu

CHRISTY, JOHN R., B.A. (California State University), M.Div. (Golden Gate Baptist Theological Seminary), M.S., Ph.D. (University of Illinois). Professor of Atmospheric Science, 1991.* Research Interests: Climate, climate dynamics. Email: christy@atmos.uah.edu

CHUNG, T.J., Engineering Diploma (Seoul National University), M.S., Ph.D. (Oklahoma State University). Distinguished Professor of Mechanical Engineering, 1970.* Research Interests: Computational fluid dynamics, continuum mechanics, numerical modeling of combustion and propulsion, fluid dynamics, heat transfer, and transport phenomena. Email: tchung@mae.uah.edu

CLING, ANDREW D., B.A. (University of Missouri), M.A., Ph.D. (Vanderbilt University). Associate Professor of Philosophy, 1988. Research Interests: Questions about the nature and extent of knowledge. Email: clinga@uah.edu

COBB, JEAN, B.S.N. (Florida State University), M.S.N. (Emory University). Clinical Associate Professor of Nursing, 1999.* Research Interests: Surgical, perinatal, ambulatory care, and nursing management. Email: cobbj@uah.edu

COLCLOUGH, GLENNA, B.A., M.A. (Kent State University), Ph.D. (University of Georgia). Chair and Associate Professor of Sociology, 1984.* Research Interests: Organization of work and social stratification. Email: colclog@uah.edu


COLEMAN, HUGH W., B.S. (Mississippi State University), M.S., Ph.D. (Stanford University). Eminent Scholar in Propulsion and Professor of Mechanical Engineering, 1991.* Research Interests: Propulsion, uncertainty analysis, experimentation. Email: coleman@mae.uah.edu

COMFORT, RICHARD H., B.A. (Harvard University), M.S., Ph.D. (University of Alabama, Huntsville). Director of the Institute for Science Education and Research Professor of Physics, 1977.* Research Interest: Space plasmas. Email: comfortr@espar.uah.edu

COMPONATION, PAUL J., B.S. (West Virginia University), M.S. (Troy State University), Ph.D. (West Virginia University). Assistant Professor of Industrial and Systems Engineering and Engineering Management, 1996*. Research Interests: Product development, work design, methods analysis, manufacturing methods, engineering economy, ergonomics. Email:pjc@ise.uah.edu

CONFER, CARLA, B.S., M.S. (State University of New York, New Paltz), Ph.D. (State University of New York, Albany). Assistant Professor of Education, 2001. Research Interests: Student centered teaching and learning and disciplinary thinking in academic coursework. Email: conferc@uah.edu

CORSETTI, CHARLES, B.E. (Manhattan College, New York), M.S., Ph.D. (Air Force Institute of Technology, Ohio), Lecturer in Electrical and Computer Engineering, 1999. Research Interests: Design and analysis of real-time digital and analog systems, and development of software programs and documentation, engineering applications of MATLAB, SIMULINK, MATHCAD and electronics workbench. Email: corsetti@ece.uah.edu

COST, THOMAS L., B.S.A.E. (University of Alabama, Tuscaloosa), M.S.A.E. (University of Illinois), Ph.D. (University of Alabama, Tuscaloosa), P.E. Professor of Mechanical Engineering, 1985.* Research Interests: Finite element hyperelastic materials, microstructural changes, energy functions, strain invariants, parabolic membranes, mass additive methods for model testing. Email: tcost@mae.uah.edu

COX, GLENN W., B.E.E., M.E.E., Ph.D. (Auburn University). Assistant Professor of Computer Science, 2001. Email: gcox@cs.uah.edu

CRAWFORD, ANN, B.S.N., M.S.N., D.S.N. (University of Alabama at Birmingham). Instructor of Nursing, 2000. Research Interests: Obstetrics, perinatal, and pathophysiology. Email: crawfora@uah.edu

CROUSE, MICHAEL G., B.F.A. (Atlanta College of Art), M.F.A. (University of Michigan). Chair and Professor of Art, 1980. Email: crousem@uah.edu

CRUISE, JAMES F., B.S., M.S. (Virginia Polytechnic Institute and State University), Ph.D. (University of Virginia). Professor of Civil and Environmental Engineering, 1996*. Research Interests: Hydrologic processes, remote sensing and GIS applications to hydrologic and sediment transport modeling, impacts of land use changes on near shore environments, stochastic hydrology. Email: cruise@cee.uah.edu

DASHER, GLENN T., B.F.A. (University of Georgia), M.F.A. (Indiana University). Professor of Art, 1985. Research Interests: Creation of large and small scale postmodern-surrealist sculptures utilizing a wide range of processes and materials. Email:dasherg@uah.edu.

DELUGACH, HARRY S., B.A. (Carleton College), M.S. (University of Tennessee), Ph.D. (University of Virginia). Associate Professor of Computer Science, 1990.* Research Interests: Software requirements engineering, knowledge acquisition and conceptual graphs. Research Interests: Software Requirements Engineering, Knowledge Acquisition and Conceptual Graphs. Email:delugah@cs.uah.edu

DILLARD, NANCY F., B.A., M.A., (University of South Carolina), Ph.D. (University of Tennessee). Assistant Professor of English, 1972.* Research Interests: Milton and seventeenth century literature. Email:dillardn@uah.edu

DIMMOCK, JOHN O., B.S., Ph.D. (Yale University). Director, Center for Applied Optics and Professor of Physics, 1993.* Research Interests: Theoretical optics and solid state physics. Email:dimmock@uah.edu

DOW, STEPHEN, B.A., M.A., Ph.D. (University of Florida). Associate Research Professor of Mathematical Sciences, 1997. Research Interests: Discrete mathematics, computer graphics, and image processing. Email:dow@math.uah.edu

DOWELL, MARSHA, B.S.N. (Mount Mercy College, Pittsburgh), M.S.N. (University of Virginia), Ph.D. (George Mason University). Associate Dean, College of Nursing and Associate Professor of Nursing, 1997* Research Interests: Family caregivers, diversity issues in education administration, health policies, issues in family nursing. Email: dowellm@uah.edu

DROST, JOHN, Lecturer in the Library, 2001. Research Interests: Library automation systems, UNIX, Sirsi and BRS software applications, Awk and Sed scripting and the Sirsi API Interface. Email: drostj@uah.edu

DUNAR, ANDREW J., B.A. (Northwestern University), M.A. (University of California, Los Angeles), Ph.D. (University of Southern California). Interim Chair of Music and Professor of History, 1984.* Research Interests: 20th century U.S., U.S. diplomatic. Email: dunara@uah.edu

EARLY, JULIE E., B.A., M.A. (Michigan State University), Ph.D. (University of Chicago). Associate Professor of English, 1990.* Research Interests: Victorian and Edwardian literature and culture, the novel. Email:earlyj@uah.edu
Eaton, Rebecca, B.S., M.S., Ph.D. (Virginia Polytechnic Institute and State University). Assistant Professor of Psychology, 1999.* Research Interests: Contextual determinants of psychobiological organization during prenatal and postnatal development, dynamic systems approach to studying learning and development, psychobiological, behavioral, and social determinants in development of learning and memory, and role of early experience in perceptual and developmental outcomes. Email: eatonr@uah.edu

Eley, Michael H., B.A. (West Georgia College), M.S., Ph.D. (University of Georgia). Professor of Biological Sciences, 1974.* Research Interests: Microorganisms and enzymes for bioconversions of lignocellulosic materials to fuels and chemicals. Email: eleym@uah.edu

Ellis, Jack D., B.A. (Baylor University), M.A., Ph.D. (Tulane University). Professor of History, 1992.* Research Interests: 19th and 20th century Europe, France; social history of medicine. Email: ellisj@uah.edu

Emslie, A. Gordon, B.Sc., Ph.D. (University of Glasgow, Scotland), M.S., M.S.E. (The University of Alabama in Huntsville). Dean, School of Graduate Studies and Professor of Physics, 1981.* Research Interests: Astrophysics, solar flare physics. Email: emslieg@uah.edu

Enger, Sandra, B.S., M.S. (Winona State University), Ph.D. (University of Iowa). Coordinator of Science Education and Assistant Professor of Education, 1998. Research Interests: Creating and examining science learning opportunities in the classroom, science education reform, student assessment in the science classroom, using original work to create laboratory experiences. Email: engers@uah.edu

English, Jennifer, B.S., M.S., Ph.D. (Georgia Institute of Technology). Assistant Professor of Electrical and Computer Engineering, 2000.* Research Interests: The design and fabrication development of MEMs devices using silicon and ceramic-based materials, the integration of CMOS and MEMs fabrication, MEMs packaging, implementing control schemes for MEMS and wireless operation of MEMs devices. Email: english@cb.uah.edu

Epperson, James F., B.S. (University of Michigan), M.S., Ph.D. (Carnegie-Mellon University). Associate Professor of Mathematical Sciences, 1987.* Research Interests: Numerical analysis, partial differential equations. Email: epperson@math.uah.edu

Etzkorn, Letha M., B.S., M.S. (Georgia Institute of Technology), M.S. (The University of Alabama in Huntsville). Assistant Professor of Computer Science, 1998.* Research Interests: Software engineering (software reuse and object-oriented software metrics, software quality metrics), distributed systems (CORBA), artificial intelligence (knowledge-based systems, program understanding, natural language processing), computer networks (primarily protocols). Email: etzkorn@cs.uah.edu

Evans, Dorla A., B.S. (University of Texas, Austin), M.B.A. (University of Houston, Clear Lake), Ph.D. (University of Arkansas). Professor of Finance, 1991.* Research Interest: Risk decision making. Email: evans@uah.edu

Farrington, Phillip A., B.S.I.E., M.S.I.E. (University of Missouri, Columbia), Ph.D. (Oklahoma State University). Associate Professor of Industrial and Systems Engineering, 1991.* Research Interests: Quality engineering, integrated product and process design, system simulation, engineering economy, manufacturing systems design. Email: pat@ise.uah.edu

Finley, Nancy, J., B.A., M.A., Ph.D. (University of Oklahoma). Associate Professor of Sociology, 1982.* Research Interests: Sociology of gender, marriage and family, feminist theory and social movements. Email: finley@uah.edu

Fix, John D., B.S. (Purdue University), M.A., Ph.D. (Indiana University). Professor of Physics and Dean of the College of Science, 1999*. Research Interests: Growth of carbon particles, spectrophotometry, photometry, stellar atmospheres. Email: fixj@uah.edu
FLOYD, STEPHEN A., B.A. (Northeastern University), M.S.B.A. (University of Massachusetts), Ph.D. (University of Georgia). Associate Professor of Management Information Systems, 1985.* Research Interests: Analysis and design methodologies and tools, artificial intelligence, knowledge based systems, decision support systems, strategic applications of IT. Email: floyds@uah.edu

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GEBAUER, ANDREAS, Diploma Chemiker (M.S.) (University of Cologne, Germany) (University of Vienna, Austria), Ph.D. (University of Texas at Austin). Assistant Professor of Chemistry, 2000. Research Interests: Inorganic metal complexes, three dimensional non-covalent compounds and the metal coordination properties of novel expanded porphyrins and oligopyrroles, the molecular recognition properties on the basis of non-covalent interactions with anions using 1H NMR spectroscopy and electrochemical methods. Email: gebauera@uah.edu
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GRAMM, CYNTHIA L., B.S. (University of Illinois), M.A. (Michigan State University), M.A., Ph.D. (University of Illinois). Professor of Management, 1990.* Research Interests: Impact of union and employer strike strategies on the continuation of bargaining relationships, determinants and effects of a union's decision to use corporate campaign tactics during a strike, effects of human resource practices on human resource and organizational performance, effects of team heterogeneity on a team member's willingness to return to work during a strike. Email: grammc@uah.edu

GRAVES, SARA J., B.S., M.A. (University of Alabama, Tuscaloosa), Ph.D., (University of Alabama, Huntsville). Director of the Information Science and Technology Laboratory and Professor of Computer Science, 1978.* Research Interests: Distributed information systems, next generation internet, data mining and knowledge discovery, information system interoperability, image processing and data security. Email: sgraves@cs.uah.edu

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GYASI, KWAKU A., B.A. (University of Ghana), M.A. (Ohio University), M.A., Ph.D. (Ohio State University), Assistant Professor of Foreign Languages and Literatures, 1999. Research Interests: Translation and cross-cultural texts, language in African literature, second language acquisition, religion, culture and literature. Email: gyasik@uah.edu

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O'DELL, KATHERINE, M., M.S. (Middle Tennessee State University). Lecturer in Mathematical Sciences, 1999. Research Interests: Using symbolic math packages (Maple/MATLAB) to enhance the teaching, uses of Web as tool for teaching, finding problems from industry to illustrate applications for mathematics. Email: odell@math.uah.edu

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PAKHOMOV, ANDREW V., B.S., M.S. (Moscow Steel and Alloys Institute, Russia), Ph.D. (Michigan Technological University). Assistant Professor of Physics, 1998. Research Interests: Laser-Induced Plasma, Laser Propulsion, Spectroscopy, Semiconductors. Email: pakhomov@uah.edu

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PETTIBONE, JONATHAN, B.A. (College of Wooster), M.A., Ph.D. (University of South Carolina). Assistant Professor of Psychology, 2000.* Research Interests: The effects of context on decision making, and the relationship between information acquisition patterns and decision strategy choice, judgement and choice and decay effects on choice. Email: pettiboj@uah.edu

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RADONOVICH, LEWIS, J., B.A. (Thiel College), Ph.D. (Wayne State University). Provost and Vice President for Academic Affairs and Professor of Chemistry, 2000. Research Interests: Inorganic and physical chemistry, x-ray crystallography, organometallic chemistry, synthesis, structure and reactivity of transition metal organometallics. Email: radonovl@uah.edu

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ROUNTREE, J. CLARKE III, B.A. (University of Alabama, Huntsville), M.A., Ph.D. (University of Iowa), Chair and Associate Professor of Communication Arts, 1993.* Research Interests: Presidential rhetoric, supreme court opinions, and religious discourse. Email: rountrj@uah.edu

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SOUTH, LISA, B.S., (Mississippi State University), B.S.N. (University of Mississippi), M.S.N., D.S.N. (University of Alabama, Birmingham). Assistant Professor of Nursing, 1996.* Research Interests: Nursing care of children, children with cancer, sickle cell disease, hemophilia, home health care of children, self-concept and social support in children with chronic illness, adolescents, neuman systems model, psychosocial issues related to children with cancer. Email: southl@uah.edu

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TEMPLETON, GARY, F., B.S.B.A., M.B.A., M.M.I.S., Ph.D. (Auburn University). Assistant Professor of Management Information Systems, 2000. Research Interests: Defining a domain definition and measurement instrument for the Organizational Learning construct, development of managerial practices and IT infrastructures that facilitate and stimulate organizational learning for competitive sustenance, and organizational learning survey – an online survey that e-mails responses to the researcher. Email: templetg@uah.edu

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ALBURL, NORMA G., A.D.N. Affiliate Faculty of Nursing, 1997.

ALEXANDER, CHESTER JR., Adjunct Professor of Materials Science, 1988.

ANDREWS, BARRY J., Adjunct Professor of Materials Science, 1988.

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ASHLEY, PAUL, B.S. (Baylor University), M.A., M.S., D.Sc. (Washington University). Adjunct Professor of Physics, 1993.


AUSTRIN, KATHY, M.S.N. Affiliate Faculty of Nursing, 1999.

BAILLEY, CARMINE, B.A. (Rutgers University), M.S. (University of Dayton), Ph.D. (Lehigh University). Lecturer in Mathematical Sciences, 1991.*


BANERJEE, PARTHA, P., B. Tech (Indian Institute of Technology), M.S., Ph.D. (University of Iowa). Adjunct Professor of Electrical and Computer Engineering, 2000.

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BARNETT, TIMOTHY, B.S.E., M.S.E. (University of Alabama, Huntsville), P.E. Lecturer in Civil and Environmental Engineering, 1996.

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BELL, LEON W., M.D. (University of Tennessee Medical School), Adjunct Associate professor of Nursing, 1998.

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BIRMINGHAM, BARBARA R., M.S.N. (University of Alabama, Birmingham), Affiliate Faculty of Nursing, 1998.

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BRINKHURST, RALPH W., B.Sc., Ph.D., D.Sc. (Kings College, University of London). Adjunct Professor of Biological Sciences, 1993.*

BRISTOL, GINA, M.S.N. Affiliate Faculty of Nursing, 1999.


BROCKMAN, JEFFREY, Ph.D. (University of Kentucky). Adjunct Professor of Biological Sciences, 2001.

BROWER, LAURA E., M.S.N. Affiliate Faculty of Nursing, 1999.


BROWN, LINDA, M.S.N. (University of Alabama, Huntsville). Adjunct Associate Professor of Nursing, 1996.

BRYANT, SHERILL, A.D.N., Affiliate Faculty of Nursing, 1997.

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BURG, FREDRIC W., M.D. (Northwestern University Medical School). Adjunct Professor of Nursing, 1998.

BURRETT, SUSAN. Adjunct Assistant Professor of Materials Science, 1996.

BURKS, PAT, M.S.N. (University of Alabama, Huntsville). Adjunct Assistant Professor of Nursing, 1996.

BURLESON, JOHN D., B.S. (University of Alabama, Tuscaloosa). Lecturer in Computer Science, 1993.*


CAREY, ANN M., M.S.N. (University of Alabama, Huntsville). Adjunct Assistant Professor of Nursing, 1997.

CARLYLE, JULIE V., M.S.N. (Catholic University of America). Lecturer in Nursing, 1996.

CARROLL, CHESTER C., B.S., M.S., Ph.D. (University of Alabama, Tuscaloosa). Adjunct Professor of Electrical and Computer Engineering, 1999.


CAVA, MICHAEL P., Adjunct Professor of Materials Science, 1988.

CAYVENGER, JIM, B.S. (University of North Texas), Lecturer in Music, 1999.

CHESTER, ELIZABETH A., Pharm.D. (University of Utah), Lecturer in Nursing, 1997.


CHRISTIAN, HUGH, Ph.D. (Rice University). Adjunct Professor in Atmospheric Science, 1997.

CLARK, PETER E., Adjunct Associate Professor of Materials Science, 1988.


COLEMAN, RICK, Ph.D. (Florida State University). Lecturer in Computer Science, 1991.

COLLINS, LEE, M.S.N. (University of Alabama, Huntsville), Affiliate Faculty of Nursing, 1998.


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DEAL, PAMELA, M.S.N. (University of Alabama, Huntsville), Affiliate Faculty of Nursing, 1999.

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DELUCA, L. J., Adjunct Associate Professor of Materials Science, 1988.

DEPREE, MARCIA J., M.S.N. (University of Alabama, Huntsville). Affiliate Faculty of Nursing, 1999.


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DOYLE, WILLIAM D., Adjunct Professor of Materials Science, 1993.


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ESSENWANGER, OSKAR M., M.S. (Technical University of Danzig), M.S. (University of Vienna), Ph.D. (University of Wuerzburg). Research Professor of Atmospheric Science, 1989.

ETZKORN, DAVID, M.S.E.E. (Georgia Institute of Technology). Lecturer in Computer Science, 1997.

EVANS, JOHN L., B.E.E. (Auburn University), M.S.E., Ph.D. (University of Alabama, Huntsville). Lecturer in Finance and Adjunct Assistant Professor in Industrial and Systems Engineering, 1991.*

FAIRCLOUGH, PAMELA, B.S.N. (University of Alabama, Huntsville), M.S.N. (University of Alabama, Birmingham). Adjunct Associate Professor of Nursing, 1996.
FELDMAN, DALE S., Adjunct Associate Professor of Materials Science, 1988.
FETTERS, DEBRA A., M.S.N. (University of Alabama, Huntsville), Lecturer in Nursing, 1999.
FLEMING, BONNYE, B.A., M.A. (University of Alabama, Huntsville). Adjunct Professor of English, 1988
FOGLE, FRANK R., B.S.E., M.S.E., Ph.D. (University of Alabama, Huntsville). Adjunct Assistant Professor in Industrial and Systems Engineering, 1990.
FOX, JANET, A.D.N., Affiliate Faculty of Nursing, 1997.
FREDERICK, DAVID A., M.S.H.A. (University of Alabama, Birmingham), Adjunct Assistant Professor of Nursing, 1998.
FULLER, BRYAN SCOTT, B.A. (Western Kentucky University), M.A. (University of Alabama, Huntsville), M.S. (Florida Institute of Technology). Adjunct Instructor in Psychology, 1994.
GAD, SHARON I., M.S. (Alabama A & M University), Lecturer in Nursing, 1999.
GALBREATH, JIMMIE, M.S.N. (University of Alabama, Huntsville). Adjunct Assistant Professor of Nursing, 2000.
GARDNER, BETITINA, M.S.N. (University of Alabama in Huntsville). Adjunct Assistant Professor of Nursing, 2001.
GILBERT, STEPHEN M., B.S. (New Jersey Institute of Technology), M.S. (University of Southern California), Ph.D. (Cornell University). Adjunct Professor of Electrical and Computer Engineering, 1998.
GILLANI, NOOR, D.Sc. (Washington University, St. Louis), Adjunct Professor in Atmospheric Science, 1995.
GOODMAN, STEVE, Ph.D. (University of Alabama, Huntsville), Adjunct Professor in Atmospheric Science, 1993.
GOSWICK, DEBORAH, M.S.N. Affiliate Faculty of Nursing, 1999.
GRAHAM, NIALL, B.A., B.A.I. (Trinity College, Dublin, Ireland), M.S. (Ohio State University), Ph.D. (New Mexico State University). Visiting Assistant Professor in Computer Science, 1994.*
GRANT, PHYLLIS H., M.S.H.A. (University of Alabama, Birmingham), Adjunct Associate Professor of Nursing, 1997.
GRAY, GARY M., Adjunct Associate Professor of Materials Science, 1988.
GROCE, VICKY, M.S.N. (University of Alabama, Huntsville), Affiliate Faculty of Nursing, 1998.
GRIFFIN, ROBINS., Adjunct Assistant Professor of Materials Science, 1993.
GRIGGS, BORIS., Adjunct Associate Professor of Materials Science, 1988.
GRIFFIN, ROBIN S., Adjunct Associate Professor of Materials Science, 1993.
GROCE, BILLY C., M.B.A. (Florida Institute of Technology), Affiliate Faculty of Nursing, 1998.
GROCE, VICKY, M.S.N. (University of Alabama, Huntsville), Affiliate Faculty of Nursing, 1998.
GUESS, TERESA, M.S.N., Affiliate Faculty of Nursing, 1997.
HALE, MARGARET S., M.S.N. (Vanderbilt University) Affiliate Faculty of Nursing, 1999.
HAMILTON, TRACY P., Adjunct Assistant Professor of Materials Science, 1993.
HANNON, NELL, M.S.N. (University of Alabama, Huntsville). Affiliate Faculty of Nursing, 1999.
HARRISON, JOSEPH G., Adjunct Associate Professor of Materials Science, 1988.
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HELMER, KRISTINE, B.S.N., Affiliate Faculty of Nursing, 1997.
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HILL, JAMES L., Adjunct Professor of Materials Science, 1988.
HUGOLENS, CHARLES. Lecturer in Music, 1999.
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HODGES, RANDY, B.S.A.E. (Georgia Institute of Technology), M.S.E. (Georgia Institute of Technology). Lecturer in Mechanical and Aerospace Engineering, 2000.
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JEFCOAT, IRVIN A., Adjunct Associate Professor of Materials Science, 1988.  
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LONG, RANDY, B.S., M.Ed. (Middle Tennessee State University). Lecturer in Mathematical Sciences, 1987.

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MARTIN, JAMES, Adjunct Associate Professor of Materials Science, 1988.
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MC CORMICK, LORRAINE R., M.S.N. (University of Alabama, Huntsville), Affiliate Faculty of Nursing, 1997.
MC CRACKEN, EDWARD, B.S.N., M.S.N. (University of Alabama, Birmingham). Adjunct Associate Professor of Nursing, 1996.
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MITCHELL, RAY, Ph.D. (Renssleaur Polytechnic University). Lecturer in Mathematics, 1999.
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MOORE, JERRY DON, B.S.E.E. (Mississippi State University), M.S. (University of New Mexico), Ph.D. (University of Alabama, Tuscaloosa). Adjunct Professor of Electrical and Computer Engineering, 1999.
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MOSES, RAY, B.S.A.E. (Georgia Institute of Technology), Ph.D. (Ohio State). Lecturer in Mechanical and Aerospace Engineering, 1999.
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OLSON-ZERINGUE, JAN E., B.S.N. (University of Florida), M.S.N. (University of Alabama, Huntsville). Lecturer in Nursing, 1996.*


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PARK, DUK-WON, Adjunct Professor of Materials Science, 1988.

PARKER, MARTIN, Adjunct Professor of Materials Science, 1993.

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PETERS, BRUCE, B.S., M.S. (University of Wisconsin, Milwaukee), Ph.D. (University of Alabama, Huntsville). Associate Research Professor in Optical Science and Engineering, 1998.*


PETTY, A.D., M.B.A. Adjunct Assistant Professor of Nursing, 1999.

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ROBEY, LAWRENCE, B.S. (University of Kentucky), M.D. (University of Kentucky, College of Medicine). Adjunct Professor of Nursing, 1996.


RUSSELL, CHRISTOPHER, Ph.D. (Virginia Polytechnic Institute). Adjunct Professor in Biological Sciences, 1998.

RUSSELL, KATHY, M.S.N. (University of Alabama, Huntsville). Affiliate Faculty of Nursing, 2000.

RYDER, BRADLEY, B.S.B.A. (University of Alabama, Huntsville), J.D. (Samford University, Birmingham, AL). Lecturer in Business Legal Studies, 1995.

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SCHARATH, B.J., M.S.N. (University of Alabama, Birmingham). Adjunct Assistant Professor of Nursing, 1999.


SCHUMANN, J. PAUL, B.A., M.A. (University of Mississippi), Ph.D. (University of Oklahoma). Adjunct Assistant Professor of Political Science, 1981.*

SCHUTZENHOFER, LUKE A., B.S. (Parks College of St. Louis University), M.S. (University of Alabama, Huntsville), Ph.D. (University of Alabama, Tuscaloosa). Lecturer in Mechanical and Aerospace Engineering, 1980.


SHEALY, DAVID L., Adjunct Professor of Materials Science, 1988.

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SHUTT, GAIL, B.S.N. (Texas Women's University), M.S.N. (University of Alabama, Huntsville). Adjunct Assistant Professor of Nursing, 1996.

SKIBINSKI, KATHY, Diploma (St. Francis School of Nursing, Pennsylvania), Affiliate Faculty of Nursing, 1998.

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SMITH, BRIAN J., B.S., M.S., Ph.D. (University of Alabama, Huntsville). Lecturer in Electrical and Computer Engineering, 1996.

SMITH, SYLVIA, B.S.N., M.S.N. (University of South Carolina). Adjunct Assistant Professor of Nursing, 1996.


SPENCER, ROY, Ph.D. (University of Wisconsin, Madison). Adjunct Professor in Atmospheric Science, 1991.

STANFIELD, ELIZABETH, B.S.N. (University of Florida), M.S.N. (University of Alabama, Huntsville). Adjunct Associate Professor of Nursing, 1996.

STEFANESCU, DORU M., Adjunct Professor of Materials Science, 1988.

STEINBUCHEL, CARLA F., M.S.N. (Wichita State University), Affiliate Faculty of Nursing, 1998.

STERN, HENRY E., B.E. (Tulane University), Ph.D. (University of Alabama, Huntsville), P.E. Lecturer in Industrial and Systems Engineering and Mathematical Sciences, 1982.

STEVENS, EDWARD P., M.B.A. (University of Northern Colorado), Affiliate Faculty of Nursing, 1997.


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SWAIM, JEANNA, B.S.N., Affiliate Faculty of Nursing, 1997.


TAYLOR, ANDREW, M.D. (University of Alabama School of Medicine, Birmingham). Adjunct Associate Professor, 1996.


TEMPLE, WILLIAM M., M.D. (University of Mississippi School of Medicine). Adjunct Assistant Professor of Nursing, 1998.

TEOH, NIHAL, B.Sc. (University of Istanbul, Turkey), M.Sc. (Clarkson University). Lecturer in Mathematical Sciences, 1995.


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TROTH, REBECCA, Ph.D. (University of Michigan), Lecturer in Biological Sciences, 2001.
TUEBERT, BETH, B.S.N. (Vanderbilt University), M.S.N. (University of Alabama, Birmingham). Adjunct Assistant Professor of Nursing, 1996.
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VERMILLION, BILL F., M.D. (University of Alabama School of Medicine). Adjunct Assistant Professor of Nursing, 1999.
VISSCHER, P.B., Adjunct Professor of Materials Science, 1988.
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WALCK, SCOTT D., Adjunct Assistant Professor of Materials Science, 1988.
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WILLIAMS, ROBERT H., M.D. (University of Alabama School of Medicine). Adjunct Assistant Professor of Nursing, 1998.
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DAVIS, CARL G., B.A.E (Georgia Institute of Technology), M.S.A.E., M.S.M.H., Ph.D. (University of Alabama, Tuscaloosa). Professor Emeritus of Computer Science, 1986.*


ESTES, MARTHA I., B.S.N. (Troy State University, Montgomery), M.S.N. (University of Alabama, Birmingham), Ed.D. (University of Alabama, Tuscaloosa). Assistant Professor Emerita of Nursing, 1984.

FORTE, ALDO, D.Sc. (University of Havana, Cuba). Associate Professor Emeritus of Mathematical Sciences, 1966.


GUINN, GERALD R., B.S. (Auburn University), M.S. (Purdue University), Ph.D. (University of Alabama, Huntsville). Professor Emeritus of Mechanical and Aerospace Engineering, 1990.


HARRIS, J. MILTON, B.S. (Auburn University), Ph.D. (University of Texas, Austin). Distinguished Professor Emeritus of Chemistry, 1973.*


HEAMAN, DORIS, R.N. (Deaconess Hospital, Missouri School of Nursing), B.S.N. (University of Alabama, Huntsville), M.S.N., D.S.N. (University of Alabama, Birmingham). Associate Professor Emerita of Nursing, 1975.*

HENZE, REET L., B.S.N. (Gustavus Adolphus College), M.S.N. (University of Colorado), D.S.N. (University of Alabama, Birmingham). Associate Professor Emerita of Nursing, 1973.*


JAMES, ROBERT E., B.S. (Carnegie Institute of Technology), M.A. (Hollins College), Ph.D. (University of Tennessee). Associate Professor Emeriti of Psychology and Communication Arts, 1971.

JOHANNES, JAMES D., B.S. (Arizona State University), M.S. (University of Alabama, Huntsville), Ph.D. (Vanderbilt University). Professor Emeritus of Computer Science, 1974.*


KILGO, REESE D., B.A. (University of Alabama, Tuscaloosa), M.Ed. (University of Florida), Ph.D. (University of Texas). Associate Professor Emerita of Psychology, 1966.


MAC DOUGALL, JOHN J., B.A. (Boston College), B.S. (Georgetown School of Foreign Service), M.S. (Massachusetts State College), M.A., Ph.D. (University of Michigan). Associate Professor Emeritus of Political Science, 1975.


MC CALISTER, DONALD V., B.A. (Fresno State College), Ph.D. (University of Tennessee). Professor Emeritus of Medical School, 1972.


MC KNIGHT, WILLIAM B., B.S. (Purdue University), Ph.D. (Oxford University). Research Professor Emeritus of Physics, 1974.


MC NIDER, RICHARD T., B.S. (University of Alabama, Tuscaloosa), M.S. (Florida State University), Ph.D. (University of Virginia). Distinguished Professor Emeritus of Mathematical Sciences, Adjunct Professor of Atmospheric and Environmental Science, 1985.*


MUNSON, WILLIAM F., B.A. (Oberlin College), M.A., Ph.D. (Yale University). Associate Professor Emeritus of English, 1974.*


PEARSON, BONNIE C., R.N. (St. Joseph's Hospital School of Nursing), B.S., M.Ed. (University of Minnesota). Associate Professor Emerita of Nursing, 1974.*

PENOT, DOMINIQUE M., B.A. (University of Aix-France), License (University of Montpellier), Ph.D. (Yale University). Professor Emeritus of Foreign Languages and Literature, 1970.


PORTER, GROVER L., B.S. (University of Tennessee), M.S. (University of North Carolina), Ph.D. (Louisiana State University), C.P.A. Professor Emeritus of Accounting, 1985.*


RILEY, CLYDE, B.S. (University of Rochester), Ph.D. (Florida State University). Professor Emeritus of Chemistry, 1967.*


ROGERS, JON G., B.A. (Kansas State Teachers College), M.A. (University of Arkansas), Ph.D. (University of New Mexico). Professor Emeritus of Psychology, 1968.

ROSENBERGER, FRANZ E., B.S., Diploma (University of Stuttgart, Germany), Ph.D. (University of Utah). Professor Emeritus of Physics, 1986.*

ROZELL, BILLIE R., R.N. (St. Mary's Memorial Hospital), B.S.N., M.S.N., D.S.N. (University of Alabama, Birmingham). Associate Professor of Nursing, 1989.*


SHIH, CORNELIUS C., B.S. (National Taiwan University), M.S., Ph.D. (Michigan State University), P.E. Professor Emeritus of Mechanical and Aerospace Engineering, 1965.
SOUDER, WILLIAM E., B.S. (Purdue University), M.B.A., Ph.D. (St. Louis University), Professor Emeritus of Management Science, 1990.*

SPITZ, ALLAN, B.A. (University of New Mexico), M.A., Ph.D. (Michigan State University). Professor Emeritus of Political Science, 1985.*

STROMECKY, OSTAP, M.A. (Vanderbilt University), Ph.D. (University Libera Ucrainensis, Pragensis). Associate Professor Emeritus of Foreign Languages and Literature, 1967.


SUNG, CHI-CHING, B.A. (National Taiwan University), Ph.D. (University of California, Berkeley). Professor Emeritus of Physics, 1972.

TARGER, DONALD E. B.S. (Middle Tennessee State College), Ph.D. (University of Tennessee). Associate Professor Emeritus of Sociology, 1966.


WALKER, JACK R., B.S. (Mississippi State University), M.S. (Georgia Institute of Technology), Ph.D. (Oklahoma State University), P.E. Associate Professor Emeritus of Industrial and Systems Engineering, 1982.


WHARRY, RHODA E., B.S.E. (University of Arkansas), M.S. (Memphis State University), Ph.D. (Purdue University). Professor Emerita of Education, 1967.


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