1998-1999 Undergraduate Catalog

University of Alabama in Huntsville

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ACADEMIC CALENDAR 1998-99

(Prepared January 1998 - All dates tentative and subject to change without prior notice.)

Fall Semester 1998

August 17-21
August 25
August 26
August 29
September 7
September 9
October 15-16
November 25, 26, 27
December 7
December 8
December 8
December 9
December 9
December 10, 11, 14, 15, 16, 17
December 12
December 14
December 17
December 23-31

Registration
Faculty Convocation/New Faculty Orientation
First day of classes
First Saturday class
Labor Day holiday
Last day to withdraw with a refund
Fall break
Thanksgiving holidays - no classes
Last MW and MWF class
Last TR class
Last Tuesday evening only class*
Last Wednesday evening only class*
Study Day/Weather Day
Final Examinations
Last Saturday class and Final Exam
Last Monday evening only class*
Last Thursday evening only class*
Winter break

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

Spring Semester 1999

January 1
January 5, 6, 7
January 11
January 16
January 18
January 25
March 29 - April 3
April 22
April 22
April 23
April 26
April 27
April 27
April 28
April 28, 29, 30, May 3, 4, 5
April 29
May 1
May 3
May 23

New Year's holiday
Registration
Classes begin
First Saturday class
Martin Luther King Jr. holiday
Last day to withdraw with a refund
Spring break
Honors Convocation
Last TR class
Last MWF class
Last MW class
Last Tuesday Evening only class*
Study Day/Weather Day
Last Wednesday evening only class*
Final Examinations
Last Thursday evening only class*
Last Saturday class and Final exam
Last Monday evening only class*
Commencement

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

Summer 1999

May 13, 14
May 17
May 21

Registration
SS#1 Classes Begin
Last day to withdraw with a refund (SS#1)
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 31</td>
<td>Memorial Day holiday</td>
</tr>
<tr>
<td>June 2</td>
<td>10-week Classes Begin</td>
</tr>
<tr>
<td>June 15</td>
<td>Last day to withdraw with a refund (10-week)</td>
</tr>
<tr>
<td>June 28</td>
<td>Last day SS#1 classes</td>
</tr>
<tr>
<td>June 29, 30</td>
<td>Final Examinations - SS#1</td>
</tr>
<tr>
<td>July 5</td>
<td>Independence Day holiday</td>
</tr>
<tr>
<td>July 6</td>
<td>SS#2 Classes Begin</td>
</tr>
<tr>
<td>July 12</td>
<td>Last day to withdraw with a refund (SS#2)</td>
</tr>
<tr>
<td>August 10</td>
<td>Last TR class - 10-week</td>
</tr>
<tr>
<td>August 11</td>
<td>Last MW class - 10-week</td>
</tr>
<tr>
<td>August 11</td>
<td>Last MWF class - 10-233k</td>
</tr>
<tr>
<td>August 13</td>
<td>Study Day - 10-week</td>
</tr>
<tr>
<td>August 16</td>
<td>Last day SS#2 classes</td>
</tr>
<tr>
<td>August 16, 17, 18</td>
<td>Final Examinations - 10-week</td>
</tr>
<tr>
<td>August 17, 18</td>
<td>Final Examinations - SS#2</td>
</tr>
</tbody>
</table>

SS= Summer Sessions (Two six-week sessions and a ten-week session)

PROPOSED ACADEMIC CALENDAR 1999-2000

(Prepared January 1998 - All dates tentative and subject to change without prior notice.)

**Fall Semester 1999**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>August 16-20</td>
<td>Registration</td>
</tr>
<tr>
<td>August 24</td>
<td>Faculty Convocation/New Faculty Orientation</td>
</tr>
<tr>
<td>August 25</td>
<td>First day of classes</td>
</tr>
<tr>
<td>August 28</td>
<td>First Saturday class</td>
</tr>
<tr>
<td>September 6</td>
<td>Labor Day holiday</td>
</tr>
<tr>
<td>September 8</td>
<td>Last day to withdraw with a refund</td>
</tr>
<tr>
<td>October 7, 8</td>
<td>Fall break</td>
</tr>
<tr>
<td>November 24, 25, 26</td>
<td>Thanksgiving holidays - no classes</td>
</tr>
<tr>
<td>December 6</td>
<td>Last MW, MWF class</td>
</tr>
<tr>
<td>December 7</td>
<td>Last TR class</td>
</tr>
<tr>
<td>December 8</td>
<td>Last Tuesday evening only class*</td>
</tr>
<tr>
<td>December 8</td>
<td>Last Wednesday evening only class*</td>
</tr>
<tr>
<td>December 9, 10, 13, 14, 15, 16</td>
<td>Study Day/Weather Day</td>
</tr>
<tr>
<td>December 11</td>
<td>Final Examinations</td>
</tr>
<tr>
<td>December 13</td>
<td>Last Saturday class and Final Exam</td>
</tr>
<tr>
<td>December 16</td>
<td>Last Monday evening only class*</td>
</tr>
<tr>
<td>December 23-31</td>
<td>Last Thursday evening only class*</td>
</tr>
</tbody>
</table>

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

**Spring Semester 2000**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 4, 5, 6</td>
<td>Registration</td>
</tr>
<tr>
<td>January 10</td>
<td>Classes begin</td>
</tr>
<tr>
<td>January 15</td>
<td>First Saturday class</td>
</tr>
<tr>
<td>January 17</td>
<td>Martin Luther King Jr. holiday</td>
</tr>
<tr>
<td>January 24</td>
<td>Last day to withdraw with a refund</td>
</tr>
<tr>
<td>March or April</td>
<td>Spring break  To Be Announced</td>
</tr>
<tr>
<td>April 20</td>
<td>Honors Convocation</td>
</tr>
<tr>
<td>April 20</td>
<td>Last TR class</td>
</tr>
<tr>
<td>April 21</td>
<td>Last MWF class</td>
</tr>
</tbody>
</table>
April 24  Last MW class
April 25  Study Day/Weather Day
April 25  Last Tuesday evening only class*
April 26  Last Wednesday evening only class*
April 27  Last Thursday evening only class*
April 29  Last Saturday class and Final Exam
May 1    Last Monday evening only class*
May 21   Commencement

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

**Summer 2000**

May 11, 12  Registration
May 15      SS#1 Classes begin
May 19      Last day to withdraw with a refund (SS#1)
May 29      Memorial Day holiday
May 31      10-week classes begin
June 13     Last day to withdraw with a refund (10-week)
June 26     Last day SS#1 classes
June 27, 28 Final examinations - SS#1
July 3, 4   Independence Day holiday
July 5      SS#2 Classes begin
July 11     Last day to withdraw with a refund (SS#2)
August 9    Last MWF class - 10-week
August 9    Last MW class - 10-week
August 10   Last TR class - 10-week
August 11   Study day - 10-week
August 14, 15, 16 Final Examinations - 10-week
August 15   Last day SS#2 classes
August 16, 17 Final Examinations - SS#2

SS - Summer Sessions (Two six-week sessions and a ten-week session)

June 30 - July 1  Examinations, 1st 6-week session
August 12-14      Examinations, 10-week session
August 17-18      Examinations, 2nd 6-week session
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). Both the Bachelor of Science in Business Administration program and the Master of Science in Management program offered by the
College of Administrative Science are accredited by the American Assembly of Collegiate Schools of Business (AACSB).

Facilities
The 354-acre UAH campus is in northwest Huntsville adjacent to Cummings Research Park. The University has 31 major buildings, including the Central Campus Residence Hall and the nine-building Southeast Campus Housing Complex, 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, and the Office of Environmental Health and Safety.

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

The Research Institute 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, 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 College of 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, a swimming pool, 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 mail room.

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 and 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 Laboratory.

Salmon Library

The Salmon Library supports the academic and research programs of the University. It has a collection of 412,571 volumes along with collections of U.S. Government Documents, sound recordings, materials in microform and microfiche, and manuscript collections designed to support the efforts of students and faculty. In addition, the library currently receives some 2,766 periodicals. For students in the social sciences and humanities, microfiche collections such as the Evans Imprint series and the Library of American Civilization and slide collections on Afro-American art are of particular value. For students in the sciences, work at UAH is supported by the Redstone Scientific Information Center which is 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 its collections of 351,967 volumes and 6,596 journal subscriptions along with more than 1.9 million research reports make it one of the finest scientific libraries in the southeast. It is available without charge to faculty members and graduate students of the University. Reciprocal borrowing agreements are also in force with Alabama A&M University, the University of Alabama, UAB, and Auburn University to allow UAH students free access to those libraries.

The library is also a member of several consortia that are designed to make available 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 study rooms, orientation for classes, and on-line bibliographic database searching, assist faculty and students in their research. The library homepage which provides access to the library catalog as well as quick-reference sources and other information about the library is available on-the-world wide web at this address: www.uah.edu/library. Guides and handouts detailing individual services of the library are available without charge at the library's reference desk and on the library homepage.
The University Noojin House

Built in 1950 as the private residence of F. Kenneth Noojin, the house became available to the community through acquisition by the University of Alabama Huntsville Foundation, which in turn gave the facility to the University. The house is available for use by University departments and recognized student organizations for receptions, conferences, luncheons, parties and workshops.
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 890-6203 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. For more information, please call Mathematical Sciences Department at 890-6470.

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 890-6470.

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 890-6592.

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, parenting, test anxiety, family, and stress management. In keeping with accepted professional practice, all counseling is confidential. No information is released to University officials, faculty, parents or outside agencies without the explicit written authorization of the student, 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 890-6203.
Services for Students with Disabilities
The Student Development Services Office provides a professional counselor 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 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 inservice faculty training on accommodating students with disabilities.

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 890-6203.

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 in Morton Hall, Room 220, or telephone (256) 890-6822.

UAH Wellness Center
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 the University Center, Room 203.

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 8:00 a.m. to 5:00 p.m. The telephone number is 890-6775.

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 both 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 COPS 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. The Strong Interest Inventory compares the student's similarities and dissimilarities with those of persons currently employed in specific career fields. 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, 890-6612, 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, 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 suitemate. 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 South Loop Road 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 upperclass 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.

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. 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. Some unfurnished units are available. 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 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 South Loop Road (256/890-6108). 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 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 dining room, 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, Financial Aid, Academic Advisement, Co-op, Career Services, Student Activities, Student Development Services and the Bursar are also located in the University Center.

Student Identification Cards
All students must have a valid photo I.D. for the semester in order to use the library, to participate in student elections, athletic events, and all functions for which a student may be entitled to special privileges. Photo I.D. cards are issued once and only need to be validated each semester enrolled. Validation is done at the University Center, Information Desk. Photo I.D. cards are made on the lower level of the University Center during announced hours.

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.
Lounges
Two well lit, spacious lounges, designed as a place to relax and meet friends, are 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. A large number of board games are also available. 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 and a more formal dining area, located behind the cafeteria, is available for luncheon buffets and catered dinners. The Food Service will cater to all areas of the Center as well as other parts of the campus. Additionally, several types of meal plans are available for purchase by students, faculty, and staff. 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 Student Government Association promotes the welfare of students in all areas of University life. Its primary purpose is to help improve the educational environment. This includes promoting academic innovation and working closely with faculty and administration toward making desirable changes in institutional policies.
The SGA is responsible for developing and sponsoring programs which will enrich the student's cultural, intellectual, and social life. Each student enrolled in UAH is automatically a member of the SGA. An executive branch, a fifteen member legislature, and a five member arbitration board are responsible for carrying out the official business of the organization.
The association sponsors 130 clubs and organizations across campus in addition to providing many student services such as health insurance, special rates for community cultural events, and a student directory.

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

ACE also provides the students with a telephone information service known as "The Source", which can be reached at 890-6666.

Cabaret
The ACE Cabaret Series presents various types of live performers to UAH, from comedians to magicians. Past entertainers have included Paula Poundstone, Renee Hicks, Del Suggs, The Spencers, and Dan LaRosa.

Cabaret operates "Mom's"—UAH's only nightclub. Each Thursday night, Mom's provides live entertainment, soft drinks, and assorted chips for just $1.00. Mom's is located in Room 146 of the University Center—just look for the stained glass window.

Film and Video
The Film series presents popular movies as well as a series of films devoted to serious film buffs. In addition to showing films, events are planned around the film. For example, the film "Jaws" was shown at a swimming pool.

Lectures
The ACE Lecture Series helps bring together the academic and social environments within the University, presenting speakers on the serious issues of today. The Lecture Series also brings stars and speakers from popular television shows and motion pictures. Past guests have included Billy West (voice of Ren & Stimpy), Barry Williams (Greg Brady), John Brennan of MTV's Real World, and Bill Demby, motivational speaker.

Publicity
The Publicity and Promotions Director informs potential audiences of all programs that the other ACE Activity Boards are bringing to campus through the Source Hotline and quarterly ACE calendars that are distributed across campus. Radio, television, and printed materials are all utilized in the effort to publicize ACE programs.

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. Additionally, monthly events include Human Foosball, Virtual Reality, Murder Mysteries On Campus, and Extreme Air (a simulated sky diving machine).

Student Organizations
UAH has more than 130 special-interest organizations and clubs. For a complete listing, see the student organization booklet available at the University Center Information Desk.

Greeks
Interfraternity Council (IFC)
IFC serves as the governing body of the eight fraternities at UAH in order to develop cooperation and coordination of activities among the member fraternities. The six national social fraternities on campus are Alpha Phi Alpha, Alpha Tau Omega, Delta Chi, Kappa Alpha Psi, Pi Kappa Alpha Sigma Nu, Phi Beta Sigma, and Kappa Sigma. For more information contact the Interfraternity Council Advisor at 890-6445.
Panhellenic Council (Panhel)
The Panhellenic Council is the organization which coordinates sorority activities at UAH. The five social sororities available to young women at UAH are Alpha Kappa Alpha, Chi Omega, Delta Sigma Theta, Delta Zeta, and Kappa Delta. For more information contact the Panhellenic Advisor at 890-6445.

Academic Honor Societies

Alpha Epsilon Delta (Pre-Health)
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 be a junior with an overall GPA of 3.0, must maintain a 3.0 GPA in sociology courses taken at UAH, and must have completed at least four regular courses in sociology prior to initiation.

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 and second semester of enrollment.

Alpha Pi Mu (Industrial Engineering)
The national honor society for industrial engineers, Alpha Pi Mu was founded at the Georgia Institution 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. 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.

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.

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.

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 alma mater 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 Old Church Gallery, 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 Faculty Exhibition

During the Spring Semester, visitors to the UC Gallery have an opportunity to study the outstanding work recently produced by UAH's own studio faculty members.

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.

The UAH Southeastern Student Biennial Exhibition

This exhibition, juried by noted artists or art professionals, is open to all college art students in the southeastern United States, undergraduate and graduate. This is a unique opportunity for students to see excellent work being done by up and coming young artists in the region.

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.

Huntsville Symphony Orchestra

The Huntsville Symphony Orchestra, a semiprofessional blend of University and community talent, prepares nine formal concerts each year. International artists perform with each annual concert series. Audition with conductor is required. Attendance at rehearsals and performances is also required.
UAH Jazz Ensemble
A workshop experience providing students with instruction in jazz arranging and composition and in improvised jazz is stressed. Attendance at rehearsals and performances is required. Audition with instructor is also required.

UAH Wind Ensemble
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 and may elect to enroll in the group for class credit.

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 AA affiliate of the Oakland A's 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.

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.

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.

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.

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, 4 on 4 volleyball, and weightlifting.

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: 890-6090. 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.

An art and literary magazine, the printed campus forum for art and literature, is sponsored by the Publications Board. 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 their work to the Exponent office, Room 104, University Center.
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 of all ages—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. A copy of the UAH catalog is mailed to each new student upon admission to the University; additional copies are available for purchase in the UAH bookstore.

Information for prospective students is available through the Office of Admissions. Campus tours on an individual or group basis may be arranged (phone 890-6070). Faculty members and academic advisors (phone 890-6290) 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 never attended any college (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 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 nondegree or preparatory basis for graduate school (nondegree postgraduate)
- students who have no immediate degree plans (nondegree)

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.
High School Graduates

High school graduates may be admitted as regular freshmen on the basis of acceptable high school records and scores achieved on the American College Testing (ACT) program examinations (SAT is accepted as substitute for ACT). The two factors of grades and scores are considered together. Higher results in one area will offset lower performance in the other. For example, an applicant who earns an ACT score of 22 must have at least a 2.25 average on high school academic units in order to qualify for admission. See the chart below for further definition.

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

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<th>If Act score is</th>
<th>If SAT score is</th>
<th>Then for Regular Admission Minimum</th>
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<tbody>
<tr>
<td>17 or below</td>
<td>840 or below</td>
<td>3.25 Note: College of Engineering</td>
</tr>
<tr>
<td>18</td>
<td>850-880</td>
<td>3.00 requires minimum</td>
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<tr>
<td>19</td>
<td>890-920</td>
<td>2.75 ACT of 21</td>
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<tr>
<td>20-21</td>
<td>930-1000</td>
<td>2.50 or SAT of 990</td>
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<tr>
<td>22</td>
<td>1010-1040</td>
<td>2.25 for admission to the College</td>
</tr>
<tr>
<td>23</td>
<td>1050-1080</td>
<td>2.00</td>
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<tr>
<td>24 or above</td>
<td>1090 or above</td>
<td>1.75</td>
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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
(The State of Alabama requires 3.0 units of physical education and 0.5 units of health)
Current high school students will find it to their advantage to follow the advanced diploma 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 never attended college and who have been out of high school five or more years do not need to submit ACT 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. 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 (890-6725).

Early Start Program

UAH welcomes inquiries from academically talented high school students who wish to enroll in college early. 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. The best candidates for Early Start are high school students lacking only a few credits for graduation and have the endorsement of their parents and school official. If accepted, they will skip their senior year and enroll full-time at UAH.

Dual Credit Program

The Madison County and Huntsville City 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 for 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 admission requirements may, with the approval of their principals, take classes at UAH and receive dual credit. Credit for courses completed successfully is awarded 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) a completed application for dual credit; (2) $20 application fee; (3) official transcript of high school work; (4) ACT or SAT scores; (5) written approval by the principal and the superintendent; (6) written approval by the student's parent(s) or guardian.

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 transfer student will also be reviewed for completion of required units, and deficiencies, if any, will be noted on the admission certificate. A student who is currently on suspension from another college or university is not eligible for enrollment 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 (code 07) 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.

Residency Status
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 119, at the time of any subsequent registration.

“Resident” means one whose residence is in the state of Alabama. “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 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.

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.

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 before or during 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.

Transferred courses in subject matter accepted by UAH with grades of less than C will not be awarded credit and will not be utilized in calculating the grade point average for admission criteria.
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 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.

If the previous record was earned at an institution not holding regional accreditation, a decision on acceptance of credits will be made on an individual basis. If credits are accepted, they will be classified as provisional. Full credit for a provisional credit will be based upon performance during the first 30 semester hours attempted at UAH. In order to receive full credit for provisional credit, a student must earn a C or better in each course attempted during the first 30 hours. Each student with credits in this category should see the registrar concerning his or her status at the end of the semester in which he or she has completed his first 30 semester hours at UAH.

Credit for engineering courses taken at schools accredited by the Accrediting Board for Engineering and Technology (ABET) is transferable to UAH. Engineering courses taken in non-ABET accredited institutions may also be applied toward a BSE degree based upon an appropriate examination (written or oral) at the discretion of the respective department. All inquiries concerning applicability of credit should be made to the UAH engineering department chair where the course, or its equivalent, is taught.

Credit for Business Administration courses taken in schools with American Assembly of Collegiate Schools of Business (AACSB) accredited programs is transferable to UAH. Credit in courses taken in programs without AACSB accreditation may be accepted with approval of the Dean of the College of Administrative Science. Transfer credit will be granted for administrative science courses only with a "C" or better. All inquiries concerning applicability of transfer credit should be made to the Office of Academic Assistance, College of Administrative Science, (256) 890-6024.

UAH is a member of Servicemembers Opportunity Colleges, a consortium of over 1300 institutions pledged to be reasonable in working with servicemembers and veterans trying to earn degrees even while pursuing demanding, transient careers. As a SOC member UAH is committed to easing the transfer of relevant course credits and crediting learning from appropriate military training and work experiences. SOC is sponsored by 15 national higher education associations with the military services, the National Guard Bureau, and the Office of the Secretary of Defense serving as cooperating agencies.

Transfer Students from Alabama Junior/Community Colleges

A student transferring from an Alabama junior college may choose to fulfill the degree 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. 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 must apply for admission at least three months in advance of desired attendance date.

An undergraduate international applicant must submit:

1. Completed application form.
3. Official copies in English of secondary school and college or university transcripts forwarded to the University of Alabama in Huntsville directly from the institution(s) attended. Personal copies are not accepted.
4. American College Test (ACT) scores sent directly to UAH from ACT 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 is required.
6. Since the TOEFL does not measure all language skills necessary for academic success, all international students enrolled at UAH must also take the university's English Language Placement Test and complete any course work in English as a Second Language which 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.

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 890-6070.

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 currently enrolled in 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.

**Dual Credit Students**

High school juniors and seniors may take classes at UAH that count both for college credit and toward high school completion, and may apply for admission as dual credit students. A completed application, a non-refundable $20 application fee, official ACT or SAT scores, an official high school transcript, and letters of support from the high school principal, superintendent, and from the applicant’s parent or guardian are needed for review. The applicant must meet the normal UAH admission requirements for entering freshmen.

**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 admitted to UAH as a conditional admit. The conditional admit will be required to carry a light course load until a total of 15 semester hours of work is completed with an overall C average. At the completion of 15 or more hours of work, the student will be admitted as a regular degree-seeking student. 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 when the individual has qualified 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 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.

**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 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

#### (1998-1999)

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Each additional hour over 20: $60 (resident) $129 (non-resident)

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Each additional hour over 12: $133 (resident), $274 (non-resident)

#### Laboratory and Studio Instruction Fees

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

#### Cooperative Education Fees

- Study semester is $40
- Work semester is $80
Engineering Equipment Fees
Equipment fees are assessed at $15 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 classes. Payments may be charged to VISA, MasterCard, American Express, or Discover by calling (256) 890-7321. 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. For summer sessions, please check dates in the Timetable of Classes.

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
- Duplicate Diploma .................................. $7.50
- Thesis binding and microfilming (6 copies):
  - Master’s degree .................................. $90.00
  - Ph.D. degree .................................. $100.00
- Vehicle registration
  - (Regulations concerning traffic and parking are available at the Campus Safety Office) .................................. $15.00
  - Summer only .................................. $5.00

**College of Nursing**

- Liability Insurance (per year) .................................. approximately $60.00
- College of Nursing Pin (graduation) .................................. $39.00 - $130.00
- 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) .................................. $2,700
- Shared room in Southeast Campus Housing
  - (available for juniors, seniors, and graduate students) .................................. $1,500
- Private room in Southeast Campus Housing
  - (available for juniors, seniors, and graduate students) .................................. $2,400
- Shared 1-bedroom apartment in Southeast Campus Housing
  - (available for juniors, seniors, and graduate students) .................................. $1,940

**Apartments** (Graduate Students; Student Families: Full Year Lease)

- 1-bedroom furnished
  - (payable in 12 installments of $385) .................................. $4,620
- 1-bedroom unfurnished
  - (payable in 12 installments of $350) .................................. $4,200

(Student Families Only: Full Year Lease)

- 3-bedroom furnished
  - (payable in 12 installments of $485) .................................. $5,820
- 3-bedroom unfurnished
  - (payable in 12 installments of $435) .................................. $5,220
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 close of registration for any semester will be charged a $50 late fee. 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 Office of Financial Aid, University Center, Room 124, 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 15 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.
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 Office of Financial Aid.

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.

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.

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.

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

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

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

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.

Margaret 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.

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.

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, 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.

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.
Instrument Society of America Scholarship. The Instrument Society of America established this endowed scholarship 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).

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.

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

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 Engineer, and is based on academic merit. Recipients must have a minimum GPA of 3.0 and be enrolled as full-time students.

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.

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.

Instrument Society of America Scholarship. The Instrument Society of America established this endowed scholarship to benefit students enrolled in the College of Engineering and the College of Administrative Science. 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).

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.

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.

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

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.

Dr. Daniel G. Hays Memorial Scholarship. Established in memory of Dr. Daniel G. Hays, former Association 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.

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 in honor of UAH Professor Emerita Frances C. Roberts for her many contributions and dedicated service to the university from its inception during her 29 years as a faculty member, this scholarship is awarded to junior or senior students enrolled in the College of Liberal Arts, and is based on academic merit. Preference is given to those majoring in history with demonstrated financial need as a secondary criterion for selection.

**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).

**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.

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, '89, 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.

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.

**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.

**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 124, 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 Advisement and Information Center

Academic advising is available to students in the Academic Advisement and Information Center, in advising offices in the Colleges of Nursing, Engineering, and Administrative Science 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, and career counseling is available through the Office of Career Services. Freshmen in the Colleges of Liberal Arts and Science and students in special categories are advised in the Academic Advisement Center or, in the case of engineering, nursing, and administrative science students, in the advising offices of the colleges. When students declare a major (program of study), 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.

Located in Room 118 University Center, the Academic Advisement and Information Center is staffed by a team of academic 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 registrations and orientations. Appointments may be made by calling 890-6290.

All freshmen and undeclared students in liberal arts and sciences are required to visit the Advisement Center 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 must also have schedules validated each semester in the Academic Advisement Center as long as they remain in the conditional student category. Sophomore students outside of the three professional colleges (Administrative Science, Engineering and Nursing) who have not declared a major will be advised in the Advisement Center and will continue to have their registration cards signed by advisors in the AAIC.

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 the Colleges of Engineering, Nursing, and Administrative Science, 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.
Non-discrimination 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 Equal Pay Act of 1963; the Age Discrimination in Employment Act of 1967; the Vietnam Era Veterans' Readjustment Assistance Act of 1974; the Immigration Reform and Control Act of 1986; the Age Discrimination Act of 1975; the Americans with Disabilities Act of 1990; 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 to these federal and state requirements and this policy should be directed to one of the following persons:
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 which 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 which protects the confidentiality of student education records. To implement FERPA, UAH has formulated and adopted a written institutional policy governing the handling of these records. Copies of this policy document are available to students at 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 or 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 records contain 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 the 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 he 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, date and place of birth, major field of study, participation in officially recognized activities and sports, dates of attendance, degrees and awards received, and the previous educational institution most recently attended. However, a student may prevent the release of even this information, if he/she wishes, by so indicating at the time of registration on a form provided for this purpose. A request for nondisclosure of directory information must be renewed each semester.

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.

The following officials have been designated as records officials for student records within their respective area:
- Associate Provost
- Assistant Vice-President and Director of Admissions
- Coordinator, Academic Advisement and Information Center
- Director, Cooperative Education
- Assistant Dean, College of Administrative Science
- Associate Dean, College of Engineering
- Assistant Dean, College of Engineering
- Associate Dean, College of Nursing
- Director of Student Affairs, College of Nursing
- Associate Dean, College of Science
- Director, Continuing Education
- Vice-President, Student Affairs
- Director, Financial Aid
- Director, Student Development Services

Requests concerning educational records should be directed to the appropriate official listed above. Any student who believes that his or her rights under FERPA have been violated by the University may notify and request assistance from the Provost and Vice President for Academic Affairs and may file a complaint with the Family Educational Rights and Privacy Act Office, Department of Health, Education, and Welfare, Washington, DC 20201.
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 one semester before the expected date of graduation.
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.

Instructional and Testing Services

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 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 located in Room 226 of the Administrative Science Building, telephone 890-6725.

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.

Placement in English and mathematics is determined by ACT scores and high school grades. 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 and Mathematics 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 (890-6725) 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. The Chemistry Placement Test and Mathematics Placement Test are free. 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 allowed: 1) to receive credit when a student has successfully completed a course at a higher level than the one being challenged, 2) to raise a passing grade, 3) to remove failures received in a course during the period of current enrollment, or 4) to satisfy the residence requirements 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**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Score 3 = BYS 119 (4 hrs.)</th>
<th>Score of 4 or 5 = BYS 119, 120 (8 hrs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American History</td>
<td>Score of 4 = HY 221 and 222 (6 hrs.)</td>
<td>No credit awarded.</td>
</tr>
</tbody>
</table>
Calculus AB: Score of 4 or 5 = MA 171 (4 hrs.)
Calculus BC: Score of 3 = MA 171 (4 hrs.)
Score of 4 or 5 = MA 171 and MA 172 (8 hrs.)
Chemistry: Score of 3 or higher = CH 121, 125, 123, 126 (8 hrs.)
Computer Science A, AB: Score of 4 or 5 + completion of CS 312 = CS 107, CS 207 (9 hrs. total: 3 hrs. for CS 312, 6 hrs. for AP)

English Language/Composition:
Score of 3 = EH 101 (3 hrs.)
Score of 4 or 5 = EH 101 and 102 (6 hrs.)

English Literature/Composition:
Score of 3 = EH 101 (3 hrs.)
Score of 4 or 5 = EH 101 and 102 (6 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.)

Music Theory: Score of 4 or higher = MU 201 and 203 (4 hrs.)
Music Listening and Literature: Score of 4 or higher = MU 100 (3 hrs.)

Physics B: Score or 4 or higher = PH 101 and 102 (8 hrs.)
Physics C: Score of 4 or higher = PH 101 and 102 (8 hrs.) or PH 111 and PH 114 (4 hrs.)

Psychology: Score of 4 or higher = PY 101 (3 hrs.)

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 substantially reduce the cost in both time and money spent on a college degree by taking one or more of 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.

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. Credit will be awarded on a course-by-course basis as approved by the department. (Some departments may award credit based on the subsidiary examinations.) The application of credits toward specific degree requirements will be determined by the academic unit responsible for the program of study.

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. To achieve credit for any of the general tests, the student
must score a minimum of 549. No credit is awarded for scores below 549. 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. Listed below are UAH courses in which a student may receive CLEP
credit, along with specific CLEP test titles and minimum score requirements: (See Foreign
Language section for additional information on CLEP.)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>CLEP Subject Test Title</th>
<th>Minimum Score Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSC 101</td>
<td>American Government</td>
<td>54 (with essay)</td>
</tr>
<tr>
<td>HY 101</td>
<td>Western Civilization I</td>
<td>80th percentile (plus &quot;A/B&quot; on departmental essay)</td>
</tr>
<tr>
<td>HY 102</td>
<td>Western Civilization II</td>
<td>same as HY 101</td>
</tr>
<tr>
<td>HY 221</td>
<td>History of the U.S., Part I</td>
<td>same as HY 101</td>
</tr>
<tr>
<td>HY 222</td>
<td>History of the U.S., Part II</td>
<td>Same as HY 101</td>
</tr>
<tr>
<td>EH 101</td>
<td>Freshman College Composition PLUS Analysis &amp; Interp. of Lit.</td>
<td>satisfactory performance on A&amp;I of Lit. essay</td>
</tr>
<tr>
<td>EH 102</td>
<td>Freshman College Composition PLUS Analysis &amp; Interp. of Lit.</td>
<td>composite score of 60 and superior performance on A&amp;I of Lit. essay</td>
</tr>
<tr>
<td>FH 101</td>
<td>College French</td>
<td>37</td>
</tr>
<tr>
<td>FH 101-102</td>
<td>College French</td>
<td>42</td>
</tr>
<tr>
<td>GN 101</td>
<td>College German</td>
<td>37</td>
</tr>
<tr>
<td>GN 101-102</td>
<td>College German</td>
<td>40</td>
</tr>
<tr>
<td>SH 101</td>
<td>College Spanish</td>
<td>37</td>
</tr>
<tr>
<td>SH 101-102</td>
<td>College Spanish</td>
<td>41</td>
</tr>
<tr>
<td>CH 121, 123, 125,126</td>
<td>General Chemistry</td>
<td>48 (Recommended student take chemistry placement test first)</td>
</tr>
<tr>
<td>ACC 211-212</td>
<td>Principles of Accounting</td>
<td>57</td>
</tr>
<tr>
<td>ECN 142</td>
<td>Principles of Macroeconomics</td>
<td>55</td>
</tr>
<tr>
<td>ECN 143</td>
<td>Principles of Microeconomics</td>
<td>55</td>
</tr>
<tr>
<td>SOC 100</td>
<td>Introductory Sociology</td>
<td>54</td>
</tr>
<tr>
<td>PY 101</td>
<td>Introductory Psychology</td>
<td>52</td>
</tr>
</tbody>
</table>

For further information concerning CLEP, the AP program or department examinations,
contact the Office of Instructional and Testing Services, Room 226, Administrative Science
Building, telephone 890-6725.

**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>Semester Hours Earned</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-32</td>
<td>Freshman</td>
</tr>
</tbody>
</table>
Student Course Loads
The typical full-time undergraduate course load is 15-18 semester 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 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.

Registration
Dates of priority and open registration are listed in the UAH calendar. Any continuing or returning 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.
A student who schedules courses during any registration period (priority or open) will have made 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 Bursar's Office.

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 only during the first three weeks of classes.

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 a retroactive withdrawal is granted by the Vice President for Student Affairs, the grades for all courses taken during the semester in question will be changed to W's.
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, and N.

- **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 a grade is not reported by the instructor.
- **NC** No credit.
- **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 a student’s major and minor 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 elective 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.

Gradepoint Average

The grade-point average (GPA) is computed by dividing the total number of quality points earned by the total number of semester hours attempted. 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.

**Conditional/Probational to Regular Status**

Students admitted conditionally or on probation will be evaluated for regular student status after earning 15 hours or 30 quality points with no more than 15 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, 895-6290. 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
- Music
- Communication Arts
- Philosophy
- Elementary Education
- Political Science
- English
- Psychology
- Foreign Language
- Slavic Area Studies
- International Trade
- Sociology
- French
- Spanish
- German
- History

Other areas with course offerings are Japanese, Latin, linguistics, Russian, statistics, women's studies, and physical education.

College of Engineering
Areas of study in which majors are currently offered are:
- Chemical Engineering
- Electrical Engineering

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Civil and Environmental Engineering
Computer 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/international trade, French, German, history, mathematics, mathematics education, music, music education, philosophy, political science, psychology, Slavic area studies, sociology, Spanish.

- 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.

Second Bachelor’s/Dual 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).

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 cards 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.

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.

Any exceptions to this policy must be approved by the student's advisor and college dean 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.

ROTC Programs

Army ROTC
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.

Air Force ROTC

Air Force ROTC is available to students through a cooperative program with Samford University.

The Air Force Reserve Officer Training Corps program provides college men and women the opportunity to compete for and attain a commission as a second lieutenant in the U.S. Air Force upon graduation from college. The general military course includes the courses offered during the first two years of the program and is open to all students without military obligation. The professional officer course includes the junior- and senior-level courses and is restricted to those who meet entry requirements or through special permission from the Aerospace Studies Department at Samford.

Requirements for a minor in Air Force Studies are described in the College of Liberal Arts section of this catalog.

Call (256) 870-2859 or 1-800-611-3531 for complete enrollment, course, and scholarship information.

Cooperative Education (Co-op) Program

Ms. Suzanne Norris, Director
212 University Center

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, University Center, Room 212, Huntsville, AL 35899. The telephone number is (256) 890-6741.
Honors Program

Dr. Richard Modlin, Director
336 Morton Hall

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 should plan to complete four hours of Honors Forum (H100), two courses (6 hours) in Honors Interdisciplinary Seminars (H399), an Honors Senior Project (4 hours), and, depending on point of entry into the program, 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, art, economics, etc., and contract honors courses in their major or minor. With permission from the instructor, a student may elect to enter into a contract for honors credit for any regular academic course. The honors contract specifies additional coursework which the instructor and student deem 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 students with a grade point average of 3.3 or higher who have completed less than 29 hours of coursework can still fully complete 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. University students who meet appropriate admissions standards for the Honors Program may enroll in honors courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>H100</td>
<td>Honors Forum</td>
<td>1 hr.</td>
</tr>
<tr>
<td>EH 105(H)</td>
<td>Honors English Seminar</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>EH 250(H)</td>
<td>Honors World Literature I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>EH 251(H)</td>
<td>Honors World Literature II</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

Regularity scheduled enrichment experiences for Honors Program students using lectures, concerts, exhibits, and other events. Provides exposure to a broad range of University disciplines. Prerequisite: admission to Honors Program. (See offerings of the Department of English) Required for all students who enter the Honors Program before completing freshman English. 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. Focuses on major texts from 1700 to the present.
H 399 Honors Interdisciplinary Seminar 3 hrs.
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 256-890-6450.

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 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:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. General chemistry with laboratory</td>
<td>8 hrs.</td>
</tr>
<tr>
<td>3. Organic chemistry with laboratory</td>
<td>8 hrs.</td>
</tr>
<tr>
<td>5. General physics with laboratory</td>
<td>8 hrs.</td>
</tr>
<tr>
<td>6. Two semesters of mathematics may include statistics or computer science</td>
<td>6 hrs.</td>
</tr>
</tbody>
</table>

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:

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

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, telephone 890-6605.
Accreditation

The Bachelor of Science in Business Administration (BSBA), the Master of Science in Management (MSM), and the Master of Accountancy (MAcc) programs offered by the College of Administrative Science are accredited by the American Assembly of Collegiate Schools of Business (AACSB).

Mission

The College of Administrative Science is a professional school with the mission of providing a high quality business education primarily to students from north Alabama. This education leads to the Bachelor of Science in Business Administration (BSBA) degree, to the Master of Science in Management (MSM) degree with an emphasis on the management of technology, and the Master of Accountancy (MAcc) degree. The College produces research which furthers knowledge in its disciplines and in the interdisciplinary area of technology management. The College provides service to the University, to the public, and to professional and academic organizations.

Accreditation and Membership

The College of Administrative Science is accredited by the American Assembly of Collegiate Schools of Business (AACSB) - the International Association for Management Education. The AACSB 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 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 the Management of Science and Technology (CMOST)

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. CMOST is staffed by personnel with degrees and backgrounds in science and engineering, who also have advanced degrees in management. Most of the staff have several years of business experience in managing science and technologies.

**Center for Management and Economic Research (CMER)**

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 socioeconomic 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, and organizational development.

CMER offers customized training programs for businesses 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, tax and fiscal impact analysis, and technology assessment.

For additional information, contact CMER. Mail: ASB 202, UAH, Huntsville AL 35899. Phone: (256) 890-6736. FAX: (256) 890-6328. Email: CMER@email.uah.edu.

**NorthEast Alabama Regional Small Business Development Center**

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. Phone: (256) 535-2061; FAX: (256) 535-2050; E-mail: Smallbus@hsvchamber.org.

**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) 890-6736. FAX: (256) 890-6328. Email: executiv@email.uah.edu.
Degrees Offered

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

The following BSBA majors are offered during the day: accounting, finance, management-business administration track, management-human resources management track, marketing, management information systems. The following BSBA majors are offered after 5:00 p.m.: accounting, management-business administration track, marketing, 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 (MSM). The MSM 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 MSM program is an interdisciplinary curriculum which 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 coursework 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 MSM degree should contact the College's Assistant Dean in Room 102, Administrative Science Building (256) 890-6024. For more information on the MSM program, refer to the Graduate Catalog.

Master of Accountancy (MAcc). The MAcc degree provides students with the background necessary to enter a career in public, private, or government accounting. To meet the needs of employed students, required courses are scheduled in the evenings. 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 a technological orientation and a focus on understanding the role of accounting in managing business processes. Another distinguishing feature is the ability to combine graduate education in accounting and information systems.

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Highly qualified undergraduate accounting graduates may be able to complete the requirements for the MAcc degree by completing one additional year of coursework beyond the bachelor’s level. Individuals interested in the MAcc program should contact the Assistant Dean in Room 102, Administrative Science Building, or call (256) 890-6024. For more information, 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. 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 BSBA degree requirements.

Students who choose one of the minors in business administration may be able to count ECN 142 and ECN 143 or ECN 239 to meet their social science Area IV degree requirements. These hours in economics are counted within the 30 hour or 25 percent maximum rule. The approved business administration minors are shown below. The minor program must have the approval of the Director of Advisement, Room 102, ASB.

**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:

- ECN 142 Principles of Macroeconomics 3 hrs.
- ECN 143 Principles of Microeconomics 3 hrs.
- ACC 211 (Lab ACC 221) Financial Accounting 3 hrs.
- ACC 212 (Lab ACC 222) Management Accounting 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.
- 6 hours at the 300 or 400-level 6 hrs.

30 hrs.

**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. A minor in international business includes the following courses:

- ECN 142 Principles of Macroeconomics 3 hrs.
- ECN 143 Principles of Microeconomics 3 hrs.
- ACC 211 (Lab ACC 221) Financial Accounting 3 hrs.
- ACC 212 (Lab ACC 222) Management Accounting 3 hrs.
- BLS 211 Legal Environment of Business 3 hrs.
- FIN 352 Money and Banking 3 hrs.
- MGT 301 Managing Organizations 3 hrs.
- MKT 301 Principles of Marketing 3 hrs.
- MGT 450 International Business 3 hrs.

27 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:

ECN 142  Principles of Macroeconomics 3 hrs.
ECN 143  Principles of Microeconomics 3 hrs.
MKT 301  Principles of Marketing 3 hrs.
and 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  Advanced Marketing Seminar
MKT 480*  Marketing Management 27 hrs.

*Students electing MKT 343 or MKT 480 must take AHS 300 or an equivalent statistics course.

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 (Lab ACC 221)  Financial Accounting 3 hrs.
ACC 212 (Lab ACC 222)  Management Accounting 3 hrs.
BLS 211  Legal Environment of Business 3 hrs.
BLS 411  Business Law for Accountants 3 hrs.
MSC 287  Business Statistics 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:

ECN 142  Principles of Macroeconomics 3 hrs.
ECN 143  Principles of Microeconomics 3 hrs.
ACC 211 (Lab ACC 221)  Financial Accounting 3 hrs.
ACC 212 (Lab ACC 222)  Management Accounting 3 hrs.

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Economics Minor

A student wishing to minor in economics may choose 21 semester hours of appropriate courses in economics and finance. The minor program must have the prior approval of the Chair of the Department of Economics and Finance.

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.

Policies, Procedures and Assistance

Course Numbers

Course numbers are coded by prefixes as follows:

<table>
<thead>
<tr>
<th>Accounting</th>
<th>ACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Legal Studies</td>
<td>BLS</td>
</tr>
<tr>
<td>Economics</td>
<td>ECN</td>
</tr>
<tr>
<td>Finance</td>
<td>FIN</td>
</tr>
<tr>
<td>Management</td>
<td>MGT</td>
</tr>
<tr>
<td>Management Information Systems</td>
<td>MIS</td>
</tr>
<tr>
<td>Management Science</td>
<td>MSC</td>
</tr>
<tr>
<td>Marketing</td>
<td>MKT</td>
</tr>
</tbody>
</table>

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 BSBA 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 successfully 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 BSBA are advised to follow the transfer program outlined below:

<table>
<thead>
<tr>
<th>Area I</th>
<th>English Composition</th>
<th>6 hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area II</td>
<td>Humanities and Fine Arts:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Literature</td>
<td>6 hrs.*</td>
</tr>
<tr>
<td></td>
<td>Fine Arts</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Humanities Elective</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>
Area III  Natural Sciences and Mathematics  
Laboratory Science  8 hrs.  
Precalculus algebra  3 hrs.  

Area IV  History, Social and Behavioral Sciences  
History  3 hrs.  
Principles of Micro and Macro Econ.  6 hrs.  
Psychology, Sociology, Anthropology  3 hrs.  

Area V  Business  
Business Statistics  6 hrs.  
Legal Environment of Business  3 hrs.  
Financial and Managerial Accounting  6 hrs.  
Microcomputer Applications  3 hrs.  
Business Calculus  3 hrs.  

*Must take a 6 hour sequence in any literature.

The specific credit for work done at other institutions which will apply toward the BSBA 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 BSBA degree. All inquiries concerning the applicability of credit should be made to the College's Director of Advisement (256-890-6024).

Credit for business administration courses taken at schools with programs accredited by the American Assembly of Collegiate Schools of Business (AACSB) 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 which 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. These policies have been in effect since December 14, 1982.

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 admitted into the pre-business classification may not attempt any business course number 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 101-102).
3. Earned a minimum average of "C" (2.0) 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 being admitted to the upper-division will be administratively withdrawn from those classes.

Student Advisement and Enrollment

Advising for BSBA degree candidates is handled by the Director of Advisement in the College and faculty members in the student's intended major. The College's Office of Academic Assistance is a student's contact point 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 256-890-6024).

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 grade of "C" (2.0/4.0) 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, Room 102, ASB, 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 sections and of times for courses 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 locations described in this section 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 (116 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 data base software. Students will be 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 followed by either MIS 146 or the set of MIS 102, 104, and either MIS 103 or 108. This extra credit hour of microcomputer applications will count in the "Electives in Business Administration" area. Advanced students with mastery of at least one of these areas (word processing, spreadsheets, data base) may choose at least 3 credit hours from the following: Word Processing (MIS 102 or 103); spreadsheet (MIS 104 or 105); Presentation Graphics (MIS 106); Database (MIS 108); Introduction to Internet (MIS 110); PC UNIX (MIS 112); Web Publishing with HTML (MIS 114); and other microcomputer applications courses approved by the college's undergraduate programs committee (UPAC). All students enrolling in upper division administrative science courses will be expected to have mastered word processing, spreadsheets, and data base.

Probation and Dismissal
Students are placed on probation at the end of any semester in which they do not have a cumulative GPA 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 BSBA students, the hours taken in residency must include at least 50 percent of the BSBA program (core curriculum and major option) including a minimum of 12 hours in the major option and 3 hours in 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 BSBA 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 BSBA 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 assigned advisor 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 administratively be approved 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 which relate 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 American 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 BSBA 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 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) 6 hrs.
2. Humanities and Fine Arts
   a. Survey of Literature* 6 hrs.
      (EH 205 and 206 or 240 and 241)
   b. Fine Arts 3 hrs.
      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* 3 hrs.
      Recommended: Introduction to Ethics (PHL 202)
3. Natural Sciences and Mathematics
   a. Laboratory Science 8 hrs.**
      Choose biology, chemistry, environmental science or physics
   b. Mathematics with Applications I & II 6 hrs.***
      (MA 117 & 145)
4. History, Social and Behavioral Sciences
   a. History 3 hrs.
   b. Psychology, sociology, or anthropology 3 hrs.

Total General Education Requirements 38 hrs.

*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 scoring below 21 on the quantitative section of the ACT will be required to pass MA 004 (Remedial Algebra) before enrolling in MA 117. Students scoring sufficiently high on a mathematics placement test at UAH may skip MA 004. Students placing at Level III should enroll in MA 171 and choose two 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 track: MA 119, 121, 171.

II. Pre-professional Business Administration Core Curriculum

Micro and Macro Economics (ECN 142, 143) 6 hrs.
Microcomputer Applications (MIS 146 *) 3 hrs.
Business Statistical Analysis I & II (MSC 287, 288) 6 hrs.
Legal Environment of Business (BLS 211) 3 hrs.
Financial Accounting (ACC 211 with Lab ACC 221) 3 hrs.
Management Accounting (ACC 212 with Lab ACC 222) 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.
Lower-division Schedule for Full-time Student  
(Semester hours credit noted in parentheses)  
FRESHMAN

Fall Semester
English 101  
Economics 142  
Microcomputer Applications 146*  
Mathematics I**  
History  
(15 hours)

Spring Semester
English 102  
Economics 143  
Humanities Elective  
Mathematics II **  
Psychology, Sociology or Anthropology  
(15 hours)  
30

SOPHOMORE

Fall Semester
Financial Accounting 211, 221  
Business Statistics I 287  
Literature I (3)***  
Lab Science I (4)  
Business electives (2)  
Fine Arts (3)  
(18 hours)

Spring Semester****
Management Accounting 212, 222  
Business Statistics II 288  
Literature II (3) ***  
Lab Science II (4)  
Legal Environment of Business 211  
(16 hours)  
34

Total  
64 hrs.

*Refer to MIS placement policy.  
**If the student requires MA 004, the lower-division requirement will be 67 hours. The student is encouraged to enroll in summer school in the freshman year to complete the mathematics sequence: MA 004, MA 117, and MA 145.  
***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 (EHT 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 (These electives may be taken at the lower-division level)</td>
<td>5 hrs.</td>
</tr>
<tr>
<td>Total Upper Division General Education Requirements</td>
<td>14 hrs.</td>
</tr>
</tbody>
</table>

*This course is co-requisite or prerequisite for all business courses with a number greater than 301 and prerequisite for 400-level courses.
IV. Upper Division Business Administration Core Curriculum

Accounting Information Systems (ACC 307)* 3 hrs.
Principles of Finance (FIN 301) 3 hrs.
Managing Organizations (MGT 301) 3 hrs.
Information Systems in Organizations (MIS 301) 3 hrs.
Principles of Marketing (MKT 301) 3 hrs.
Production Management (MSC 385) 3 hrs.
International Business (MGT 450)** 3 hrs.
Business Policy (MGT 499) 3 hrs.
Total Business Administration Core Curriculum 24 hrs.

*Required for accounting majors. Non-accounting major 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) 5 hrs.
Total Upper Division Requirements 64 hrs.
Total minimum hours for a BSBA Degree 128 hrs***

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

Majors in the BSBA Degree
The college offers the following majors: accounting, finance, management-business administration, management-human resources management, marketing, and management information systems. The finance and management-human resources management majors are offered only during the day. The other majors are offered during the day and after 5:00 p.m.

Department of Accounting and Information Systems
Professors Morse (Chair), Porter; Associate Professors Bryson, Lai; Assistant Professors Ballenger, Floyd, Maddocks, Pendley, Rieder, Spearing, Woodward; Lecturers Gabre, 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 several 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 BSBA 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 (MAcc) 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 BSBA degree are as follows:

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 310</td>
<td>Intermediate Financial/Accounting I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 311</td>
<td>Intermediate Financial/Accounting II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 313</td>
<td>Income Tax Accounting I</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 ACC 317 (Government Accounting) as an elective.

**Upper Division Schedule for Full-time Student**
(Semester credit hours noted in parentheses)

**JUNIOR YEAR**

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHT 300*</td>
<td>MSC 385</td>
</tr>
<tr>
<td>FIN 301</td>
<td>MGT 301</td>
</tr>
<tr>
<td>Elective (3)**</td>
<td>MKT 301</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></td>
</tr>
<tr>
<td>(18)</td>
<td></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 313 (Tax)</td>
<td>ACC Electives***</td>
</tr>
<tr>
<td>ACC 431 (Auditing)</td>
<td>ECN Requirement</td>
</tr>
<tr>
<td>CM 313</td>
<td>Electives (3)**</td>
</tr>
<tr>
<td>Electives (4)**</td>
<td></td>
</tr>
<tr>
<td>(16)</td>
<td>(15) (31)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>(64)</td>
<td></td>
</tr>
</tbody>
</table>

*EHT 300, Strategies of Business Writing, 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.

***Select two of the following:

- ACC 317 Government Accounting
- ACC 413 Income Tax Accounting II
- ACC 432 Advanced Financial Accounting
- ACC 450 Seminar in International Accounting
- ACC 470 Seminar in Contemporary Accounting Issues

**Management Information Systems**

The major in management information systems is designed for students who want to become designers of information systems that utilize computers in a business or administrative environment. Management information systems’ subject matter includes computer hardware, computer software, systems analysis and design methodologies, behavioral issues and the business or administrative context within which computer systems are applied. The management information systems curriculum can be characterized as follows:
a. The management information systems curriculum covers information system concepts and processes within the contexts of organizational functions, management activity and technical information systems knowledge.

b. The management information systems graduate is expected to work within the environment of an organization and to interact with both organizational functions and computer technology.

c. In technical expertise, the management information systems curriculum places a substantial emphasis on analysis and design methodologies appropriate to the business and administrative environment.

The management information systems major is offered during the day and the evening.

Requirements for a major in management information systems within the BSBA 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>Data Bases 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 460</td>
<td>Telecommunications</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 499</td>
<td>Systems Development Project</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

Plus one of the following:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIS 350</td>
<td>Advanced Data Bases for Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 400</td>
<td>Decision Support Systems</td>
<td></td>
</tr>
<tr>
<td>MIS 480</td>
<td>Current Topics in Mgmt. Information Sys.</td>
<td></td>
</tr>
<tr>
<td>MIS 490</td>
<td>Special Projects</td>
<td></td>
</tr>
</tbody>
</table>

Management Information Systems Major
Upper Division Schedule for Full-time Student
(Semester credit hours noted in parentheses)

JUNIOR YEAR

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHT 300*</td>
<td>MSC 385</td>
</tr>
<tr>
<td>MIS 301</td>
<td>MGT 301</td>
</tr>
<tr>
<td>ACC 307***</td>
<td>MKT 301</td>
</tr>
<tr>
<td>MIS 210</td>
<td>MIS 310</td>
</tr>
<tr>
<td>Electives (3) **</td>
<td>MIS 340</td>
</tr>
<tr>
<td></td>
<td>Electives (2)**</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

SENIOR YEAR

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
<th>ECN Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 301</td>
<td>MGT 450</td>
<td>Electives (3)**</td>
</tr>
<tr>
<td>MIS 412</td>
<td>MGT 499</td>
<td></td>
</tr>
<tr>
<td>MIS 460</td>
<td>MIS 499</td>
<td></td>
</tr>
<tr>
<td>CM 313</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIS 350, 400, 480, 490</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electives (2)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>(64)</td>
</tr>
</tbody>
</table>
*EHT 300, Strategies of Business Writing, 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.

**Department of Economics and Finance**

Professors Billings, Evans, Paul (Chair), Schnell, Schoening, Stafford, Wilhite; Associate Professors Burnett, Tseng; Assistant Professors Allen, Patel; Adjunct Assistant Professors Ballenger, Jones.

Finance

The BSBA degree in finance acquaints students with the modern analytic principles of the discipline which prepares them to function in a wide variety of institutional settings. The finance major prepares students for careers in security analysis, portfolio 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 BSBA 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>3 hrs.</td>
</tr>
</tbody>
</table>

**Finance Major**

Upper Division Schedule for Full-time Student

(Semester credit hours noted in parentheses)

**JUNIOR YEAR**

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHT 300*</td>
<td>MSC 385</td>
</tr>
<tr>
<td>FIN 301</td>
<td>MIS 301</td>
</tr>
<tr>
<td>FIN 352</td>
<td>ACC 307***</td>
</tr>
<tr>
<td>MGT 301</td>
<td>FIN 440</td>
</tr>
<tr>
<td>Elective (3)**</td>
<td>ECN 345</td>
</tr>
<tr>
<td>(15)</td>
<td>Electives (2)**</td>
</tr>
<tr>
<td></td>
<td>(17) (32)</td>
</tr>
</tbody>
</table>

**SENIOR YEAR**

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 301</td>
<td>MGT 450</td>
</tr>
<tr>
<td>FIN 361</td>
<td>MGT 499</td>
</tr>
<tr>
<td>FIN 478</td>
<td>FIN 461</td>
</tr>
<tr>
<td>FIN 431</td>
<td>ECN Requirement</td>
</tr>
<tr>
<td>CM 313</td>
<td>Electives (3)**</td>
</tr>
<tr>
<td>Electives (2)**</td>
<td>(15) (32)</td>
</tr>
<tr>
<td></td>
<td>(17) (64)</td>
</tr>
</tbody>
</table>
*EHT 300, Strategies of Business Writing, 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. FIN 454 recommended.
***or a 300-level accounting elective.

Department of Management and Marketing
Professor Emeritus McCollum; Professors Gramm, Rhoades, Sherman (Chair), Souder; Associate Professors Olsen, Simpson; Assistant Professors Berkowitz, Seale, Wren; Adjunct Instructor Davis.

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 BSBA degree are as follows:

Business Administration Track:

The Business Administration Track shall consist of 21 hours at the 300- or 400-level in addition to courses in the core curriculum. At least 6 hours must be taken in at least 3 of the different disciplines shown below:

<table>
<thead>
<tr>
<th>Accounting</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economics</td>
<td>Management Information Systems</td>
</tr>
<tr>
<td>Finance</td>
<td>Management Science</td>
</tr>
<tr>
<td></td>
<td>Marketing</td>
</tr>
</tbody>
</table>
### 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>
<tr>
<td>MGT 462</td>
<td>Government Regulation of Employment Relations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 460</td>
<td>Employee Training 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>ECN 475</td>
<td>Economics of Labor Markets &amp; Human Resources Administration</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

### Business Administration Track

**Upper Division Schedule for Full-time Student**  
(Semester credit hours noted in parentheses)

**JUNIOR YEAR**

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT 301</td>
<td>FIN 301</td>
</tr>
<tr>
<td>MKT 301</td>
<td>MSC 385</td>
</tr>
<tr>
<td>EHT 300*</td>
<td>MIS 301</td>
</tr>
<tr>
<td>ACC 307**</td>
<td>Discipline I</td>
</tr>
<tr>
<td>Electives (3) **</td>
<td>Discipline I</td>
</tr>
</tbody>
</table>

(15) (14) (32)

**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>Discipline II</td>
<td>Discipline III</td>
</tr>
<tr>
<td>Discipline II</td>
<td>Discipline III</td>
</tr>
<tr>
<td>Discipline II</td>
<td>ECN Requirement</td>
</tr>
<tr>
<td>CM 313</td>
<td>Electives (2)**</td>
</tr>
<tr>
<td>Electives (3)**</td>
<td></td>
</tr>
</tbody>
</table>

(18) (14) (32) (64)

*EHT 300, Strategies of Business Writing, 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.
MKT 301  
Electives (3) **  
(15)  

MGT 363  

SENIOR YEAR  

Fall Semester  
MGT 450  
MGT 460  
ECN 475  
CM 313  
Electives (4) **  
(16)  
Total  

Spring Semester  
MGT 499  
MGT 461  
ECN Requirement  
Electives (3)**  
(15)  
Total  

*EHT 300, Strategies of Business Writing, 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  
The marketing program studies the 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. A degree in marketing 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 marketing major is offered during the day and the evening.

Requirements for a major in marketing within the BSBA degree are as follows:

<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>Advanced Marketing Seminar</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 480</td>
<td>Marketing Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Elective</td>
<td>Marketing Elective*</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 hrs.</td>
</tr>
</tbody>
</table>

*Students who took MKT 415 to satisfy the international business requirement prior to March 4, 1994 cannot use MKT 415 as a marketing elective course. Additional marketing courses can be taken as college electives. MGT 405 can be used to satisfy the marketing elective.
## Marketing Major
### Upper Division Schedule for Full-time Student
*(Semester credit hours noted in parentheses)*

<table>
<thead>
<tr>
<th>JUNIOR YEAR</th>
<th>SENIOR YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall Semester</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>EHT 300*</td>
<td>MKT 332</td>
</tr>
<tr>
<td>ACC 307***</td>
<td>MKT 343</td>
</tr>
<tr>
<td>Electives (3) **</td>
<td>(15)</td>
</tr>
<tr>
<td>(18)</td>
<td>(33)</td>
</tr>
<tr>
<td><strong>Fall Semester</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) **</td>
<td>Electives (3) **</td>
</tr>
<tr>
<td>(16)</td>
<td>(15)</td>
</tr>
<tr>
<td>Total</td>
<td>(31)</td>
</tr>
<tr>
<td></td>
<td>(64)</td>
</tr>
</tbody>
</table>

*EHT 300, Strategies of Business Writing, 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.

### Possible Minors for the BSBA Degree

BSBA 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 BSBA 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, secure the approval of the Chair of the Department of Accounting and Information Systems, 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 Accounting Option and the Public Accounting Option. At least 12 hours of the required UAH hours for any option must be in accounting and business legal studies 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 211/221</td>
<td>Financial Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 222/222</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 239*</td>
<td>Principles of Economics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 146</td>
<td>Microcomputer Applications</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MSC 287 or AHS 300</td>
<td>Statistical Analysis</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>Income Tax Accounting I</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:** 36 hrs.

*Three hours of principles of microeconomics and three hours of macroeconomics may be substituted for ECN 239.*

### Management Accounting Option

**Course Number**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<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:** 45 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><strong>General Accounting Option Requirements:</strong></td>
<td></td>
<td></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 317</td>
<td>Government Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 413</td>
<td>Income Tax II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 415</td>
<td>Advanced Financial 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>
<tr>
<td><strong>Total Hours Required</strong></td>
<td><strong>69 hrs.</strong></td>
<td></td>
</tr>
</tbody>
</table>

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

To receive the Certificate in Accounting—Public Accounting Option, a student must also 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 Resources 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.
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 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 (completion of at least 60 semester hours) and admission to UAH as a regular student. See NOTE at end of this section.

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.

NOTE: 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 EHT 300.

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. Concurrent enrollment in ACC 211 is required. Prerequisites: Sophomore standing and MIS 146 or 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. Concurrent enrollment in ACC 222 is required. Prerequisite: ACC 211. F, Sp, Su.

221 Financial Accounting Lab 0 hrs.
Personal computer and computerized materials, such as spreadsheet software, are used to reinforce comprehension of financial accounting concepts and enhance the student’s ability to effectively and efficiently develop accounting reports. Concurrent enrollment in ACC 211 is required. Perquisites: Sophomore standing and MIS 146 or equivalent. Lab Fee: $20. F, Sp, Su.

222 Management Accounting Lab 0 hrs.
Personal computer and computerized materials, such as spreadsheet software, are used to reinforce comprehension of management accounting concepts and enhance the student’s ability to effectively and efficiently develop accounting reports. Concurrent enrollment in ACC 212 is required. Prerequisite: ACC 211. Lab Fee: $20. F, Sp, Su.

Upper Division Courses (see prerequisites for upper division)

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. Lab Fee: $30. (Same as MIS 307.) F, Sp, Su.

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. Lab Fee: $30. 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 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. Lab Fee: $30. F, Sp.

313 Income Tax Accounting I 3 hrs.
Determination of taxable income, business and non-business deductions, and selected aspects of tax accounting for individuals and sole proprietorships. Prerequisite: ACC 212. Lab Fee: $20. 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. Lab Fee: $30. F, Sp.

317 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 212. Lab Fee: $10. F, Sp.

413 Income Tax Accounting II 3 hrs.
Tax accounting for partnerships, corporations, S corporations, estates, and trusts. Tax administration and research are emphasized. Prerequisite: ACC 313. Lab Fee: $10. F.
415 Advanced Financial Accounting 3 hrs.
Analysis of issues and alternatives in advanced problem areas including partnerships, intercorporate investments, business combinations, and foreign exchange. Prerequisite: ACC 311. Lab Fee: $10. 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. Lab Fee: $20.

450 Seminar in International Accounting 3 hrs.
Current topics in international accounting. Prerequisite: ACC 311.

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 prerequisites for upper division)

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 105. 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 obtainment 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 105. F, Sp, Su.

239 Principles of Economics for Engineering & Science Students 3 hrs.
Principles of microeconomics for students with advanced analytical and mathematical capabilities. Topics of study parallel those in ECN 143 with traditional presentation of material augmented by calculus. Topics include economic methodology, scarcity, supply and demand analysis, consumer choice theory, production-cost, profit maximizing behavior of the firm under varying demand conditions (market structures), resource market functioning and comparative advantage, and international trade. Prerequisite: Survey of Elementary Calculus. F, Sp, Su.

Upper Division Courses (see prerequisites for upper division)
340 Macroeconomic Analysis 3 hrs.
Comprehensive study of the national economic system. Interdependent market processes in determining income, consumption, saving, investment, interest, employment, and the price level. Economic growth as influenced by institutional structure, technological change, business management, and government monetary and fiscal policy. Application of economic accounting structure and method. Prerequisite: ECN 142, and permission of the department chair. F.

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. Sp.

450 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. Lab Fee: $10. F. Sp.

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. F, Sp.
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. Lab Fee: $10. F.

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. Not open for credit to finance majors as an elective.

Upper Division Courses (see prerequisites for upper division)

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.
Organization, operation, and economic significance of monetary and banking systems. Fractional reserve banking systems, money creation, the Federal Reserve System, U.S. financial intermediaries, introduction to monetary theory and international finance. Prerequisite: ECN 143. Lab Fee: $10. F.

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. Lab Fee: $30. F.

431  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. Lab Fee: $30. F.

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. Lab Fee: $10. Sp.

461  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. Lab Fee: $30. Sp.

470  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. Lab Fee: $10. Sp.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
<th>Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>478</td>
<td>Long-term Capital Management</td>
<td>3 hrs.</td>
<td>Financial theory as it relates to corporate policy, the efficient market hypothesis, capital structure theory, long-term financing and dividend policies. Prerequisite: FIN 301. Lab Fee: $20. F.</td>
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<tr>
<td>490</td>
<td>Special Projects</td>
<td>3 hrs.</td>
<td>Independent study in an area of interest to the student in the field of finance. Prerequisite: Senior standing and approval of department chair. F, Sp, Su.</td>
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</tr>
<tr>
<td>495</td>
<td>Internship in Finance</td>
<td>1, 2, or 3 hrs.</td>
<td>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. F, Sp, Su.</td>
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Management (MGT)

Lower Division Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
<th>Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Introduction to Business</td>
<td>3 hrs.</td>
<td>Career options for students interested in business are stressed. Fundamentals of business organizations, effective management and the functions of business are explored.</td>
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<tr>
<td>101</td>
<td>Introduction to Entrepreneurship</td>
<td>3 hrs.</td>
<td>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. Lab Fee: $10.</td>
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</table>

Upper Division Courses (see prerequisites for upper division)

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
<th>Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>301</td>
<td>Managing Organizations: Theory, Behavior, and Communications</td>
<td>3 hrs.</td>
<td>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. Lab Fee: $10. F, Sp, Su.</td>
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<tr>
<td>362</td>
<td>Management and Labor Relations</td>
<td>3 hrs.</td>
<td>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. Lab: Fee: $20.</td>
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<tr>
<td>363</td>
<td>Personnel: Human Resource Management</td>
<td>3 hrs.</td>
<td>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. Prerequisite: MGT 301. Lab Fee: $10.</td>
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<tr>
<td>404</td>
<td>Negotiation Techniques</td>
<td>3 hrs.</td>
<td>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. Lab Fee $20.</td>
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</tbody>
</table>
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. Lab Fee $20.

Small Business Counseling 3 hrs.
Practical exposure to problems and opportunities of small business firms. Assignment of student teams as counseling unit to assist local business managers with identification of problems and formulation of alternative solutions, as well as identification of areas of opportunity within the organization. A selection of students with demonstrated ability to understand and apply knowledge from several disciplines to day-to-day operations of business enterprise. Prerequisite: approval of SBDC director. F, Sp, Su.

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. Lab Fee: $10. F. Sp.

Employee Training and Development 3 hrs.
The nature of the contemporary training function, using an experiential approach to learning about training, development, and learning in organizations. Prerequisite: MGT 361.

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. Prerequisites: MGT 301, 363, or permission of instructor. Lab Fee: $10.

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. Lab Fee: $10.

Special Topics in Management 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.

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.

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.

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, ACC 301, EH 300, FIN 301, MGT 301, MIS 301, MSC
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. Lab Fee: $20.

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. Lab Fee: $20.

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. Lab Fee $20.

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. Lab Fee: $20.

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. Lab Fee: $20.

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. Lab Fee: $20.

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. Lab Fee: $20.

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)

112 Introduction to PC UNIX 1 hr.
Introduction to a PC-based UNIX (Linux) operating system, commands, file management, networking, and e-mail. Prerequisite: MIS 101. Lab Fee: $20. (Same as CS 112)

114 Web Publishing Using HTML 1 hr.
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. Lab Fee: $20. (Same as CS 114)

146 Computer Applications in Business 3 hrs.
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. Use of business software packages such as Windows, word processing, spreadsheets, and
databases. Applications and examples will generally be from administrative areas. Lab Fee: $60. F, Sp, Su.

210 Introduction to Computer Programming in Business  3 hrs.
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. Lab fee: $60. F.

Upper Division Courses (see prerequisites for upper division)

301 Information Systems in Organizations  3 hrs.
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, 210, MSC 287, ACC 211, 212. Lab Fee: $40. F, Sp, Su.

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. Lab Fee: $30. Prerequisite: ACC 212. (Same as MIS 307.)

310 Advanced Computer Programming in Business  3 hrs.
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. Lab Fee: $60. Sp.

340 Data Bases for Management  3 hrs.
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. Lab Fee: $60. F.

350 Advanced Data Bases for Management  3 hrs.
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. Lab Fee: $60. Sp.

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. Lab Fee: $30. (Same as MSC 400)

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 310 or equivalent. Lab Fee: $20. F.

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. Lab Fee: $20. F.

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: senior standing and approval of department chair. Lab Fee: $60. 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. Lab Fee: $50. F, Sp.

495 **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.

499 **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, 310 or 350. Lab Fee: $60. F, Sp.

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. Lab Fee: $20. 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. Lab Fee: $40. F, Sp.

Upper Division Courses (see prerequisites for upper division)

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, MSC 287, and MSC 288 or 325. Lab Fee: $50. 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. F, Sp, Su.
Marketing (MKT)

Upper Division Courses (see prerequisites for upper division)

301 Principles of Marketing 3 hrs.
Integration and study of functional commodity, and institutional approaches from viewpoint of consumer and marketing manager. Prerequisite: junior standing. Lab Fee: $10. F, Sp, Su.

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. Lab Fee: $10.

316 Retailing Policy and Management 3 hrs.
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.

332 Buyer Behavior 3 hrs.
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. Lab Fee: $20.

342 Promotional Strategy 3 hrs.
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, MSC 325.

343 Marketing Research Design 3 hrs.
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. Lab Fee: $30.

344 Marketing Research Applications 3 hrs.
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, 325, MKT 301, 343. Lab Fee: $20.

345 Market Channel Structure and Strategy 3 hrs.
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. Lab Fee: $10.

414 Marketing Emerging Technologies 3 hrs.
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. Lab Fee: $20.

415 International Marketing 3 hrs.
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. Lab Fee: $10.
470 Advanced Marketing Seminar 3 hrs.
Investigation of advanced marketing topics to include marketing in a high technology environment, relationship marketing, channel design and strategy, retailing, transportation, and logistics. Prerequisites: MKT 301, 6 hrs. of MKT, and senior standing. Lab Fee: $10.

480 Marketing Management hrs.
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, 344. Lab Fee: $10.

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. Lab Fee: $10.

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. F, Sp, Su.
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 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 gives 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, and 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>Chemical Engineering</th>
<th>CHE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering</td>
<td>CE</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>CPE</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>EE</td>
</tr>
<tr>
<td>Industrial and Systems Engineering</td>
<td>ISE</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>MAE</td>
</tr>
<tr>
<td>Optical Engineering</td>
<td>OPE</td>
</tr>
</tbody>
</table>

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, and mechanical 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.) will be admitted 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.

Credit for engineering courses taken in schools with ABET accredited programs is transferable to UAH. 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 respective 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.
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 dropped 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 are allowed in any of these prerequisite courses.

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.

<table>
<thead>
<tr>
<th>Category</th>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Engineering core. The engineering core consists of 4 courses, including the 3 courses listed below.</td>
<td>Statics - MAE/CE 271</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Electrical Circuits I - EE 300</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Engineering Economy - ISE 321</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Plus one course from the following list:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Solid State Fundamentals - EE 310</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Thermodynamics I - MAE 341</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Fluid Mechanics I - MAE 352</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>as specified by program requirements.</td>
<td></td>
</tr>
<tr>
<td>2. English - EH 101, 102</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>3. Humanities and Social Sciences.</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

Engineering students are required to take a total of 18 semester hours (in addition to EH 101 and 102) in the humanities and social sciences, including a 6-hour sequence in history or literature. The remaining 12 semester hours should be a balanced choice from the following areas: anthropology, art history, economics, foreign languages (other than a student's native language(s)), history, literature, music appreciation, philosophy, religion, sociology, political science, and psychology. Courses should be selected to fulfill an objective appropriate to the engineering profession. Courses treating subjects such as accounting, industrial management, finance, personnel administration, and ROTC normally do not fulfill this objective regardless of their general value in the total
engineering curriculum. 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

Degree: Bachelor of Science in Engineering

Professor Emeritus Grohse; Professors Cerro (Chair), Chen, Smith; Associate Professors Chittur, Weimer; Assistant Professor Hayes.

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, and pollution control.

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.
Goals and Success Criteria
1. Provide quality and innovative undergraduate education to students seeking to become chemical engineers. Quality will be based on maintaining national accreditation standards and by interaction with alumni.

2. Increase the number of students within the program while seeking to diversify the ethnic and cultural origin of both traditional and non-traditional students. Success will be monitored through annual reports that track performance in these areas. Current recruiting efforts are focused on the goal of reaching a level of 150 full-time students within the next five years.

3. Maintain and enhance the department’s national chemical engineering research and development ranking. Success will be determined by the number of contracts and grants, the level of funding for the department, and on the average level of funding per full-time faculty member.

4. Improve the interdisciplinary and interdepartmental nature of graduate and undergraduate programs. At the undergraduate level, areas of concentration in materials engineering and in biotechnology will be introduced. This will improve visibility for recruitment purposes and strengthen ties with the Chemistry Department at UAH.

5. Increase the number of full-time faculty and decrease faculty teaching loads to further develop research programs at national and international levels.

Chemical Engineering Option
To obtain a Bachelor of Science in Engineering degree with the chemical engineering option, students are required to take:

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Basic Sciences</td>
<td></td>
</tr>
<tr>
<td>Chemistry-CH 123, 126, 331, 335, 332, 336</td>
<td>12</td>
</tr>
<tr>
<td>Advanced science electives from approved area</td>
<td>7</td>
</tr>
</tbody>
</table>

Chemical Engineering Option
<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 197-Computer Methods for Chem. Engrs.</td>
<td>3</td>
</tr>
<tr>
<td>CHE 244-Stoichiometry</td>
<td>3</td>
</tr>
<tr>
<td>CHE 295-Nature and Properties of Materials Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>MAE 341-Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>CHE 344-Chemical Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>CHE 347-Quant. Modeling for Chem. Engrs.</td>
<td>3</td>
</tr>
<tr>
<td>CHE 352-Fluid Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>CHE 440-Unit Operations Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>CHE 441-Chemical Kinetics and Reactor Design</td>
<td>3</td>
</tr>
<tr>
<td>CHE 442-Introduction to Heat and Mass Transfer</td>
<td>4</td>
</tr>
<tr>
<td>CHE 443-Mass Transfer Operations</td>
<td>4</td>
</tr>
<tr>
<td>CHE 445-Chemical Process Control</td>
<td>3</td>
</tr>
<tr>
<td>CHE 446-Anal. &amp; Design of Transport Equip.</td>
<td>3</td>
</tr>
<tr>
<td>CHE 448-Chemical Engineering Design</td>
<td>4</td>
</tr>
<tr>
<td>CHE 455-Fluid Mechanics Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>Advanced engineering electives from approved area</td>
<td>6</td>
</tr>
</tbody>
</table>

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, 750 Washington Ave.,
Montgomery, AL. 36130-1001. Phone: (256) 261-5568. Contact the College of Engineering Student Affairs Office for further information.

### Suggested Schedule of Courses for Full-time Chemical Engineering Students

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<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>
</tr>
<tr>
<td>MA 171</td>
<td>4</td>
<td>MA 172</td>
</tr>
<tr>
<td>CHE 197</td>
<td>3</td>
<td>PH 111</td>
</tr>
<tr>
<td>HU/SS*</td>
<td>3</td>
<td>PH 114</td>
</tr>
<tr>
<td>EH 101</td>
<td>3</td>
<td>EH 102</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>15</td>
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<table>
<thead>
<tr>
<th>Second Year</th>
<th></th>
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<tbody>
<tr>
<td>CH 331</td>
<td>3</td>
<td>CH 332</td>
</tr>
<tr>
<td>CH 335</td>
<td>1</td>
<td>CH 336</td>
</tr>
<tr>
<td>MA 201</td>
<td>4</td>
<td>MA 324</td>
</tr>
<tr>
<td>PH 112</td>
<td>3</td>
<td>HU/SS*</td>
</tr>
<tr>
<td>PH 115</td>
<td>1</td>
<td>HU/SS*</td>
</tr>
<tr>
<td>HU/SS*</td>
<td>3</td>
<td>CHE 244</td>
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<tr>
<td></td>
<td>18</td>
<td>16</td>
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</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MAE 341</td>
<td>3</td>
<td>CHE 352</td>
</tr>
<tr>
<td>CHE 294</td>
<td>3</td>
<td>CHE 344</td>
</tr>
<tr>
<td>ISE 321</td>
<td>3</td>
<td>EE 300</td>
</tr>
<tr>
<td>MAE 271</td>
<td>3</td>
<td>CHE 347</td>
</tr>
<tr>
<td>CHE 295</td>
<td>1</td>
<td>SciElec**</td>
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<tr>
<td>SciElec**</td>
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<td></td>
<td>16</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Fourth Year</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>CHE 442</td>
<td>4</td>
<td>CHE 440</td>
</tr>
<tr>
<td>CHE 443</td>
<td>4</td>
<td>CHE 448</td>
</tr>
<tr>
<td>EngrElect***</td>
<td>3</td>
<td>CHE 446</td>
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<td>CHE 441</td>
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<td>CHE 445</td>
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<tr>
<td>HU/SS*</td>
<td>3</td>
<td>Engr Elect***</td>
</tr>
<tr>
<td>CHE 455</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>16</td>
</tr>
</tbody>
</table>

Total Hours: 132

*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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>197</td>
<td>Computer Methods for Chemical Engineering</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>244</td>
<td>Stoichiometry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Introduction to basic calculations of chemical engineering, emphasizing material and energy balances on physical and chemical processes. Prerequisites: PH 111, CH 123, CHE 197.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Introduction to structure, composition, and properties of solid materials such as metals, polymers, ceramics, semiconductors, and composites. Crystalline, glassy, and amorphous materials; defects and microstructure. Pure materials, alloys, mixtures, and compounds, including phase diagrams. Mechanical properties such as stress-strain behavior, hardness, and fatigue; corrosion properties; electrical properties. Prerequisites: CH 121, PH 111. (Same as MAE 294.)</td>
<td></td>
</tr>
<tr>
<td>295</td>
<td>Nature and Properties of Materials Laboratory</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>Typical experiments include microstructure, stress-strain phase diagrams, corrosion, and resistivity. Emphasis is placed on written reports for each lab experiment. Students apply uncertainty analysis to the experimental results using principles from probability and statistics. Prerequisite or parallel: CHE 294.</td>
<td></td>
</tr>
<tr>
<td>344</td>
<td>Chemical Engineering Thermodynamics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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, MAE 341.</td>
<td></td>
</tr>
<tr>
<td>347</td>
<td>Quantitative Modeling for Chemical Engineers</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Modeling and analysis of physical phenomena that arise in chemical engineering and an introduction to computer-aided design. Prerequisites: CHE 197, MA 324.</td>
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<tr>
<td>352</td>
<td>Fluid Mechanics I</td>
<td>3 hrs.</td>
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<td></td>
<td>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.)</td>
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<tr>
<td>440</td>
<td>Unit Operations Laboratory</td>
<td>3 hrs.</td>
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<td></td>
<td>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. Prerequisite: CHE 443.</td>
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<tr>
<td>441</td>
<td>Chemical Kinetics and Reactor Design</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>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 541.)</td>
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<tr>
<td>442</td>
<td>Introduction to Heat and Mass Transfer</td>
<td>4 hrs.</td>
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<tr>
<td></td>
<td>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.)</td>
<td></td>
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<tr>
<td>443</td>
<td>Mass Transfer Operations</td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
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</tr>
</tbody>
</table>
445 Chemical Process Control 3 hrs.
Fundamental principles of chemical process control; control system design for chemical processes. Prerequisites: MA 324, CHE 244.

446 Analysis and Design of Transport Equipment 3 hrs.
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, 442, 443.

448 Chemical Engineering Design 4 hrs.
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 443, 441, 445.

449 Introduction to Environmental Engineering 3 hrs.
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.)

455 Fluid Mechanics Laboratory 1 hr.
Introduction to experimental uncertainty analysis and statistical data analysis. Application to experiments concerning fluid properties, flow losses, pipe flows, lift and drag, compressible flow and other fluid phenomena. (Same as MAE 455). Prerequisite: CHE 352.

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, 363.

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, 363, CHE 460.

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.

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 494, CH 540.
CIVIL AND ENVIRONMENTAL ENGINEERING

Degree: Bachelor of Science in Engineering

Professor Emeritus Kubitza; Professors Cruise, Schonberg (Chair); Associate Professors Leonard, Toutanji; Assistant Professor Anderson; Research Assistant Professor Alshibli.

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 either in structural 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. See the "Undergraduate Student Handbook" from the Civil Engineering Department for more specific information.

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 at UAH 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.

Mission Statement

The mission of the Civil and Environmental Engineering Department is to educate men and women of diverse backgrounds in the profession of civil and environmental engineering. The department is dedicated to excellence in teaching, research, and service, and utilizes its position in Huntsville’s center of advanced civil and environmental engineering research to provide unique opportunities and creative programs for faculty, students, and the community. The department is committed to maintaining a diverse faculty of international recognition in a well-equipped facility which provides an environment that facilitates intellectual, personal, and professional growth. The department 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. The department through its B.S.E. and M.S.E. graduates, its programs, and its service activities, contributes to economic advancement and the quality of life throughout the region, state, and nation.

Goals and Success Criteria

1. To graduate civil engineers rigorously educated and trained in the most modern aspects of the field while maintaining a solid foundation in the traditional areas. Success will be measured by continuous industrial and government demand for B.S.E. graduates from the UAH civil engineering program. Quality will be assured by maintaining ABET accreditation.

2. To provide skilled civil engineers who can meet the needs imposed by the rapid growth of the southeastern region of the United States, the state of Alabama, and the Huntsville community. Success will be measured by the performance of graduating B.S.E. students on the Fundamentals of Engineering Examination.
3. To promote interaction between students and the surrounding high tech engineering community. Success will be measured by: a) the attendance of undergraduate civil engineering students at the monthly luncheon meetings of the ASCE Huntsville Branch, and b) the use of guest lecturers from government and industry in appropriate civil engineering courses.

4. The department will emphasize research to achieve national and international recognition for research in areas supportive of its educational mission and in areas important to the economy of the region. Success will be measured by: a) the number of funded research contracts and grants secured by civil engineering faculty, the funded research contract level of the department, and the average funded research contract level of each civil engineering faculty member, and b) the productivity of civil engineering faculty with regard to refereed journal articles published and presentations made at national and international engineering and scientific conferences.

5. The department will recruit and develop a strong and diverse faculty by offering competitive salaries and by providing support for teaching and research that meets the highest professional standards. Success will be measured by: a) the number and quality of faculty acquisitions and retentions over the next five years, and b) the adherence of the department, college, and university to the faculty hiring plan put forth in the department’s five year strategic plan.

Degree Requirements

To obtain a Bachelor of Science in Engineering, civil engineering students are required to take:

<table>
<thead>
<tr>
<th>Additional Basic Sciences</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>Chemistry - CH 123, 126</td>
<td>4</td>
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</table>

**Civil Engineering Option:**

- EE 197 - Computer Methods in Engineering ........................................ 3
- MAE 198 - Engineering Graphics .......................................................... 2
- CE 284 - Land Surveying I ................................................................. 2
- MAE 341 - Thermodynamics I .................................................................. 3
- MAE/CHE 352 - Fluid Mechanics I ........................................................... 3
- MAE/CE 362 - Dynamics ........................................................................ 3
- MAE/CE 370 - Mechanics of Materials .................................................... 4
- CE 371 - 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 Engr .................................................... 3
- CE 472 - Hydraulic Engineering ............................................................. 3
- CE 473 - Transportation Engineering and Design .................................... 3
- CE 480 - Civil Engineering Design Project .............................................. 3
- *Technical Electives ............................................................................. 6

**Civil Engineering Concentration** .......................................................... 12

**Structural Engineering Concentration:**

- CE 381 - Structural Analysis II .............................................................. 3
- CE 403 - Reinforced Concrete Design ...................................................... 3
- CE 404 - 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
General Civil Engineering:
Choose 12 hours from CE 381, 403, 404, 455, 456, 457, 458, 485,
subject to satisfactory completion of prerequisite
requirements.................................................. 12
* Choose from CE 375, 384, 411, 461, 474, 477, 478, 481, 482, 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.

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, 750 Washington Ave., Montgomery, AL. 36130-1001.
Phone: (256) 261-5568. Contact the College of Engineering Student Affairs Office for further
information.

Suggested Schedule of Courses for Full-time Civil Engineering Students
First Year  Fall   Spring
MA 171  4      MA 172  4
CH 121/125  4     CH 123/126  4
MAE 198  2     PH 111/114  4
CE 284  2     EH 102  3
EH 101  3     EE 197  3
\hline
15

Second Year
MA 201  4  MA 324  3
HU/SS*  3  HU/SS*  3
CE 271  3  CE 370  4
CHE 294  4  MA 244  3
PH 112/115  4  CE 362  3
\hline
17

Second 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  HU/SS*  3
CE 371  3  Tech.Elect.  3
\hline
18

Third Year
CE 449  3  CE 485/456  3
CE 404/458  3  CE 480  3
CE 403/457  3  CE 472  3
Tech.Elect  3  CE 473  3
HU/SS*  3  CE 381/455  3
\hline
15

Fourth Year
Total Hours 130

*HU/SS-18 hours in humanities/social sciences.

Undergraduate Civil Engineering Courses (CE)
271 Statics 3 hrs.
Topics include: forces, resultant forces, moments, couples equivalent force systems,
equilibrium, distributed loads, two force members, trusses, centroids, moments of
112
inertia, shear and bending moment diagrams, static and kinematic friction. Prerequisite: PH 111; parallel MA 201. (Same as MAE 271.)

284 **Land Surveying I** 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: MAE 198 or consent of instructor/advisor.

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: MAE/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: MAE/CE 271. (Same as MAE 370.)

371 **Structural Analysis I** 3 hrs.
Reactions, shears, moments in determinate structures. Influence lines, energy methods in computing deformations. Introduction to indeterminate structures. Prerequisites: MAE/CE 362, 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: MAE/CE 370; Parallel MAE/CHE 352.

373 **Soil Mechanics Lab** 1 hrs.

375 **Civil Engineering Systems Analysis and Design** 3 hrs.
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, EE 197.

380 **Engineering Design Project** TBA
Individualized design project under supervision of instructor. Prerequisite: Junior standing.

381 **Structural Analysis II** 3 hrs.
Reactions, shears, moments and deformations in complex structural systems. Statically indeterminate systems, advanced geometric and energy methods. Prerequisite: CE 371.

384 **Land Surveying II** 3 hrs.
Surveying public lands; topography, mapping, construction surveys, and boundary surveys. Topographic surveying project, computer applications and laboratory work included. Prerequisite: CE 284.

403 **Reinforced Concrete Design** 3 hrs.

404 **Structural Steel Design** 3 hrs.
Principles of design of steel structures using ASD methods. Analysis and design of structural elements including beams, columns, connection details. Prerequisite: CE 371.

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. Prerequisite: Senior standing or approval of instructor. (Same as CE 511, ES 411/511, and ATS 411/511.)

430 Concrete Mix Proportioning 3 hrs.
Classification of concrete aggregates and their effects on concrete properties. Mixing, placing, and testing of normal weight, high strength, and lightweight concretes. Proportioning according to ACI methods. Laboratory included.

449 Introduction to Environmental Engineering 3 hrs.
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 or parallel: MAE 352/CHE 352. (Same as CE 549 and CHE 449/549.)

455 Water Quality Laboratory 3 hrs.
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.)

456 Water Quality Control Processes 3 hrs.
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.)

457 Hydrology 3 hrs.
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: MAE 352. (Same as CE 557.)

458 Environmental Engineering Design 3 hrs.
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.)

459 Selected Topics in Civil Engineering TBA

461 Vibration of Elastic Systems 3 hrs.
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 MAE 461/561.)

472 Hydraulic Engineering 3 hrs.
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. Prerequisites: MAE/CHE 352.

473 Transportation Engineering and Design 3 hrs.
Theory, design, and operation of various modes of transportation with emphasis on traffic flow. Prerequisite: CE 284.

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 CE 574 and MAE 474/574.)

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 photo-elasticity. Application of transducers and
experimental analysis of engineering systems. Prerequisites: MAE/CE 370 and junior standing. (Same as CE 577 and MAE 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 362, CE 370. (Same as CE 578 and MAE 478/578.)

480 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.

481 Advanced Soil Mechanics 3 hrs.
Continuum mechanics applied to soil behavior. Theoretical approaches to consolidation, shear strength, slope stability and soil stabilization. Prerequisite: CE 372. (Same as CE 581.)

482 Soil Dynamics 3 hrs.
Behavior of soils under dynamic, earthquake and blast loading. Analysis of foundation vibration and isolation. Prerequisite: CE 372. (Same as CE 582.)

485 Foundation Engineering 3 hrs.
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 403. (Same as CE 585.)

ELECTRICAL AND COMPUTER ENGINEERING

Degree: Bachelor of Science in Engineering

Eminent Scholar Kavi; Distinguished Professor Johnson; Professor Emeritus Audeh; Professors Abushagur, Banerjee, Fork, Ho, Jarem, Kowel, Kulick, Porter, Poularikas, Singh, Stensby; Associate Professors Adhami (Interim Chair), Boykin, Katsinis, Maier, Nordin, Shen, Shtessel; Wells; Assistant Professors Cohen, Gaede, Joiner.

Electrical and computer engineering today is concerned with the broad problem of generating, transmitting, receiving, and processing information and energy. Emphasis in the department is on "information" related areas: antennas and microwaves, communications and signal processing, digital processing, computer architecture, software engineering, control and system theory, electronics, and solid state devices.

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

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 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 design, 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.

Mission

The undergraduate program in computer engineering is aimed at a broad based education in computer engineering covering analysis, design, and application of computer systems. A computer engineering graduate will be prepared to consider the role of both hardware and software subsystems and design a complete system. The engineering core curriculum provides a general foundation in engineering. Technical specialization and depth in selected areas of computer engineering is developed through a blend of electives. The computer engineering program prepares graduates for life-long learning and dealing with a broad spectrum of commercial, legal, and ethical issues.

Goals and Success Criteria

1. To provide a broad-based education in computer engineering by designing a carefully crafted curriculum that covers analysis, design, and application of computer systems. The faculty in the Electrical and Computer Engineering Department will continue to educate students and maintain its programs by providing intellectual leadership, innovative teaching, bringing state-of-the-art research challenges to classroom education. The university, the college, and the department will continue to maintain and improve laboratories by upgrading both hardware and software available to undergraduate students. The university, the college, and the department will continue to recruit and retain high quality computer engineering faculty. The faculty size will be increased in order to maintain a reasonable teaching load, and to encourage scholarly activities.

2. To provide a broad-based education in humanities and social sciences. The computer engineering program will require courses in non-technical areas such as English, mathematics, basic sciences, humanities, and social sciences.

3. To inculcate written and oral presentation skills. The computer engineering curriculum will require written reports and oral presentations in several courses. The capstone design project sequence (CPE 427/437) will require both oral and written presentations.

4. To provide opportunities to explore the hardware-software design space and to study design tradeoffs. The computer engineering curriculum will require design-oriented term projects in several courses. The capstone design project will emphasize hardware-software co-design.

Additional Basic Sciences

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<tr>
<th>Course</th>
<th>Semester Hours</th>
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<tr>
<td>PH 113 - General Physics with Calculus III</td>
<td>3</td>
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Computer Engineering Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>CPE 197 - Computer Methods in Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EE 201 - Digital Logic Design Lab</td>
<td>1</td>
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<tr>
<td>EE 202 - Introduction to Digital Logic Design</td>
<td>3</td>
</tr>
<tr>
<td>CPE 203 - Fund. of Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EE 301 - Electronic Measurement Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CPE/EE 302 - Design of Digital Computer</td>
<td>3</td>
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</tbody>
</table>
EE 315 and 305 - Electronics I & Lab ..................................................... 4  
EE 382 - Analytical Methods for Continuous Time Systems ........................ 3  
EE 383 - Analytical Methods for Multivariable and Discrete Time Systems .. 3  
CPE 454/455 ......................................................................................... 5  
CPE 403 - Software Design & Engr......................................................... 3  
EE 420 - Random Signals and Noise (or ISE 390) .................................. 3  
CPE/EE 422 - Adv.Logic Design or CPE/EE 492 VLSI Design I ................ 3  
CPE/EE 429 - Microcomputers .............................................................. 3  
CPE 427 - Computer Engr. Design I ...................................................... 2  
CPE 437 - Computer Engr. Design II .................................................... 2  
CPE 433 - Adv. Techniques in Comp. Design ........................................ 3  
CPE 452 - Real Time & Embedded Systems ......................................... 3  
CS 214 - Discrete Structures ................................................................... 3  
CS 317 - Design & Analysis of Algorithms ........................................... 3  
CPE Electives (300-level or above approved by a computer engineering advisor) 9  

Suggested schedule of courses for full-time Computer Engineering students.

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td></td>
<td>MA 171 4</td>
<td>MA 172 4</td>
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<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>MA 244 3</td>
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<td>Second Year</td>
<td>EE 310 3</td>
<td>EE 301 1</td>
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<tr>
<td>Third Year</td>
<td>EE 315 3</td>
<td>CPE 454/455 5</td>
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<td>CPE 302 3</td>
<td>CPE/EE 429 3</td>
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<td>CS 214 3</td>
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<td>Fourth Year</td>
<td>EE 420** 3</td>
<td>CPE 403 3</td>
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<td>CPE 422 3</td>
<td>CPE 452 3</td>
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<td>or 492</td>
<td>CPE Elect. 3</td>
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<td>17</td>
<td>15 32</td>
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</tbody>
</table>

*HU/SS - 18 hours in humanities/social sciences.

**May substitute ISE 390.

Total Hours 135
Undergraduate Computer Engineering Courses (CPE)

197 Computer Methods in Engineering 3 hrs.
Solution of engineering problems using a digital computer. Hardware structure of the stored-program computer; machine language programming, engineering approximation of dynamic systems; flowcharting and algorithms. Practice in solving engineering problems on the university computer using "C". Prerequisite: Precalculus

203 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 197.

302 Design of Digital Computer 3 hrs.
Functional organization of stored-program digital computers including number representation, computer hardware, micro-operations, and control logic; microprocessor architecture. Prerequisite: EE 202. (Same as EE 302.)

325 Principles of Digital Computer Systems 3 hrs.
Introduction to minicomputers and microcomputers. Topics include: machine organization and operation; information control and transfer within a machine; data transfer and communication with external devices; computer response time; engineering applications of computers. Prerequisite: EE 315.

335 High Level Languages and Computer Hardware 2 hrs.
Application of high level languages in interrupt processing, real time clock management, device independent high level input/output operations, device drivers, microprocessor networks. Prerequisite: EE 302.

355 Software Design for Real Time Systems 3 hrs.
Development and interfacing of software components using a major high level language and a representative assembly language. Applications in hardware support, high level I/O operations, interrupt processing and device drivers. Use of the UNIX operating system. Prerequisite: CPE 203, CPE/EE 202.

Use of the UNIX operating system to develop high level and assembly language programs for hardware control. Parallel CPE 355.

403 Software Design & Engineering 3 hrs.
Basic concepts of software engineering. Software project management including specifications, design, implementation, testing, and documentation. Software tools for project management. Includes a major multi-student software project. Prerequisites: CS 317, CPE 203.

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. Homework and other out-of-class assignments focus on the actual design and implementation of sizeable digital design problems using representative Computer Aided Design (CAD) tools. Prerequisite: EE 202. (Same as EE 422 and EE 502.)

427 Computer Engineering Design I 2 hrs.
Senior design project course involving microcomputer based systems. First design course on digital system design. Case studies of legal, economic, and ethical design issues. Prerequisites: CPE/EE 302, CPE/EE 429.
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 509 and EE 429.)

Advanced Techniques in Computer Design 3 hrs.
Study of existing computer structures. Computer organization with emphasis on busing systems, storage systems, and instruction sets. Special purpose architecture, performance models and measures, VLSI influence on architecture. Fault-tolerant computer systems. Prerequisite: CPE/EE 302.

Computer Engineering Design II 2 hrs.
Senior design project course involving microcomputer based systems. Second design course on digital system design. Oral presentations and written reports are required. Prerequisite: CPE 427.

Real Time and Embedded Systems 3 hrs.
Software design of real time and embedded systems. High level programming for real time and embedded systems, interrupt management, scheduling, device drivers, and formal techniques for verification of real time and embedded systems. Prerequisites: CPE 203, CPE/EE 302, CPE 454.

Computer Systems Software 3 hrs.
System programming with emphasis on hardware support and applications. Interrupt processing, real-time clocks, device independent I/O, process management, memory management, file systems. Programming and basic concepts of UNIX. Operating system internals. Prerequisites: CPE 355. Parallel CPE 455.

Systems Software Laboratory 2 hrs.
Experience in UNIX programming. Analysis and design of process and memory management algorithms, and device drivers. Parallel CPE 454.

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 493. Prerequisite: EE 202, EE 315. (Same as EE 492.)

VLSI Design II 2 hrs.
Advanced experience with CAD tools for VLSI design, IC testing. Design Project from EE/CPE 492 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. Fulfills senior design requirement. Prerequisite: EE 492/CPE 492. (Same as EE 493.)

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.

Mission
The mission of the electrical engineering program is to prepare the student for a successful professional career. The curriculum is structured to provide each student with a sound background in the basic mathematics, sciences, and a thorough foundation in engineering for the analysis and design of representative engineering systems. The curriculum provides courses necessary for technical competence as well as courses on professional ethics and the responsibility of the engineer as a leader in the community and society.
Goals and Success Criteria
1. Provide the student with education in mathematics, science, and fundamental concepts in engineering. Enable the student to function effectively in interdisciplinary environment in industry and government. With the broad-based education provided by this program, graduates are able to find jobs with local and national industry, enter other graduate programs, and compete with graduates in different disciplines.

2. Give the student a more in-depth knowledge of electrical engineering through elective courses tailored for different areas of specialization such as controls, computer hardware/software, communications, signal processing, electronics, electromagnetic fields, and optics. Employers' feedback has been the main source for evaluating the effectiveness of elective courses.

3. Provide the student with the ability to apply electrical engineering knowledge in the analysis, design, and testing of engineering systems, processes, and components. This includes the ability to use the computer and appropriate software tools, facilitated by laboratory techniques, and with the analysis and interpretation of data. Application of modern analysis tools in advanced courses for a better understanding of the subjects has proved to be very helpful.

4. Enhance written and oral communication skills. The curriculum requires written reports and oral communication in several courses. The capstone design project sequence requires both oral and written presentations.

5. Introduce the student to engineering practice and to its ethical and societal aspects, and to make the student proficient in communication skills.

6. Provide the opportunity for in-depth study of a secondary area of interest through fulfilling a departmental minor, such as: music, mathematics, and physical science.

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>
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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>EE or CPE 197 - 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>
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<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>
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</tr>
<tr>
<td>EE 384 - Digital Signal Processing Lab</td>
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</tr>
<tr>
<td>EE 420 - Random Signals and Noise (or ISE 390)</td>
<td>3</td>
</tr>
<tr>
<td>EE 425 - Introduction to Control and Robotic Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE 448 - Analytical and Computational Methods in EE</td>
<td>3</td>
</tr>
<tr>
<td>EE 494 - DSP Senior Design Project</td>
<td>3</td>
</tr>
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</table>

Technical Engineering Electives*                  | 18             |

Technical Electives**                             | 3              |

*These must include at least one of: EE 407, 424, or 426. The remaining hours can be chosen from any courses at 300 level or above offered by the ECE Department.

**Choose any course from the College of Engineering, level 300 or above.
### Suggested Schedule of Courses for Full-time Electrical Engineering Students

#### First Year

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>MA 171</td>
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<tr>
<td>CH 121/125</td>
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<td>PH 111/114</td>
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<td>HU/SS*</td>
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#### Second Year

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<tr>
<td>MA 201</td>
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<td>EE 202</td>
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<tr>
<td>PH 112/115</td>
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<td>MA 324</td>
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<tr>
<td>HU/SS*</td>
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<td>MA 244</td>
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<tr>
<td>CPE/EE 197</td>
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<td>EE 300</td>
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<tr>
<td>ISE 321</td>
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#### Third Year

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<tbody>
<tr>
<td>EE 307</td>
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<td>EE 305</td>
</tr>
<tr>
<td>EE 310</td>
<td>3</td>
<td>EE 313</td>
</tr>
<tr>
<td>EE 315</td>
<td>3</td>
<td>EE Elect.</td>
</tr>
<tr>
<td>HU/SS*</td>
<td>3</td>
<td>EE 383</td>
</tr>
<tr>
<td>EE 382</td>
<td>3</td>
<td>CE/MAE 271</td>
</tr>
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<td>EE 301</td>
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<tr>
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</table>

#### Fourth Year

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<tbody>
<tr>
<td>EE 425</td>
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<td>EE Elect.</td>
</tr>
<tr>
<td>EE Elect.</td>
<td>6</td>
<td>EE 494</td>
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<tr>
<td>EE 420**</td>
<td>3</td>
<td>Tech Elect.</td>
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<tr>
<td>HU/SS*</td>
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<td>EE 448</td>
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<td>EE 384</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

*HU/SS - 18 hours in humanities and social sciences.

**Can substitute ISE 390.

### 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.

**197 Computer Methods in Engineering**

3 hrs.

Solution of engineering problems using a digital computer. Hardware structure of the stored-program computer; machine language programming; engineering approximation of dynamic systems; flowcharting and algorithms. Practice in solving engineering problems on the university computer using FORTRAN. Prerequisite: Precalculus.

**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/EE 197.
**300 Electrical Circuit Analysis I** 3 hrs.
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.

**302 Design of Digital Computers** 3 hrs.
Functional organization of stored-program digital computers including number representation, computer hardware, micro-operations, and control logic; microprocessor architecture. Prerequisite: EE 202. (Same as CPE 302.)

**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** 3 hrs.
Basic physical processes occurring in solids. Schrodinger 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** 3 hrs.

**315 Introduction to Electronic Analysis and Design** 3 hrs.
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.

**382 Analytical Methods for Continuous Time Systems** 3 hrs.

**383 Analytical Methods for Multivariable and Discrete Time Systems** 3 hrs.
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 1 hr.
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 3 hrs.
Introduction to digital signal processor architectures, applications, assembly language programming, and development tools for designing and implementing DSP systems. Prerequisite: EE 383.

404 Electrical Networks Laboratory 1 hr.
Experiments that apply and verify principles presented in EE 382 and 414. Prerequisite or parallel: EE 414.

406 Electronics Laboratory II 1 hr.
Experiments and reports related to electronic devices such as oscillators, multi-stage amplifiers, modulation and switching circuits. Integrated circuits and microelectronics methods. Prerequisite: EE 305 and must parallel EE 416.

410 Selected Topics in Electrical Engineering TBA

411 Electric Power Systems 3 hrs.
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 TBA
Individual design project under the direction of an ECE faculty member. Prerequisites: Senior standing and permission of instructor.

414 Analog and Digital Filter Design 3 hrs.
Analog filter design via Butterworth, Chebyshev, and elliptical approximation. Active filter design using operational amplifiers. Digital filter design methods. Prerequisite: EE 383.

416 Electronics II 3 hrs.
Integrated circuits and microdevices related to multistage amplifiers, oscillators, design specifications, operational amplifiers, and microcircuits. Computer simulation. Prerequisites: EE 313, 315.

420 Random Signals and Noise 3 hrs.
Random variables and probabilities description of signals. Introduction to random processes. Prerequisite: EE 382 (Same as EE 500/OSE 500.)

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. Homework and other out-of-class assignments focus 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 422, EE 502.)

424 Introduction to Data Communication Networks 3 hrs.
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.

425 Introduction to Control and Robotic Systems 3 hrs.
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.)
426 Communication Theory 3 hrs.
Transmission of information including effects of networks, modulation systems, noise, and use of statistics in analysis of information transmission. Prerequisites: EE 382 or permission of instructor. (Same as EE 506.)

429 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 509 and CPE 429.)

436 Digital Electronics 3 hrs.
Electronic devices. Integrated-circuit logic families (DTL, TTL, etc.) and their design theory. MOSFET circuits and their design theory. Flip-flop, registers and counters. Arithmetic operations. Semi-conductor memories. Analog switches. Analog-to-digital conversion. Prerequisites: EE 202, 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, 537.)

439 Digital Electronics Laboratory 1 hr.
Experiments and reports related to logic circuit realization of digital hardware. RTL, DTL, TTL, ECL families for combinational and sequential switching circuits. Must parallel EE 436. (Same as EE 519.)

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. Prerequisites: EE 307, 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 441/PH 441/OPE 441.)

462 **Interference and Diffraction** 3 hrs.

492 **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 493. Prerequisite: EE 202, EE 315. (Same as CPE 492.)

493 **VLSI Design II** 2 hrs.
Advanced experience with CAD tools for VLSI design, IC testing. Design project from EE/CPE 492 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. Fulfills senior design requirement. Prerequisite: EE 492/CPE 492. (Same as CPE 493.)

494 **DSP Senior Design Project** 3 hrs.
Design, simulation, and construction of selected projects in digital signal processing (DSP). Review of legal, economic, and ethical issues. Oral presentations and written reports are required. Fulfills senior design requirement. Prerequisite: EE 383.

**INDUSTRIAL AND SYSTEMS ENGINEERING AND ENGINEERING MANAGEMENT**

Degree: Bachelor of Science in Engineering

Professors Rhoades, Schroer, Westbrook (Chair), Wyskida; Professor Emeritus Brown; Adjunct Professors Dorsett, Safie; Associate Professors Farrington, Messimer, Swain, Tippett; Associate Professor Emeritus Walker; Adjunct Associate Professor Thomas; Assistant Professors Componation, Utley; Adjunct Assistant Professors Evans, Fogle, Lovelace; Lecturers Cottingham, Gholston.

**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.

The department’s goals include:

- to be a highly ranked department on the basis of curricular excellence and size of student population
- to effectively and efficiently use distance learning delivery systems to reach students remote from the UAH campus
- to provide a high quality of support service to regional industries
- to provide a well-integrated curriculum which prepares students for the profession of industrial engineering, encourages lifelong learning, and meets the needs of employers.

125
The goals will be assessed by:

- surveying regional employers of the department’s students
- surveying graduates annually
- surveying distance learning students, graduates and employers annually
- comparing the department’s curricula with others in the region annually
- attempting to measure efforts against potential through continuous self-assessment reported annually.

**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>
</tr>
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<tbody>
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<td>CH 123, 126</td>
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**Industrial Engineering Option**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>CPE/EE 197</td>
<td>Computer Methods in Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MAE 198</td>
<td>Engineering Graphics</td>
<td>2</td>
</tr>
<tr>
<td>ISE 224</td>
<td>Introduction to Industrial &amp; Systems Engr</td>
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<td>ISE 340</td>
<td>Operations Research</td>
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<td>Mechanics of Materials</td>
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<tr>
<td>ISE/MAE 378</td>
<td>Materials and Manufacturing Processes</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

First Year

<table>
<thead>
<tr>
<th>Fall</th>
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<td>CH 121/125</td>
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Second Year

| ISE 224    | 3 | MA 244      | 3 |
| MA 201     | 4 | MA 324      | 3 |
| PH 111/114 | 4 | MAE 271     | 3 |
| HU/SS      | 3 | HU/SS       | 3 |
| HU/SS      | 3 | PH 112/115  | 4 |
|            | 17 |             | 16 |

Third Year

| ISE 321    | 3 | EE 300      | 3 |
| ISE 340    | 3 | Tech. Elect. | 3 |
| ISE 390    | 3 | ISE 391     | 3 |
| MAE 370    | 4 | ISE/MAE 378 | 3 |
| MAE 341    | 3 | HU/SS       | 3 |
|            | 16 |             | 15 |

Fourth Year

| ISE 424    | 3 | ISE 423     | 3 |
| ISE 428    | 3 | ISE 433     | 3 |
| ISE 430    | 3 | ISE 427     | 3 |
| ISE Elect. | 3 | ISE 429     | 3 |
| ISE 447    | 3 | Design Elect. | 3 |
|            | 15 |             | 18 |

Total Hours 130

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 exercises. Prerequisite: Senior standing. (Same as ISE 530.)

433 Production and Inventory Control Systems 3 hrs.
Inventory models including classical optimal economic order quantity models. Manufacturing Resource Planning (MRP) systems, master production scheduling, material requirements planning, capacity planning, and purchase order control. Prerequisite: ISE 390. (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.)
Selected Topics in ISE TBA
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/EE 197, ISE 391. (Same as ISE 547.)

MECHANICAL AND AEROSPACE ENGINEERING

Degree: Bachelor of Science in Engineering

Eminent Scholar Coleman; Distinguished Professors Chung, Wu; Professors Emeriti Harwell, Shih; Professors Cost, Gilbert, Hawk, Karr (chair), Musielak, Wallace, Wessling; Associate Professor Emeritus Thompson; Associate Professors Bower, Frederick, Hampton, Landrum; Assistant Professor Emeritus Thompson; 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 Department is to educate men and women in the profession of mechanical and aerospace engineering. The department is dedicated to excellence in teaching, research, and service. The department capitalizes on its position in Huntsville’s center of advanced mechanical and aerospace engineering research to provide unique opportunities and creative programs for faculty, students, and the community. The department is committed to maintaining a faculty of international recognition in a well-equipped facility which provides an environment that facilitates intellectual, personal and professional growth. The department 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. The department through its B.S.E., M.S.E. and Ph.D. graduates and its programs contributes to economic advancement and the quality of life in the region, state, and nation.

Department Goals

Development of Academic Programs

1. The department will provide undergraduate and graduate education in mechanical and aerospace engineering for a student body of diverse ethnic and cultural origin and for traditional and non-traditional students. Graduation numbers will be reported annually along with data on ethnic and cultural origin.

2. The department will strive to achieve the maximum obtainable accreditation from ABET for all its undergraduate programs. The accreditation status of all programs offered by the MAE Department will be reported annually.
3. The department will maintain strong undergraduate and graduate programs which graduate an average of 50 B.S.E., 25 M.S.E., and 5 Ph.D. students per year. The graduation of B.S.E., M.S.E., and Ph.D. students will be reported annually.

4. The department will strive to have its academic programs fully funded from state appropriations. The degree to which the academic program is fully funded will be reported annually.

5. The department will provide superior quality instruction. The quality of instruction will be measured in every course through the university administered student evaluation of instruction forms.

Development of Research

6. The department will maintain national recognition for research in selected areas of mechanical and aerospace engineering. The annual report of the department will include a listing of all research publications and presentations at national meetings for all faculty.

7. The department faculty will develop research programs that attract external funding which enables 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. The annual report for the department will include a listing of all externally funded research for all faculty.

8. The department will provide leadership and encourage partnerships to further cooperation among the department and UAH research centers, other UAH departments, the community, industry, and government through its instructional, research and service programs. The annual report of the department will include a listing of all center interactions, inter-departmental interactions, and community-industrial-governmental interactions for each faculty member.

9. The department will improve service to the UAH local community and strive to develop local support for its programs of instruction and research. The service of each faculty member will be listed in the annual report. All support from the community for the instruction and research of the faculty will be acknowledged in the annual report of the department.

Improving National Visibility

10. The department will augment and develop programs of space-related instruction, research, and service that will enable it to achieve national recognition as a leading Mechanical and Aerospace Engineering Department in direct support of UAH’s designation as a Space Grant University. The annual report of the department will include a listing of all programs of space-related instruction, research, and service.

11. The department will use national standards of excellence in evaluating its programs, faculty, and staff. The programs, faculty, and staff of the department are to be evaluated periodically through the ABET and SACS accreditation process.

Student Development

12. Each student will receive academic advising from full-time faculty in the department. All students are assigned advisors from the full-time faculty and the student files contain a record of each advisement session. The assignments are listed in the faculty annual report.
13. The department will support and foster student organizations that enhance and enrich the student life in the department. The support of student organizations will be summarized in the department annual report.

14. The department will strive to maximize student retention. The retention of students will be monitored and reported annually.

15. The department will increase the opportunities for informal student-faculty interaction. The annual report of the department will list all student-faculty interactions for the year.

Facilities Development

16. The department will improve its instructional laboratories. The improvements will be recorded annually in the department report.

Faculty Development

17. The department will strive to enhance the national and international reputations of its faculty. The annual report will list all faculty development activities which enhance the national and international reputations of the faculty.

Additional Basic Sciences

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Mechanical Engineering Option

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<td>MAE 198 - Engineering Graphics</td>
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<tr>
<td>MAE/CHE 295 - Nature &amp; Properties of Materials Lab</td>
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<tr>
<td>MAE 311 - Principles of Measurement &amp; Instrumentation</td>
<td>3</td>
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<tr>
<td>MAE 341 - Thermodynamics I</td>
<td>3</td>
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<td>MAE 342 - 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/CE 362 - Dynamics</td>
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<td>MAE 364 - Kinematics &amp; Dynamics of Machines</td>
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<tr>
<td>MAE/CE 370 - Mechanics of Materials</td>
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<td>MAE/ISE 378 - Materials and Manufacturing Processes</td>
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<td>MAE 396 - Numerical Methods and Computations</td>
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<tr>
<td>MAE/CHE 442 - Introduction to Heat and Mass Transfer</td>
<td>4</td>
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<td>MAE 446 - Design of Thermal Systems</td>
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<td>MAE 454 - Fluid Mechanics II</td>
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<td>MAE 455 - Fluid Mechanics Lab</td>
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<td>MAE 465 - Engineering Design</td>
<td>3</td>
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<td>MAE 466 - Mechanics and Design of Machine Elements</td>
<td>3</td>
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<td>MAE 488 - Analysis of Engineering Systems</td>
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<td>MAE 493 - Introduction to Engineering Design</td>
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<tr>
<td>*Technical Electives</td>
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*MAE courses at level 300 or above or other upper level courses approved by the Department.

Students applying for graduation in the mechanical engineering option must show evidence of having taken the Fundamentals of Engineering (FE) Examination. The exam is offered by the State of Alabama Board of Registration for Professional Engineers, 750 Washington Ave.,
Montgomery, AL 36130-1001. Phone: (256) 261-5568. Contact the College of Engineering Student Affairs Office for further information.

### Suggested Schedule of Courses for Full-time Mechanical Engineering Students

#### First Year

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#### Second Year

| Second Year | MA 201 4 | MA 324 3 |
|            | HU/SS* 3 | ISE 321 3 |
|            | MAE 271 3 | MAE 362 3 |
|            | EE 197 3 | MAE 294/295 4 |
|            | PH 112/115 4 | MA 244 3   |
|            | 17         | 16         |

#### Third Year

| Third Year | MAE 341 3 | MAE 342 3 |
|           | MAE 370 4 | MAE 352 3 |
|           | MAE 396 2 | MAE 378 3 |
|           | EE 300 3  | MAE 311 3 |
|           | HU/SS* 3  | MAE 364 4 |
|           | HU/SS* 3  | 18         |

#### Fourth Year

| Fourth Year | MAE 442 4 | MAE 446 3 |
|            | MAE 454 3 | MAE 465 3 |
|            | MAE 466 3 | MAE 488 3 |
|            | MAE 493 2 | TechElec 3 |
|            | HU/SS* 3  | TechElec 3 |
|            |           | Total Hours 18 |
|            |           | 33 |

*Hu/SS: 18 hours in humanities/social sciences

### 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.

Total Hours 134
Aerospace Engineering Concentration

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<td>Principles of Measurement &amp; Instrumentation</td>
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<td>Mechanics of Materials</td>
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<td>MAE 371</td>
<td>Aerospace Structures</td>
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<td>Aerospace Structures Lab</td>
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<td>MAE 396</td>
<td>Numerical Methods &amp; Computations</td>
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<td>Introduction to Heat &amp; Mass Transfer</td>
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<td>MAE 497</td>
<td>Aerospace Engineering Senior Project</td>
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<td>*MAE courses at 300-level or above, or other upper level courses approved by the department.</td>
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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) 261-5568. Contact the College of Engineering Student Affairs Office, EB 157, for further information.

Suggested Tentative Schedule of Courses for Full-Time
MAE/Aerospace Engineering Concentration

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### Third Year

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### Fourth Year

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Total Hours: 134

*HU/SS* - 18 hours in humanities/social sciences.

### Undergraduate Mechanical and Aerospace Engineering Courses (MAE)

#### 198 Engineering Graphics
2 hrs.
Principles of engineering graphical expression: sketching, instrument drawing, orthographic projections. Descriptive geometry problems involving locations, relationships of points, lines, areas, and bodies, and intersection of surfaces. Dimensioning for production, pictorial design, vector geometry, and monographs.

#### 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 or parallel MA 201, PH 111. (Same as CE 271).

#### 294 Nature and Properties of Materials
3 hrs.
Introduction to structure, composition, and properties of solid materials such as metals, polymers, ceramics, semiconductors, and composites. Crystalline, glassy, and amorphous materials; defects and microstructure. Pure materials, alloys, mixtures, and compounds, including phase diagrams. Mechanical properties such as stress-strain behavior, hardness, and fatigue; corrosion properties; electrical properties. Prerequisites: CH 121, PH 111. (Same as CHE 294.)

#### 295 Nature and Properties of Materials Laboratory
1 hr.
Typical experiments include microstructure, stress-strain phase diagrams, corrosion, and resistivity. Emphasis is placed on written reports for each lab experiment. Students apply uncertainty analysis to the experimental results using principles from probability and statistics. Prerequisite or parallel: MAE 294. (Same as CHE 295.)

#### 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
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.

342 Thermodynamics II
Continuation of ME 341. Thermodynamic cycles, thermodynamic relations among properties, chemical reactions, and phase and chemical equilibrium. Prerequisite: MAE 341.

352 Fluid Mechanics I
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. Prerequisite: MA 324. (Same as CHE 352.)

362 Dynamics
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: MAE/CE 271 (Same as CE 362.)

364 Kinematics and Dynamics of Machines
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/CE 362.

370 Mechanics of Materials
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: MAE/CE 271. (Same as CE 370.)

371 Aerospace Structures
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.

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 362, 370.

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 Intergraph CAD systems. Laboratory projects. Prerequisite: MAE 198, MAE/CE 271.
Numerical Methods and Computation 2 hrs.
Numerical techniques associated with complex problems. Evaluation of functions, finding roots of equations, solution of simultaneous algebraic and differential equations. Use of computers. Prerequisites: EE 197, MA 244, and prerequisite or parallel MA 324.

Selected Topics in Mechanical Engineering TBA

Introduction to Heat and Mass Transfer 4 hrs.
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.)

Analysis and Design of HVAC Systems 3 hrs.
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.)

Aerospace Propulsion 3 hrs.
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.

Design of Thermal Systems 3 hrs.
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; MAE 493 recommended.

Energy Conversion and Power Generation I 3 hrs.
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.)

Atmospheric Fluid Dynamics 3 hrs.
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.)

Experimental Techniques in Fluid Mechanics 3 hrs.
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.)

Propulsion Laboratory 1 hr.
Experimental investigation of the performance of various aerospace propulsion systems. Prerequisite: Concurrent registration in MAE 445.

Fluid Mechanics II 2 hrs.
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.
455 Fluid Mechanics Laboratory 1 hr.
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. (Same as CHE 455.)

456 Aerodynamics Laboratory 1 hr.
Experimental investigation of airfoils and other bodies in subsonic flow. Pressure distributions, boundary layer studies, and vortex formation. Computer simulations. Prerequisite: MAE 342, 454.

457 Fundamentals of Aerodynamics 3 hrs.
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, 454. (Same as MAE 557/457.)

459 Selected Topics in Engineering TBA

461 Vibrations of Elastic Systems 3 hrs.
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.)

464 Aerospace Design 3 hrs.
Senior design project. Prerequisite: MAE 493 or equivalent, senior standing and permission of instructor.

465 Mechanical Engineering Design 3 hrs.
Senior design project. Prerequisites: MAE 493 or equivalent, senior standing, and permission of instructor.

466 Mechanics and Design of Machine Elements 3 hrs.
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 198, 364, MAE/CE 370.

468 Spacecraft Dynamics 3 hrs.
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.

470 Mechanics of Materials II 3 hrs.

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, 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 4 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.
Mathematical modeling of physical systems and determining their dynamic response. Mechanical, electrical, electromechanical, heat transfer, fluid-mechanical, and other engineering problems. Prerequisite: MAE 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 TBA

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 TBA

Optical Engineering Option
The Department of Electrical and Computer Engineering administers the 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. Two routes are available, one based on the electrical engineering program and accredited as an electrical engineering program (Route A) and one based on the mechanical engineering program (Route B). These routes are described below.
Mission

The optical engineering program in the Department of Electrical and Computer Engineering is dedicated to developing optical engineers with strong electrical 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 Success Criteria

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. Success will be monitored through annual department reports. The program’s goal is to have 75 full-time students within five years.

3. Continue to improve the national ranking and visibility of the optical engineering program. Success will be measured by graduates’ marketability, research contract and grant funding, and the average funding level of the full-time faculty.

Optical Engineering Option

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<thead>
<tr>
<th>Additional Basic Sciences</th>
<th>Semester Hours</th>
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<td>PH 113 - General Physics with Calculus III</td>
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<th>Optical Engineering Core</th>
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<tr>
<td>CPE/EE 197 - Computer Methods in Engineering</td>
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<tr>
<td>EE 307 - Electricity and Magnetism</td>
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<td>EE 313 - Electrical Circuits II</td>
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<td>OPE 453 - Laser Systems</td>
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<td>OPE 459 - Optical Engineering Design</td>
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<td>OPT 341 - Geometrical Optics</td>
<td>3</td>
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<td>OPT 342 - Physical Optics</td>
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<td>OPT 411 - Geometrical Optics Lab</td>
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<th>Route A (EE)</th>
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<td>Total Route B</td>
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*Courses at 300-level or above, approved by optical engineering advisor

Total optical engineering course requirements, Route A, 133; Route B, 138.
Suggested Schedule of Courses for Full-time Optical Engineering Students (Route A)

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*HU/SS - 18 hours in humanities/social sciences

Suggested Schedule of Courses for Full-time Optical Engineering Students (Route B)

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140
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, PH 441 and OPT 441.)

3 hrs.

442 Interference and Diffraction

3 hrs.

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.)

3 hrs.

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.)

3 hrs.

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.)

3 hrs.

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 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, 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

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 personal and intellectual development of students and to assist them in preparing for successful careers. These programs emphasize the development of communication skills, patterns of critical thinking, and problem solving capabilities. They contribute to the development of an understanding of the relationships among people, and between human beings and the elements of the physical and biological world.

The arts and the humanities, encompassing art, history, languages and literatures, music, and philosophy, lead to an understanding and appreciation of life as humankind has perceived it and as individuals have lived it. This study leads to a heightened critical faculty and a greater ability to use, evaluate and appreciate values and ideas; to the ability to be more effective in utilizing language; and to the cultivation of taste. 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. Each student must file an official Program of Study no later than the close of the sophomore year. This 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 and international trade, French, German, history, music, (emphases on studio music education, or music hardware and software), philosophy, political science, psychology, Slavic studies, sociology, or Spanish. With the exception of elementary education, and Slavic studies, minors are available in the disciplines listed in the previous sentence. Minors are also available in classical studies, women's studies, air force studies, and Russian. In addition to these majors and minors, courses are offered in linguistics, physical education, and statistics. 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.
2. An approved cognate area from two 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.

Requirements for Programs of Study Leading to the B.A. Degree

General Education Requirements for B.A. Degree

(Student seeking teacher certification: additional requirements and modification of requirements are indicated in italics.)

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<thead>
<tr>
<th>Requirement</th>
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<tr>
<td>English Composition: EH 101-102.</td>
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<tr>
<td>(Students in the Honors Program may substitute EH 105H)</td>
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<tr>
<td>Humanities and Fine Arts</td>
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<td>(No more than 6 hours may be taken in any single discipline)</td>
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<tr>
<td>3 hours fine arts: ARH 100, 101, ARS 160, CM 122, MU 100</td>
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<tr>
<td>6 hours literature: EH 205-206, 205-241, 205-230, 240-206, 240-241, 250-251</td>
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<tr>
<td>6 hours humanities and fine arts: ARH 100, 101, ARS 160, CM 122, FH 202,</td>
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<tr>
<td>GN 202, JE 202, LN 202, MU 100, PHL 101, 202, RN 202, SH 202, WS 200</td>
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<tr>
<td>(Exception for students seeking teaching certification: CM 113 must be</td>
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<td>completed in lieu of one course in this area.)</td>
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<tr>
<td>9-10 hours foreign language and literature (through 201; course dependent on</td>
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<tr>
<td>placement)</td>
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<tr>
<td>Natural Science and Mathematics</td>
<td>11</td>
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<tr>
<td>8 hours science: Courses which count will depend on which courses have been</td>
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<tr>
<td>approved by the state, but a likely list from UAH offerings includes: AST</td>
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<tr>
<td>106, AST 107, BYS 119, BYS 120, BYS 214, CH 101, CH 105, CH 113, CH 121,</td>
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<tr>
<td>CH 123, CH 126, CH 127, MS 202, PH 100, PH 101, PH 102, PH 106, PH 107,</td>
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<tr>
<td>PH 111, PH 112, PH 114, PH 115.</td>
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<tr>
<td>3 hours mathematics: Level I: MA 119, Level II: MA 121, 143, Level III: MA 171</td>
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<tr>
<td>(See advisor for appropriate course.)</td>
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<tr>
<td>(Additional requirements for students seeking teaching certification:</td>
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<tr>
<td>Elementary education majors must complete 4 courses in science and 3 courses</td>
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<td>in mathematics to meet State Department of Education requirements.)</td>
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144
History, Social and Behavioral Sciences ................................................. 18
(No more than 6 hours may be taken in any single discipline.)
6 hours history: HY 101, HY 102
12 hours social science: ECN 142, ECN 143, PSC 101, PSC 102, PSC 260,
PY 101, SOC 100, SOC 200

Additional requirements for students seeking teacher certification ........ 4-6
HPE 294 plus 2 additional activity courses

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 and Foreign Language Departments for exceptions.

In lieu of a minor, students may choose a minimum of 21 semester hours in cognate studies
drawn from two closely related disciplines. A minimum of 12 hours must be 300 level of 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 communication arts, 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: MA 105 or 119. Lab Fee: Level 4.

Art and Art History Department

Professors Crouse, Dasher (Chair); 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 studies.

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 (24 hours)
1. Art Studio Requirements
ARS 120—Two-Dimensional Design 3 hrs.
ARS 121—Color in Design 3 hrs.
ARS 140—Three-Dimensional Design 3 hrs.
ARS 160—Introduction to Drawing 3 hrs.
ARS 260-Intermediate Drawing 3 hrs.

2. Art History Courses
ARH 100—Art History Survey: Ancient to Medieval 3 hrs.
ARH 101—Art History Survey: Renaissance to Modern 3 hrs.
ARH 201—Contemporary Art and Issues 3 hrs.

Note: There are no prerequisites for ARH 100 and 101, ARS 120, 121, 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 five courses in an individual area.
Graphic Design—ARS 330, 331, 332, 430, 431
Painting/Drawing—ARS 375, 376, 377, 360, 475, 476, 477
Printmaking—ARS 380, 381, 383, 480, 481, 483
Photography—ARS 350, 352, 353, 452, 453
Sculpture—ARS 340, 341, 342, 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:** 400-level courses are to be taken only after successful completion of the appropriate 300-level courses.

ARS 330 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 330 and 331. Most other 300-level ARS courses need not be taken in sequence.

### C. Total Number of Hours
- 48 semester hours within the Department of Art and Art History
- 45 hours if ARH 100 or 101 is applied to the fine arts GER
- 39 hours when ARH 100, 101 and 201 are part of an art history minor
- 42 hours if ARH 100 and 101 are included in an art history cognate

## II. The Art History Discipline

### A. Lower Division Requirements (18 hours)

1. **Art History Courses**
   - ARH 100-Art History Survey: Ancient to Medieval 3 hrs.
   - ARH 101-Art History Survey: Renaissance to Modern 3 hrs.
   - ARH 201-Contemporary Art and Issues 3 hrs.

2. **Art Studio Courses**
   - Any three 100-level foundation courses 9 hrs.

### B. Upper Division Requirements (24 hours)

1. **Art History Courses**
   - Seven courses at the 300-level or above. 21 hrs.

2. **Art Studio Courses**
   - One 300-level course, selected in consultation with advisor 3 hrs.

   (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 department chair.)

### C. Total Number of Hours
- 42 semester hours with the Department of Art and Art History
- 39 hours if ARH 100 or 101 is applied to the fine arts GER

## 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 (24 hours)

1. Art Studio Courses
   ARS 120-Two-Dimensional Design 3 hrs.
   ARS 121-Color in Design 3 hrs.
   ARS 140-Three-Dimensional Design 3 hrs.
   ARS 160-Introduction to Drawing 3 hrs.
   ARS 260-Intermediate Drawing 3 hrs.

2. Art History Courses
   ARH 100-Art History Survey: Ancient to Medieval 3 hrs.
   ARH 101-Art History Survey: Renaissance to Modern 3 hrs.
   ARH 201-Contemporary Art and Issues 3 hrs.

B. Upper Division Requirements (27 hours)

1. Art Studio Courses
   Choose two:
   - Painting/Drawing-ARS 360, 375,376,377 6 hrs.
   Choose two:
   - Printmaking/Graphic Design-ARS 330,380,381,383 6 hrs.
   Choose two:
   - Sculpture-ARS 340,341,342,346 6 hrs.
   Photography-ARS 350 3 hrs.

2. Art History Courses
   One 300-level history of art before 1800 3 hrs.
   One 300-level history of art after 1800 3 hrs.

C. Total Number of Hours
   51 semester hours with the Department of Art and Art History

Note 1: General education requirements for certification differ from those of the preceding programs. Students should consult the catalog description listed under the Education Department for course requirements and other relevant program information.

Note 2: An art education exit examination/presentation is required for all students in the studio major with teacher certification program. Contact the Department of Art and Art History to schedule the exit examination/presentation prior to the last semester.

Minors and Cognate Studies Programs

1. Art History Minor
   21 semester hours within the Department of Art and Art History
   18 hours if ARH 100 or 101 is applied to the fine arts GER
   ARH 100 and ARH 101-Art History Surveys 6 hrs.
   ARH 201-Contemporary Art and Issues 3 hrs.
   One 300-level history of art before 1800 3 hrs.
   One 300-level history of art 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
   18 hours if ARH 100 or 101 is 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 ARH 100 or 101 is applied to the fine arts GER.
One 100-level ARH survey 3 hrs.
Two 100-level studio foundation 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
Choose three:
ARS 120, 121, 140, 160, 260-Studio foundation courses 9 hrs.
Choose four:
ARS 375, 376-Painting
ARS 380, 383-Printmaking
ARS 340-346-Sculpture
ARS 350-Photography 12 hrs.

Note 1: An art education exit examination/presentation is required for elementary education majors with art as a second area of study. Contact the Department of Art and Art History to 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.

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.

120 Two-Dimensional Form in Design 3 hrs.
Introduction to the elements and principles of two-dimensional design. Studio work exploring form and intuitive theories of composition. Lab Fee: $30.

121 The Study of Color in Design 3 hrs.
Physiological, psychological, and physical properties of color with studio work in subjective and objective uses 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 life, 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. Nude models may be used. 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.
260 Intermediate Drawing 3 hrs.
Further development of drawing skills and individual expression through the study and practice of selected drawing approaches. Prerequisites: ARS 120, 121, and 160. 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.

330 Graphic Design I 3 hrs.
Introduction to the tools, techniques, theories, and practices of graphic design. Emphasis is placed on visual and conceptual problem solving from a formalized and process oriented approach. Prerequisites: All lower division foundation requirements or approval of instructors. Lab Fee: $30.

331 Graphic Design II 3 hrs.
Continuation of ARS 330 plus an introduction to both production techniques and solutions. Included are the beginnings of computer assisted layout techniques using Adobe Pagemaker. Prerequisite: ARS 330 or approval of instructor. Lab Fee: $30.

332 Graphic Design III 3 hrs.
Layout and design on the Macintosh- computer using Quark XPress-. Problems include the experience of designing newsletters, brochures, ads, letterheads, resumes, and business cards for a client. Prerequisite: ARS 331 or approval of the 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: None. Art majors and minors must have completed all lower division foundation requirements. 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: None. Art major and minors must have completed all lower division foundation requirements. 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: None. Art majors and minors must have completed all lower division foundation requirements. Lab Fee: $30.

346 Sculpture: Figure Modeling 3 hrs.
Human form through direct clay modeling from life including anatomical studies, armature construction, mold making and casting. Prerequisite: None. Art majors and minors must have completed all lower division foundation requirements. Lab Fee: $30.

350 Basic Photography 3 hrs.
Understanding and practice of photography through its use as a fine art medium. Introduction to camera use and darkroom techniques. Students will be required to provide their own 35mm. camera. Prerequisite: None. Art majors and minors must have completed all lower division foundation requirements. 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 350 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 350 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 and completion of all lower division foundation requirements. 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: None. Art majors and minors must have completed all lower division foundation requirements. 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: None. Art majors and minors must have completed all lower division foundation requirements. 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: None. Art majors and minors must have completed all lower division foundation requirements. Lab Fee: $30.

380 **Printmaking: Intaglio** 3 hrs.
Beginning studio practice in etching, engraving, aquatint, photo-etching and dry-point. Prerequisite: None. Art majors and minors must have completed all lower division foundation requirements. Lab Fee: $30.

381 **Printmaking: Lithography** 3 hrs.
Beginning studio practice in autographic and photographic lithography processes utilizing aluminum plate and stone. Prerequisite: None. Art majors and minors must have completed all lower division foundation requirements. Lab Fee: $30.

383 **Printmaking: Screenprinting** 3 hrs.
Investigation of silkscreen processes, including autographic and photographic methods. Prerequisite: None. Art majors and minors must have completed all lower division foundation requirements. 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.
Designing both graphics and illustrations using both Adobe Illustrator- and an introduction to designing electronic fonts using Alsys Fontographer-. Prerequisite: ARS 331 or approval of the instructor. Lab Fee: $30.

431 **Advanced Graphic Design II** 3 hrs.
Using Adobe Photoshop_ as a tool for both for illustration and for pre-press work, plus an introduction to Fractal Design's Painter_ to make illustrations. Also included: final portfolio work. Prerequisite: ARS 331 or approval of the instructor. Lab Fee: $30.
440  **Advanced Sculpture: Assemblage**  
Continued exploration of assemblage processes. Prerequisites: ARS 340 and approval of instructor. Lab Fee: $30.

441  **Advanced Sculpture: Carving**  
Continued exploration of subtractive processes. Prerequisites: ARS 341 and approval of instructor. Lab Fee: $30.

442  **Advanced Sculpture: Casting**  
Continued exploration of casting and foundry processes. Prerequisites: ARS 342 and approval of instructor. Lab Fee: $30.

452  **Advanced Photography: Non-silver**  
Continued exploration of non-silver photographic processes. Prerequisites: ARS 352 and approval of instructor. Lab Fee: $30.

453  **Advanced Photography: Black/White and Color**  
Continued exploration of fine art photography. Prerequisites: ARS 353 and approval of instructor. Lab Fee: $30.

475  **Advanced Painting: Traditional Approaches**  
Continued exploration of oil painting processes. Prerequisites: ARS 375 and approval of instructor. Lab Fee: $30.

476  **Advanced Painting: Contemporary Approaches**  
Continued exploration of contemporary painting approaches. Prerequisites: ARS 376 and approval of instructor. Lab Fee: $30.

477  **Advanced Painting: Mixed Media**  
Continued exploration of mixed and non-traditional media. Prerequisites: ARS 377 and approval of instructor. Lab Fee: $30.

480  **Advanced Printmaking: Intaglio**  
Continued exploration of intaglio processes. Prerequisites: ARS 380 and approval of instructor. Lab Fee: $30.

481  **Advanced Printmaking: Lithography**  
Continued exploration of lithographic processes. Prerequisites: ARS 381 and approval of instructor. Lab Fee: $30.

483  **Advanced Printmaking: Screenprinting**  
Continued exploration of silkscreen processes. Prerequisites: ARS 383 and approval of instructor. Lab Fee: $30.

493  **Advanced Multi-Media**  
Continued exploration of multi-media art works. Prerequisites: ARS 393 and approval of instructor. Lab Fee: $30.

495  **Technical Problems**  
Technical problems in studio disciplines for which advanced courses are not available. May be repeated for a total of six hours credit. Prerequisite: 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**  
Survey of the major works of art and architecture produced in the Near East, Egypt, and Europe from the Paleolithic period to the end of the Middle Ages, within the contexts of the cultures which created them.

101  **Art History Survey: Renaissance to Modern**  
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.
201 Contemporary Art & 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.

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: None. Art majors and minors must have completed ARH 100, 101, 201.

302 Art of the Medieval World, to AD 1000 3 hrs.
The formation of medieval visual culture in western and Byzantine Europe during the early middle ages, studied through examples of art and architecture. Special attention to historic, religious, and social contexts. Prerequisite: None. Art majors and minors must have completed ARH 100, 101, 201.

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: None. Art majors and minors must have completed ARH 100, 101, 201.

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: None. Art majors and minors must have completed ARH 100, 101, 201.

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: None. Art majors and minors must have completed ARH 100, 101, 201.

306 Baroque 3 hrs.
Development of Baroque art in Europe. The art and architecture of this period will be examined through the works of Borromini, Bernini, Gentileschi, Rubens, Rembrandt, Leyster, Velasquez, and Poussin. Prerequisite: None. Art majors and minors must have completed ARH 100, 101, 201.

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: None. Art majors and minors must have completed ARH 100, 101, 201.

308 Art of the Medieval World, AD 1000-1400 3 hrs.
Art and architecture of western Europe during the last four centuries of the middle ages in their historic, social, political, and religious context. Prerequisite: None. Art majors and minors must have completed ARH 100, 101, 201.
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: None. Art majors and minors must have completed ARH 100, 101, 201.

320 Special Topics in Art History  3 hrs.
Special topics on periods of art history selected from ancient to contemporary as offered. Prerequisite: None. Art majors and minors must have completed ARH 100, 101, 201.

400 Art History Seminar  3 hrs.
Directed study for the development of a scholarly research paper on special topics in art history as offered. Prerequisites: 12 semester hours of upper division ARH courses or approval of instructor.

500 Special Problems in Art History  3 hrs.
Directed reading and research. Prerequisites: 12 semester hours of upper division ARH courses and approval of instructor.

Communication Arts Department

Associate Professors James, Rountree (Chair); Assistant Professors Bell, Smith; Lecturer Langford.

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 wishing to major in communication arts should make that declaration at or before the beginning of the sophomore year, and schedule a meeting with the chair of Communication Arts after filing the appropriate forms in the Office of Student Records. Students need to work closely with a faculty advisor to plan a program of study.

A major in communication arts consists of either 30 or 36 hours of coursework within the department, at least 18 or 21 hours of which (respectively) 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 310 Persuasion or CM 315 Argumentation and Debate
CM 331 Communication Theory (AHS 300 is a prerequisite)
CM 431 Senior Seminar in Communication Theory and Research
12 hours of electives from CM or other approved courses in an allied discipline

Technical Communications Track
CM 301 Technical Writing
CM 302 Technical Editing
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: 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 from an allied discipline

Those choosing a minor emphasizing technical communication should elect to take CM 301, 302, 320, and one approved technical course.

Communication Arts (CM)
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. (Does not satisfy College of Engineering HU/SS requirement.)

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 re-writing 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 EHT 302.)

305 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.

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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>322</td>
<td>Theater History I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Explores the development of theater art from its origins to French neoclassicism and Moliere with particular emphasis on the Greeks, Shakespeare, and his contemporaries.</td>
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</tr>
<tr>
<td>323</td>
<td>Theater History II</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Traces the development of world theater from French neoclassicism to contemporary drama with emphasis on changes in the twentieth century.</td>
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<tr>
<td>330</td>
<td>Psychology of Nonverbal Communication</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>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.)</td>
<td></td>
</tr>
<tr>
<td>331</td>
<td>Communication Theory</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Review and criticism of the major approaches to communication and the major theories that have been devised by scholars to examine the processes and effects of human communication. Prerequisites: AHS 300 and 12 hrs. CM. Offered Fall semester.</td>
<td></td>
</tr>
<tr>
<td>334</td>
<td>History of American Cinema</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>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.</td>
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<tr>
<td>340</td>
<td>Special Topics in Communication Arts</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Topics announced in advance. Representative topics include Women and Minorities in Media, Intercultural Communication, Rhetorical Criticism, and Communication and Gender. May be repeated twice for credit.</td>
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<tr>
<td>350</td>
<td>Organizational Communication</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Investigation of formal and informal communication in organizations, with emphasis on the relational and cultural forces affecting communication in corporations and government agencies.</td>
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<tr>
<td>400</td>
<td>Internship</td>
<td>1-6 hrs.</td>
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<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>410</td>
<td>Political Communication</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
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<tr>
<td>415</td>
<td>Contemporary American Public Address</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
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<tr>
<td>416</td>
<td>Women Orators</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
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<tr>
<td>431</td>
<td>Senior Seminar in Communication Theory and Research</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Research and public presentation of original work demonstrating the ability to carry out a complete scholarly project. Prerequisites: 15 hours of CM including 331, senior standing. Offered spring semester.</td>
<td></td>
</tr>
<tr>
<td>450</td>
<td>Studies in Organizational Communication</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>
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.)

Education Department

Associate Professors Brindley, Johnson, Piersma (chair), Spor; Assistant Professors Carroll, Cound, Enger, Harwell.

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 committed 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 and a Computer Education Laboratory in Morton Hall 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 inservice 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 (N-12)
- Elementary Education (1-6)
- Secondary/High School Education (7-12) with majors in biology, chemistry, English-language arts, French, general science, German, history, mathematics, physics, Russian, social science, and Spanish
- Music Education (N-12)

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 PLANNING AND PLACEMENT

The Office of Career Planning and Placement, located in the University Center, 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 Office of Career Planning and Placement 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 from the State Department of Education 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 from the State Department of Education. 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 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 and Enrollment in 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 may not have accumulated more than 12 semester hours of coursework in education before they are admitted to the TEP. Special permission may be requested from the department chair to take courses beyond the 12 hour limit. 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 after completion of at least 60 hours including 48 semester hours in the general education requirements.
2. Maintain a cumulative grade point average of 2.5 on all work attempted.
3. Achieve a passing score on the Alabama Basic Skills Test.
4. Pass ED 300 - Introduction to Education, which "shall include a minimum of 5 days of full-time structured field experience designed to meet specific objectives and related to one or more professional education courses."
5. Successfully complete (with a grade of "C" or higher) ED 305, 306, 308 or equivalent courses.
6. Submit a written summary of applicant's strengths and weaknesses.
7. Complete a satisfactory interview(s) with faculty advisor in the Department of Education.

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 2.5 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 2.5 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 2.5 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.

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. Students enrolling for an internship should not expect to be enrolled in other courses while interning. Applications for the internship are available in the department office. Students may apply for the internship according to the following deadlines:

- January 30 for Fall semester internship
- June 30 for Spring semester internship

Admission Criteria.

1. Acceptance into the Teacher Education Program, including a completed Program of Study.
2. A minimum grade point average of 2.5.
3. A minimum grade point average of 2.5 on all work attempted in each teaching field(s)
4. A minimum grade point average of 2.5 in all work attempted in professional education courses, with no grade lower than "C"
5. Satisfactory completion of all appropriate General Education Requirements,
6. Satisfactory completion of 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 301, 305, 306, 308, 360, 374, 375, 371 or 400, 372 or 373, and 593. 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 301, 305, 306, 308, 388, 408, 414 or 415, 410, and 593. ED 490 is to be taken concurrently with student teaching.

7. A passing score on Part I of the comprehensive exit examination. Part I - Foundation Knowledge examination covers concepts associate 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, 593). A score of 70% or better is considered passing. Students who fail to meet that standard 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 quality of the internship experience and of the supervision provided by the cooperating teacher. All internship placements are in the Huntsville-Madison County area, in order to facilitate supervision of students by UAH faculty. Elementary Education students must complete a lower and upper grade assignment during the 15-week internship. Secondary Education students will complete a middle and a high school assignment during the 15-week internship.

Professional Licensure (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 a 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.

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.

Applicants for certification will be required to obtain background clearance through a fingerprinting review conducted by the Alabama Bureau of Investigation (ABI) after July 1, 1997. 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.

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.

**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.

**General Education Requirements (B.A.)**

B.A. programs are available for the following certification programs: art, biology, elementary education, English-language arts, French, general science, German, history, mathematics, music, Russian, social science, and Spanish.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours</th>
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<tbody>
<tr>
<td>English Composition (EH 101 and EH 102)</td>
<td>6</td>
</tr>
<tr>
<td>or EH 105-Honors English Seminar (permission required)</td>
<td>3</td>
</tr>
<tr>
<td>Survey of Literature (EH 205-230, 240-241, or 250-251)</td>
<td>6</td>
</tr>
<tr>
<td>Foreign Language (two courses at 200 level or placement at that level)</td>
<td>6</td>
</tr>
<tr>
<td>Origin and Development of the Contemporary World (HY 101 and HY 102)</td>
<td>6</td>
</tr>
<tr>
<td>Fine Arts (ARH 100, 101, ARS 160, MU 100, 101, or CM 122)</td>
<td>3</td>
</tr>
<tr>
<td>Lower Division Humanities Course</td>
<td>3</td>
</tr>
<tr>
<td>Education students may select CM 113.</td>
<td></td>
</tr>
<tr>
<td>Upper Division Humanities or Fine Arts Elective.</td>
<td></td>
</tr>
<tr>
<td>Chosen from English (excluding EH 300, EH 301, and 302), history, philosophy, art, music, foreign languages (literature courses only), or communication arts (CM 309 or CM 322). Students may select a course from their humanities cognate.</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics.</td>
<td></td>
</tr>
<tr>
<td>Elem Ed.: (3 hours must be at Level II or above)</td>
<td>9</td>
</tr>
<tr>
<td>Sec. Ed.: Level II or above</td>
<td>3</td>
</tr>
<tr>
<td>Laboratory Science. Two courses in a single discipline and one course in a second laboratory science discipline. The choices must include some biological and some physical (BYS, AST, CH, PH, or ES)</td>
<td></td>
</tr>
<tr>
<td>Elementary education (four courses)</td>
<td>12-16</td>
</tr>
<tr>
<td>Secondary education (three courses)</td>
<td>12</td>
</tr>
<tr>
<td>Social Sciences.</td>
<td></td>
</tr>
<tr>
<td>PSC 101</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

163
Upper division social science elective.
   Chosen from political science, sociology, psychology or economics 3
Elementary education students may select a social science course from their
cognate.

Additional Requirements.
   HPE (HPE 294 plus 2 additional activity courses) 3

General Education Requirements (B.S.)

   English Composition (EH 101 and EH 102) 6
   or EH 105-Honors English Seminar (permission required) 3

   Survey of Literature (EH 205-230, 240-241, or 250-251) 6

Foreign Language and Communication Skills:
   (a) two semesters of foreign language at the 200 level, 6
   or
   (b) three courses in communication skills
      (CS 107 or CS 113; CM 113*; EH 301) 9
   *All education students must take CM 113.

   Origin and Development of the Contemporary World
      (HY 101 and HY 102) 6

   Fine Arts (ARH 100, 101, ARS 160, MU 100, 101, CM 122,
      PHL 101, 202, or 311) 6

Social and Behavioral Sciences:
   PSC 101 3
   Elective 3
   Upper division social science elective chosen from
   political science, sociology, psychology, and economics.
   Six of the nine hours must be taken in one discipline
   Mathematics. One course at Level III or above 3

Laboratory Science and Technical Studies:
   Note: Laboratory sciences are—astronomy, biological
   science, chemistry, environmental science, and physics.
      (a) Two courses in a single laboratory science,
      outside of major/minor, and 8
      (b) Coursework outside the major or the minor in any
      department or program (outside of major/minor) in the
      Colleges of Science and Engineering. The course work
      must include at least one laboratory science course. 7-8
   Note: Teacher education students must have within major/minor
   and/or general education requirements, work in both
   biological and physical sciences.
   HPE (HPE 294 plus 2 additional activity courses) 3-4

ELEMENTARY EDUCATION

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 cognate area of study.

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 qualified to teach in grades 1-6.

Course Requirements for an Elementary Education major:
General Education Requirements (See B.A. in education section of the catalog)

Program of Study—Elementary Education Major
ED 301 - Introduction to Education 0-1
ARS 215 - Art for Elementary Teachers 3
MUE 215 - Music for the Young Child 3
ED 215 - P.E. for the Elementary Teacher 3
ED 305 - Foundations of Education 3
ED 306 - Human Development 3
ED 308 - Educational Psychology 3
ED 309 - Group Processes 2
ED 350 - Technology in the Classroom 3
(Prerequisite to classes below: Admission to Teacher Education Program)
ED 360 - Diagnostic & Prescriptive Teaching 3
ED 372 - Teaching Elementary Social Studies 3
ED 373 - Teaching Elementary Science 3
ED 374 - Teaching Elementary Mathematics 3
ED 375 - Teaching Elementary Reading 3
ED 371 - Teaching Elementary Language Arts or
ED 400 - Literature for Children and Adolescents 3
ED 408 - Teaching Reading in the Content Area 3
ED 490 - Senior Seminar in Education 1
ED 493 - Elementary School Internship 9
ED 593 - Education of Exceptional Child & Youth 3

Cognate Area
A student planning to teach in an elementary field must select a cognate area consisting of 18 hours minimum (most are 21-24 hours) which must include 9-15 hours of courses at the 300-level or above. Available programs in the College of Liberal Arts are art, English, communication arts, history, French, German, Russian, Spanish, music, political science, psychology and sociology. Approved programs in the College of Science are biology, chemistry, mathematics and physics. Economics is offered in the College of Administrative Science. Other cognate fields may be approved by petitioning for special consideration.

SECONDARY/HIGH SCHOOL EDUCATION
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 counseling 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 qualified to teach in grades 7-12.

Course Requirements for Secondary Education Certification:
General Education Requirements (See B.A./B.S. in education section of the catalog.)

Program of Study—Secondary Education

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 301</td>
<td>Introduction to Education</td>
<td>0-1</td>
</tr>
<tr>
<td>ED 305</td>
<td>Foundations of Education</td>
<td>3</td>
</tr>
<tr>
<td>ED 306</td>
<td>Human Development</td>
<td>3</td>
</tr>
<tr>
<td>ED 308</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>ED 309</td>
<td>Group Processes</td>
<td>2</td>
</tr>
<tr>
<td>ED 350</td>
<td>Technology in the Classroom</td>
<td>3</td>
</tr>
</tbody>
</table>

(Prerequisite to classes below: Admission to Teacher Education Program)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 388</td>
<td>Teaching Middle and High School Subjects</td>
<td>2</td>
</tr>
<tr>
<td>ED 408</td>
<td>Reading in the Content Area</td>
<td>3</td>
</tr>
<tr>
<td>ED 410</td>
<td>Foundations of Educational Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>ED 414</td>
<td>Teaching Sec. Science and Math</td>
<td>2</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED 415</td>
<td>Teaching Sec. Human./Soc.Sci</td>
<td>2</td>
</tr>
<tr>
<td>ED 490</td>
<td>Senior Seminar in Education</td>
<td>1</td>
</tr>
<tr>
<td>ED 497</td>
<td>High School Internship</td>
<td>9</td>
</tr>
<tr>
<td>ED 593</td>
<td>Education of Exceptional Children &amp; Youth</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition to the above, the student is required to select one teaching field. Approved teaching fields are biology, chemistry, English-language arts, French, general science, German, history, mathematics, physics, Russian, social science, Spanish. Students may select a second teaching field if desired; however, they should be advised that this will delay the completion of their program.

The number of hours required varies from one teaching field to another. The student should seek advisement from the Education Department on this matter. The specific program of studies in the teaching field(s) will be developed with advisors from the teaching fields.

MIDDLE/JUNIOR HIGH SCHOOL ENDORSEMENT

Under the State of Alabama plan, there are five levels of certification of teachers, namely: N-3, 1-6, 4-8, 7-12, and N-12. UAH offers all options except N-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 1-6 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 (1-6 certification) must meet the following additional requirements: (1) ED 388 - Teaching Middle and High School Subjects, (2) ED 414 - Teaching Secondary Science & Mathematics or ED 415 - Teaching Secondary Humanities/Social Sciences, (3) cognate must be extended to 27-30 approved hours in a single subject area, (4) additional internship in grades 4-8.
For a person with high school certification, adding middle school endorsement would also permit teaching in grades 4-6 in the teaching field(s) for which the person has completed the requirements. Additional requirements for students enrolled in the high school program (7-12) 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.

**N-12 CERTIFICATION**

Programs are available in art and in music leading to Alabama Class B Certification for grades N-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.

**Course Requirements for an Art Major with Teacher Certification**

General Education Requirements (See B.A. in education section of the catalog.)

**Area of Concentration for Art Education**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARS 215 Art for the Elem. Teacher</td>
<td>3</td>
</tr>
<tr>
<td>ED 301 - Introduction to Education</td>
<td>0-1</td>
</tr>
<tr>
<td>ED 305 - Foundations of Education in U.S.</td>
<td>3</td>
</tr>
<tr>
<td>ED 306 - Human Development</td>
<td>3</td>
</tr>
<tr>
<td>ED 308 - Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>ED 309 - Group Processes</td>
<td>2</td>
</tr>
<tr>
<td>ED 388 - Teaching Middle &amp; High School Subjects</td>
<td>2</td>
</tr>
<tr>
<td>ED 408 - Teaching Reading in the Content Areas</td>
<td>3</td>
</tr>
<tr>
<td>ED 410 - Foundations of Educational Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>ED 415 - Teaching Soc. Humanities/Soc Sciences</td>
<td>2</td>
</tr>
<tr>
<td>ED 490 - Senior Seminar in Education</td>
<td>1</td>
</tr>
<tr>
<td>ED 499 - Internship</td>
<td>9</td>
</tr>
<tr>
<td>ED 593 - Educ. of Exceptional Children &amp; Youth</td>
<td>3</td>
</tr>
</tbody>
</table>

Total: 37-38

**Studio Art Major**

The major in art studio is made up of some 51 semester hours of work, part of which may be included in the general studies component. This program should be planned with faculty in the Art Department providing advice and approval.

**Course Requirements for a Music Education Emphasis**

General Education Requirements (See B.A. in education section of the catalog.)

**Area of Concentration for Music Education: Instrumental or Vocal/Choral**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 301 - Introduction to Education (MUE 200)</td>
<td>0-1</td>
</tr>
<tr>
<td>ED 305 - Foundations of Education in U.S.</td>
<td>3</td>
</tr>
<tr>
<td>ED 306 - Human Development</td>
<td>3</td>
</tr>
<tr>
<td>ED 308 - Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>ED 309 - Group Processes</td>
<td>2</td>
</tr>
</tbody>
</table>

167
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 408</td>
<td>Teaching Reading in the Content Areas</td>
<td>3</td>
</tr>
<tr>
<td>ED 410</td>
<td>Foundations of Educational Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>ED 490</td>
<td>Senior Seminar in Education</td>
<td>1</td>
</tr>
<tr>
<td>ED 499</td>
<td>Internship</td>
<td>9</td>
</tr>
<tr>
<td>ED 593</td>
<td>Educ. of Exceptional Children &amp; Youth</td>
<td>3</td>
</tr>
<tr>
<td>MUE 225</td>
<td>Introduction to Music Education</td>
<td>1</td>
</tr>
<tr>
<td>MUE 326</td>
<td>Teaching Gen. Music in Elem. Schools</td>
<td>3</td>
</tr>
<tr>
<td>MUE 327</td>
<td>Teaching Gen. Music in Sec. Schools</td>
<td>3</td>
</tr>
<tr>
<td>MUE 428</td>
<td>Organizing and Directing Vocal Groups in Secondary Schools or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MUE 429 Organizing and Directing Instrumental Groups in Secondary Schools</td>
<td>2</td>
</tr>
</tbody>
</table>

**Music Education Emphasis: Instrumental or Vocal/Choral**

The emphases in music education (both instrumental and vocal/choral) are made up of some 48-51 semester hours of coursework, part of which may be counted as general studies. These programs of study should be planned with faculty in the Music Department providing advice and approval.

### Education (ED)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>Career Exploration</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>Educational and vocational planning. Lab Fee: $10.</td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>Effective Reading and Study Skills</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>301</td>
<td>Introduction to Education Practicum</td>
<td>0-1 hr.</td>
</tr>
<tr>
<td></td>
<td>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 and will provide a foundation for the coursework and activities. (Concurrent registration with ED 305. This experience is a prerequisite for admission to the Teacher Education Program.)</td>
<td></td>
</tr>
<tr>
<td>305</td>
<td>Foundations of Education in the United States</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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. (To be taken concurrently with ED 301.)</td>
<td></td>
</tr>
<tr>
<td>306</td>
<td>Human Development</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Overview of human development stressing continuity from conception to adulthood. Practical applications for teachers and parents. (May be taken concurrently with ED 305.)</td>
<td></td>
</tr>
<tr>
<td>308</td>
<td>Educational Psychology</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Psychological principles basic to an understanding of the learner, the learning process, and the learning situation. Prerequisites: ED 301, 305, and 306.</td>
<td></td>
</tr>
<tr>
<td>309</td>
<td>Group Processes</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>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. Course is graded S/U only. Prerequisites: ED 301, 305, and 306.</td>
<td></td>
</tr>
</tbody>
</table>
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).

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.

Guidance for Teachers 3 hrs.
Sociological, psychological, and philosophical bases for guidance in schools.

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 263 or junior standing.

Tests and Measurements 3 hrs.
Survey of standardized and teacher-made evaluation instruments.

Special Problems in Education 3 hrs.
Independent study, special projects, and special in-service programs. Prerequisite: senior standing.

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.

Audiovisual Instruction 3 hrs.
Audiovisual media in teaching and the selection, use, and maintenance of audiovisual materials in educational programs.

Education of Exceptional Children and Youth 3 hrs.
Introduction to the field of exceptional children and youth, including observations. Prerequisites: ED 305, 306, and 308.

Elementary Education

Physical Education for the Elementary Teacher 3 hrs.
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.

Teaching the Young Child 3 hrs.
Total pattern of child development, curriculum, learning, methods, and guidance for the child from two to nine years of age.

Diagnostic and Prescriptive Teaching 3 hrs.
Strengths and deficiencies of student in academic area and a program to enhance strengths and remedy weaknesses. Group and individual processes. Prerequisites: ED 263, junior standing and admission to the Teacher Education Program. School-based practicum required.

Teaching Elementary Language Arts 3 hrs.
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.
372 **Teaching Elementary Social Studies**  
Teaching social studies in grades 1-6. Helping beginning teachers acquire background skills in organizing and teaching units of work. Prerequisite: admission to the teacher education program. School-based practicum required.

373 **Teaching Elementary Science and Health**  
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.

374 **Teaching Elementary Mathematics**  
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.

375 **Teaching Elementary Reading**  
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.

400 **Literature for Children and Adolescents**  
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.

408 **Teaching Reading in the Content Area**  
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.

490 **Senior Seminar in Education**  
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**  
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**  
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 10 must be consecutive. Prerequisites: ED 305, 306, 308, 309, 360, 374, 375, 371 or 400, 372 or 373, and 593. (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.

**Middle and High School Education**

388 **Teaching Middle and High School Subjects** 2 hrs.
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.

408 **Teaching Reading in the Content Area** 3 hrs.
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.

410 **Foundations of Education Evaluation** 3 hrs.
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.

414 **Teaching Secondary Science and Mathematics** 2 hrs.
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.

415 **Teaching Secondary Humanities and Social Sciences** 2 hrs.
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.

490 **Senior Seminar in Education** 1 hr.
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.

495 **Middle School Internship** 9 hrs.
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 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 10 must be consecutive. Prerequisites: all required professional educational 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 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 10 must be consecutive. Prerequisites: ED 305, 306, 308, 309, 388, 408, 410 or 415, 510, and 593, 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 N-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

Professor Neff; Associate Professors Early, Mebane (Chair), Moore, Munson, Nelson, Norman, Schenker, Szilagyi; Assistant Professors Bell, Bollinger, Dillard, Mangum; Instructor Allen; Lecturers Bradburn, Lavan, 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 wishing to major in English should make that declaration at the beginning of the sophomore year. The English Department office provides forms for this purpose and will let the student choose an advisor or will assign one.
English Major

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, EHL, and EHT courses) 12

Further requirements and conditions for the major:
1. One course devoted entirely to the novel; additional such courses count as English electives.
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.

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.

Semester Hours
Sophomore Survey (as described in GER) 6
Shakespeare (EH 360) 3
Courses numbered 300, 400, or 500 9
Courses numbered 400 or 500 3 21

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 EHT 301 (Technical Writing), EHT 302 (Technical Editing), and EHT 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 of Business and Technical Writing Director for current requirements. A typical program for a non-technical major is:

Semester Hours
Technical Writing (EHT 301) 3
Technical Editing (EHT 302) 3
Practicum in Writing (EHT 320) 3
Directed elective (e.g. CM 305, EHL 307, and others) 3
Technical courses approved by Director 9 21
English for Second Area of Study/Cognate

Students majoring in elementary education or seeking certification in secondary education* may select English as their second area of study. This area consists of a minimum of fifteen 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.

*Note: Education students are required to pass an exit examination in their teaching field in order to graduate and be recommended for certification.

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>American literature (EH 330, 331, 339, 430, 431, 530, 532, 533)</td>
</tr>
<tr>
<td>Shakespeare (EH 360)</td>
</tr>
<tr>
<td>Structure of Modern English (EH 307)</td>
</tr>
<tr>
<td>Literature before 1800 (EH 380, 381, 450, 460, 470, 492, 551, 571, 572)</td>
</tr>
<tr>
<td>Literature after 1800 (EH 330, 331, 390, 391, 418, 421, 430, 431, 493, 520, 522, 532, 533, 592)</td>
</tr>
</tbody>
</table>

One 3-hour course in creative writing (EH 310) may be substituted for any course in the pre-1800 or post-1800 categories.

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.

101 Freshman Composition
Emphasis on writing, including at least one documented paper; readings in the essay and other non-fiction prose models. Prerequisite: placement.

102 Freshman Composition
Emphasis on writing related to close critical reading of fiction, drama, and poetry. Prerequisite: EH 101.

105 Honors English Seminar
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
Anglo-Saxon period through Milton.

206 Survey of English Literature
Restoration through twentieth century.

230 Survey of American Literature
Survey of writers, genres, and periods from the European discovery to the present day.

240 World Literature I
Selected major contributions with focus on western civilization; Homer to the Renaissance.

241 World Literature II
Selected major contributions with focus on western civilization; Enlightenment to the present.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>242</td>
<td>Mythology</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Archetypal, metaphorical, and historical significance of deities and myths.</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>Honors World Literature Seminar I:</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Major texts from the ancient world to 1700. Prerequisite: EH 105 or admission to Honors Program.</td>
<td></td>
</tr>
<tr>
<td>251</td>
<td>Honors World Literature Seminar II:</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Major texts from 1700 to the present. Prerequisite: EH 105 or admission to Honors Program.</td>
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</tr>
<tr>
<td>310</td>
<td>Fiction Writing</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Practice in writing of fiction from conception to revision. Prerequisites: GER literature requirement and approval of instructor.</td>
<td></td>
</tr>
</tbody>
</table>

Courses below are open to students who have completed the general education requirement in literature, with exceptions as indicated.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>330</td>
<td>Major American Writers</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Major writers from the Colonial period to Whitman and Melville.</td>
<td></td>
</tr>
<tr>
<td>331</td>
<td>Major American Writers</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Dickinson to Eliot and Faulkner.</td>
<td></td>
</tr>
<tr>
<td>339</td>
<td>Special Studies in American Literature and Culture</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Topics announced in advance.</td>
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</tr>
<tr>
<td>340</td>
<td>Special Topics in Literature</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Theme, writer, or historical movement to be announced in advance.</td>
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</tr>
<tr>
<td>360</td>
<td>Shakespeare</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Renaissance background and at least six plays, including history, comedy, and major tragedies.</td>
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</tr>
<tr>
<td>380</td>
<td>Restoration and Early Eighteenth Century</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Poetry, drama, and various emergent prose forms in the early modern period, 1660-1744, with attention to cultural contexts.</td>
<td></td>
</tr>
<tr>
<td>381</td>
<td>Later Eighteenth Century</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Poetry, drama, the novel, and other emergent prose forms in the early modern period, 1744-1799, with attention to cultural contexts.</td>
<td></td>
</tr>
<tr>
<td>390</td>
<td>Romantic Poetry and Prose</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Poetry and prose (excluding the novel), 1780-1832. Emphasis may vary.</td>
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</tr>
<tr>
<td>391</td>
<td>Victorian Poetry and Prose</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Poetry and prose (excluding the novel), 1832-1901. Emphasis may vary.</td>
<td></td>
</tr>
<tr>
<td>418</td>
<td>Representative Texts by Women Writers</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Focus on women's contribution to the literary tradition.</td>
<td></td>
</tr>
<tr>
<td>421</td>
<td>Modern Drama</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>New movements in drama from Ibsen to the present.</td>
<td></td>
</tr>
<tr>
<td>430</td>
<td>The American Novel</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>The American novel from the beginning through James.</td>
<td></td>
</tr>
<tr>
<td>431</td>
<td>The American Novel</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>The American novel from James to the present.</td>
<td></td>
</tr>
<tr>
<td>450</td>
<td>Chaucer</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Emphasis on the Canterbury Tales and Troilus and Criseyde.</td>
<td></td>
</tr>
<tr>
<td>460</td>
<td>Sixteenth-Century Poetry and Prose</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Works chosen from the following: More, Wyatt, Sidney, Spenser, and others.</td>
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</tr>
<tr>
<td>470</td>
<td>Milton</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Milton's minor poems, selected prose, and the major poems Paradise Lost, Paradise Regained, and Samson Agonistes. Recommended prerequisite: one upper level English course.</td>
<td></td>
</tr>
<tr>
<td>492</td>
<td>The Early English Novel</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Emergence and development of the genre as evident in representative eighteenth-century texts.</td>
<td></td>
</tr>
</tbody>
</table>
493 The Victorian Novel
Dickens through Hardy: critical reading of representative novels accompanied by historical survey of major trends.

499 Senior Research Project
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
Major texts and approaches from Plato to the present.

501 Theory and Practice in Technical Communication
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. May then become the basis for further graduate study in technical communication. Prerequisites: advanced undergraduate standing; EHT 301 and 302 are strongly recommended.

502 Problems in Technical Editing
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: EHT 302 or EH 501.

510 Advanced Fiction Writing
Workshop in advanced fiction writing. Prerequisite: approval of instructor.

520 Modern Poetry
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 present century.

522 Modern Novel
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
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
Topics announced in advance.

532 Literature of the American South
Selected figures and movements from colonization to the present.

533 William Faulkner
Biography, background, and critical study of the major novels.

540 Special Studies in English Literature
Topics announced in advance.

551 Middle English Literature
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
Major plays of the sixteenth and early seventeenth centuries, including Marlowe, Jonson, and others. Excludes Shakespeare.
Seventeenth-Century Poetry 3 hrs.
Emphasis on major figures, excluding Milton, (Donne, Jonson, Herbert), their followers, and major themes and genres of the period.

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)

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 U.S.

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.

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 recommended.

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 (EHT)**

**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** 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. Prerequisites: EHT 300 or 301. Counts as elective in English major. Does not count toward English minor except for Cognate Studies in Technical Writing. 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: EHT 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.

**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** 3 hrs.
Introduction to the listening/speaking activities needed for university study in the U.S. 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 of the ELPT.

**101 ESL Listening/Speaking II** 3 hrs.
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.

**102 ESL Listening/Speaking III** 3 hrs.
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.

103 ESL Composition I 3 hrs.
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.

104 ESL Composition II 3 hrs.
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.

Foreign Languages and Literatures Department

Professor Emeritus Penot; Associate Professor Emerita Heller; Associate Professor Emeritus Stromecky; Associate Professors Buksa, Goebel, Maier, Meister, Nielsen (Chair); Assistant Professor Emerita Traylor; Assistant Professors Abernethy, Wild.

The acquisition of a second language, and through it an understanding of another country’s literature and culture, is a rich academic experience for students interested in the liberal arts or in a career in today’s world of global markets, increasing political interdependence, and international scientific collaborations. The programs are designed to teach the effective use of foreign languages, literatures, and cultures, both oral and written, in various areas of academic and professional life.

French, German, Japanese*, Latin*, Russian, Spanish

The department offers the B.A. in French German, and Spanish, minors in French, German, Russian, and Spanish, and participates in the Slavic Area Studies Program, a B.A. degree program. A composite major in Foreign Languages and International Trade (in cooperation with the College of Administrative Science) with French, German, Russian, or Spanish is also available, and leads to a B.A. degree.

*Japanese and Latin courses can be taken to satisfy the language requirements or as electives.

General Education Requirements and Placement Procedures

Twelve semester hours of credit in one foreign language are required for the B.A. and can be an option in the B.S. degree unless the student can demonstrate a competence at a level more advanced than the beginning 101 course. French, German, Russian and Spanish courses at 100- and 200-level are taught at least twice each calendar year.

Students with a prior knowledge of French, German or Spanish may take the CLEP examination for the equivalent of 101 and 102. Irrespective of the resultant placement, the student will have to take a minimum of six additional hours of course work to fulfill the language requirement. The test is administered by the UAH Testing Services 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.

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 may earn up to fifteen hours of credit with no quality points and must still take a minimum of six additional hours of course work.

Students who studied a foreign language in high school will be placed according to the following scale:

<table>
<thead>
<tr>
<th>Placement Level</th>
<th>Language in High School</th>
<th>Courses to be Taken to Satisfy Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st level (101)</td>
<td>0-1 units*</td>
<td>101, 102, 201, 202</td>
</tr>
<tr>
<td>2nd level (102)</td>
<td>1-2 units</td>
<td>102, 201, 202</td>
</tr>
<tr>
<td>3rd level (201)</td>
<td>2-3 units</td>
<td>201, 202</td>
</tr>
<tr>
<td>4th level (202)</td>
<td>3-4 plus</td>
<td>202 plus one 300-level</td>
</tr>
</tbody>
</table>

*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.

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: 9 hours credit (i.e. through 201)
- Score of 4: 12 hours credit (through 202)
- Score of 5: 15 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 two additional courses (6 credit hours) of the appropriate language.

Foreign Language Major

This major offers students a personally and academically enriching program in French, German, Slavic Area Studies, and Spanish. Firmly guided by principles of humanistic thinking, the curriculum places equal emphasis on communicative proficiency, literary criticism, and cross-cultural awareness.

A foreign language major consists of 24 semester hours above the basic course sequence in a single language. Students beginning the language on the 101 level must take a total of 36 hours.

A student majoring in a foreign language and seeking teacher certification in that language must take 36 semester hours of credit, including 9 hours at the 400 level. See further instructions under Programs involving Teacher Education/Certification.

A transfer student declaring a major or minor must have a minimum of six (6) hours of upper-level credit earned at UAH in the language studied.

Foreign Language Minor

A foreign language minor consists of 12 semester hours above the basic-course sequence in a single language. Students beginning the language on the 101 level must take a total of 24 semester hours. Conversation, advanced grammar and composition, and one of the introduction to literature courses are required. An additional course on the 300- or 400-level completes the requirement for the minor.
Program of Study Models

Students majoring in a foreign language will find a program of study which enables them to develop depth and breadth in the major and related areas: other languages, humanities, social and behavioral sciences, mathematics, engineering, natural sciences, and elementary education. Students who wish to plan their own program of study should do so in consultation with a member of the particular language faculty. This Program of Study may also be used for teacher certification.

Program of Study with French Major

Required courses: FH 301, 302, 304, 305, three courses on the 400-level, and one elective from either the 300- or 400-level.

Program of Study with German Major

Required courses: GN 301, 302, 304, 305, three courses on the 400-level, and one elective from either the 300- or 400-level.

Program of Study with Spanish Major

Required courses: SH 301, 302, 305, three courses on the 400-level, and one elective from either the 300- or 400-level.

Program of Study with Slavic Area Studies Major

The Slavic Area Studies major is an enrichment program which prepares students for careers in government, industry, international commerce and trade, and other related areas of work, while providing the necessary preparation for graduate level studies.

Drawing from three disciplines, foreign languages and literatures, history, and political science, the program places emphasis on Russian studies with strong supporting work in history and political science.

Slavic area studies offers the student intensive training aimed at the development of competency in more than one area. Requirements for the Slavic area studies major are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Courses</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN 101, 102, 201, 202, 301, 302, 304 or 399, 305, 306, and three 400-level courses</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>HY 101, 102, 375, 376, 479</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>PSC 101, 102, and nine hours drawn from 260, 342, 344, and 346</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

Total 66 Semester Hours

Foreign Languages and International Trade

The department offers a degree program that combines the study of a foreign language, administrative science, history, political science and other disciplines related to international trade. Such a program of study opens up a broad variety of career opportunities in the multinational and multilingual business world of today.

In addition to the general education requirements for the B.A. degree, the student's program must include the following courses:

Foreign Languages

Intermediate foreign language (French, German, Russian or Spanish) 6 hrs.
301 Conversation 3 hrs.
302 Advanced Composition 3 hrs.
303 Business and Professions 3 hrs.
304 Culture 3 hrs.
305 or 307 (Survey of Literature) 3 hrs.
400 Foreign language electives 6 hrs.
410 Practicum 3 hrs.
Total 30 hrs.

**Administrative Science Cognate**
ECN 142, 143 - Principles of Economics 6 hrs.
ACC 211, 221 - Principles of Accounting I 3 hrs.
ACC 212, 222 - Principles of Accounting II 3 hrs.
BLS 211 - Legal Environment of Business 3 hrs.
*FIN 301 - Principles of Finance 3 hrs.
MGT 301 - Principles of Management 3 hrs.
MKT 301 - Principles of Marketing 3 hrs.
MGT 450 - International Business 3 hrs.
Total 27 hrs. **

*Students are advised to take AHS 300, Statistical Analysis, as a prerequisite to FIN 301.

**In no case may the Administrative Science courses included in a student's program of study exceed 25 percent of the student's program.

**Other Requirements**
Each of the following:
PSC 102 - Comparative Politics 3 hrs.
PSC 362 - International Law 3 hrs.
HY 392 - Europe Since 1815 3 hrs.
One of the following appropriate to language studied:
HY 341 - Modern France 3 hrs.
HY 343 - Modern Germany 3 hrs.
HY 376 - Soviet Russia 3 hrs.
HY 399 - Special Topics 3 hrs.
One course from the following:
HY 374 - U.S. Foreign Relations 3 hrs.
HY 391 - Europe 1500-1815 3 hrs.
HY 478 - Europe in the Nineteenth Century 3 hrs.
HY 479 - Europe in the Twentieth Century 3 hrs.
One course from the following:
PSC 260 - International Relations 3 hrs.
PSC 342 - Western European Governments 3 hrs.
PSC 344 - Eastern European Governments 3 hrs.
PSC 346 - Third World Systems 3 hrs.
PSC 348 - Asian Governments 3 hrs.
Total 18 hrs.

*These courses may be counted as part of the general education requirements where appropriate.

**Programs Involving Teacher Education/Certification**
A student majoring in elementary education may utilize French, German, Russian or Spanish for a cognate area (second area of study). The cognate area in foreign languages will total 27 hours and must include 15 hours of courses 300-level or above, 3 hours of which must be a survey of literature course and 3 hours which must be a 400-level course. A student seeking certification in Middle/Junior High School Education or High School Education who wishes to have a single teaching field in French, German, Russian or Spanish must conform to the requirements of a
language major. For a second teaching field, a student needs 30 hours including one 400-level course.

In teacher education/certification programs students are advised to seek help from a faculty advisor from the Department of Foreign Languages and Literatures for the selection and approval of courses. Students are also advised to see total degree requirements under the Education section of the catalog.

Education students are required to pass an exit examination in their teaching field in order to graduate and be recommended for certification.

**Foreign Languages & Literatures (FLL)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>450</td>
<td>Comparative Cultures and Literatures</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Comparative study of literary texts crosses borders and boundaries, drawing upon more than one linguistic or national tradition. This pluralistic approach opens new critical perspectives. Through reading, lecture and discussion, the student comes to understand more profoundly such contemporary issues as identity, difference, genre, period, the sacred and the profane, tradition and modernity in two or more literatures. Conducted in English.</td>
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</tbody>
</table>

**French (FH)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Elementary French I</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Lab Fee: $30.</td>
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<tr>
<td>102</td>
<td>Elementary French II</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: FH 101 or placement.</td>
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<tr>
<td>201</td>
<td>Intermediate French I</td>
<td>3 hrs.</td>
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<td></td>
<td>Lab Fee: $30. Prerequisite: FH 102 or placement.</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>Intermediate French II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: FH 201 or placement.</td>
<td></td>
</tr>
<tr>
<td>301</td>
<td>French Conversation</td>
<td>3 hrs.</td>
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<td></td>
<td>Oral drills, pronunciation exercises, and oral reports. Prerequisite: FH 202, or approval of instructor.</td>
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</tr>
<tr>
<td>302</td>
<td>Advanced French Composition</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Composition with emphasis on grammar review and idiomatic expression. Prerequisite: FH 202, or approval of instructor.</td>
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</tr>
<tr>
<td>303</td>
<td>French for Business and Professions</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Reading and translation of materials, documents, and forms pertinent to commerce and professions. Prerequisite: FH 202 or approval of instructor.</td>
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<tr>
<td>304</td>
<td>French Culture: Identity, Difference, Mentalités</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>What does it mean to &quot;be French?&quot; How does this determination change, according to what pressures and thought processes? Prerequisite: FH 202.</td>
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<tr>
<td>305</td>
<td>Introduction to French Literature</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Historical origins, flowering and proliferation of writing in French from Saint Eulalie to the Terror. Prerequisite: FH 301, 302, or approval of instructor.</td>
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</tr>
<tr>
<td>403</td>
<td>Texts and Contexts</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Problems in periodization and interpretation. Relations between individual works, French society and historical tensions in one of four areas, offered on a rotating basis: Middle Ages, the ancien régime, Philosophical Enlightenment, or Modernism and the emergence of post-modern modes. Prerequisite: FH 305 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>404</td>
<td>Genres and Anti-Genres</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Pursues the emergence, proliferation and transformation of literary forms in cultural representation. Topics include: epic and lyric, tragedy and comedy, essay, philosophical dialogue, novel, conte fantastique, romantic drama, prose poem, automatic writing, and narrative film. Prerequisite: FH 305 or approval of instructor.</td>
<td></td>
</tr>
</tbody>
</table>
405 **Author and Culture**  
3 hrs.  
Close reading of works by one or two authors (on rotating basis) in the context of French history, individual psychology and social upheaval. Problems of authorship, authority, ethics, and mastery will organize reading and discussion. Prerequisite: FH 305 or approval of instructor.

406 **Paris and the Mirror of History**  
3 hrs.  
Advanced course in French cultural practices and mythography explores models for understanding French mentalités based on the history of the city: its origins, institutions, architecture, morphology and literary vision of the urban group and its component individuals. Prerequisite: FH 305 or approval of instructor.

409 **Gender and Representation**  
3 hrs.  
Women authors, philosophers, and reformers studied in relation to ideologies of sexuality and social justice. Aspects of women's images and self-fashioning from Marie de France to contemporary feminism, including modern media. Prerequisite: FH 305 or approval of instructor.

410 **Practicum**  
3 hrs.  
Student oral presentations, guest speakers, periodicals and brochures are utilized for instructional purposes. Prerequisite: FH 303 or approval of instructor.

499 **Independent Studies**  
1-3 hrs.  
Prerequisite: approval of department chair.

**German (GN)***

101 **Elementary German I**  
3 hrs.  
Lab Fee: $30.

102 **Elementary German II**  
3 hrs.  
Lab Fee: $30. Prerequisite: GN 101 or placement.

201 **Intermediate German I**  
3 hrs.  
Lab Fee: $30. Prerequisite: GN 102 or placement.

202 **Intermediate German II**  
3 hrs.  
Lab Fee: $30. Prerequisite: GN 201 or placement.

301 **German Conversation**  
3 hrs.  
Oral practice, communication and reports, emphasizing topics of daily experiences, travels, and contemporary German life. Prerequisite: GN 202 or approval of instructor.

302 **Advanced German Composition and Usage**  
3 hrs.  
Composition with emphasis on grammar review and idiomatic expression. Prerequisite: GN 202 or approval of instructor.

303 **German for Business and Professions**  
3 hrs.  
Reading and translation of materials, documents, and forms pertinent to commerce and the professions. Prerequisite: GN 202 or approval.

304 **German Culture**  
3 hrs.  
German cultural patterns and historical context. Prerequisite: GN 202 or approval of instructor.

305 **Introduction to German Literature**  
3 hrs.  
German literature from its beginning to 1785. Prerequisite: GN 301 or GN 302 or approval of instructor.

404 **History of the German Language**  
3 hrs.  
Traces the development of the standard German language and of the present configuration of dialects in Germany. Prerequisite: GN 302 or permission of instructor.

410 **Practicum**  
3 hrs.  
Student oral presentations, guest speakers, periodicals and brochures are utilized for instructional purposes. Prerequisite: GN 303 or approval of instructor.
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>412</td>
<td>Goethe, Schiller and Other Major Writers of the 18th Century</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Contributions of Goethe and Schiller to German literature compared with significant works of other writers of the era. Prerequisite: GN 305 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>413</td>
<td>German Romanticism</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>German literature of the romantic period, its philosophy and theory. Prerequisite: GN 305 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>414</td>
<td>The German &quot;Novelle&quot; from Goethe to Kafka</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Important literary genre using representative novellas of the nineteenth and twentieth centuries. Prerequisite: GN 305 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>416</td>
<td>Twentieth Century German Literature</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Writers and works of the twentieth century with emphasis on post-World War II German literature. Prerequisite: GN 305 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>418</td>
<td>Modern German Drama</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>German drama from the nineteenth century to present showing development and diversity of modern German drama. Prerequisite: GN 305 or approval of instructor.</td>
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</tr>
<tr>
<td>419</td>
<td>German Poetry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Interpretation of selected masterpieces of major German poets from the seventeenth to the twentieth centuries. Prerequisite: GN 305 or approval of instructor.</td>
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</tr>
<tr>
<td>490</td>
<td>Special Topics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>In-depth studies in German literature and culture, concentrating on specific authors, themes, genres or periods, as well as on revaluation of neglected writers, non-canonical texts, or innovative methodological approaches. Topics vary and will be announced in advance.</td>
<td></td>
</tr>
<tr>
<td>499</td>
<td>Independent Studies</td>
<td>1-3 hrs.</td>
</tr>
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<td></td>
<td>Prerequisite: approval of department chair.</td>
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</table>

**Japanese (JE)***

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>101</td>
<td>Elementary Japanese I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab Fee: $30.</td>
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<tr>
<td>102</td>
<td>Elementary Japanese II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: JE 101 or placement.</td>
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</tr>
<tr>
<td>201</td>
<td>Intermediate Japanese I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: JE 102 or placement.</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>Intermediate Japanese II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: JE 201 or placement.</td>
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</tr>
<tr>
<td>399</td>
<td>Independent Studies.</td>
<td>1-3 hrs.</td>
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<td></td>
<td>Prerequisite: Approval of department chair.</td>
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</table>

**Latin (LN)***

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>101</td>
<td>Elementary Latin I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: LN 101 or approval of instructor.</td>
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</tr>
<tr>
<td>102</td>
<td>Elementary Latin II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: LN 102 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>201</td>
<td>Intermediate Latin I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: LN 201 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>Intermediate Latin II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: LN 201 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>399</td>
<td>Independent Studies.</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: approval of department chair.</td>
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</table>

**Russian (RN)***

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>101</td>
<td>Elementary Russian I</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Lab Fee: $30.</td>
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</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
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<tr>
<td>------------</td>
<td>--------------------------------------------------</td>
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</tr>
<tr>
<td>102</td>
<td>Elementary Russian II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: RN 101 or placement.</td>
<td></td>
</tr>
<tr>
<td>201</td>
<td>Intermediate Russian I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: RN 102 or placement.</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>Intermediate Russian II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: RN 201 or placement.</td>
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</tr>
<tr>
<td>300</td>
<td>Old Church Slavonic</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>A linguistic approach to the language of the oldest Slavic written texts, recopied in Russia. Special attention paid to the characteristics of the phonetic system, morphology and vocabulary which have been created by the fusions of the Church Slavonic and Russian lexical forms. Prerequisite: RN 202 or permission of instructor.</td>
<td></td>
</tr>
<tr>
<td>301</td>
<td>Russian Conversation</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Oral drills, pronunciation exercises, emphasizing topics of daily experiences, travels, and contemporary Russian life. Prerequisite: RN 202 or permission of instructor.</td>
<td></td>
</tr>
<tr>
<td>302</td>
<td>Advanced Grammar and Composition</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Compositions with emphasis on grammar review and idiomatic expression. Prerequisite: RN 202 or permission of instructor.</td>
<td></td>
</tr>
<tr>
<td>303</td>
<td>Russian for Business and Professions</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Reading and translation of materials, documents, and forms pertinent to commerce and the professions. Individualized instruction. Prerequisite: RN 202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>304</td>
<td>Russian Culture</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Russian cultural patterns: their causes and effects. Prerequisite: RN 202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>305</td>
<td>Survey of Russian Literature I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Russian literature from its beginning to Pushkin. Prerequisite: RN 301 or RN 302 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>306</td>
<td>Survey of Russian Literature II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Russian literature from Pushkin to the present. Prerequisite: RN 301 or RN 302 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>399</td>
<td>Study Program Abroad</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>On-site study of the language, culture, politics or other aspects of Russian, Belorussian, or Ukrainian societies. Extra-curricular activities such as culture-oriented excursions and meetings with writers, artists, and educators. Prerequisite: RN 202 or permission of instructor.</td>
<td></td>
</tr>
<tr>
<td>410</td>
<td>Practicum</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Student oral presentations, guest speakers, periodicals and brochures are utilized for instructional purposes. Prerequisite: RN 303 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>433</td>
<td>Major Writers of the Nineteenth Century</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Representative works from Pushkin through Chekhov. Prerequisite: RN 305 or 306 or approval of instructor.</td>
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<tr>
<td>438</td>
<td>Russian Poetry</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Russian verse from its beginning to Pushkin. Examination of Russian literary-poetic language, with consideration of the role of Church Slavonic, regional dialects, and foreign influences as well as the contribution of particular authors. Prerequisite: RN 202.</td>
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</tr>
<tr>
<td>439</td>
<td>Gogol</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Gogol's major works, especially Dead Souls. An examination of his style, philosophy and technique. Prerequisite: RN 305 or 306 or approval of instructor.</td>
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<tr>
<td>440</td>
<td>Dostoevsky</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Major works by Dostoevsky, regarding style, ideology, philosophies, and technique. Prerequisite: RN 305 or 306 or approval of instructor.</td>
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<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credit Hours</td>
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<tr>
<td>444</td>
<td>Russian Novelists of the 20th Century</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Interpretation of the main literary trends and</td>
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<tr>
<td></td>
<td>major figures from Gorki to the present.</td>
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<td></td>
<td>Prerequisites: RN 305, 306, or permission of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>instructor.</td>
<td></td>
</tr>
<tr>
<td>499</td>
<td>Independent Studies</td>
<td>1-3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: approval of department chair.</td>
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</tbody>
</table>

**Spanish (SH)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>101</td>
<td>Elementary Spanish I</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Lab Fee: $30.</td>
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<tr>
<td>102</td>
<td>Elementary Spanish II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: SH 101 or placement.</td>
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</tr>
<tr>
<td>201</td>
<td>Intermediate Spanish I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: SH 102 or placement.</td>
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</tr>
<tr>
<td>202</td>
<td>Intermediate Spanish II</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Lab Fee: $30. Prerequisite: SH 201 or placement.</td>
<td></td>
</tr>
<tr>
<td>301</td>
<td>Spanish Conversation</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: SH 202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>302</td>
<td>Advanced Spanish Grammar and Composition</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Composition with emphasis on grammar review and</td>
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<td></td>
<td>idiomatic expressions. Prerequisite: SH 202 or</td>
<td></td>
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<tr>
<td></td>
<td>approval of instructor.</td>
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</tr>
<tr>
<td>303</td>
<td>Spanish for Business and Professions</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Reading and translation of materials, documents,</td>
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<tr>
<td></td>
<td>and forms pertinent to commerce and the professions.</td>
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<tr>
<td></td>
<td>Prerequisite: SH 202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>304</td>
<td>Hispanic Culture</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Hispanic cultural patterns. Prerequisite: SH 202</td>
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<tr>
<td></td>
<td>or approval of instructor.</td>
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</tr>
<tr>
<td>305</td>
<td>Introduction to Spanish Literature</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Spanish literature from the beginning to 1700.</td>
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<td></td>
<td>Prerequisite: SH 202 or approval of instructor.</td>
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<tr>
<td>307</td>
<td>Introduction to Spanish American Literature</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Representative works from the colonial period</td>
<td></td>
</tr>
<tr>
<td></td>
<td>through Romanticism. Prerequisite: SH 301, 302,</td>
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<td></td>
<td>or approval of instructor.</td>
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<tr>
<td>410</td>
<td>Practicum</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Student oral presentations, guest speakers,</td>
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<td></td>
<td>periodicals, and brochures are utilized for</td>
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</tr>
<tr>
<td></td>
<td>instructional purposes. Prerequisite: SH 303 or</td>
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<tr>
<td></td>
<td>approval of instructor.</td>
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<tr>
<td>423</td>
<td>Cervantes</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Major works of this important writer with</td>
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<td></td>
<td>emphasis on Don Quijote. Prerequisite: One of</td>
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<td></td>
<td>SH 305, 307, or approval of instructor.</td>
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</tr>
<tr>
<td>424</td>
<td>Golden Age Drama</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Drama of the 16th and 17th centuries, with</td>
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<td></td>
<td>emphasis on the major dramatists: Lope de Vega,</td>
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<tr>
<td></td>
<td>Tirso, and Calderon. Representative works.</td>
<td></td>
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<tr>
<td></td>
<td>Prerequisite: One of SH 305, 307, or approval of</td>
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<tr>
<td></td>
<td>instructor.</td>
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<tr>
<td>427</td>
<td>Spanish American Novel</td>
<td>3 hrs.</td>
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<td></td>
<td>Representative novels of the modern and</td>
<td></td>
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<tr>
<td></td>
<td>contemporary period. Prerequisite: One of SH 305</td>
<td></td>
</tr>
<tr>
<td></td>
<td>307, or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>428</td>
<td>Spanish American Short Story</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Special emphasis on representative authors and</td>
<td></td>
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<td></td>
<td>major trends. Prerequisite: One of SH 305, 307,</td>
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<tr>
<td></td>
<td>or approval of instructor.</td>
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</tr>
<tr>
<td>429</td>
<td>The Generation of 1898</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Representative works produced by this literary</td>
<td></td>
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<tr>
<td></td>
<td>generation in the late 19th and early 20th</td>
<td></td>
</tr>
<tr>
<td></td>
<td>centuries. Prerequisite: One of SH 305, 307, or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>433</td>
<td>Spanish American Poetry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Textual analysis of Spanish American poetry with</td>
<td></td>
</tr>
<tr>
<td></td>
<td>special emphasis on representative poets and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>major trends. Prerequisite: One of SH 305, 307,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or approval of instructor.</td>
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</tbody>
</table>
490 **Special Topics in Spanish Literature** 3 hrs.
Spanish and Spanish American literature, concentrating on a specific author, theme, period, genre, or country. Topics will vary and be announced in advance. Prerequisite: One of SH 305, 307, or approval of instructor.

499 **Independent Studies** 3 hrs.
Prerequisite: Approval of department chair.

**Health and Physical Education Program**

Associate Director: Michelle Keene

**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. 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. Grades of satisfactory (S) or unsatisfactory (U) 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. Normal letter grades (A through F) and other academic standards apply to such courses.

**Health and Physical Education (HPE)**

**Activity Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>100</td>
<td>Fitness Enhancement. Lab Fee: $10.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>101</td>
<td>Slimmastics. Lab Fee: $10.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>102</td>
<td>Aerobic Dance I. Lab Fee: $10.</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>103</td>
<td>Jogging for Fitness and Weight Control. Lab Fee: $10.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>104</td>
<td>Beginning Weight Training. Lab Fee: $10.</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>105</td>
<td>Beginning Karate. Lab Fee: $10.</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>106</td>
<td>Beginning T'ai Chi. Lab Fee: $10.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>107</td>
<td>Beginning Stunts and Tumbling. Lab Fee: $10.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>108</td>
<td>Yoga. Lab Fee: $10.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>109</td>
<td>Bicycle Touring. Lab Fee: $10.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>110</td>
<td>Beginning Swimming. Lab Fee: $20.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>111</td>
<td>Country-Western Dance. Lab Fee: $10.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>112</td>
<td>Deep Water Workout. Lab Fee: $10</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>113</td>
<td>Basic Sailing. Lab Fee: $40.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>114</td>
<td>Sailboat Cruising. Lab Fee: variable.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>115</td>
<td>Badminton. Lab Fee: $10.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>116</td>
<td>Racquetball. Lab Fee: $10.</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>117</td>
<td>Beginning Tennis. Lab Fee: $10.</td>
<td>1 hr.</td>
</tr>
<tr>
<td>118</td>
<td>Bench Stepping. Lab Fee: $10.</td>
<td>2 hrs.</td>
</tr>
</tbody>
</table>
120 Roller Skating. Lab Fee: $10. 1 hr.
121 Ice Skating. Lab Fee: $40. 1 hr.
122 Beginning Ballroom Dance. Lab Fee: $10. 2 hrs.
123 Body Sculpting. Lab Fee: $10. 2 hrs.
124 Backpacking. Lab Fee: $20. 1 hr.
125 Basic Horseback Riding. Lab Fee: $120. 1 hr.
(all-weather indoor arena available.)
126 Beginning Golf. Lab Fee: $80. 1 hr.
127 Beginning Bowling. Lab Fee: $30. 1 hr.
128 Speleology. Lab Fee: $10. 1 hr.
129 Snow Skiing. Lab Fee: Variable. 1 hr.
130 Basketball. Lab Fee: $10. 1 hr.
131 Volleyball. Lab Fee: $10. 1 hr.
132 Softball. Lab Fee: $10. 1 hr.
133 Soccer. Lab Fee: $10. 1 hr.
134 Jazz Dance. Lab Fee: $10. 1 hr.
135 Intermediate Jazz Dance. Lab Fee: $10. 1 hr.
136 Fencing. Lab Fee: $40. 1 hr.
137 Hang Gliding Fundamentals. Lab Fee: $10. 1 hr.
138 Intermediate Ice-Skating. Lab Fee: $40. 1 hr.
139 Intermediate Swimming. Lab Fee: $20. 1 hr.
140 Intermediate Karate. Lab Fee: $10. 2 hrs.
141 Intermediate Tennis. Lab Fee: $10. 1 hr.
142 Intermediate Racquetball. Lab Fee: $10. 2 hrs.
143 Intermediate Swimnastics. Lab Fee: $10. 1 hr.
144 Intermediate Stunts and Tumbling. Lab Fee: $10. 1 hr.
145 Intermediate Golf. Lab Fee: $80. 1 hr.
146 Intermediate Bench Stepping. Lab Fee: $10. 2 hrs.
147 Aerobic Dance II. Lab Fee: $10. 2 hrs.
148 Intermediate Sailing. Lab Fee: $40. 1 hr.
149 Advanced Tennis. Lab Fee: $10. 1 hr.
150 Advanced Karate. Lab Fee: $10. 2 hrs.
151 Advanced Swimnastics. Lab Fee: $10. 1 hr.
152 Advanced Racquetball. Lab Fee: $10. 2 hrs.
153 Advanced Ballet. Lab Fee: $10. 1 hr.
154 Advanced Volleyball. Lab Fee: $10. 2 hrs.
155 Ballet. Lab Fee: $10. 1 hr.
156 Advanced Weight Training. Lab Fee: $10. 2 hrs.
157 Advanced Bowling. Lab Fee: $30. 1 hr.
158 Intermediate Yoga. Lab Fee: $10. 1 hr.
159 Aerobic Dance III. Lab Fee: $10. 2 hrs.
160 Intermediate Tai Chi. Lab Fee: $10. 1 hr.
161 Advanced Ballroom Dance. Lab Fee: $10. 1 hr.
162 Intermediate Field Riding. Lab Fee: $120. 1 hr.
163 Basic Shooting. Lab Fee: $30. 1 hr.
164 Intermediate Weight Training. Lab Fee: $10. 2 hrs.
165 Intermediate Ballroom Dance. Lab Fee: $10. 1 hr.
166 Basic Rowing. Lab Fee: $10. 1 hr.
167 Advanced Sports-Basketball. Lab Fee: $10. (Section 01 will be offered for men; Section 02 for women.)
168 Advanced Sports-Tennis. Lab Fee: $10. (Section 01 will be offered for men; Section 02 for women.)
169 Advanced Sports-Soccer. Lab Fee: $10. (Section 01 will be offered for men; Section 02 for women.)
170 Advanced Sports-Crew. Lab Fee: $10. 1 hr.
171 Advanced Sports-Tennis. Lab Fee: $10. 1 hr.
Advanced Sports-Ice Hockey. Lab Fee: $10.
Advanced Sports-Softball. Lab Fee: $10.
Special Topics in Health and Physical Education. Lab Fee: Variable.

Professional Courses

210 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.

211 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.

212 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 interscholastic and recreational levels.

213 Soccer Officiating 2 hrs.
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.

220 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. Prerequisite: Instructor approval. Lab Fee: $110.

221 Advanced Scuba 1 hr.
Lecture and dives necessary to earn a YMCA-Silver Star Water Rating. Lab Fee: $110.

223 Lifeguard Training 2 hrs.
Certification as a Red Cross approved lifeguard upon successful completion of classroom and in-water instruction and testing. Lab Fee: $60

224 Water Safety Instructor 3 hrs.
Techniques for teaching infant and pre-school aquatics. Red Cross Learn to Swim Program, Basic Water and Emergency Water Safety courses. Includes pre-test and instructor candidate training course. Lab Fee: $60.

269 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.

279 Instrument Flying: Ground School 3 hrs.
Provides student with knowledge needed for instrument flight instruction air training. Prepares student for FAA Instrument Flying Examination. Prerequisite: FAA Private Pilot Rating. Kit must be purchased.

280 History and Principles of Physical Education 3 hrs.
290 **Beginning Athletic Training** 3 hrs.
Knowledge and techniques necessary to prevent and/or care for the common athletic injuries. For coaches, athletes, parents and those working in recreation, physical education, or athletics. Lab Fee: $20.

291 **CPR Instructor** 1 hr.
Basic techniques cardiopulmonary resuscitation, and methods of teaching these skills to others. An American Heart Association certificate is awarded. Lab Fee: $30.

294 **Contemporary Nutrition for Today’s Lifestyle** 1 hr.

299 **Field Work in Athletics, Physical Education, or Leisure Services** 2 hrs.
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: $10.

390 **Advanced Athletic Training** 3 hrs.
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: $10.

500 **Boating Safety** 3 hrs.
Techniques for teaching boating safety to elementary and secondary students. The Alabama Better Boating Home-Study Course, The Alabama Young Boatmen’s Program, and water skiing safety will be stressed. Instructor’s rating in boating safety will be awarded upon successful completion. Lab Fee: $10.

**History Department**

Professors Boucher, Dunar (Chair), Ellis, Gerberding, Williams; Professor Emerita Roberts; Professor Emerita Shields, Professor Emerita C. White; Professor Emeritus J. White; Associate Professors Severn, Waring; Associate Professor Emerita Parker; Assistant Professor Baird, Martin.

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.

History students may also pursue an already approved and published composite major such as the Slavic Area Studies Program. As currently established, a composite major consists of a minimum of 36 semester hours, 24 of which must be upper division. In the Slavic Area Studies Program, history contributes six courses including HY 101-102 (GER), four of which must be upper division and include 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. A student who wishes to plan an individual program of study can do so through a history advisor and with the coordination of the department chair.

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
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).

History (HY)
101 Origins and Development of the Contemporary World, Part I 3 hrs.
   Major western civilizations to 1500. Taught every semester.
102 Origins and Development of the Contemporary World, Part II 3 hrs.
   Major western civilizations since 1500. Taught every semester.

Courses below are open to all students other than beginning freshmen, with exceptions as indicated.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>202</td>
<td>Current World Issues in History</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Selected topics in world history during the twentieth century designed to foster a historical awareness of present day problems.</td>
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<tr>
<td>221</td>
<td>The United States to 1877</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Discovery of America through the Civil War and Reconstruction.</td>
<td></td>
</tr>
<tr>
<td>222</td>
<td>The United States Since 1877</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>United States from the end of the Civil War era to the present.</td>
<td></td>
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<tr>
<td>225</td>
<td>History of Alabama</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>The state's past from colonial times to the present with emphasis on its place in United States history.</td>
<td></td>
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<tr>
<td>229</td>
<td>Survey of Ancient Times</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Ancient Near East, Greece, and Rome. Prerequisites: HY 101-102 or approval of instructor.</td>
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<tr>
<td>230</td>
<td>The Rise of Medieval Civilizations</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Survey of the origins and development of medieval society in the West, with attention also given to Byzantium and the Islamic world, as well as to the Latin west. Prerequisites: HY 101 and 102 or permission of instructor.</td>
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</tr>
</tbody>
</table>

Courses listed below are open to students who have completed 9 semester hours in history or have junior standing.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>318</td>
<td>Constitutional History of the United States</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
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<tr>
<td>326</td>
<td>Colonial America</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Political, social, economic, and religious developments in the North American colonies, 1607-1783.</td>
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<tr>
<td>329</td>
<td>Imperial Rome</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Roman Empire from the Principate to the barbarian invasions.</td>
<td></td>
</tr>
<tr>
<td>341</td>
<td>Modern France</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>343</td>
<td>Modern Germany</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>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.</td>
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<tr>
<td>347</td>
<td>English History to 1660</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>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.</td>
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<tr>
<td>348</td>
<td>English History since 1660</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
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</tr>
<tr>
<td>364</td>
<td>The Westward Movement in American History since 1803</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Pioneering society, Indian relations, land policies, expansion, and politics of the trans-Mississippi frontier.</td>
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<tr>
<td>365</td>
<td>American Labor History</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>American labor relations from colonial times but concentrating on post-Civil War topics.</td>
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</tr>
</tbody>
</table>
African-Americans in Twentieth Century America 3 hrs.
Interrelationship of the African-American and the industrial-urban environment of the United States.

Social and Cultural History of the United States to 1865 3 hrs.
Major themes in the development of American culture and society from the colonial period to the Civil War era.

Social and Cultural History of the United States since 1865 3 hrs.
Major themes in American culture and society since the Civil War.

Foreign Relations of the U. S. to 1920 3 hrs.
American foreign relations from the Revolutionary era through World War I. American territorial and commercial expansion, imperialism, and emergence as a world power.

Foreign Relations of the U. S. since 1920 3 hrs.
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.

Imperial Russia 3 hrs.
Traces the development of Russian society under the Romanov Dynasty. Particular attention is paid to the emergence of Russia as a great power and the strains this imposed on its domestic order.

Soviet Russia 3 hrs.
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.

Europe, 1500-1815 3 hrs.
Examination of the economic, scientific, social, political, and cultural developments in Europe from the Renaissance to the close of the Napoleonic Wars.

Europe Since 1815 3 hrs.
Europe from the end of the Napoleonic Wars to the present with equal emphasis on the nineteenth and twentieth centuries.

Special Topics in History 3 hrs.
Intensive examination of particular problems, periods, or topics in history.

Courses listed below are open to students who have completed 12 semester hours in history or 12 semester hours in history with senior standing.

The Old South 3 hrs.
Southern society, economics, politics and culture concentrating on the nineteenth century south through Reconstruction.

The New South 3 hrs.
Post-reconstruction South emphasizing the economic, social, and political readjustments made during the twentieth century.

The Atlantic World 3 hrs.
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.

The Age of the American Revolution 3 hrs.
Politics, society, economy, culture, and international conflicts from 1754 through the Revolutionary War to 1815.

The Republic in Crisis 3 hrs.
Political, social, and economic changes in the United States and its sections from 1815 through the Civil War and Reconstruction.
The Rise of Modern America
Economic and social changes, imperialism, and the growth in government in the United States from 1877 to the 1920s.

Modern America
American society, politics, economics, and foreign affairs from the end of World War I to the origins of the Cold War.

Recent America
Contemporary America from the 1950s to the present, analyzing both domestic and foreign affairs.

The High Middle Ages
Political, economic, and cultural features of Europe when medieval civilization was at its height.

The Renaissance and Reformation
Selected topics in the Italian Renaissance and European Reformation.

Crisis in Europe, 1560-1660
Europe in an age of anxiety, religious wars, political upheaval, witch-hunts, and the early scientific revolution.

Absolutism and Enlightenment, 1660-1763
Europe from Louis XIV to the Peace of Paris, an age of political stability and intellectual innovation.

The French Revolution and Napoleon
European ideas, institutions, and events from the beginning of the French Revolution to the demise of the Napoleonic Empire.

Europe in the Nineteenth Century
Major political, social, economic, and intellectual developments in Europe from the Congress of Vienna to World War I.

Europe in the Twentieth Century
Major developments in Europe from 1914 to the present, including the two World Wars and post-war reconstruction.

Research Seminar in History
Historiography, research and writing, and recent interpretations in the field of history. Required of all history majors. Taught once annually.

Music Department
Professors Emeriti Boyer, Pales; Associate Professor Graves (chair), Sanders, Sneed; Assistant Professors McDuffie, Smith; Adjunt Lecturers Regni, Weaver.

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 will also be 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.

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 which 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.
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; many 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 215 Music for the Young Child
MU 310 American Music
MUA 190/390 UAH Choir
MUA 191/391 Chamber Choir
MUA 192 Tenor-Bass Chorale
MUA 193/393 Women’s Choir
MUA 198/398 Jazz Ensemble
MUA 199/399 UAH Wind Ensemble

Music Major

The major in music, with emphasis in either performance, technology (in combination with engineering or computer science minors), or music literature 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 Education Emphasis

The emphasis in music education is a 152 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 N-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 Requirement

GER for the B.A. degree are listed in earlier in this section. The student should include MU 100 to fulfill the fine arts option. Music education students must include ED 306, ED 308, ED 410, 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. Music education students must also include three hours of HPE courses (including HPE 294 and two activity courses). 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 (select A or B)

A. Music

Major

MUA 2-1/4-4 Principal Instrument* (8 terms; 4 hours upper level) 12
(Include MUA 401-2-3 for music technology emphasis.)
MUA 1-1/1-4 Secondary Instrument** (4 terms) 4
(Substitute MU 106 for music technology emphasis) (3)
MU 201, 202, 301, 302 Theory-Harmony 12
MU 203, 204, 303, 304 Musicianship Skills 4
MU 100 Introduction to Music Literature (include in GER) 3
MU 311, 312 Music History 6
MU 325 Conducting 2
Ensembles*** 4
Junior recital 0
Senior recital 0

Minor

Select either a minor from a discipline represented in the GER, the minor in computer science, or the cluster in electrical engineering.

B. Music Education Emphasis

(Composite Major-Minor)

Minimum 62 hrs.

Music Performance, Theory, and Literature

MUA 2-1/4-4 Principal Instrument (7 terms; 4.5 hours upper level) 10.5
Junior recital (solo and ensemble works) 0
Secondary instrument(s): (4-6 terms) 4-6
Voice principals elect piano, MUA 131-134
Piano principals elect voice, MU 111-114

Instrument principals elect the following courses:

Percussion, MUA 189
Strings, MU 158, 159
Woodwinds, MU 168, 169
Brasses, MU 178, 179 (one course to be deleted in principal instrument area)

Ensembles*** 6-8
(Combined secondary and ensembles must be 12 hrs.)

MU 201, 202, 301, 302 Theory-Harmony 12
MU 203, 204, 303, 304 Musicianship Skills 4
MU 100 Introduction to Music Literature (GER) 3
MU 311, 312 Music History (include 312 in GER) 6
MU 325 Conducting 2
MU 416 Orchestration 2
MU 425 Advanced Conducting 2

Music Education

MUE 200 Introduction to Music Teaching 1
MUE 326 Teaching General Music in Elementary Schools 3
MUE 327 Teaching General Music in Secondary Schools 3
MUE 428 Vocal/Choral Methods OR
MUE 429 Organizing and Directing InstrumentalGroups in Secondary Schools 2

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Professional Education

ED 305 Foundations of Education in U.S. 3
ED 306 Human Development (GER) 3
ED 308 Educational Psychology (GER) 3
ED 300 Group Processes 2
ED 408 Teaching Reading in the Secondary School 3
ED 410 Foundations of Educational Evaluation (GER) 3
ED 490 Principles of High School Teaching 1
ED 499 N-12 Internship*** 9
ED 593 Education of Exceptional Children and Youth 3

*Students electing the music literature, church music, or music technology emphasis will be limited to 8-9 hours rather than 12 hours of studio instruction. Three to four hours of appropriate upper-level music literature, technology, or history courses replace studio work. For the church music emphasis, this 4 hours will include MU 415, MUE 428, and MU 412. MU 315 replaces MU 311 in the church music program. In the music technology emphasis, this will include 3 hours of MUA 401, 402, and 403. Other special projects replace junior and senior recitals in each of these emphases.

**All or part of the secondary requirement may be satisfied by examination. In the church music emphasis, some organ study may be substituted for piano. In the music technology emphasis, secondary instrument is replaced with MU 106, Survey of Electro-Acoustic Music Techniques.

***Students must complete a minimum of 8 terms of small or large ensemble experiences; however, a maximum of 4 hours may count towards the degree (8 in the music education emphasis).

****Students must pass a piano competency examination 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 (12 hours upper-level), including the following courses:

MUA 1-1/1-4 Studio Instruction 4
(Music technology minors substitute MU 106) (3)
MU 201, 202, 301 Theory-Harmony 9
MU 203, 204, 303 Musicianship Skills 3
MU 100 Introduction to Music Literature (include in GER) 3
MU 312 History of Music II 3
Ensemble (300 level) 5
(Music technology minors should substitute 3 hrs. MUA 401-2-3 for 3 hours of the ensembles.)

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. Twenty-four hours in music are required:

MU 201, 202 Theory of Music ................................................................. 6
MU 203, 204 Musicianship Skills ......................................................... 2
MU 100 Introduction to Music Literature ......................................... 3
MU 310 American Music ................................................................. 3
MU 312 Music History II ................................................................. 3
MUE 326 Teaching Gen. Music in Elementary School ..................... 3
(Replacement for MUE 215 in the GER)
Ensembles (at 300 level) ............................................................. 4

198
Music (MU)

100 Introduction to Music Literature 3 hrs.
Basic music appreciation. Exploration of ideas and issues in various types of western music through reading, listening, and discussion.

101 Introduction to Music Theory 3 hrs.
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 Survey of Electro-acoustic Music Techniques 3 hrs.
Introduction to techniques in electro-acoustic music, including tape manipulation, psychoacoustics, sound synthesis, sampling, algorithmic composition and computer music fundamentals.

201 Theory of Music I 3 hrs.
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.

202 Theory of Music II 3 hrs.
Continuation of MU 201. Prerequisites: MU 201 and 203.

203 Musicianship Skills I 1 hr.
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.

204 Musicianship Skills II 1 hr.
Continuation of MU 203. Prerequisites: MU 201 and 203.

301 Theory of Music III 2 hrs.
Continuation of studies on a more advanced basis than MU 201-202. Prerequisites: MU 202 and 204.

302 Theory of Music IV 2 hrs.
Continuation of MU 301, with emphasis on twentieth-century materials. Prerequisites: MU 301 and 304.

303 Musicianship Skills III 1 hr.
Continuation of MU 204. Prerequisites: MU 202 and 204.

304 Musicianship Skills IV 1 hr.
Continuation of MU 303. Prerequisites: MU 301 and 303.

309 Analysis of Musical Form 2 hrs.
Analysis for structure and form of representative small and large compositions of the sixteenth through the twentieth centuries. Prerequisites: MU 100 and 302 or approval of instructor.

310 American Music 3 hrs.
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.

311 History of Music I 3 hrs.
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 110 and 301, or approval of instructor.

312 History of Music II 3 hrs.
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 110 and 301, or approval of the instructor.

313 Survey of a Musical Form 3 hrs.
A musical form (e.g., concerto, opera, etc.) from its origins to present time. Variable topics. Prerequisites: MU 303 and 311 or 312.

314 Biographical Survey 3 hrs.
Life and work of great composers. Variable topics. Prerequisites: MU 302 and 311 or 312.

315 History of Music in Liturgy 3 hrs.
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.

320 Piano Pedagogy 2 hrs.
Materials, techniques, and practices in teaching beginners and students through lower advanced grades of piano. Practical experience. Prerequisite: approval of instructor. Offered upon demand.

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.

325 Conducting 2 hrs.
Basic techniques of choral and instrumental conducting. Prerequisites: MU 301 or approval of instructor.

401 Twentieth Century Materials and Techniques 3 hrs.
Systems of tonal organization, compositional procedures, terminology, and analytical methods that relate to music of this century. Prerequisites: MU 303 and 312 or approval of instructor.

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 110, Junior standing or permission of instructor.

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.

415 Church Music Methods 2 hrs.
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 326.

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.

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.

511 Master Class in Piano Literature and Pedagogy 2 hrs.
Topic of course varies. Examination of selected forms.

Studio Instruction In Vocal and Instrumental Music (MUA)
Students must fill out a "Request for Studio Instruction" card 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 MU 211, 221, etc., 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, etc.

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 one letter to reflect jury performance. Non-majors may enroll in 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 1 hr.
For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.

211-219, 411-419 Studio Instruction in Voice 1.5 hr.
For music majors' principal instrument. Studio instruction fee: $90.

121-129 Studio Instruction in Organ 1 hr.
For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.

221-229, 421-429 Studio Instruction in Organ 1.5 hr.
For music majors' principal instrument. Studio instruction fee: $90.
131-139 Studio Instruction in Piano 1 hr.
For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.

231-239, 431-439 Studio Instruction in Piano 1.5 hr.
For music majors' principal instrument. Studio instruction fee: $90.

141-149 Studio Instruction in Guitar 1 hr.
For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.

241-249, 441-449 Studio Instruction in Guitar 1.5 hr.
For music majors' principal instrument. Studio instruction fee: $90.

151-157 Studio Instruction in Strings 1 hr.
For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.

158, 159 Class Instruction in Strings 1 hr.
For secondary instrument, instrumental music education students. Studio instruction fee: $70.

251-259, 451-459 Studio Instruction in Strings 1.5 hr.
For music majors' principal instrument. Studio instruction fee: $90.

161-167 Studio Instruction in Woodwinds 1 hr.
For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.

168, 169 Class Instruction in Woodwinds 1 hr.
For secondary instrument, instrumental music education students. Studio instruction fee: $70.

261-269, 461-469 Studio Instruction in Woodwinds 1.5 hr.
For music majors' principal instrument. Studio instruction fee: $90.

171-177 Studio Instruction in Brass 1 hr.
For secondary instrument, instrumental music education students. Studio instruction fee: $70.

178-179 Class Instruction in Brass 1 hr.
For secondary instrument, instrumental music education students. Studio instruction fee: $70.

271-279, 471-479 Studio Instruction in Brass 1.5 hr.
For music majors' principal instrument. Studio instruction fee: $90.

181-188 Studio Instruction in Percussion 1 hr.
For secondary instrument, instrumental music education students. Studio instruction fee: $70.

189 Class Instruction in Percussion 1 hr.
For secondary instrument, instrumental music education students. Studio instruction fee: $70.

281-289, 481-489 Studio Instruction in Percussion 1.5 hr.
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 creat individual projects in MIDI, sound creation and editing, and multimedia. Prerequisite: MU 106 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. A maximum of 6 semester hours in ensemble courses (MUA 190-199, 390-399) may be applied as credit toward
total degree requirements in any discipline except music education, where the maximum is 8 hours. Students may continue to enroll, however, and repeatedly participate in ensembles throughout their university career. Only students who have held membership in an ensemble for four semesters should enroll in 300-level instruction. Through audition students may receive upper-level credit after three semesters of membership.

**190, 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.

**198, 398 Jazz Ensemble** 1 hr.
Open to all students with the permission of the director. Provides the participant with opportunities to perform a wide variety of jazz styles in varied settings. Required attendance at rehearsals and performances.

**199, 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)**

**200 Introduction to Music Teaching** 1 hr.
Designed to explore and provide answers to the following questions: What is music teaching? What abilities should a music teacher possess in order to be successful? Who are the students who will be taught? What comprises a music curriculum? Intended for music education majors as a substitute for ED 200 (Introduction to Teaching).

**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.

**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.

### 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.

#### Philosophy Department

Professor Martine (Chair); Associate Professors Cling, Hanks, Rochowiak; Assistant Professors Heikes, 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.

### 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.

**Philosophy (PHL)**

**101 Being, Knowledge, and Value**

Introduction to philosophical reflection focusing upon central problems in each of the major branches of the western tradition: metaphysics, epistemology and axiology.  

**201 Introduction to Logic**

Methodology of correct formal and informal reasoning.  

**202 Introduction to Ethics**

Major ethical positions in both classical and modern thought.  

**301 Ancient Philosophy**

Survey of classical philosophy from the Pre-Socratics through Aristotle. Prerequisite: PHL 101 or permission of instructor.  

**302 Modern Philosophy**

Survey of the British and Continental traditions from Descartes through Kant. Prerequisite: PHL 101 or permission of instructor.  

**303 Contemporary Philosophy**

Examination of some of the most important trends in late nineteenth and twentieth century thought. Prerequisite: PHL 101 or permission of instructor.  

**310 Philosophy of Art**

Major aesthetic theories of the western tradition, with emphasis on the relation between artistic and discursive expression. Prerequisite: PHL 101 or permission of instructor.  

**311 Philosophy of Science**

Critical assessment of the historical and logical foundations of the natural and theoretical sciences. Prerequisite: PHL 101 or permission of instructor.  

**312 American Philosophy**

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.  

**314 Philosophy of Eastern and Western Religions**

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.  

**320 Symbolic Logic**

Symbolic deductive logic, including propositional calculus (truth-functional logic), predicate calculus (propositional functions and quantification), and the logic of relations. Prerequisite: PHL 201.  

**330 Classical Political Philosophy**

(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).  

**332 Modern Political Philosophy**

(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).
385 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.

392 Engineering Ethics and Professional Behavior 3 hrs.
Examination of ethical aspects of decisions made by engineers, including consideration both of the kinds of professional and organizational situations confronting the engineer and philosophical bases of choosing and evaluation.

395 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.

399 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.

401 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.

402 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.

403 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.

Political Science Department

Professors Meek, Spitz (Chair); Associate Professors Pottenger, Williams; Assistant Professor Reeves; Adjunct Assistant Professors Moorman, Schumann; Lecturer Hawk.

The Department of Political Science offers the Bachelor of Arts in political science and the Master of Arts in public affairs.

General Education Requirements

PSC 101 (American Government) and/or PSC 102 (Introduction to Comparative Government) are the two courses to be used to fulfill General Education Requirements (GER) for non-majors. Political science majors must include AHS 300 (Statistical Analysis) in their GER.

Political Science Major

Students wishing to major in political science must complete a minimum of 36 semester hours in political science, including:
PSC 101 - American Government
PSC 102 - Introduction to Comparative 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)
Students must also take AHS 300 - Statistical Analysis, but may not count these hours toward the required 36. In addition to the 15 hours of required courses, students must take at least one course from any three of the following five sub-fields of political science:

1. International relations (PSC 362, 464, 468)
2. Comparative politics (PSC 342, 344, 346, 348)
4. American law (PSC 351, 452, 454)
5. Political theory (PSC 330, 332, 334, 436, 438)

Students may satisfy the remaining 12 hours of the 36 hour degree requirement by taking additional courses in the subfield(s) of their choice or by taking courses from the following "Optional" category:

**Optional Courses**

- PSC 280 - Special Topics in Political Science I
- PSC 311 - Scope and Methods in Political Science
- PSC 382 - Political Sociology
- PSC 480 - Advanced Topics in Political Science
- PSC 484 - Senior Seminar in Political Science*
- PSC 495 - Internship in Government
- PSC 500 - The American Polity
- PSC 501 - Approaches to Public Policy
- PSC 510 - Public Management Profession
- PSC 580 - Special Topics in Political Science

A student with a major in political science must choose either 1) a minor from another discipline; or 2) 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.

Freshmen considering a major in political science should consult with the chair of the department during their freshman year. Sophomores should file a program of study before the end of their sophomore year. 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 graduate school preparation.

**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).

**Political Science for Second Area of Study**

Students majoring in elementary education may select political science as their second area of study. Major requirements can be found in the Education section. Students seeking certification in secondary education should seek advisement from the Education Department where a program of study leading to courses in political science and/or the social sciences can be developed.

**Internship Programs**

The Department of Political Science has an internship option for students in political science, public affairs and prelaw. Internships bridge the gap between learning experience and entry into professional life. Normally, students must have junior status or above in order to be considered for this option.

**Political Science (PSC)**

101 **American Government**

Introductory examination of American government and politics.  
3 hrs.
102 Comparative Politics and Foreign Governments 3 hrs.
Survey of government and politics in parliamentary, communist, transitional and third world political systems.

260 Introduction to International Relations 3 hrs.
Examination of the basic factors underlying the conduct of international relations, focusing upon 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 and 135 recommended.

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 upon 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 upon 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 upon 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.

311 Scope and Methods in Political Science 3 hrs.
Examination of the main concerns of political scientists and the methods used by political scientists. Students will gain an understanding of the history of the discipline and the research methods used by political scientists of all fields. Prerequisite: AHS 300. Lab Fee: $40.

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.

342 Western European Governments and Politics 3 hrs.
Examination of selected governments and politics of western Europe. Focus will vary but will always include Great Britain, Germany and France. Prerequisite: PSC 101, 102 recommended.

344 Eastern European Governments and Politics 3 hrs.
Examination of selected governments and politics of eastern Europe. Emphasis will be on the USSR and selected countries in process of transition from communism. Prerequisite: PSC 101, 102 recommended.

346 Third World Systems 3 hrs.
Growth and decay of third world nations, their socioeconomic problems and their political responses to the requirements of economic and social change. Prerequisite: PSC 102.

348 Asian Governments & Politics 3 hrs.
Examination of Asian governments and politics with focus on twentieth century China and Japan. 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 recommended.

362 International Law and Organization 3 hrs.
Contribution of international law and organization to world order since World War II. Role of the United Nations in the third world and to political and sociological origins of international law and its application to selected contemporary problems. PSC 102 or PSC 260 recommended.

382 Political Sociology 3 hrs.
Examination of concepts, theories, and research findings related to the structure of political institutions in society and their relation to other societal institutions. Stratification, correlates, bases, legitimization, and change of power in society. Prerequisite: PSC 101 or 351 recommended. (Same as SOC 382)

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.

414 State Government and Politics 3 hrs.
Introduction to state and local politics in America. Different governmental forms and their impact on public policies. 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. PSC 306 or PSC 414 recommended.

436 Contemporary 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.  (Formerly PSC 371) 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 452 recommended.

464 American Foreign Policy 3 hrs.  Institutions, processes, interests and personalities affecting the formation of American foreign policy. Prerequisite: PSC 101, 102 recommended.

466 Foreign Policy of Eastern European Governments 3 hrs.  Examination of the transitional foreign policies of the eastern European countries with a focus on the USSR. Prerequisite: PSC 260 and/or 344.

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. PSC 500 or 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.

Psychology Department
Professors Kirkpatrick; Associate Professor Emeritus Sullins; Associate Professors Carpenter, James (Chair); Assistant Professors Bliss, Lohmeir, Torres.

The Department of Psychology offers the B.A. and M.A. degrees in psychology.

Psychology Major
The program of study for a psychology major includes 35 hours of psychology with at least 26 hours of these courses numbered 300 or above. In addition, the psychology major must be accompanied by a minor which 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), 2) complete PY 101, PY 102, AHS 300, and PY 302 no later than the sophomore year, and 3) seek advice from the departmental chair in planning a program of study before enrolling in advanced courses.

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 counseling in the Department of Education. A student majoring in elementary education may choose psychology as the second area of study. 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 PY 102. Prior to enrollment in PY 302 and PY 311, 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 6 hrs.
- AHS 300 Statistical Analysis 4 hrs.
- PY 302* Experimental 4 hrs.
- PY 500 Human Research I 3 hrs.
  - Two courses from Group A (See below) 6 hrs.
  - Two courses from Group B (See below) 6 hrs.
  - Elective 3 hrs.

* AHS 300 is a prerequisite for PY 302 and PY 311.

Group A:
- PY 314 - Learning
- PY 316 - Perception
- PY 380 - Cognition
- PY 436 - Biological Psychology

Group B:
- PY 301 - Personality
- PY 310 - Child 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 6 hrs.
- One course from Group A (See above) 3 hrs.
- One course from Group B (See above) 3 hrs.
- Additional coursework 300-level and above 9 hrs.
- Total 21 hrs.
Curricula for Students Seeking Teacher Certification

Cognate for Elementary Education Majors

- PY 101-102 - General Psychology I and II 6 hrs.
- PY 380/314 - Cognition or Learning 3 hrs.
- PY 311* - Ind Diffs: Tests & Meas. 3 hrs.
- PY 315 - Developmental Psychology 3 hrs.
- PY 375 - Social Psychology 3 hrs.
- PY 301/433 - Personality or Abnormal and Health Psychology for the Human Services Professions 3 hrs.

*AHS 300 is a prerequisite for PY 311.

Social Science Composite for Secondary Education Majors

Students planning to teach psychology in secondary schools will need to complete the Social Studies Composite which includes courses in history, psychology, sociology, political science, and economics. The psychology courses included in this cognate are PY 101, PY 102, and PY 375. Students seeking certification in secondary education should contact the Education Department for specific requirements.

Psychology (PY)

101 General Psychology I 3 hrs.
Introduction to methods and research findings in the field. Topics will include: historical perspectives, learning, memory, cognition, language, the biological and social basis of behavior, sensation, perception, human development, personality theories, and abnormal behavior. The student is encouraged to participate in approved experiential activities such as participation in a research study, lecture, 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.

102 General Psychology II 3 hrs.
Introduction to applied topics in psychology, such as counseling, human factors, health psychology, industrial and organizational psychology. Career opportunities are discussed. Students are encouraged to engage in approved experimental activities such as subject participation in a current research study or in laboratory, lecture, and video experiences designed to illustrate the development, testing, and validation of psychological knowledge. Prerequisite: PY 101.

PY 101 and 102 are prerequisites for all PY courses numbered 200 and above.

207 Psychology of Personal Adjustment 3 hrs.
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 subject participation in a current research study or laboratory, lecture, and video experiences designed to illustrate the development, testing and validation of psychological knowledge. Prerequisite: PY 101 and 102.

301 Personality 3 hrs.
Examination of various theories of personality with possible implications for research. Prerequisite: PY 101 and 102.

302 Experimental Psychology 3 hrs.
Design and execution of experiments in psychology. Data analysis and manuscript preparation. Prerequisites: PY 101, 102 and AHS 300. Lab Fee: $30.

212
310 Child Psychology 3 hrs.
The process of development in the human organism. Research, practical, and theoretical orientation used to explore developmental issues and processes will be examined. Prerequisites: PY 101 and 102.

311 Individual Differences: Tests and Measurements 3 hrs.
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, 302 and AHS 300.

314 Learning 3 hrs.
Analysis of learning principles from simple relationships with animals to the complexities of human language and problem solving. Prerequisites: PY 101, 102, 3 hrs. PY 300-level or above. PY 302 strongly recommended.

315 Developmental Psychology 3 hrs.
Cognitive, psychoanalytic, ethological, behavioral, and humanistic theories of development. Prerequisites: PY 101 and 102. PY 310 recommended.

316 Perception 3 hrs.
Examines sensory systems and elements of perception. Topics include vision research, audition, chemical senses, and body sensations. Prerequisites: PY 101, PY 102, 3 hrs. PY 300-level or above. PY 302 strongly recommended.

330 Psychology of Nonverbal Communication 3 hrs.
Investigates processes of nonverbal communication such as body language, gestures and paralinguistics through empirical studies and naturalistic observation. Prerequisites: PY 101, 102 or 3 hrs. PY 300-level or above. PY 302 strongly recommended.

375 Social Psychology 3 hrs.
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, 102. (Same as SOC 375.)

380 Cognition 3 hrs.
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, 3 hrs. PY 300-level or above. PY 302 recommended.

Courses listed below are open to students who are seniors or those enrolled in the last semester of their junior year.

420 Seminar in Psychology 3 hrs.
Presentation and discussion of reports on psychological problems within a particular area. Prerequisites: 15 hours PY and approval of instructor. 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.
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.)

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: 12 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.

500 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; Prerequisites or corequisites: PY 311, one Group A course, one Group B course. Lab Fee: $30. (Offered Fall Semester)

501 Human Research II 3 hrs.
Continuation of PY 500. Prerequisite: PY 500 and approval of instructor. Lab Fee: $30. (Offered Spring Semester)

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.

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.

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.)

530 Psychometrics 3 hrs.
History and development of psychological testing with special emphasis given to both theory and process of effective evaluation. Prerequisites: AHS 300 and PY 311.

535 Theory 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. Prerequisite: 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. Prerequisites: 9 hours. PY or BYS. (Same as BYS 536.)

Sociology Department

Associate Professors: Colclough (Chair), Finley; Assistant Professors Berbrier, Sitaraman.

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 33 hours of sociology courses including:

SOC 100 Introduction to Sociology
AHS 300 Statistical Analysis
SOC 300 Research Methods
SOC 465 Sociological Theory

Cluster 1
SOC 200 - Introduction to Anthropology
SOC 315 - Cultural Change
SOC 330 - Race and Ethnicity
SOC 350 - Class, Status, and Power
SOC 380 - Sociology of Science and Technology
SOC 382 - Political Sociology
SOC 440 - Sociology of Religion
SOC 450 - Sociology of Health
SOC 455 - Sociology of Work and Occupations

Cluster 2
SOC 106 - Marriage and Family
SOC 306 - Gender Roles
SOC 310 - Sociology of Childhood
SOC 311 - Life Span Development
SOC 319 - Deviance and Social Control
SOC 325 - Sociology of Education
SOC 345 - Social Gerontology
SOC 375 - Social Psychology

A minimum of 21 hours must be taken in courses numbered 300 or above.

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)
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.
Critical exploration of 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.

333 Sociology of the South 3 hrs.
Examines the contemporary south focusing on unique social processes and cultural heritage leading to its development.

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 insstructor. (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.

Air Force Studies
Samford University AFROTC (Birmingham)
(205) 870-2954

The Air Force Reserve Officer Training Corps program provides college men and women the opportunity to compete for a commission as a second lieutenant in the U.S. Air Force upon graduation from college. The program is divided into the General Military Course and the Professional Officer Course. The General Military Course includes the courses offered during the first two years of the program and is open to all students without military obligation. The Professional Officer Course includes the junior and senior level courses and is restricted to those who meet entry requirements or through special permission from the Professor of Aerospace Studies. Air Force ROTC students can gain confidence, leadership training, communications skills, and an appreciation for the role of the military in contemporary society.

Air Force ROTC is offered at UAH through a cooperative agreement with Samford University in Birmingham. All courses are taught on the Samford campus. Students interested in this program are encouraged to contact the department by calling (205) 870-2954 or by email afrotc@samford.edu.

Air Force Studies Minor
Requirements for the air force studies minor are 24 hours of coursework. Students must earn a C or better in all air force studies courses. Students must complete 18 semester hours of air force studies coursework and successfully complete two of the following electives:

HY 374 - Foreign Relations of the U.S. Since 1920
PHL 403 - Advanced Moral Philosophy
PSC 342 - Western European Governments and Politics
PSC 344 - Eastern European Governments and Politics
PSC 346 - Third World Systems
PSC 348 - Asian Governments and Politics
PSC 362 - International Law and Organizations
PSC 464 - American Foreign Policy
General Military Course
The General Military Course is comprised of AFS 101, 102, 201, and 202. These courses are open to all students regardless of qualifications for military service or intent to compete for a commission. As part of the General Military Course, students will examine the basic organization and structure of the Air Force, appreciate the historical significance of air power, apply basic communication skills, and receive an introduction to total quality management. Each course is one hour of academic credit.

Air Force ROTC field training is offered during the summer months at selected Air Force bases throughout the U.S. Students who have completed all courses in the General Military Course may enroll in AFS 250 which is 4 weeks of field training. This training normally occurs between the sophomore and junior years in college. Students who have not completed all of the courses in the General Military Course may enroll in AFS 300 which is six weeks of field training. The additional two weeks of training will provide the student with the basic knowledge and skills offered in the General Military Course (AFS 101, 102, 201, 202). Field training is an intense training environment designed to orient students toward service in the U.S. Air Force. The major areas of study in the 4-week field training program include officer training, aircraft and aircrew orientation, career orientation, survival training, base functions, and Air Force environment, and physical training. The major areas of study in the 6-week field training program are essentially the same as those conducted in the 4-week field training, with the addition of areas studied during the General Military Course.

Professional Officer Course
The Professional Officer Course includes AFS 301, 302, 401, and 402. This course program is generally restricted to students who have completed field training. Students enrolling in these courses are generally committed to service on active duty in the U.S. Air Force. Other students desiring to enroll in these courses should first secure the permission of the Professor of Aerospace Studies, Samford University. The Professional Officer Course program is designed to provide students with advanced leadership training, application techniques for a quality culture, study of military history with particular attention paid to the role of air power, and a complete understanding of the national security process. The Professional Officer Course will prepare men and women with the skills necessary to be leaders in the U.S. Air Force.

Scholarship Programs
Four-year college scholarships are available to highly qualified high school seniors. Interested students should contact their local Air Force recruiter or the nearest AFROTC program for application booklets. Applications are due by December 1 of the senior year in high school.

Three-year and two-year scholarships are also available to college students. Air Force ROTC scholarships pay college tuition, laboratory fees, incidental fees, and books. Scholarship students also receive a $150 monthly tax-free stipend. Unlike most academic scholarships, family income has no bearing on qualification. For additional information, contact the department at (205) 870-2859.

All qualified students enrolled in the Professional Officer Course receive up to $2,000 per year to apply to tuition and books, and a $150 stipend. Veterans receive this allowance in addition to their normal veteran benefits. Uniforms and textbooks for all air force studies courses are provided at no charge. Additionally, UAH provides subsidies to Air Force ROTC scholarship recipients. The exact amount of the subsidy is subject to change. Check with the department to determine the current amount of the subsidy.
101 The Air Force Today I 1 hr.
Survey of topics relating to the Air Force and national defense. Discussion of purpose, structure, and career opportunities in the U.S. Air Force. Introduction to effective written communications. Students should also take AFS 101L Lab. Offered fall semester only.

102 The Air Force Today II 1 hr.
Introduction to interpersonal communications. Seminar focusing on effective listening techniques, verbal and nonverbal communications. Practical exercises and group projects designed to demonstrate barriers to effective communications and techniques to overcome barriers. Students should also take AFS 102L Lab. Offered spring semester only.

201 The Air Force Way I 1 hr.
Historical survey of technological innovation in warfare. Focus on the emergence of air power and its significance in war and national security policy implementation. Students should also take AFS 201L Lab. Offered fall semester only.

202 The Air Force Way II 1 hr.
Analysis of leadership and followership traits in the context of a modern military force. Discussion of ethical standards of military officers and Air Force core values. Advanced practical application of oral communication skills. Organization, research, delivery, and audience analysis for briefings and presentations. Group leadership problems designed to enhance interpersonal communications. Introduction to total quality management. Students should also take AFS 202L Lab. Offered spring semester only.

250 Field Training 6 hrs.
Six-week training and evaluation course designed to select potential candidates for the Professional Officer Course. Content includes all topics in AFS 101, 102, 201, 202. Students participate in rigorous physical training. Students must have the permission of the Professor of Aerospace Studies before enrolling. Offered summer term only.

300 Field Training 2 hrs.
Four-week training and evaluation course designed to select potential candidates for the Professional Officer Course. Students participate in rigorous physical training. Students must have the permission of the Professor of Aerospace Studies before enrolling. Offered summer term only.

301 Air Force Leadership and Management I 3 hrs.
Analysis of selected concepts, principles, and theories of quality Air Force leadership and management. Discussion of individual leadership skills and personal strengths and weaknesses as applied to an Air Force environment. Students must also take AFS 301L Lab. Offered fall semester only.

302 Air Force Leadership and Management II 3 hrs.
Seminar focusing on selected Air Force officers’ duties and responsibilities as a subordinate leader. Application of effective listening, speaking, and writing skills in Air Force-peculiar formats and situations with accuracy, clarity, and appropriate style. Discussion of the responsibility and authority of an Air Force officer. Students must also take AFS 302L Lab. Offered spring semester only.

401 National Security Forces in Contemporary American Society I 3 hrs.
Instruction in and discussion of the basic elements of national security policy and process. Examination of roles and missions of air power in implementing national security policy. Students must also take AFS 401L Lab. Offered fall semester only.

402 National Security Forces in Contemporary American Society II 3 hrs.
Instructor-led seminar focusing on contemporary roles for the military in society and current issues affecting the military profession. Comparative analysis of civil and military justice systems. Students must also take AFS 402L Lab. Offered spring semester only.
Leadership Laboratory

Leadership Laboratory is an integral part of the Air Force ROTC program. It provides an opportunity for students to apply classroom teachings to actual environments. Each course has an associated leadership laboratory, conducted once each week during the semester for a duration of two hours. Instruction is conducted within the framework of an organized cadet corps with a progression of experiences designed to develop leadership potential. Leadership Laboratory involves a study of Air Force customs and courtesies, drill and ceremonies, career opportunities in the Air Force, and the life and work of Air Force junior officers. Students develop their leadership potential in a practical, supervised laboratory, which typically includes field trips to Air Force installations throughout the U.S.

The first two years of Leadership Laboratory involve activities classified as initial leadership experiences. They include a study of Air Force customs and courtesies, drill and ceremonies; giving military commands; instructing, correcting, and evaluating the preceding skills; studying the environment of an Air Force base; and learning about career opportunities available to commissioned officers. The last two years consist of activities classified as advanced leadership experiences. They involve the planning, organizing, coordinating, directing, and controlling the military activities of the cadet corps; the preparation and presentation of briefings and other oral and written communications; and the providing of interviews, guidance, and information that will increase the understanding, motivation, and performance of other cadets.

Classical Studies

Dr. Richard Gerberding, Director
410 Roberts Hall
Telephone (256) 890-6310

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 language.

Classical Studies Courses
- CL 100 - (Art History 100. Survey Ancient to Medieval)
- CL 101 - (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
Dr. Rose Norman, Director
215 Morton Hall
(256) 890-6320

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, and the professions. 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 two required courses (WS 200 and WS 460), four 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 (6 hrs.)
   WS 200 - Introduction to Women's Studies
   WS 460 - Feminist Theory

2. Core Courses - 4 courses required from the following (12 hrs.)
   Note: 1. At least 6 hrs. within a single subject area and at least 6 hrs. outside that 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 area.

   Humanities:
   CM 340 - Gender and Communication
   CM 416 - Women Orators
   EH 418 - Women Writers
FH 409 - Gender and Representation
HY 202/399 - Special Topics: 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
PHL 395 - Junior Research Seminar: Feminist Philosophy

Social Sciences:
SOC 106 - Marriage and Family
SOC 306 - Gender Roles
PY 420 - Special Topics: Psychology of Women
Approved Special Topics courses may count toward the minor. Examples within this area include:
PSC 480 - Advanced Topics in Political Science: Equal Protection Under the Law - The Issues of Race and Gender

Health, Sciences, Business and Technology
MGT 462 - Government Regulation of Employment Relations
NUR 325 - Human Sexuality
NUR 390/500 - Perspectives on Women’s Health

Elective Course - 1 course from the following (3 hrs.)

ARH 201 - 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
MU 310 - American Music
PHL 202 - Introduction to Ethics
PHL 303 - Contemporary Philosophy
PHL 438 - Contemporary Political Thought
PY/SOC 375 - Social Psychology
PY/BUS 536 - Psychobiology of Stress and Illness
SOC 200 - Introduction to Anthropology
SOC 315 - Human Ecology
Approved Special Topics courses may count toward the minor. Examples within this area include:
FH 399 - Special Topics in French: French Cinema

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. For descriptions of courses other than those with the WS prefix, see listings of individual departments.
Women’s Studies Courses (WS)

200  Introduction to Women’s Studies  3 hrs.
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.

340  Special Topics  3 hrs.
Pre-announced special areas addressed in seminar format, laboratory work, or practicum. May be taken twice for credit. Prerequisite: WS 200.

460  Feminist Theories  3 hrs.
Introduces the epistemologies and methodologies currently developing in the area of feminist theory, leading to an understanding of the interdisciplinary nature of the enterprise of feminist theory. Exposure to major debates and concepts in feminist theory, such as post-modernism, deconstructionism, and essentialism. Prerequisite: WS 200 or permission of instructor. (Same as SOC 460)

499  Independent Study  3 hrs.
Readings and/or individual research in an area of specialized interest to both student and instructor. Prerequisite: WS 200 and permission of instructor.
College of Nursing

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
Director of Nursing Student Affairs: Mary Beth Magathan

Professor Raines; Associate Professors Anderson, Cash, Dowell, Heaman, Henze, Rozell, Tanner, Warren, Williamson; Assistant Professors Hays, Johnson, South; Clinical Assistant Professors Bonilla, Brookman, George, Hendricks, McLeod, Moquin-Germann, Redmon, Showalter, Spearman, Stanfield, Young; Clinical Instructors Eddleman, Foote, Newman, 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 nursing is a caring profession that is based on a unique body of knowledge which is derived from the arts, humanities, physical, biological, social, behavioral and health sciences, as well as from clinical practice.

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 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.

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) 890-6742.

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 courses 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) 890-6742.

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 200 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 Health Center 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. Columbia 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.

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. 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. A nursing advisor’s signature is required for all registrations. Students must complete all lower division prerequisites for admission to the upper division of nursing. For information and assistance, call the College of Nursing Office of Student Affairs (256) 890-6742.

Admission into the upper division nursing major is competitive. 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

Transfer students seeking admission to UAH should read carefully the Admissions Information section of this catalog. Students planning to transfer into the lower division nursing program from another institution should follow the program as indicated below. Some changes will be made during the 1998-99 academic year in accordance with the statewide articulation plan.

Baccalaureate Program of Studies: Lower division (59 semester hours)

Natural science, mathematics, and statistics
  College Algebra (MA 105)
  General Biology (BYS 119)
  Microbiology (BYS 214 or 221)
  Anatomy and Physiology (BYS 313 and 314)
  Statistics (AHS 300)
  Chemistry (CH 101 and 105)

Social and behavioral sciences
  Introduction to Sociology (SOC 100)
  General Psychology (PY 101)
  Human Growth and Development (ED 306)
  Elective (at least 3 semester hours)

Humanities
  English Composition (EH 101 and 102)
  History or Literature (6 semester hours)
  Being, Knowledge and Value, Introduction to Logic, or Introduction to Ethics (PHL 101, 202 or 210)

Free Electives
  At least 6 semester hours

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 colleges may satisfy 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 these minimum requirements:
   a) 2.0 GPA on all required prerequisite coursework
   b) Completion of all lower division course requirements with a minimum of 59-60 hours of credit.

   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) 2.0 GPA 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.

   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 April 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

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, suspended, or revoked.
5. Recent graduates of associate degree or diploma nursing programs who are not yet licensed may 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.

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.

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. 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.

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

The following lower division UAH courses or equivalent transfer courses are required for the baccalaureate degree in nursing for all students. Some changes will be made during the 1998-99 academic year in accordance with the statewide articulation plan.

Lower Division: 59 semester hours

- Natural science, mathematics, and statistics:
  - College Algebra (MA 105)
  - General Biology (BYS 119)
  - Microbiology (BYS 214 or 221)
  - Anatomy and Physiology (BYS 313 and 314)
  - Statistics (AHS 300)
  - Chemistry (CH 101 and 105)

- Social and behavioral sciences:
  - Introduction to Sociology (SOC 100)
  - General Psychology (PY 101)
  - Human Growth and Development (ED 306)
  - Elective (at least 3 semester hours)

- Humanities:
  - English Composition (EH 101 and 102)
  - History or Literature (6 semester hours)
  - Being, Knowledge and Value, Introduction to Logic, or Introduction to Ethics (PHL 101, 210, or 202)
  - Free Electives (at least 6 semester hours)

The following Upper Division courses are required for a baccalaureate degree in nursing:

- 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 corequisite: 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.

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>307</td>
<td>Scholarly Inquiry in Nursing</td>
<td>3 hrs.</td>
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<td>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.</td>
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<tr>
<td>308</td>
<td>Nursing Care of Adults with Alterations in Health I</td>
<td>6 hrs.</td>
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<td>307</td>
<td>Professional Practice in Nursing I</td>
<td>4 hrs.</td>
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<td>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</td>
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<td>324</td>
<td>Health Care and the Law</td>
<td>3 hrs.</td>
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<td>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.</td>
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<td>325</td>
<td>Human Sexuality</td>
<td>3 hrs.</td>
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<td>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.</td>
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<tr>
<td>332</td>
<td>Nursing Care of Perioperative Client</td>
<td>3 hrs.</td>
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<td>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.</td>
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<td>334</td>
<td>Death and Dying</td>
<td>3 hrs.</td>
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<td>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.</td>
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<td>337</td>
<td>Nursing as a Political Force</td>
<td>3 hrs.</td>
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<td>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.</td>
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<tr>
<td>338</td>
<td>Drug and Substance Abuse</td>
<td>3 hrs.</td>
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<td>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.</td>
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<tr>
<td>339</td>
<td>Introduction to Computers in Nursing</td>
<td>3 hrs.</td>
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<td>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.</td>
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<td>390</td>
<td>Independent Study</td>
<td>1-4 hrs.</td>
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<td>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.</td>
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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.

403 Family-Centered Parent-Infant Nursing  4 hrs.
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.

404 Family-Centered Nursing Care of Children  4 hrs.
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.

405 Community Health Nursing  6 hrs.

406 Leadership and Management in Nursing  3 hrs.
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 302, 303, 304, 305, 308 310. Lab Fee: $30. Spring.

407 Professional Practice in Nursing II  6 hrs.
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.

410 Transition into Professional Roles  4 hrs.
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.

411 Theoretical Applications in Nursing Practice  5 hrs.
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.
412  **Caring for Aggregates, Families and Populations: Theoretical Applications**  
10 hrs.  
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 307. Lab Fee: $180. Spring.  

413  **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.
Realizing that the acquisition of scientific knowledge and expertise is not only a profession but also a vital support to other disciplines, the College of Science offers programs designed to meet various educational, vocational and professional goals. Students may select programs of study for career opportunities in mathematical, life, and physical sciences or as background requirements for professional studies in medicine, engineering and education. In addition, the faculty assists students in preparation for advanced studies and in planning research projects to enhance course work. 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.

Graduate Degrees and Study
The College of Science offers graduate programs which lead 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, materials science, optical science and engineering, and physics. The Doctor of Philosophy degree in chemistry is available through a cooperative program with the University of Alabama, Tuscaloosa. A certificate in environmental science is available in conjunction with graduate degrees in science and mathematics, and a significant number of graduate courses are offered in biochemistry. For graduate course offerings and programs, refer to the Graduate Catalog.

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, optical science, and physics. A certificate program in environmental science is offered to undergraduates majoring in sciences or mathematics and to graduates with these majors. In addition, courses are offered in atmospheric science and statistics.

Specific degree programs include:

<table>
<thead>
<tr>
<th>Biological Sciences</th>
<th>B.S., B.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>B.S.</td>
</tr>
<tr>
<td>Computer Science</td>
<td>B.S.</td>
</tr>
<tr>
<td>Mathematics</td>
<td>B.S., B.A.</td>
</tr>
</tbody>
</table>
Junior College Work (After 64 Semester Hours)

After a student majoring in the College has earned more than 64 total semester hours of credit (UAH plus all transfer), course work taken at a junior college will normally not be accepted for transfer. 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 of Science.

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. 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.

General Education Requirements for B.S. Degree

<table>
<thead>
<tr>
<th>Area</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area I</td>
<td>English Composition: EH 101-102</td>
</tr>
<tr>
<td></td>
<td>(Students in the Honors Program may substitute EH 105H)</td>
</tr>
<tr>
<td></td>
<td>Area II</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Area III</td>
<td>Natural Science and Math</td>
</tr>
<tr>
<td></td>
<td>Mathematics (3-4 hrs): One course at Level 1 or higher</td>
</tr>
<tr>
<td></td>
<td>(Level I courses are MA 105 or MA 119. All B.S. degrees require completion of a level III calculus course. See disciplines for specific course requirements)</td>
</tr>
<tr>
<td></td>
<td>Natural Science (8 sh): a two course sequence in a laboratory natural science outside the major and minor (See disciplines for specific course requirements)</td>
</tr>
<tr>
<td>Area IV</td>
<td>History, Social and Behavioral Sciences (distributed as below)</td>
</tr>
<tr>
<td></td>
<td>(No more than 6 sh can be counted in a single discipline)</td>
</tr>
</tbody>
</table>
History (3-6 sh*): HY 101-102, 221-222 (pairings indicate acceptable 2 course sequences)
Social and Behavior Sciences (6-9 sh): PSC 101, 102, 260, PY 101, 102, SOC 100, 200 ECN 142, 143

Area V
Preprofessional and elective courses ..................................................................................15
(See individual majors for specific requirements.)

Science or Engineering Course Outside the Major, and not counted in the minor requirements (3-4 sh). MA or CS majors must take a 4 sh laboratory science course (AST, ATS, BYS, CH, ES, PH) to meet this requirement.
Computer Science (3-4 sh): CS 100, 102, 104 or higher. See majors for specific requirements.
Technical Writing (3 sh): EHT 301
Electives: (4-6 sh) (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 sh
Minor Requirements for B.S. Degree: See specific disciplines - minimum 21 sh
Cognate Requirements for B.S. Degree: See specific disciplines - minimum 21 sh

Electives: Sufficient courses to meet minimum 128 hour degree requirement and the 39-hour upper level requirement.

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.

Requirements for Programs of Study Leading to the B.A. Degree.
See the College of Liberal Arts section of the catalog.

Biological Sciences Department
Professors Campbell (Chair), Eley, Garstka, Lawton, Modlin, Moriarity; Associate Professor Johnson; Assistant Professors Boyd, Leahy, Ng.

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 various areas of biological science.

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, graduate preparatory, microbiology, molecular biology, premedical technology, pre-health professional, or secondary education programs. Examples of programs of study which 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 students electing a biological sciences major consult with a biology faculty member early in their academic career to formalize a plan of study (POS) to meet their academic and career needs.

A major in biological sciences requires a minimum of 36 semester hours of coursework in BYS and includes the following core courses:

a. BYS 119 and 120, to be taken in the freshman year
b. BYS 219, to be taken in the sophomore year
c. BYS 340, to be taken in the junior year
d. BYS 490, to be taken in the senior year.

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 15-16 semester hours in at least two other sciences outside of the major. Eight (8) hours must be taken in one laboratory science and a minimum of 4 hours must be included in a different laboratory science. Generally, this degree requirement is met by the coursework in a chemistry minor or the ancillary chemistry courses needed for support of the major and 8 semester hours of general physics. 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 151 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.

Anatomy options: BYS 221, 317, 340, 372, 378, or 544

Physiology/biochemistry options: BYS 301, 318, 361, 430, 435, 436, 519, 531, 532, or 543.

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.

**Example I**

B.S. or B.A. degree with a psychology minor (psychobiology program)

<table>
<thead>
<tr>
<th>Biological sciences core courses and biological sciences electives</th>
<th>36 min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 101, 105, 113 or 331, 301</td>
<td>11</td>
</tr>
<tr>
<td>Psychology 101,102,302,436 plus electives</td>
<td>21</td>
</tr>
<tr>
<td>Physics</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics</td>
<td>3-6</td>
</tr>
<tr>
<td>GER and electives</td>
<td>As req.</td>
</tr>
</tbody>
</table>

**Example II**

B.A. or B.S. degree for secondary education.

<table>
<thead>
<tr>
<th>Biological sciences core courses and electives to</th>
<th>239</th>
</tr>
</thead>
</table>
include BYS 312

Chemistry (to include 113 or 331, and 308 or 361, depending on B.A. or B.S.)
Mathematics (depending on placement and B.A. or B.S.)
Physics 101 and 102 (depending on B.A. or B.S.)
Second teaching area
Professional education courses
GER

NOTES:
1. This curriculum may require more than the minimum 128 total semester hours.
2. Students considering this curriculum should consult 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.
3. A general sciences composite major covering the areas of chemistry, biological sciences, environmental sciences and physical sciences is possible under this curriculum. Interested students should consult the Biological Sciences or Education Departments.

Example III
B.S. degree with emphasis in biochemistry; chemistry minor.

Semester Hours
Biological sciences core courses and 221, 361, 362, 363, 365, 519, and 543 ........................................ 36 min.
Chemistry 121, 123, 125, 126, 223, 331, 332, 335, 336, (347 and 348 desirable) ........................................ 21-25
Mathematics 171, 172 ................................................................................................................................. 8
Physics 111/114 and 112/115 ........................................ 8
GER and electives ........................................................................................................................................ As req.

Example IV
B.S. degree, premedical, predental, preveterinary; chemistry minor.

Semester Hours
Biological sciences core courses and biological sciences electives (to include 317, 361, 363, 532, 543 and 544) ........................................ 39 min.
Chemistry 121, 123, 125, 126, 223, 331, 332, 335, 336 (341 desirable) + elective ........................................ 21
Mathematics 171, 172 ................................................................................................................................. 8
Physics 111/114 and 112/115 or 101,102 ........................................ 8
GER and electives ........................................................................................................................................ As req.

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.

Semester Hours
Biological sciences core courses and 221, 421, 430, 435, 521, 525 ........................................ 43
Mathematics (depending on placement) ................................................................................................. 3-9
Physics 101, 102, or 111/114 and 112/115 ............................................................................................. 8
Chemistry 121, 123, 125, 126, 223, 331, 332, 335, 336 + elective ........................................ 21
GER and electives ........................................................................................................................................ As req.

Example VI
B.S. degree, medical technology emphasis, preparatory for the Medical Technologist
certification examinations of the National Certification Agency for Medical Laboratory Personnel and the Board of Registry of the American Society of Clinical Pathologists. This curriculum satisfies academic requirements for a B.S. degree in biological sciences with a medical technology emphasis. It is offered with the cooperating clinical laboratories in the School of Health Related Professions at the University of Alabama at Birmingham (UAB). Upon satisfactory completion of the preprofessional and professional phases of the program and transfer of the UAB credits back to UAH, the B.S. degree in biological sciences with emphasis in medical technology is awarded by UAH. The candidate is then eligible to apply for certification as a medical technologist. Enrollment in the UAH phase does not automatically grant admission to the UAB phase; however, a student who has earned a UAH grade point average of 2.5 or better, has earned a C or better in all BYS and CH courses, and has been recommended by the chair of the Department of Biological Sciences will generally be accepted into the UAB phase upon application. The application deadline is January 15. Applications received after January 15 are considered on a space available basis. The three phases of the curriculum are outlined below. Students must consult with an advisor during their first semester at UAH.

**Phase I, UAH (Preprofessional)**

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological sciences core courses and 221, 313, 314, 361, 362</td>
<td>34</td>
</tr>
<tr>
<td>Physics 101, 102</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics (depending on placement)</td>
<td>9</td>
</tr>
<tr>
<td>Chemistry 121, 123, 125, 126, 223, 331, 332, 335</td>
<td>18</td>
</tr>
<tr>
<td>Computer Science 102, 104, or 107</td>
<td>4</td>
</tr>
<tr>
<td>Statistics (AHS 300)</td>
<td>4</td>
</tr>
<tr>
<td>GER</td>
<td>As req.</td>
</tr>
</tbody>
</table>

**Phase II, UAB (See UAB catalog for course descriptions; Professional)**

**Junior Year:**

**Fall**

- MT 425 Immunology .................................................. 5
- MT 420 Clinical Chemistry ......................................... 5
- HRS 400 Health and Safety Mgt. .................................. 2
- BY 311* Molecular Genetics ...................................... 3

**Winter**

- MT 436 Clinical Microbiology .................................... 7
- AHS 470 Survey of Management .................................... 3
- BY 330* Cell Biology ................................................ 3

**Spring**

- AHS 450 Quality Improvement ..................................... 3
- MT 302 Body Fluid Analysis ....................................... 3
- MT 402 Hemostasis ................................................... 2
- MT 440 Hematology I ................................................ 4

**Summer**

- AHS 330 Health Care Service ..................................... 3
- MT 430 Immunohematology ............................................ 6
- AHS Health Informatics ............................................. 2-3

*Students who have taken the equivalent of BY 311 and/or 330 will not be required to take these courses in the junior year.
Senior Year:

**Fall (August - December)**

- MT 407 Chemistry Clin. Prac. .......................................................... 3
- MT 408 Hematology Clin. Pract. .......................................................... 3
- MT 409 Immunohematology Cl. Pract. .................................................. 2
- MT 410 Immunology Clin. Pract. ....................................................... 2
- MT 411 Microbiology Clin. Pract. ....................................................... 3

**Winter**

- MT 441 Hematology II ........................................................................... 3
- MT 450 Clinical Correlations I ............................................................... 3
- MT 412 Clinical Lab Operations ............................................................. 3

**Spring**

- MT 421 Clinical Chemistry II ............................................................... 4
- MT 437 Clinical Microbiology II ............................................................. 3
- MT 451 Clinical Correlations II ............................................................... 3

**Phase III, Cooperating Clinical Laboratories**

**Spring and Summer**

**Example VII**

B.S. degree, environmental biology emphasis, preparatory for graduate study in ecology or environmental science; chemistry minor

<table>
<thead>
<tr>
<th>Biological sciences core courses and 221, 312, 378, and two from BYS 561, 562, 563 and 564</th>
<th>38-39</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 121, 123, 125, 126, 223, 331, 332, 335, 361, 362</td>
<td>22</td>
</tr>
<tr>
<td>Physics 101, 102, or 111/114 and 112/115</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics 171</td>
<td>3</td>
</tr>
<tr>
<td>Environmental science 102</td>
<td>4</td>
</tr>
<tr>
<td>Computer science 107, 207</td>
<td>8</td>
</tr>
<tr>
<td>Statistics</td>
<td>3</td>
</tr>
<tr>
<td>GER and electives</td>
<td>As req.</td>
</tr>
</tbody>
</table>

**Example VIII**

B.S. degree, composite major in biological-environmental sciences. An additional 6 hours from advanced ES courses with this program qualifies student for an environmental science certificate. Students should also see the Environmental Science section of this catalog.

<table>
<thead>
<tr>
<th>Biological sciences 119, 120, 219, 221, 312, 364, and MS 507, BYS 531, or BYS 561</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental sciences 101,102, 303 or 504, 312, 321</td>
<td>18</td>
</tr>
<tr>
<td>Mathematics 151 or 171</td>
<td>3-4</td>
</tr>
<tr>
<td>Physics 101, 102, or 111/114 and 112/115</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry 121, 123, 125, 126, 223, 331, 332, 335, 361, 362</td>
<td>22</td>
</tr>
<tr>
<td>BYS electives</td>
<td>12-14</td>
</tr>
<tr>
<td>One from 315, 317, 378</td>
<td>4-5</td>
</tr>
<tr>
<td>One from 562, 563, 564</td>
<td>3-4</td>
</tr>
<tr>
<td>Computer science 104 or 107</td>
<td>4</td>
</tr>
<tr>
<td>Statistics (AHS 300)</td>
<td>4</td>
</tr>
</tbody>
</table>
Example IX

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

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological sciences core courses</td>
<td>18</td>
</tr>
<tr>
<td>BYS 313, 314, 505, exercise physiology, kinesiology</td>
<td>18</td>
</tr>
<tr>
<td>CH 101, 105, 113 and 301</td>
<td>11</td>
</tr>
<tr>
<td>Mathematics (depending upon placement)</td>
<td>3-9</td>
</tr>
<tr>
<td>Physics 101, 102 or 111/114, 112/115</td>
<td>8</td>
</tr>
<tr>
<td>Cognate studies (as advised)</td>
<td>21</td>
</tr>
<tr>
<td>GER</td>
<td>As req.</td>
</tr>
</tbody>
</table>

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)**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Introduction to Health Professions</td>
<td>1 hr.</td>
</tr>
<tr>
<td>119</td>
<td>Principles of Biology</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>120</td>
<td>Organismal Biology</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>214</td>
<td>Infection and Immunity</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>219</td>
<td>General Genetics</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>221</td>
<td>General Microbiology</td>
<td>4 hrs.</td>
</tr>
</tbody>
</table>

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243
students who have completed BYS 214. Take no later than sophomore year. Prerequisites: BYS 119, 120; CH 101 or 121. Lab Fee: $50.

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.

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 119, 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 119, 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 and 120 or 119 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.

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 119, 120, 219, and CH 113 or 331. One lab per week. Lab Fee: $50.

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 119, 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.

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 221, 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 immunology. Prerequisites: BYS 219, 221 and BYS/CH 361 strongly recommended. One 3-hour lab a week. Lab Fee: $50.

435 Microbial Physiology and Metabolism 4 hrs.
Aspects of microbial physiology such as nutrition, growth, energy, and biosynthetic mechanisms of microorganisms. Prerequisite: BYS 221. Biochemistry 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 119 and 120, or BYS 313, and 6 hrs. of PY or approval of instructor. (Same as PY 436).
### Undergraduate Research

**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

<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>501</td>
<td>Gravitational Biology</td>
<td>3 hrs.</td>
<td>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.</td>
<td>Prerequisites: BYS 119, 120, 214 or 221, 301 or 361, and 543 recommended, or permission of instructor.</td>
</tr>
</tbody>
</table>

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>505</td>
<td>Psychopharmacology</td>
<td>3 hrs.</td>
<td>Introduction to drug classification and action with emphasis on physiological and psychology interactions. Prerequisite: 9 hrs. BYS or PY. (Same as PY 505.)</td>
<td></td>
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<tr>
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</thead>
<tbody>
<tr>
<td>521</td>
<td>Medical Mycology</td>
<td>4 hrs.</td>
<td>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.</td>
<td>Prerequisite: BYS 421, 430 or approval of instructor. Two 2-hour labs per week. Lab Fee: $40.</td>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>525</td>
<td>Medical Parasitology</td>
<td>4 hrs.</td>
<td>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.</td>
<td>Prerequisite: BYS 221 or equivalent. Two 2-hour labs per week. Lab Fee: $30.</td>
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<tr>
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<th>Description</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>531</td>
<td>Plant Physiology</td>
<td>4 hrs.</td>
<td>General introduction to life processes of plants, including water relations, mineral utilization, metabolism, photosynthesis, digestion, respiration, assimilation, and growth as affected by growth hormones.</td>
<td>Prerequisites: BYS 120, CH 113 or 331. One 3-hour lab a week. Lab Fee: $30.</td>
</tr>
</tbody>
</table>

<table>
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<tr>
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<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>532</td>
<td>Animal Physiology</td>
<td>4 hrs.</td>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>

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<tr>
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<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>533</td>
<td>Endocrinology</td>
<td>3 hrs.</td>
<td>Anatomy, physiology, and biochemistry of endocrine glands. Emphasis on regulation of hormone secretion, hormonal integration of physiological function, and mechanism of hormone action.</td>
<td>Prerequisites: BYS 313 and 314 or 532, BYS/CH 361.</td>
</tr>
</tbody>
</table>
536  Psychology of Stress and Illness  3 hrs.
Overview of physiological stress responses and their influence on health, behavior, and illness. Prerequisite: 9 hrs. BYS or PY. (Same as PY 536.)

543  Cellular and Developmental Biology  3 hrs.
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 119, 120, 219, and 331 (may be taken concomitantly).

544  Cellular and Developmental Biology  3 hrs.
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 543.

545  Cellular and Developmental Biology Laboratory  2 hrs.

547  Biochemistry I  3 hrs.
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  3 hrs.
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  4 hrs.
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  4 hrs.
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  4 hrs.
Distribution, population dynamics and behavior of animal population in relation to environmental factors. Prerequisites: BYS 312. One 3-hour lab a week. Lab Fee: $30. Field trips required.

564  Limnology  3 hrs.
Fresh-water environments and organisms exemplified by lakes, ponds, and streams in north Alabama. Prerequisites: BYS 312, 315 and/or 378 recommended.

578  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:

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>202</td>
<td>Marine Biology</td>
<td>4 hrs.</td>
<td>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.</td>
</tr>
<tr>
<td>304</td>
<td>Coastal Zone Management</td>
<td>2 hrs.</td>
<td>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.</td>
</tr>
<tr>
<td>507</td>
<td>Physiology of Marine Animals</td>
<td>4 hrs.</td>
<td>Environmental adaptations of marine animals. Biochemical, osmotic, respiratory, and temperature responses of both invertebrates and fish. Prerequisite: 12 hours in biological sciences. Biochemistry recommended.</td>
</tr>
<tr>
<td>509</td>
<td>Marine Ecology</td>
<td>4 hrs.</td>
<td>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.</td>
</tr>
<tr>
<td>510</td>
<td>Marsh Ecology</td>
<td>4 hrs.</td>
<td>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.</td>
</tr>
</tbody>
</table>
511 **Benthic Community Structure** 4 hrs.
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.

512 **Fisheries Science** 4 hrs.
Principles and methods of marine fishery biology and their application to conservation. Lecture and laboratory work. Prerequisite: General biology.

513 **Fisheries Economics** 4 hrs.

515 **Coastal Ornithology** 4 hrs.
Coastal and pelagic birds with emphasis on ecology, taxonomy, and distribution. Food habits, field identification, and population dynamics. Prerequisite: Introductory zoology.

525 **Marine Biology for Teachers** 6 hrs.

599 **Research** 1-4 hrs.
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.

204 **Commercial Marine Fisheries of Alabama** 2 hrs.
Biology, harvesting technology, and processing of commercially valuable fish and shellfish species of Alabama.

301 **Marine Technical Methods I** 2 hrs.
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.

302 **Marine Technical Methods II** 2 hrs.
Equipment and techniques in laboratory analysis of water and other marine samples. Emphasis on water quality parameters. Prerequisite: Introductory biology, chemistry, or physics.

303 **Coastal Climatology** 2 hrs.
Physical factors that result in climatic conditions in and near coastal region. Emphasis on northern Gulf of Mexico.

501 **Introduction to Oceanography** 4 hrs.
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.

514 **Estuarine Science** 4 hrs.
Physical, chemical, and biological parameters of estuarine ecosystems. Field experience and lecture material. Mobile Bay in detail. Prerequisite: Introductory zoology, chemistry, physics, or geology.

516 **Scientific Data Management** 2 hrs.
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.
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

Professors Baird, Gregory, Harris (Research), Loo, McManus, Riley (chair), Setzer; Associate Professors Lumpkin, Meehan, VanAlstine (Research), Weimer; Assistant Professors George (Research), Kaukler (Research), Scholz.

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 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; and (6) employment as a biochemist or clinical chemist.

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:

<table>
<thead>
<tr>
<th>Category</th>
<th>Hours</th>
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<tbody>
<tr>
<td>English (6 hours of composition and 3-6 hours of literature)</td>
<td>9-12</td>
</tr>
<tr>
<td>History</td>
<td>3-6</td>
</tr>
<tr>
<td>Social Science (one discipline)</td>
<td>6</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>3-6</td>
</tr>
<tr>
<td>Mathematics (MA 171) (see note [b] below)</td>
<td>4</td>
</tr>
</tbody>
</table>

Semester Hours

250
Communication skills (CS 104 or 107, CM 113; EHT 301) 10
Laboratory Science and Technical Studies (see note [c] below) 8
(1) Two courses in a single laboratory science outside the major and the minor (see note [d] below) and
(2) Coursework (to include at least one laboratory science) in any department or program (outside the major and the minor) in the Colleges of Science and/or Engineering (see note [e] below) 7-8

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.
[c] Applicable laboratory sciences are astronomy, biological sciences, environmental science, physics, and some courses in the College of Engineering.
[e] Ordinarily met by taking PH 113 and 116 and 3-4 hours of an applicable laboratory science or mathematics. If the minor is not mathematics, then PH 113, 116, and MA 172 satisfy this requirement.

5. 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.
6. Completion of sufficient electives to meet the overall minimum hour requirements for the degree.
7. 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.

Curriculum I Premedical Program
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 VI and Biological Sciences Example IV.)

<table>
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<th>Semester Hours</th>
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<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 335, 336, 341, 342, 343, 345 plus 6 hours at the 300 level or above</td>
</tr>
<tr>
<td>Physics—PH 111/114, 112/115, 113/116</td>
</tr>
<tr>
<td>Mathematics—MA 171, 172, 201, 244, and 324</td>
</tr>
<tr>
<td>Biological Sciences—BYS 119, 120, 219, 361 and 362 are recommended</td>
</tr>
</tbody>
</table>
Curriculum II 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>
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<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 315, 331, 332, 335, 336, 361, 362, 347, and 348</td>
</tr>
<tr>
<td>Physics—PH 111/114, 112/115, 113/116</td>
</tr>
<tr>
<td>Mathematics—MA 171, 172, 201</td>
</tr>
</tbody>
</table>

NOTES:
1. This curriculum will probably 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.
3. A general sciences composite major covering the areas of chemistry, biological sciences, environmental science and physical sciences is possible under this curriculum. Interested students should consult the Education Department.

Curriculum III 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.

| Semester Hours | |
|-----------------|
| GER (humanities and social sciences) | 54-58 |
| Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 335, 336, 337, 341, 342, 343, 345, 346, 361, 362, 401, 402, 421, 493 | 45 |
| Physics—PH 111/114, 112/115, 113/116 | 12 |
| Mathematics—MA 171, 172, 201, 244, and 324 | 18 |

Curriculum IV General Education Curriculum

General education curriculum with a chemistry major. Deficiencies may exist with respect to graduate school entrance requirements.

<table>
<thead>
<tr>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 335, 336, 337, 341, 342, 343, 345, 346,401, and 493 plus 3 hours at the 300-level or above</td>
</tr>
<tr>
<td>Physics—PH 111/114, 112/115, 113/116</td>
</tr>
<tr>
<td>Mathematics—MA 171, 172, 201, 244, and 324</td>
</tr>
</tbody>
</table>

Curriculum V Chemical Physics Curriculum

Chemistry-physics program appropriate for pregraduate education.

| Semester Hours | |
|-----------------|
| GER (humanities and social sciences) | 54-58 |
| Chemistry—CH 121, 123, 125, 126, 223, 331, 332,335, 336, 337, 341, 342, 343, 345, 346,401, 402, 421 and 493 | 42 |
Mathematics—MA 201, 244, 324, and one elective

Curriculum VI Biochemistry Curriculum
(Excellent for premedical/predental/preveterinary)
This curriculum is approved by the American Chemical Society's Committee on Professional Training. It constitutes a typical chemistry - biological sciences program appropriate for employment in biochemistry or clinical chemistry and for admission to some Ph.D. granting graduate departments of biochemistry. Although less dependent on quantitative skills, this curriculum also provides a satisfactory foundation for admission to medical school.

Curriculum VI meets the minimum requirements of the American Association of Clinical Chemistry. A person completing one year of acceptable experience in clinical chemistry subsequent to the B.S. degree may apply for certification as a clinical chemical technologist. Further successful experience may lead to certification as a clinical chemist.

Semester Hours

<table>
<thead>
<tr>
<th>Course Sequence</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>54-58</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, and 421</td>
<td>43</td>
</tr>
<tr>
<td>Biological sciences—BYS 119, 120, 221, 219, 340 and 543 or 519 or 547</td>
<td>23</td>
</tr>
</tbody>
</table>

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.

253
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)

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 105 or 119 or mathematics Level II placement. Parallel: CH 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.

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.

General and Inorganic Chemistry 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 105 or MA 119 or placement Level II mathematics: parallel: CH 125.

General and Inorganic Chemistry 3 hrs.
Continuation of 121 with in-depth study of topics listed. Prerequisite: CH 121. Parallel: CH 126.

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.

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.

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.

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 3 hrs.
Chemistry of organic compounds. Synthetic methods, theory, and reaction mechanisms. Prerequisites: CH 123, 126; CH 223 recommended.

332 Organic Chemistry 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 3 hrs.
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 2 hrs.
Quantum mechanical treatment of atoms, molecules, and spectroscopy. Prerequisites: CH 341, PH 113, and MA 324.

345 Experimental Physical Chemistry I 1 hr.
Laboratory investigations into thermodynamics. Prerequisite: CH 223 and 341 or 347. Lab Fee: Level 5.

346 Experimental Physical Chemistry II 1 hr.
Laboratory investigations into kinetics and spectroscopy. Lab Fee: $50.

347 Biophysical Chemistry I 3 hrs.

348 Biophysical Chemistry II 3 hrs.

361 General Biochemistry I 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 mechanism. Glycolysis, Kreb's cycle, and oxidative phosphorylation. Prerequisites: BYS 120, CH 223, 332, and 353. (Same as BYS 361).
General Biochemistry Laboratory I 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 BYS 362).

General Biochemistry II 3 hrs.
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. CH 348 is recommended. (Same as BYS 363).

General Biochemistry Laboratory II 1 hr.
Experimental course illustrating the topics in CH 363. Prerequisites: CH 361 and CH 362. Parallel CH 363. Lab Fee: $50. (Same as BYS 365)

Inorganic Chemistry 3 hrs.
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.

Inorganic Chemistry Laboratory 1 hr.
Laboratory techniques of inorganic chemistry including synthesis, purification, isolation, and identification of inorganic compounds. Prerequisite: CH 401. Lab Fee: $60.

Instrumental analysis 4 hrs.
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.

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.

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

Professors Amin, Davis (Chair), Graves, Johannes, Richards, Shiva; Adjunct Professor Kavi; Associate Professors Delugach, Hinke, Ranganath, Rochowiak; Assistant Professors Erzkorn, Graham, Li, Newman, Weisskopf; Lecturers Bowen, Morrison, Seo.

The computer science program at UAH prepares students to contribute to the rapidly changing world of computing. The 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 outstanding teachers and are 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. PC laboratories are also distributed across
the campus. The department has a microcomputing laboratory for instruction in logic design and computer architecture.

Computing lab fees are associated with most computer science classes. Extensive lab work is required in almost every course. In order to accommodate student needs, lab scheduling is very flexible.

The Computer Science Department’s home page at http://www.cs.uah.edu/ may also be consulted for additional information about the program.

Degree Requirements
The minimum number of hours required for the B.S. degree with a major in computer science is 128 semester hours. These hours include:

- General studies courses: 48 hrs.
- Computer Science major courses: 45 or 46 hrs.
- Mathematics minor courses: 24 hrs.
- General elective courses: 11 hrs.
- Total: 128 or 129 hrs.

These courses are described in detail in the course requirements section below.

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.

Alternative track
Beginning with the fall semester of 1998, the CS curriculum will phase in an alternative track of introductory courses based upon JAVA and C++ as teaching languages in an object oriented development paradigm.

Students entering in the fall of 1998 will have the option of taking the existing CS 107 and 207 courses using C or the new development sequence CS 104, 204, 304. The alternative introductory sequence will become the normal sequence for all entering students in the fall of 1999.

Course Requirements for a B.S. Degree in Computer Science

Articulated General Studies Curriculum (Areas I through V)
The minimum number of hours required for a B.S. degree with a major in computer science is 128 as shown below. If placement examinations exempt a student from taking pre-calculus or introductory programming, electives may be substituted. AP credit may be used to replace certain required courses. Transfer students wishing to complete their degrees in the minimum number of hours should follow these guidelines. The articulated general studies requirements are undergoing evolution at the time of publication of this catalog. The requirements stated below are subject to revision. See the Computer Science Department for current requirements.
I. Written Composition (EH 101,102 or equivalent)  

II. Humanities and Fine Arts  
Students must complete a 6-semester hour sequence in either literature or history. Humanities disciplines include, but are not limited to, literature, history, philosophy, religious studies, speech, foreign languages, art, music, theater, and dance. For example, acceptable sequences include but are not limited to HY 101, 102; EH 205, 206; EH 205, 230; EH 230, 240. Check with a CS departmental advisor for a complete listing.

III. Natural Science and Mathematics  
3 semester hours in Level I or higher mathematics (as required by placement). A two-course sequence in a laboratory science discipline that emphasizes analysis fundamentals. The courses should be ones included as major discipline courses. Examples would include the following or their equivalents: 
- Calculus based physics PH 111/114 and 112/115, or 
- Chemistry - CH 121/125, and 123/126, or 
- Biological Science - BYS 119 and 120. 
See the CS department for other acceptable science sequences.

IV. History, Social and Behavioral Sciences  
12 semester hours of credit, including but not limited to the areas of economics, psychology, sociology, political science, anthropology, and geography. See the CS department for a list of acceptable courses.

V. Pre-professional, Major and Elective Courses  
3 hours (CS 102) - If student is placed at a higher level, these hours can be used for general electives.  
Calculus A, B, and C, or equivalent (12 hours)  
General elective hours to bring total hours in this category to 23.  
(Precalculus may be counted as an elective if it is required.)

Total 64

College of Science Requirements  
CM 113 or EHT 301 - 3 semester hours  
Additional lab science course (4 semester hours), any course that stresses analytical methods, the scientific method, and meets the requirements for a course acceptable for major in that discipline. Examples would include the courses listed in section III above. See a computer science advisor if there are questions regarding a course’s acceptability in this category.

Computer Science Major Core  
Current sequence (valid through 1998-99)  
CS 107, 207, 214, 308, 309, 317, 413, 490, 499, 524  
or Alternative sequence:  
CS 104, 204, 214,304,308,309,317,413,490,499,524  
CS 105 - Computer Science Ethics & Professionalism Seminar  

Semester Hours

I. 6
II. 12
III. 11
IV. 12
V. 23
Total 64
Computer Science Electives
Designed to add in-depth knowledge to the core courses and must be pre-approved by a computer science advisor. Four courses, two at the 300-level or higher and two at the 400-level or higher.

Mathematics Minor
Additional mathematics courses needed to complete a minor in mathematics: MA 244, 385, 415, 442, or 324. If students are required to take precalculus 1 or 2 (MA 119 or 121), they may be counted as general electives.

Total Hours Required (varies by one hour depending upon introductory CS sequence that is selected)

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, 107, 207, 214, 308, 317, and two CS electives,* one at the 300-level or higher and one at the 400-level or higher;
or an alternative sequence: CS 104, 105, 204, 214, 304, 317, and two CS electives,* one at the 300-level or higher and one at the 400-level or higher.

Computer Languages and Systems Minor (Suitable for students with non-technical majors and minimal mathematics background):
CS 102, 105, 107, 207, and three CS electives,* two at the 300-level or higher and one at the 400-level or higher;
or alternative sequence CS 102, 104, 105, 204, 304, 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.

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 3 hrs.
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.
104 Introduction to Computer Science
Overview of hardware and software components of computer systems. Techniques of problem analysis and algorithm development. Introduction to object-oriented program design, coding, and testing using the JAVA programming language. Program design, development, and debugging. Laboratory provides structured demonstrations of the application of design and implementation principles. Lab Fee: $40. Prerequisites: MA 119 and CS 100 or 102 or 312. Corequisite: MA 121.

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.

107 Computer Science I
Overview of hardware and software components of computer systems. Techniques of problem analysis and algorithm development. Principles of program design, coding, and testing. Introduction to C programming language. Extensive experience in program design and development. Laboratory provides structured demonstrations of the application of design and implementation principles. Lab Fee: $40. Prerequisite: MA 119. Corequisite: MA 121.

204 Introduction to Data Structures
Continuation of CS 104, with emphasis on advanced object-oriented features of the JAVA programming language including recursion, exception handling, polymorphism, and class inheritance. Introduction to elementary data structures including linked lists, stacks, queues, and simple binary trees. Basic sort and search algorithms. Practical experience in the design, implementation, and debugging of larger programs. Laboratory provides structured demonstrations of the application of design and implementation principles. Lab Fee: $40. Prerequisite: CS 104. Corequisite: MA 171.

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. Lab Fee: $40. Prerequisites: CS 107. Corequisite: 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 104 or 107 and 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. Lab Fee: $40. Prerequisite: CS 204 or 306 or proficiency in another object-oriented programming language.

306 Concurrent Programming Using JAVA
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.)
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 107, 207. (Cannot be taken if CS 104, 204, 304 sequence is taken.)

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.

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.

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.

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.

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 and 214.

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.

Software Design and Development Using Ada 3 hrs.
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.

UNIX Programming 3 hrs.
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.
403 Introduction to Formal Languages and Automata Theory 3 hrs.
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: Level 4. Prerequisite: CS 317.

413 Introduction to Digital Computer Design 3 hrs.
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. Lab Fee: $50. Prerequisites: CS 308, 309.

470 Introduction to Computer Networks 3 hrs.
ISO reference model for interconnection; physical, data link, network and transport layer protocols; local area networks; TCP/IP and applications. Prerequisite: senior standing.

487 Database Systems 3 hrs.
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 3 hrs.
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 for students taking M.S. program breadth), or CPE 302.

495 Selected Topics in Undergraduate Computer Science 3 hrs.
Covers selected areas of computer science. Prerequisites: To be arranged with the instructor. Lab Fee: Level 4.

499 Senior Project: Team Software Development 3 hrs.
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 3 hrs.
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.

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, 424.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>537</td>
<td>Introduction to Neural Networks</td>
<td>3 hrs.</td>
<td>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 530.</td>
</tr>
<tr>
<td>545</td>
<td>Introduction to Computer Graphics</td>
<td>3 hrs.</td>
<td>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 or 304 (or proficiency with the C/C++ programming language), MA 244.</td>
</tr>
<tr>
<td>548</td>
<td>Human-Computer Interaction</td>
<td>3 hrs.</td>
<td>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.</td>
</tr>
<tr>
<td>550</td>
<td>Ada Program Support Environments</td>
<td>3 hrs.</td>
<td>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.</td>
</tr>
<tr>
<td>551</td>
<td>Object Oriented Software Development</td>
<td>3 hrs.</td>
<td>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.</td>
</tr>
<tr>
<td>552</td>
<td>Advanced Object-Oriented Design and Development</td>
<td>3 hrs.</td>
<td>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.</td>
</tr>
<tr>
<td>553</td>
<td>Client/Server Computing</td>
<td>3 hrs.</td>
<td>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.</td>
</tr>
<tr>
<td>555</td>
<td>Theory of Program Development</td>
<td>3 hrs.</td>
<td>Propositional and predicate calculi, reasoning about programs, weakest precondition, program development, developing invariants, efficiency consideration, and program documentation. Lab Fee: $40. Prerequisite: CS 524.</td>
</tr>
<tr>
<td>590</td>
<td>Programming Environments with UNIX</td>
<td>3 hrs.</td>
<td>Advanced strategies for the design and development of systems and programs in the UNIX environment. Emphasis on automated tool and system development using UNIX.</td>
</tr>
</tbody>
</table>

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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 3 hrs.
Special topics requested by students. Prerequisites: Approval and consent of instructor.

Environmental Science

Professors Lawton, McNider, Modlin, Perkey; Research Professor Essenwanger; Associate Professors Christy, Knupp.

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER—Consult catalog section on B.S. degree requirements</td>
<td>As req.</td>
</tr>
<tr>
<td>(ECN or PSC recommended in the social sciences)</td>
<td></td>
</tr>
<tr>
<td>Mathematics—MA 151</td>
<td>3</td>
</tr>
<tr>
<td>Physics—PH 101, 102 or 111/114, 112/115</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry—CH 121,123,125,126,223,331,332,335,361,362</td>
<td>22</td>
</tr>
<tr>
<td>Environmental Science—ES 101,102,303 or 501,312,321</td>
<td>18</td>
</tr>
<tr>
<td>Biological Sciences—BYS 119,120,221,312, and MS 507, BYS 531 or BYS 561</td>
<td>23</td>
</tr>
<tr>
<td>BYS electives</td>
<td>12-14</td>
</tr>
<tr>
<td>One from 315, 317, 378</td>
<td>4-5</td>
</tr>
<tr>
<td>One from 562, 563, 564</td>
<td>3-4</td>
</tr>
<tr>
<td>One from 364, 372</td>
<td>4-5</td>
</tr>
<tr>
<td>Computer Science—CS 107</td>
<td>3</td>
</tr>
<tr>
<td>Electives (to include statistics)</td>
<td>3</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES/BYS 312</td>
<td>Principles of Ecology</td>
</tr>
<tr>
<td>ES 321</td>
<td>Pollution Problems</td>
</tr>
<tr>
<td>ES 521</td>
<td>Environmental Data Analysis (or other approved course)</td>
</tr>
</tbody>
</table>
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 504 Survey of Atmospheric Science
- ES 593 Directed Studies in Environmental Science

**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. A minor is tailored to the student's needs through consultation with the department advisor and the Environmental Science Coordinator.

**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.

Spatial relationships of earth, moon and sun that determine earth motions, seasons, atmospheric and oceanic circulation, weather and climates. Practical and field work. Lab Fee: $40. Prerequisite: MA 105. Fall, Spring.

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**

3 hrs.

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 105 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 119, 120, CH 121. (Same as BYS 312) Fall.

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.)

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 ES/ATS 511.) 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 511. (Same as ES/ATS 513.) 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 ES/ATS 514.) Fall.

490 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

Professors Chang (Chair), Gibson, McNider, Morales, Siegrist; Slater; Associate Professors Emeriti Cook, Forte; Associate Professors Ames, Dow (Research), Epperson, Friedman, Howell, Kunin, Li, Zhang; Assistant Professors Huang, Janik; Lecturers Johnson, Presson, Reeder.

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 105, 117, 119, 143, 145, 151, 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), and a placement test.

Students with various placement levels must begin their MA courses for credit as follows: Level I—MA 105, 117, or 119; Level II—MA 121 or 143; Level III—MA 151 or 171. No credit can be obtained for an MA course below a student’s placement level, no more than 3 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 MA courses taken at UAH and 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 104 or 107 (or CS 113), 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 University of Alabama in Huntsville courses and courses 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

| Mathematics—MA basic core, MA 324, and 9 hours of electives numbered 300 or above, including at least one 500 level course, preapproved by student's mathematics advisor | 42 |
| Computer Science—CS 104 or 107 | 4 |
| Physics—PH 111, 112, 114, 115 | 8 |
| Minor | 21-24 |
| General Education Requirements and Electives (to total 128 semester hours) | 50-54 |

(GER for the B.A. and B.S. degrees are listed in the Academic Information section.)

**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.

| Mathematics—MA basic core, MA 333, MA/ST 487 and 6 hours of electives numbered 300 or above, including at least one 500 level course, preapproved by student's mathematics advisor | 39 |
| Computer Science—CS 104 or 107 | 4 |
| Physics—PH 111, 112, 114, 115 | 8 |
| Professional education courses (Consult Education Dept. section of catalog) | 33 |
| General Education Requirements and electives | 44 |

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 will probably 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.

**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 placed at Level II may receive no more than 3 hours credit for MA courses numbered below 150.
3. Students placed at Level III will receive no credit for MA courses numbered below 150.
4. 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.
5. 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.

105 College Algebra
Rational expressions, roots and radicals, algebraic and absolute value equations, inequalities, relations, functions, inverse functions and their graphs, systems of equations, conic sections, exponential and logarithmic functions. No credit given to students who have received credit for another MA course or who place at Level II or above. Prerequisite: Level I placement or removal of mathematics deficiencies.

115 Calculus Review
A single semester review of differential and integral calculus, together with Taylor’s Theorem. Intended for those students (graduate as well as undergraduate) who have completed a calculus sequence, but who need a review before taking further courses. Not intended to replace the calculus sequence. Graded on a pass/fail basis only. Prerequisite: Completion of a full calculus sequence (12 hours) with grade of C or better.

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 received credit for another MA course 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 an MA course numbered above 121 or who place at Level III. Prerequisite: Level II 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 II placement or MA 105.
145 Mathematics with Applications II 3 hrs.
Exponential and logarithmic functions, continuity, differentiation, applications of the integration, the fundamental theorem of calculus, applications of the integral. No credit given to students who have already received credit for a calculus course.

151 Survey of Elementary Calculus 3 hrs.
Limits, continuity, derivatives, chain rule, derivative tests, logarithm and exponential functions, applications of the derivative, antiderivatives, fundamental theorem of calculus, applications of the integral. No credit given to students who have received credit for any other calculus course. Designed for students who do not plan further study in calculus. Students planning to continue in calculus should begin with MA 171 instead of this course. Prerequisite: Level III placement or MA 143.

171 Calculus A 4 hrs.
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.

172 Calculus B 4 hrs.
Techniques of integration, applications of the integral, polar coordinates, sequences, series, and conic sections. Prerequisite: MA 171 with a grade of C or better.

201 Calculus C 4 hrs.
Vectors, vector-valued functions, partial derivatives, multiple integrals, vector fields, line and surface integrals. Prerequisite: MA 172 with a grade of C or better.

244 Introduction to Linear Algebra 3 hrs.
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, 151.

324 Introduction to Differential Equations 3 hrs.
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 3 hrs.
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 3 hrs.
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 3 hrs.
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 151 or 172, and one MA course at the 200-level or above.

415 Introduction to Numerical Methods 3 hrs.
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, and one MA course at the 300-level. Lab fee: $40.

**442 Algebraic Structures with Applications** 3 hrs.
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** 3 hrs.
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** 3 hrs.
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** 3 hrs.
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** 3 hrs.
Brief review of basic probability theory, sampling distributions, estimations, hypothesis testing, experimental design, correlation and regression, analysis of variance, and nonparametric statistics. Prerequisites: MA 201 and either MA 385 or ISE 190. Lab Fee: $40. (Same as ST 487)

**490 Selected Topics in Undergraduate Mathematics** 1-3 hrs.
Requested undergraduate topics. Prerequisite: Approval of instructor.

**499 Mathematics Project** 1 hr.
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.

**502 Introduction to Real Analysis** 3 hrs.
(See MA 452)

**503 Introduction to Complex Analysis** 3 hrs.
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.

**504 Intermediate Differential Equations** 3 hrs.
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.

**506 Methods of Partial Differential Equations** 3 hrs.
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.
508 Applied Linear Algebra  
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.

515 Introduction to Numerical Analysis  
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 113, plus one 500-level (or higher) MA course. Lab Fee: $40.

524 Dynamical Systems I  
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.

526 Partial Differential Equations I  
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.)

538 Metric Spaces with Applications  
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.

540 Combinatorial Enumeration  
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.

542 Algebra  
Topics from group theory and ring theory: subgroups, normal subgroups, quotient groups, homomorphisms, isomorphism theorems, ideals, principal ideal domains, Euclidian domains, fields, extension fields, elements of Galois theory. Prerequisite: MA 442 or approval of instructor.

544 Linear Algebra  
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.

560 Intermediate Fourier Analysis  
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).
565 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 or equivalent.

585 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.

590 Selected Topics in Mathematics 3 hrs.
Requested selected topics.

Statistics (ST)

281 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.

487 Introduction to Mathematical Statistics 3 hrs.
Brief review of basic probability theory, sampling distributions, estimations, 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)

381 Elements of Statistical Analysis II 3 hrs.
Analysis of variance and multiple comparisons, analysis of covariance, multiple regression and correlations, nonparametric methods, and use of a typical statistical package such as MINITAB. Prerequisite: ST 281 or approval of instructor. Lab Fee: $40.

Optical Science Program

Professor Emeritus Duthie; Professors Dimmock, Emslie (Chair); Research Professor Barr; Associate Professors Gregory, Hillman; Assistant Research Professors Sanghadasa, Smith.

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 catalog section dealing with GER for B.S. degree for details.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH 101-102</td>
<td>6</td>
</tr>
<tr>
<td>EH 101-102 Literature</td>
<td>6</td>
</tr>
<tr>
<td>HY 101-102</td>
<td>6</td>
</tr>
<tr>
<td>Social Science (One discipline)</td>
<td>9</td>
</tr>
<tr>
<td>Fine Arts &amp; Humanities</td>
<td>6</td>
</tr>
<tr>
<td>Communication Skills (CS 107, CM 113, EHT 301)</td>
<td>10</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>

2. **Areas of Concentration**

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 111 General Physics w/Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>PH 112 General Physics w/Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>PH 113 General Physics w/Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>PH 114 General Physics Lab I</td>
<td>1</td>
</tr>
<tr>
<td>PH 115 General Physics Lab II</td>
<td>1</td>
</tr>
<tr>
<td>PH 116 General Physics Lab III</td>
<td>1</td>
</tr>
<tr>
<td>PH 205 Mathematical Methods for Physics</td>
<td>4</td>
</tr>
<tr>
<td>PH 337 Electronics</td>
<td>4</td>
</tr>
<tr>
<td>OPT 341 Geometrical Optics</td>
<td>3</td>
</tr>
<tr>
<td>OPT 342 Physical Optics</td>
<td>3</td>
</tr>
<tr>
<td>OPT 411 Geometrical Optics Lab</td>
<td>2</td>
</tr>
<tr>
<td>OPT 412 Physical Optics Lab</td>
<td>2</td>
</tr>
<tr>
<td>PH 431 Intermed. Electricity &amp; Magnetism I</td>
<td>3</td>
</tr>
<tr>
<td>PH 432 Intermed. Electricity &amp; Magnetism II</td>
<td>3</td>
</tr>
<tr>
<td>OPT 441 Optical Systems</td>
<td>3</td>
</tr>
<tr>
<td>OPT 442 Interference &amp; Diffraction</td>
<td>3</td>
</tr>
<tr>
<td>OPT 445 Introduction to Lasers</td>
<td>3</td>
</tr>
<tr>
<td>PH 451 Quantum Physics I</td>
<td>3</td>
</tr>
<tr>
<td>OPE 456 Photonics Lab</td>
<td>2</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>50</strong></td>
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3. **Mathematics Minor**

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
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</thead>
<tbody>
<tr>
<td>MA 171 Calculus A</td>
<td>4</td>
</tr>
<tr>
<td>MA 172 Calculus B</td>
<td>4</td>
</tr>
<tr>
<td>MA 201 Calculus C</td>
<td>4</td>
</tr>
<tr>
<td>MA 244 Introduction to Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MA 324 Introduction to Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MA 460 Introduction to Fourier Analysis</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>21</strong></td>
</tr>
</tbody>
</table>
4. Required Technical Courses
   CS 107 Introduction to Computer Science I 4
   CS 207 Introduction to Computer Science II 4
   TOTAL 8

5. 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) 7-13.
   TOTAL REQUIRED 128

Typical Schedule for Full-Time Students

<table>
<thead>
<tr>
<th></th>
<th>Full</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EH 101</td>
<td>3</td>
<td>EH 102</td>
</tr>
<tr>
<td>GER (SS)</td>
<td>3</td>
<td>GER (SS)</td>
</tr>
<tr>
<td>CS 107</td>
<td>4</td>
<td>CS 207</td>
</tr>
<tr>
<td>MA 171</td>
<td>4</td>
<td>MA 172</td>
</tr>
<tr>
<td>GER (Arts)</td>
<td>3</td>
<td>PH 111</td>
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<tr>
<td></td>
<td></td>
<td>PH 114</td>
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<tr>
<td>Sophomore</td>
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<tr>
<td>PH 112</td>
<td>3</td>
<td>PH 113</td>
</tr>
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<td>PH 115</td>
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<td>PH 116</td>
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<tr>
<td>EH 205</td>
<td>3</td>
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<tr>
<td>HY 101</td>
<td>3</td>
<td>HY 102</td>
</tr>
<tr>
<td>MA 201</td>
<td>4</td>
<td>MA 244</td>
</tr>
<tr>
<td>GER (Arts)</td>
<td>3</td>
<td>PH 205</td>
</tr>
<tr>
<td>Junior</td>
<td></td>
<td></td>
</tr>
<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>
</tr>
<tr>
<td>EHT 301</td>
<td>3</td>
<td>CM 113</td>
</tr>
<tr>
<td>Senior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPT 441</td>
<td>3</td>
<td>OPT 442</td>
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<tr>
<td>OPT 411</td>
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<td>OPT 412</td>
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<tr>
<td>PH 337</td>
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<td>OPE 456</td>
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<td>OPT 445</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(PH 301)</td>
</tr>
</tbody>
</table>

#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, plus one of the following: OPT 444, 445, 446, or 447.
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 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, 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
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, cousto-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.

445 Introduction to Lasers
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.

446 Radiometry
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. Fluctuations and statistics of electromagnetic fields. Prerequisite: OPT 342. (Same as PH 546.) Spring.

276
447 Polarized Light


Physics Department

Professor Emeritus Duthie; Professors Comfort, Dimmock, Emslie (Chair), F. Franz, J. Franz, Horwitz, Smalley, van Paradijs; Research Professors Barr, Paciesas, Takahashi; Associate Professors Alexander, Gregory, Hillman, Müller, Sheldon; Assistant Professors Lieu, Pakhomov, Zhang; Assistant Research Professors Pendleton, Sanghadasa, Smith; Lecturers Seeley, 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 curriculum contains additional options for those wishing to place increased emphasis upon optics, astrophysics, engineering physics, or secondary school teaching.

Physics Major

The basic courses for a B.S. degree with a major in physics include PH 111, 112, 113, 114, 115, 116, 205, 301, 305, 310, 311, 337, 351, 416, 421, 431, 432, 451, 452. Five approved curricula are listed. Each has a major core of courses, plus either a minor or cognate studies requirement as indicated. 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. Other programs may be approved after consultation with the student's faculty advisor. Students are encouraged to file a Program of Study, in consultation with their faculty advisor, at the earliest opportunity.

Physics Minor


Curriculum I

For working professionally at the B.S. level or preparation for graduate school.

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td><strong>GER (humanities and social sciences)</strong></td>
<td>36-42</td>
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<tr>
<td>EH 101, 102, 6 hours of literature</td>
<td>12</td>
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<tr>
<td>(See options in GER section of catalog.)</td>
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<tr>
<td>HY 101, 102</td>
<td>6</td>
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<tr>
<td>Social science (one discipline)</td>
<td>6</td>
</tr>
<tr>
<td>Fine arts</td>
<td>6</td>
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<tr>
<td>Communication skills (CS 107, CM 113, EHT 301)</td>
<td>10</td>
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<tr>
<td><strong>Physics Major</strong>—PH 111, 112, 113, 114, 115, 116, 205, 301, 305, 310, 311, 337, 351, 416, 421,431, 432, 451, 452</td>
<td>50</td>
</tr>
<tr>
<td><strong>Mathematics Minor</strong>—MA 171, 172, 201, 244, 324, one additional MA course at 400-level or above</td>
<td>21</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126</td>
<td>8</td>
</tr>
</tbody>
</table>

277
Computer Science - CS 107 ................................................................. 4
Electives ......................................................................................... 3-9

Curriculum II
For working professionally in optics at the B.S. level.

Semester Hours

GER (humanities and social sciences) ................................................. 36-42

Physics Major—PH 111, 112, 113, 114, 115, 116, 205,
305, 310, 311, 341, 342, 351, 431, 432, 451 ........................................... 41
Optical Science-OPT 412, 442, 445, one of
444, 446, 447 ..................................................................................... 11
Mathematics Minor—MA 171, 172, 201, 244, 324, 460 .................. 21

Chemistry—CH 121, 123, 125, 126 ..................................................... 8
Computer Science-CS 107 ................................................................. 4
Electives ............................................................................................ 1-7

NOTE: For entry into a graduate program in physics, students should include PH 301, 421 in their
program of study.

Curriculum III
B.S. degree with a major in physics for students interested in Engineering Physics.

Semester Hours

GER (humanities and social sciences) ................................................. 36-42

Physics Major—PH 111, 112, 113, 114, 115, 116, 205,
301, 305, 310, 311, 351, 421, 431, 432, 451 ........................................... 41
Mathematics—MA 171, 172, 201, 244, 324 ....................................... 18

Chemistry—CH 121, 123, 125, 126 ..................................................... 8
Computer Science—CS 107 ................................................................. 4
Engineering Cognate Studies—to be decided with concurrence of the chair and advisor ......................................................... 30

NOTE: This curriculum will probably require more than the minimum total of 128 semester hours.

Curriculum IV
B.S. degree with a major in physics. This plan meets requirements for an Alabama Class B
High School Teacher's Certificate.

Semester Hours

GER (humanities and social sciences) ................................................. 36-42

Physics Major—PH 111, 112, 113, 114, 115, 116, 205,
301, 310, 311, 351, 416, 421, 431, 451, 452 ........................................... 40
Mathematics Minor—MA 171, 172, 201, 244, 324,
one additional MA course at 400-level or above .................................. 21

Chemistry—CH 121, 123, 125, 126 ..................................................... 8
Biological sciences (minimum of 4 hours) ........................................... 4
Second teaching area ........................................................................ 27

278
Professional education courses ........................................... 33

NOTES:
1. This curriculum will probably require more than the minimum total of 128 semester 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.
3. It is possible for the general education requirements to count toward the second teaching area. Early academic advisement is recommended for students who wish to pursue this option.

Curriculum V

B.S. degree with a major in physics for students interested in astrophysics

Semester Hours.

GER (humanities and social sciences) ............................................. 36-42

Physics Major—PH 111, 112, 113, 114, 115, 116, 205, 301, 305, 310, 311, 351, 421, 431, 432, 451 ............................................. 41
Astronomy—AST 371, 471, 472, 473 ............................................. 12
Mathematics Minor—MA 171, 172, 201, 244, 324, one additional MA course at 400-level or above ............................................. 21

Chemistry—CH 121, 123, 125, 126 .................................................. 8
Computer Science—CS 107 .......................................................... 4
Electives—Suggested courses include AST 106, 107, ST 281 ..................... 0-6

Typical Four Year Program (128 Credits)

<table>
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<tr>
<th>Fall</th>
<th>Spring</th>
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<tr>
<td>Freshman</td>
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<td>EH 101</td>
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<td>MA 171</td>
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<td>GER(Arts)</td>
<td>PH 111</td>
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<tr>
<td>GER(Arts)</td>
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<td>Junior</td>
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<td>PH 351</td>
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<td>PH 337</td>
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<td>CS 107</td>
<td>EHT 301</td>
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<td>GER (SS)</td>
<td>GER (SS)</td>
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<td>Senior</td>
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<td>PH 431</td>
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<td>PH 451</td>
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<td>CM 113</td>
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<td>Elective</td>
<td>PH 421</td>
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<td>Elective</td>
<td>Elective</td>
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</tbody>
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279
Astronomy (AST)

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 113, 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.

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 3 hrs.
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 1 hr.
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 1 hr.
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 1 hr.
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.

205 Mathematical Methods in Physics 4 hrs.
301 Intermediate Mechanics 3 hrs.

305 Applied Physics 3 hrs.
Application of physical principles to realistic problems. Systems with many degrees of freedom, non-linear systems, matrix methods, approximate techniques. Solution of problems by numerical methods, use of computers. Prerequisites: PH 205, CS 107, MA 244. Spring.

310 Intermediate Laboratory I 2 hrs.
Experimental study of laws of mechanics, acoustics, fluids. Introduction to study of statistical methods. Lab Fee: $40. Fall.

311 Intermediate Laboratory II 2 hrs.
Electronics instrumentation and circuits, electric fields, optics. Prerequisite: PH 310. Lab Fee: $40. Spring.

337 Electronics 4 hrs.
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.

341 Geometrical Optics 3 hrs.
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 3 hrs.
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 3 hrs.
Special relativity—length contraction, time dilation, simultaneity, relativistic dynamics, Kinetic theory. Quantum physics—wave packets, the uncertainty principle, Schrodinger's equation and solutions for simple systems, application to atomic, nuclear, and solid-state physics. Prerequisite: PH 205. Fall.

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 113, MA 201. (Same as AST 371.) Fall.

411 Geometrical Optics Laboratory 2 hrs.
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 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. 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 2 hrs.
Advanced experimental techniques in various subfields of physics. Prerequisite: PH 311. Lab Fee: $40. Fall, Spring.

420 Senior Thesis 3 hrs.
Semi-original work performed under direction of faculty member. All terms.

421 Thermal and Statistical Physics 3 hrs.
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 3 hrs.
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 205, MA 201. Prerequisite or parallel: MA 324. Fall.

432 Intermediate Electricity and Magnetism II 3 hrs.
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 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: PH 342. (Same as OPT 441 and OPE 441.) Fall.

442 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: PH 431 or 441. (Same as OPT 442, OPE 442 and EE 462.) Spring.

451 Introductory Quantum Mechanics I 3 hrs.
Waves and particles; Bohr's model of the atom; deBroglie waves, wave-packets and the uncertainty principle; postulates of quantum mechanics; Schroedinger's equation; simple systems in one, two and three dimensions; the hydrogen atom. Prerequisites: PH 205, 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.
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 AST 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 AST 473.) Spring, even years.
Library

Dean Wilson Luquire, Ph.D.

Professor Luquire; Associate Professors Herring, Kendrick, Warren; Assistant Professors McNamara, Womack; Lecturers Mead, Moorehead.

Library research courses provide students with the skills necessary to complete their academic studies and to prepare for successful professional lives. The method and material covered here would support students in a lifetime of research and learning.

Library research courses are offered as electives only.

Bibliography (BIB)

100 Introduction to Library Research 2 hrs.
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. Offered Fall and Spring.

230 Library Research for Business and Economics 1 hr.
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. Offered Fall and Spring.

310 Library Research for Languages and Literature 2 hrs.
Library research methods in the subject areas of language and literature; reference and research materials.

320 Library Research in American and European History 2 hrs.
Library research methods in American and European history; reference and research materials. Lab Fee: $10.

355 Library Research in the Physical Sciences and Engineering 2 hrs.
Research methods and materials in science and engineering. Examines information flow in the professional literature. Focuses on the use of reference materials, indexes and abstracts, and computerized sources specific to the sciences and engineering. Includes practical applications of both traditional and computerized tools and resources. Lab Fee: $10.

360 Library Research in the Social Sciences 1 hr.
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.

380 Library Research in Music 2 hrs.
Library research methods in music; production, organization, and utilization of information; reference and research materials.
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>385</td>
<td>Library Research in Art</td>
<td>2 hrs.</td>
<td>Library research methods in art; production, organization, and utilization of information; reference and research materials.</td>
</tr>
<tr>
<td>499</td>
<td>Special Topics</td>
<td>2 hrs.</td>
<td>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.</td>
</tr>
<tr>
<td>545</td>
<td>Library Research in Life and Health Sciences</td>
<td>2 hrs.</td>
<td>(See BIB 445.)</td>
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</tbody>
</table>
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; Special Programs, Sports and Fitness; and Space Orientation for Professional Educators. The Division of Continuing Education's offices are located in Wilson Hall.

**Professional Development**

The Department of Professional Development develops and presents professional training and educational activities in the areas of business, management, engineering, environmental, computers, and advanced technologies. Seminars and customized training activities are provided for individual or organizational clients in business, industry, and government. Certificate programs and professional review series are offered in areas such as contract management, project management, supervisory development, ISO9000, secretarial and administrative skills, web developer, visual basic, oracle developer, oracle database administrator, multimedia design and development, C programming, and Microsoft Certified Systems Engineer.

Professional development is also responsible for the development and coordination of university conferences and workshops in cooperation with industry, professional associations, government agencies, and UAH colleges and research centers. Programs primarily highlight the specialized interests and research thrusts of the university and the north Alabama region.

For more information on professional development programs, call (256) 890-6372 or 1-800-448-4035.

**Special Programs**

The Special Programs Department offers non-credit and credit courses designed to enhance and improve the quality of life for people of all ages in the area. Courses are developed to respond to the special interests and scheduling needs of non-traditional students. Courses meet on the UAH campus and at convenient off-campus centers. In cooperation with academic departments of the university, credit courses are scheduled on and off campus, late night, early morning, and weekends. For information, call (256) 890-6355
Non-credit programs include Elderhostel and the Academy for Lifetime Learning (The Academy) for mature adults; academic and Kids' College for ages 5-17. Offerings include self-enrichment courses in a variety of academic areas; certificate programs in photography and interior design; and a certificate series in horticulture, gerontology, computer graphics, and antiques and collectibles.

Special Programs also 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. The Listener's License fee is $59 per course for undergraduate courses and $89 per course for graduate courses. (Some courses also have associated laboratory fees.) Listeners have UAH library privileges while participating in the program, and they must purchase a UAH parking decal. 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 (256) 890-6355.

Sports and Fitness
Fitness, active participation, and good health habits are essential in today's society. Through health and physical education course offerings, an individual can improve his/her fitness level, learn lifetime leisure skills, and participate in a wide variety of sports and fitness activities. Some of these courses provide professional training and/or meet certification standards. A variety of sports camps and programs are offered for youth, ages 6 months through 17 years.

Domestic and foreign travel programs are offered. These programs are based on an educational theme and study in such areas as art, music, history, and sports. The study of local culture of the countries visited is emphasized. Professional training courses in travel are also offered. For additional information, call (256) 890-6077.

Space Orientation Office
The Space Orientation Office 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, call (256) 890-6835 or 1-800-448-4032.

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) 890-6010 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 number of CEUs awarded for each class is designated in each course description. A record of CEUs is kept by the Division of Continuing Education, and an official transcript may be obtained upon written request to the Continuing Education Business Office. A $3 fee is charged per transcript.
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. Sports and fitness activities are located in Spragins Hall, an on-campus facility that contains an indoor pool, racquetball courts, gymnasium, weight room, and aerobic area. Other continuing education activities are held at various locations throughout the community.
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Wilson Luquire, B.A., M.L.S., Ph.D. ......................... Dean of the Library
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Suzanne H. Norris, B.S., M.Ed. .................... Director, Cooperative Education
Andrew M. Weaver, B.S.B.A. ...................... Director, Financial Aid
Richard F. Modlin, B.S., M.S., Ph.D. ............... Director, Honors Program
Richard H. Comfort, A.B., M.S., Ph.D. ............. Director, Institute for Science Education
Lee E. Williams, II, B.A., M.A., Ph.D. .............. Director, Multicultural Affairs
John C. Gregory, B.Sc., Ph.D. ......................... Director, Space Grant Consortium
Adriel D. Johnson, A.B., M.S., Ph.D. ................. Campus Director, Alabama Alliance
for Minority Participation
Full Time and Emeritus Faculty

(Date refers to original appointment to the university; asterisk designates Graduate Faculty.)

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.

ADHAMI, REZA, B.S.E., M.S.E., Ph.D. (University of Alabama, Huntsville). Interim Chair and Associate Professor of Electrical Engineering, 1984.* Research Interests: Digital signal processing, digital image processing, pattern recognition, data compression, and digital communications.

ALEXANDER, J. IWAN D., International Baccalaureate (United World College of the Atlantic, Wales) B.Sc. (University College Swansea, Wales), Ph.D. (Washington State University). Associate Director of the Center of Microgravity Materials Research and Associate Professor of Physics, 1991.*


ALLEN, MARY E., B.S.E. (Tulane University), M.S. (Auburn University). Lecturer in Computer Science, 1994.*

ALLEN, W. DAVID, B.A., M.A. (Eastern Illinois University), Ph.D. (University of Arkansas), Assistant Professor of Economics, 1994.

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 imagin techniques and computed tomography (CT) to study the internal fabric of geotechnical materials.

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.

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.

ANDERSON, ELMER E., A.B. (Occidental College), M.S. (University of Illinois), Ph.D. (University of Maryland). University Professor Emeritus, 1979.*

ANDERSON, GLORIA J., R.N. (Mobile General Hospital School of Nursing), B.S.N. (Indiana University), M.S.N. (University of Alabama, Birmingham). Associate Professor of Nursing, 1972.* Research Interests: Organizational change, teaching, intrusive advisement.

ARENDALE, WILLIAM F., B.S. (Middle Tennessee State University), M.S., Ph.D. (University of Tennessee). Professor Emeritus, 1964.


BAIRD, BRUCE C., B.S. (Texas A&M University), M.A. (College of William and Mary), Ph.D. (University of Florida). Assistant Professor of History, 1997*. Research Interests: Pre-Civil War southern history.
BAIRD, JAMES K., B.S. (Yale University), M.A., Ph.D. (Harvard University). Professor of Chemistry, and Director, Joint Materials Science Doctoral Program. 1982.* Research Interests: Diffusion in solids, crystal growth, critical phenomena, shock waves and plasmas.

BALLenger, Robert, B.S. (Washington & Lee University), Ph.D. (LeHigh University). Assistant Professor of Accounting. 1998. Research Interests: Auditability and internal control issues associated with new software development and technology, accounting standards and economics of information systems development, management and control of new technology, introduction and origin of audit failure and litigation.


BanSiya, Jagdish, B.S. (University of Roorkee), M.S., Ph.D. (University of Alabama, Huntsville). Lecturer in Computer Science, 1995.*


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.


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.

Bliss, James P., B.A., M.S., Ph.D. (University of Central Florida). Assistant Professor of Psychology. 1993.* Research Interests: The “Cry-Wolf Effect” and using virtual reality for training.


BOWER, MARK V., B.S.E., M.S.E., Ph.D. (University of Michigan), P.E. Associate Professor of Mechanical Engineering, 1984.* Research Interests: Solid mechanics, composite materials, fracture mechanics, viscoelasticity, nonlinear elasticity.

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.

BOYER, D. ROYCE, B.M. (Butler University), M.A. (Catholic University of America), D.M.A. (University of Texas, Austin). Professor Emeritus, 1966.

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 nano electronic devices; solid state devices.


BRAINERD, JEROME J., B.S., M.S. (University of Notre Dame), Ph.D. (Cornell University), P.E. Associate Professor Emeritus, 1965.

BRINDLEY, THOMAS A., B.A. (University of Colorado), B.F.T. (Thunderbird Graduate School of International Management), B.S.Ed., M.A. (Ohio State University), Ph.D. (University of Michigan). Associate Professor of Education, 1974.* Research Interests: Social change and social values as they affect education; comparisons of other societies and educational practices, educational theory, and educational policy studies.

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 Assistant Professor of Nursing, 1985.* Research Interests: Childbearing families, women’s health issues, distance education, teaching-learning in higher education.

BROWN, ROBERT A., B.S. (U.S. Naval Academy), M.S., Ph.D. (Ohio State University), P.E. Professor Emeritus, 1967.

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.*

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.

BURNETT, JOHN E., B.S. (University of New Mexico), M.A. (Claremont Graduate School), Ph.D. (University of Alabama, Tuscaloosa). Associate Professor of Finance, 1992.* Research Interest: Investments.

BUTTS, TED M., B.S. (Mississippi State University), M.A., Ph.D. (University of Alabama, Tuscaloosa). Assistant Professor Emeritus, 1968.

CAMPBELL, MELINDA, B.F.A. (California State University, Northridge), M.A., Ph.D. (University of California, Davis). Assistant Professor of Philosophy, 1993.

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.
CARPENTER, SANDRA L., B.A. (California State University), Ph.D. (University of California). 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.


CERRO, RAMON L., B.S. (Universidad Del Litoral, Argentina), M.S., Ph.D. (University of California, Davis). Professor and Chair, Chemical and Materials Engineering, 1997*. Research Interests: Theoretical and experimental fluid mechanics, heat and mass transfer, physicochemical hydrodynamics, coating flows, drops and bubble dynamics.


CHANG, MOU-HSIUNG, B.S. (Chung-Hsing University), M.S., Ph.D. (University of Rhode Island). Chair and Professor of Mathematical Sciences, 1974.* Research Interests: Stochastic differential equations, stochastic control, mathematical finance.

CHENG, 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.

CHENG, LILQING, 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.


CHRISTOPHER, SUNDAR A., B.E. (Madras University), M.S. (South Dakota School of Mines and Technology), Ph.D. (Colorado State University). Assistant Professor of Atmospheric Science, 1997.* Research Interests: Satellit remote sensing, earth radiation budget.

CHRISTY, JOHN R., B.A. (California State University), M.Div. (Golden Gate Baptist Theological Seminary), M.S., Ph.D. (University of Illinois). Associate Professor of Atmospheric Science, 1991.* Research Interests: Climate, climate dynamics.

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.

CLING, ANDREW D., B.A. (University of Missouri), M.A., Ph.D. (Vanderbilt University). Associate Professor of Philosophy, 1988.
COBLE, HAROLD DWAIN, B.S., (Kearney State College), M.S., Ph.D. (University of Nebraska). Associate Professor Emeritus, 1966.

COFFIELD, KENNETH E., A.B. (University of Kansas), M.A. (DePaul University), M.A., Ph.D. (University of Missouri). Associate Professor Emeritus, 1966.

COHEN, WILLIAM E., B.S., M.S. (University of Kansas), Ph.D. (Purdue University). Assistant Professor of Electrical and Computer Engineering, 1994.* Research Interests: Computer architecture and software for parallel processing.

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.

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.

COMFORT, RICHARD H., A.B. (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.

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.

COOK, F. LEE, B.S., M.S., Ph.D. (Georgia Institute of Technology). Associate Professor Emeritus, 1967.


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.

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.

DAVIS, CARL G., B.A.E (Georgia Institute of Technology), M.S.A.E., M.S.M.H., Ph.D. (University of Alabama, Tuscaloosa). Chair and Professor of Computer Science, 1986.* Research Interests: Software engineering, software requirements, design methods.

DELUGACH, HARRY S., B.A. (Carleton College), M.S. (University of Tennessee), Ph.D. (University of Virginia). Associate Professor of Computer Science, 1990.*


DILLARD, NANCY F., B.A., M.A., (University of South Carolina), Ph.D. (University of Tennessee). Assistant Professor of English, 1972.*

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.


DOWELL, MARSHA, B.S.N. (Mount Mercy College, Pittsburgh), M.S.N. (University of Virginia), Ph.D. (George Mason University). Associate Dean and Associate Professor of Nursing, 1997* Research Interests: Family caregivers, diversity issues in education administration, health policies, issues in family nursing.


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.


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.

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.


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.


ETZKORN, LETHA M., B.S., M.S. (Georgia Institute of Technology), M.S. (University of Alabama, Huntsville). Assistant Professor of Computer Science, 1998.*

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.


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.

FEIKEMA, DOUGLAS A., B.S. (Calvin College and Seminary), B.S.E., M.S., Ph.D. (University of Michigan). Assistant Professor of Mechanical and Aerospace Engineering, 1992.*

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.

FLOYD, STEPHEN A., B.A. (Northeastern University), M.S.B.A. (University of Massachusetts), Ph.D. (University of Georgia). Assistant Professor of Management Information Systems, 1985.*


FORK, RICHARD L., B.S. (Principia College), Ph.D. (Massachusetts Institute of Technology). Professor in Electrical and Computer Engineering, 1994.* Research Interests: Modelocked lasers, microresonator dynamics, optical phased arrays.

FORTE, ALDO, D.Sc. (University of Havana, Cuba). Associate Professor Emeritus, 1966.


FRANZ, FRANK A., B.S. (Lafayette College), M.S., Ph.D. (University of Illinois). President of The University of Alabama, Huntsville and Professor of Physics, 1991.

FRANZ, JUDY R., B.A. (Cornell University), M.S., Ph.D. (University of Illinois). Professor of Physics, 1991.*

FREDERICK, ROBERT A., B.S., M.S., Ph.D. (Purdue University). Associate Professor of Mechanical Engineering, 1991.* Research Interests: Hybrid propulsion systems, solid rocket motors, solid propellants.

GADEE, RHONDA K., B.S.E.E., (Southern Methodist University), M.S.E.E., Ph.D. (University of Texas, Austin). Assistant Professor of Electrical and Computer Engineering, 1992.* Research Interests: Computers, fault design for testability, fault modeling, automatic test pattern generation, VLSI, integrated circuits.

GARSTKA, WILLIAM R., B.A. (University of California), Ph.D. (Harvard University). Professor of Biological Sciences, 1982.* Research Interests: Reproductive physiology and behavior, paleontology.

GEARY, JOSEPH, B.S., (LasSalle University), M.S., Ph.D. (University of Arizona). Research Professor of Optical Science and Engineering, 1997*. Research Interests: Spaceborne optical systems, high energy laser beam diagnostics, optical metrology, optical phased arrays, medical optics, serial reconnaissance.


GERBERDING, RICHARD A., B.A. (University of Minnesota), M.A. (University of Manitoba), D.Phil. (Oxford University, England). Professor of History, Adjunct Professor of Latin, 1984.* Research Interest: Frankish history.


GRANT, SILAS W., B.A. (University of Texas), M.D. (University of Texas Medical Branch at Galveston). Professor Emeritus, 1973.


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.*

GREGORY, DON A., B.S., M.S., Ph.D. (University of Alabama, Huntsville). Associate Professor of Physics, 1992.* Research Interest: Fourier optics.

GREGORY, JOHN, B.Sc., A.R.C.S., Ph.D. (Imperial College of Science and Technology, London). Professor of Chemistry and Director of Alabama Space Grant Consortium, 1973.* Research Interests: Space science—the interaction of earth's atmosphere with surfaces of materials on satellites moving at high relative velocity and measurement of the high energy radiation environment outside the atmosphere.

GROHSE, EDWARD W., B.Ch.E., M.Ch.E. (Cooper Union Institute of Technology), Ph.D. (University of Delaware). Professor Emeritus, 1960.

GUINN, GERALD R., B.S. (Auburn University), M.S. (Purdue University), Ph.D. (University of Alabama, Huntsville). Professor Emeritus, 1990.


HAN, QINGYUAN, B.S., M.S. (Peking University), M.Ph., Ph.D. (Columbia University). Associate Professor of Atmospheric Science, 1997.* Research Interests: Satellite cloud climatology, remote sensing, radiative transfer.


HARRIS, J. MILTON, B.S. (Auburn University), Ph.D. (University of Texas, Austin). Distinguished Professor of Chemistry and Adjunct Professor of Biological Sciences, 1973.* Research Interests: Polymer chemistry, drug delivery.


HARWELL, SHARON H., B.S.Ed. (Georgia Southern College), M.Ed., Ed.S. (University of Georgia), Ed.D. (George Peabody, Vanderbilt University). Assistant Professor of Education, 1990.* Research Interests: Student and teacher perceptions of changes in the classroom learning environment, college student perspective transformation as a result of tutoring and mentoring children, inquiry-based instruction, and efficacy beliefs of pre-service and practicing teachers.

HAWK, CLARK W., B.S. (Pennsylvania State University), M.S., Ph.D. (Purdue University). Professor of Mechanical Engineering and Director of Propulsion Center, 1991.* Research Interests: Propulsion concepts, energy transfer systems, internal compressible flows, high temperature materials.
HAYES, DOUGLAS, G., B.S. (Iowa State University), Ph.D. (University of Michigan). Assistant Professor of Chemical Engineering, 1994.* Research Interests: Enzymatic reactions in nonaqueous media, protein behavior at interfaces, microemulsions, lipid chemistry, utilization and processing, bioseparation, and bioconjugate chemistry.

HAYS, MARY M., B.S.N. (University of Colorado), M.S.N. (University of Alabama, Huntsville), D.S.N. (University of Alabama, Birmingham). Assistant Professor of Nursing, 1997.* Research Interests: Long term care, nursing administration, nursing staff interactions.

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 of Nursing, 1975.* Research Interests: Health care related to children and families, parenting, ethical issues in health care, stress, coping and adaptation, teaching strategies for nurses.

HEIKES, DEBORAH, B.A. (University of Kansas), M.A. (Baylor University), Ph.D. (University of Illinois). Assistant Professor of Philosophy, 1998. Research Interests: Kant, philosophy of mind, philosophy and language, epistemology, analytic philosophy, ethics, feminist philosophy.

HELLER, HERTHA D., Perm. Teachers Certificate (Teachers College for Women, Hanover, Germany), M.A. (Vanderbilt University). Associate Professor Emerita, 1965.

HENZE, REET L., B.S.N. (Gustavus Adolphus College), M.S.N. (University of Colorado), D.S.N. (University of Alabama, Birmingham). Associate Professor of Nursing, 1973.* Research Interests: Head injuries, spinal cord injuries, strokes, cardiac emergencies, health problems of aging.


HILLMAN, LLOYD W., B.S. (University of Arizona), Ph.D. (The Institute of Optics, University of Rochester). Associate Professor of Physics, 1989.* Research Interests: Biomedical optics, illumination and optical design, quantum optics.


HINKE, THOMAS H., B.S. (University of California, Berkeley), M.B.A. (Oklahoma City University), M.S. (University of California, Los Angeles), Ph.D. (University of Southern California). Associate Professor of Computer Science, 1990.* Research Interests: Data mining, databases, database security and computer security.

HO, FAT DUES, B.S.E.E. (South China Technological Institute, China), B.A. (Chu Hoi College, Hong Kong), M.S.E.E., Ph.D., (Southern Illinois University, Carbondale). Professor of Electrical Engineering, 1980.* Research Interests: Microelectronic devices and integrated circuits, integrated ferroelectrics.

HODGES, H. EUGENE, A.B., M.A. (University of Georgia), Ph.D. (University of Minnesota). Associate Professor Emeritus, 1975.


HUANG, WENZHANG, B.A. (Fu Yang Teachers College), M.S. (Anhui University), Ph.D. (Claremont Graduate School). Assistant Professor of Mathematical Sciences, 1994.* Research Interests: Differential equations, dynamical systems.


JAMES, ROBERT E., B.S. (Carnegie Institute of Technology), M.A. (Hollins College), Ph.D. (University of Tennessee). Associate Professor of Psychology and Communication Arts and Chair of Psychology, 1971.* Research Interests: Experimental aesthetics—particularly audience reaction to musical theater, Stephen Sondheim’s lyrics, effects of self-monitoring and gender on humor preference, experimental analysis of behavior, nonverbal communication and behavior, learned helplessness, human learning.


JAREM, JOHN M., B.S., M.S., Ph.D (Drexel University), Professor of Electrical and Computer Engineering, 1987.* Research Interests: Electromagnetism, antenna theory, microwave theory and optics.

JOHANNES, JAMES D., B.S. (Arizona State University), M.S. (University of Alabama, Huntsville), Ph.D. (Vanderbilt University). Dean of Graduate Studies and Professor of Computer Science, 1974.*

JOHNSON, ADRIEL D., A.B. (Washington University in St. Louis), M.S. (Tennessee Technological University), M.S. (University of Alabama in Huntsville), Ph.D (North Carolina State University). Associate Professor of Biological Sciences and Campus Director, Alabama Alliance for Minority Participation, 1989.* Research Interest: Cellular mechanisms regulating digestive function, neural control of pancreatic secretions in domestic animals.

JOHNSON, CARROLL D., B.S., M.S. (University of Tennessee), Ph.D. (Purdue University). Distinguished Professor of Electrical Engineering, 1963.* Research Interests: Control and dynamic systems.

JOHNSON, F. FRANCES, B.Ed. (Chicago Teachers College), M.Ed. (University of Missouri), Ph.D. (Purdue University). Associate Provost for Undergraduate Studies and Associate Professor of Education, 1996. Research Interests: Multicultural education, college student advising and persistence.


KATSINIS, CONSTANTINE, B.S. (National Technical University of Athens), M.S., Ph.D. (University of Rhode Island). Associate Professor of Electrical Engineering, 1985.* Research Interests: parallel computer architectures, modeling and applications.


KENDRICK, AUBREY WAYNE, B.A. (Georgia Southern College), M.S.L.S., M.B.A. (Florida State University). Associate Professor of Bibliography, 1985.

KILGO, REESE D., B.A. (University of Alabama, Tuscaloosa), M.Ed. (University of Florida), Ph.D. (University of Texas). Associate Professor Emerita, 1966.

KIRKPATRICK, SUE W., B.Sc., M.Sc., Ph.D. (Ohio State University). Dean, College of Liberal Arts and Professor of Psychology, 1972.* Research Interests: Interpretation of emotion from facial expressions in various populations including preschool children and adults from Japan and the U.S., learning disabled children, and sexually abused children, auditory, visual and hormonal correlates of learning disabilities; moral orientation of young and elderly adults to determine if orientation is function of type of dilemma posed as well as age group.

KNUPP, KEVIN R., B.S. (Iowa State University), M.S., Ph.D. (Colorado State University). Associate Professor of Atmospheric Science, 1991.* Research Interests: Cloud dynamics, radar meteorology.


KUNIN, BORIS I., B.S., M.S. (Leningrad University, Russia), M.S. (Yale University), Ph.D. (University of Illinois, Chicago). Associate Professor of Mathematical Sciences, 1992.* Research Interests: Probabilistic aspects of fracture, extreme value statistics, applied differential geometry.

LANDRUM, BRIAN D., B.S., M.S. (Texas A&M University), Ph.D. (North Carolina State University). Associate Professor of Mechanical and Aerospace Engineering, 1992.* Research Interests: High temperature gas dynamics, propulsion, aerodynamics, applied computational fluid dynamics.

LAVAN, OLGA, B.A. (University of Texas), M.A. (University of Iowa). Lecturer in English, 1978.


LEAHY, JOSEPH G., B.S., M.S. (Ohio State University), Ph.D. (University of Maryland). Assistant Professor of Biological Sciences, 1997. Research Interests: Physiological, molecular, genetic and ecological aspects of hydrocarbon degradation by bacteria, phylogeny of biodegradative organisms and enzymes.

LEONARD, KATHLEEN M., B.S., M.S. (University of Wisconsin), Ph.D. (University of Alabama, Huntsville). Associate Professor of Civil Engineering, 1991.* Research Interests: Environmental engineering, water quality control, groundwater contamination, hazardous waste remediation, environmental assessment, remote fiber optic chemical sensing, hydrologic systems.


LETHBRIDGE, DONA J., B.Sc.N. (University of British Columbia), M.A., Ph.D. (New York University). Associate Professor of Nursing, 1992.* Research Interests: Health care and nursing research, research issues with low income rural populations, women’s health, contraception, sexuality, professional issues in nursing, poverty.

LEWIS, MARIAN, B.A. (Georgia State College for Women), M.S. (University of Arizona), Ph.D. (University of Houston). Research Professor of Biological Sciences, 1993.* Research Interests: Effects of altered gravity environments on biological systems at the cellular and molecular level.

LI, JIA, B.S. (Hunan University), M.S. (Huazhong University of Science and Technology), Ph.D. (University of Tennessee). Associate Professor of Mathematical Sciences, 1990.* Research Interests: Differential equations, mathematical modeling in epidemiology.

LI, WEI, B.S., M.S. (University of Beijing), Ph.D. (Virginia Polytechnic Institute). Assistant Professor of Computer Science, 1996.* Research Interests: Software engineering, object oriented programming and metrics, software re-use and process control.

LIEU, RICHARD, B.Sc., Ph.D. (Imperial College London). Assistant Professor of Physics, 1995.* Research Interests: Extreme ultraviolet emission from clusters of galaxies, the hot interstellar medium, and theory of gamma ray bursts.

LOHMEIER, JILL H., B.A. (University of Kansas), M.S., Ph.D. (University of Massachusetts). Assistant Professor of Psychology, 1995.* Research Interests: Learning and memory, how people learn to categorize information using attention, time constraints, and usefulness of information; problem solving, how people understand mathematical concepts such as probability or randomness.

LOO, BOON, B.S., M.S. (University of Wellington, New Zealand), M.A., Ph.D. (University of Illinois, Chicago). Professor of Chemistry, 1982.* Research Interests: Enhanced Raman spectroscopic study of interfaces; surface chemistry of adsorbates; surface analogs of organometallic complexes; chemical modified electrodes; electrochemical sensors; metal corrosion and inhibition; non-linear optical materials, nanostructures and molecular electronic; photochromism and electrochromism of Langmuir-Blodgett films and transition metal oxide films; photoelectrochemistry of semiconductors and thin films; materials chemistry and characterization; high temperature superconductors fabrication and characterization; Raman characterization of optical coatings and synthetic diamond films.
LUMPKIN, RICHARD S., B.S. (University of Texas, Austin), Ph.D. (University of North Carolina). Associate Professor of Chemistry, 1990.* Research Interests: Semiconductor surface modification with chromophoric sensitizers and biological materials for device applications; synthesis and characterization of polypyridine-transition metal complexes for use as chromophore sensitizers and DNA drugs; spectroscopic and electrochemical investigation of the electronic ground and excited states of organic and inorganic chromophores.


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, 1975.

MADARASZ, FRANK L., B.S. (Utah State University), M.S., Ph.D. (University of Connecticut). Research Professor of Optical Science and Engineering, 1988.* Research Interests: Electronic and optical properties of semiconductors and semiconductor quantum confined structures, HgCdTe heterojunction modeling, infrared detectors including the block impurity band detector, thermal transport properties in semiconductor and metallic alloys.

MADDOCKS, PAULINE MERLE, B.S. (State University of New York, Albany), M.S. (University of New Orleans), Ph.D. (University of Florida). Assistant Professor of Accounting, 1993.* Research Interests: Auditing, managerial accounting.


MAIER, MARK W. B.S., M.S. (California Institute of Technology), Ph.D. (University of Southern California). Associate Professor of Electrical and Computer Engineering, 1992.* Research Interests: Microsatellites, signal processing, system architecture.


MARTIN, VIRGINIA, B.A. (Vassar College), M.A. (University of Wisconsin, Madison), Ph.D. (University of Southern California). Assistant Professor of History, 1996.* Research Interests: Nineteenth century Kazakhstan, Russian empire, social and cultural history, colonialism.


MC KNIGHT, WILLIAM B., B.S. (Purdue University), Ph.D. (Oxford University). Research Professor Emeritus, 1974.

MC MANUS, SAMUEL P., B.S. (The Citadel), M.S., Ph.D. (Clemson University). Provost and Vice President for Academic Affairs and Professor of Chemistry, 1966.*


MC NIDER, RICHARD T., B.S. (University of Alabama, Tuscaloosa), M.S. (Florida State University), Ph.D. (University of Virginia). Interim Dean, College of Science and Professor of Mathematical Sciences, Adjunct Professor of Atmospheric and Environmental Science, and Director, Earth System Science Laboratory, 1985.* Research Interests: Numerical modeling, boundary layer dynamics.


MEBANE, JOHN S., B.A. (Presbyterian College), M.A., Ph.D. (Emory University). Chair and Associate Professor of English, 1984.* Research Interests: Renaissance literature, Shakespeare.

MEEHAN, EDWARD J., JR., B.S. (Birmingham Southern College), Ph.D. (University of Alabama, Birmingham). Associate Professor of Chemistry and Adjunct Associate Professor of Biological Sciences, 1978.* Research Interests: Protein crystallography, protein structure, lectins, drug design, phase problem.


MESSIMER, SHERRI L., B.S., M.S. (University of Texas, Arlington), Ph.D. (Texas A & M). Associate Professor of Industrial and Systems Engineering, 1989.* Research Interest: Manufacturing systems analysis.

MILLER, JAMES A., B.S. (Gannon University), M.S., Ph.D. (University of Maryland, College Park). Associate Professor of Physics, 1994.* Research Interests: Plasma astrophysics, solar physics.

MODLIN, RICHARD F., B.S., M.S. (University of Wisconsin, Milwaukee), Ph.D. (University of Connecticut). Director of Honors Program and Professor of Biological Sciences, 1976.* Research Interests: Ecophysiology of freshwater and marine invertebrates, biology of crustaceans, environmental receptors and behavioral responses, systematics and biodiversity.

MOORE, RICHARD S., B.A. (Brown University), M.A., Ph.D. (Duke University). Director of Humanities Center and Associate Professor of English, 1975.*

MOQUIN-GERMANN, MARGARET, R.N. (Washington University), B.S.N. (University of Alabama, Huntsville), M.S.N. (University of Virginia). Clinical Assistant Professor of Nursing, 1994. Research Interests: Clinical hypnosis, child sexual abuse treatment, group therapy.

MORALES, CLAUDIO, B.A., (University of Chile), M.S., Ph.D. (University of Iowa). Professor of Mathematical Sciences, 1982.* Research Interests: Functional analysis, operator theory.
MORIARITY, DEBRA M., B.S. (Pennsylvania State University), Ph.D. (Temple University School of Medicine). Associate Dean, College of Science and Professor of Biological Sciences and Adjunct Professor of Chemistry, 1984.* Research Interests: Regulation of eukaryotic gene expression and mechanisms of action of polypeptide growth factors, screening tropical plants for biologically active natural products.

MORSE, WAYNE J., B.B.A. (Siena College), M.B.A. (Cornell University), Ph.D. (Michigan State University). Chair and Professor of Accounting, 1996.* Research Interests: Quality costs, activity-based costing, cost management.


MUNSON, WILLIAM F., B.A. (Oberlin College), M.A., Ph.D. (Yale University). Associate Professor of English, 1974.* Research Interests: Medieval literature and religion.

MUSIELAK, ZDZISLAW E., M.S. M.S. (A. Mickiewicz University, Poland), Ph.D. (University of Gdansk, Poland), Professor of Astronautics, 1989.* Research Interests: Chaos, space plasma, astrodynamics, stellar phenomena.

NAUMANN, ROBERT J., B.S., M.S., Ph.D. (University of Alabama, Tuscaloosa). Professor of Materials Science, 1990.*


NEWCHURCH, MICHAEL J., B.S. (Colorado State University), Ph.D. (Georgia Institute of Technology). Associate Research Professor of Atmospheric Science, 1994.* Research Interests: Atmospheric photochemistry, remote sensing.


NEWMAN, TIMOTHY S., B.S. (Bowling Green State University), M.S., Ph.D. (Michigan State University). Assistant Professor of Computer Science, 1994.* Research Interests: Visualization, graphics, medical imaging, computer vision, applications of high performance computing to these areas.


NORDIN, GREGORY P., B.S. (Brigham Young University), M.S. (University of California, Los Angeles), Ph.D. (University of Southern California). Associate Professor of Electrical and Computer Engineering, 1992.* Research Interests: Diffractive optics, 3-D displays, holography.

NORMAN, ROSE L., B.A. (Judson College), M.A. (University of Alabama, Tuscaloosa), Ph.D. (University of Tennessee). Associate Professor of English, 1983.* Research Interests: Technical communication, American literature, women writers.

PACIESAS, WILLIAM S., B.S. (Seton Hall University), M.S., Ph.D. (University of California, San Diego). Research Professor of Physics, 1982.* Research Interests: X-ray and gamma-ray astronomy, gamma-ray bursts, x-ray binary systems.

PAKHOMOV, ANDREW V., B.S., M.S., M.S. (Moscow Steel and Alloys Institute, Russia), Ph.D. (Michigan Technological University). Assistant Professor of Physics, 1998. Research Interests: Time-resolved breakdown spectroscopy, laser assisted mass-spectrometry, high-resolution spectroscopy on tunable diode lasers; assembling and operation on vacuum/plasma/RIB equipment, solid state research techniques (scanning probe microscopy, DLTS, Hall, ploluminescence), IR-spectroscopy, liquid phase epitaxy; computer programming including experiment interfacing, LabView, web page design, data processing and visualization, AutoCAD.


PEARSON, BONNIE C., R.N. (St. Joseph's Hospital School of Nursing), B.S., M.Ed. (University of Minnesota). Associate Professor Emerita, 1974.*

PENDLETON, GEOFFREY N., Sc.B. (Brown University), Ph.D. (Case Western Reserve University). Assistant Research Professor of Physics, 1995.*

PENDLEY, JOHN, B.B.A., M.P.A. (Georgia State University), Ph.D. (University of Georgia). Assistant Professor of Accounting, 1998. Research Interests: Going concern opinion, auditor independence.

PENOT, DOMINIQUE M., B.A. (University of Aix-France), License (University of Montpellier), Ph.D. (Yale University). Professor Emeritus, 1970.

PERKEY, DONALD J., B.A., B.S., M.S. (University of Kansas), Ph.D. (Pennsylvania State University). Professor of Atmospheric Science and Director, Institute for Global Change Research and Education, 1994.* Research Interests: Global hydrologic and energy cycles, climate and global change, numerical modeling of mesoscale convective complexes, squall line precipitation systems, cyclogenesis processes, regional-scale hydrologic cycle.


PIERSMA, MARY L., B.S. (Dordt College), M.A., Ed.D. (University of South Dakota). Chair and Associate Professor of Education, 1988.* Research Interests: Content literacy instruction, literacy portfolios in college reading courses, using portfolios as a vehicle for student teacher reflection and self evaluation.


POLOCK, DAVID B., B.S., M.S. (University of Louisville), M.S. (University of Arizona). Associate Research Professor of Electrical and Computer Engineering, 1994.* Research Interest: Optical engineering.


PORTER, GROVER L., B.S. (University of Tennessee), M.S. (University of North Carolina), Ph.D. (Louisiana State University), C.P.A. Professor of Accounting, 1985.*


POTTENGER, JOHN R., B.A., M.A. (Arizona State University), Ph.D. (University of Maryland). Associate Professor of Political Science, 1986.*


RAINES, C. FAY, B.S.N., M.S.N. (University of Virginia), Ph.D. (University of Maryland). Associate Provost for Institutional Effectiveness, Dean, College of Nursing and Professor of Nursing, 1991.* Research Interest: Breast cancer.

RANGANATH, HEGGERE S., B.S.E. (Bangalore University, India), M.S. (University of Louisville), M.S.E. (Birla Institute of Technology and Science), Ph.D. (Auburn University). Associate Professor of Computer Science, 1982.*


REEVES, ANDRÉE E., A.B. (University of North Carolina), M.A., Ph.D. (Rice University). Associate Professor of Political Science, 1992.*

RHOADES, RICHARD G., B.Ch.E. (Rensselaer Polytechnic Institute), M.S. (Massachusetts Institute of Technology), Ph.D. (Rensselaer Polytechnic Institute). Director of Research Institute and professor of Engineering Management, 1997.* Research Interests: Organizational design and behavior, management of technical professionals, management of change.

RICHARDS, PHILIP G., Trained Secondary Teachers Certificate (Melbourne Secondary Teachers College), B.S., Ph.D. (La Trobe University). Professor of Computer Science, 1986.* Research Interests: numerical algorithms with applications to space science.

RILEY, CLYDE, B.S. (University of Rochester), Ph.D. (Florida State University). Chair and Professor of Chemistry, Campus Program Director of Materials Science, 1967.* Research Interests: Biomedical coating by electrodeposition and low gravity electrodeposition.


ROACH, MERLE D., B.S. (Livingston State College), M.S. (North Texas State College), Ph.D. (University of Alabama, Tuscaloosa). Associate Professor Emeritus, 1966.

ROCHOWIAK, DANIEL M., B.S. (St. Bonaventure University), Ph.D. (University of Notre Dame). Associate Professor of Cognitive Science, 1990.* Research Interests: Cognitive science, artificial intelligence, philosophy of science, network communication.

ROGERS, JON G., A.B. (Kansas State Teachers College), M.A. (University of Arkansas), Ph.D. (University of New Mexico). Professor Emeritus, 1968.

ROSENBERGER, FRANZ E., B.S., Diploma (University of Stuttgart, Germany), Ph.D. (University of Utah). Professor Emeritus, 1986.*

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.


SANDERS, CAROLYN I., B.M. (University of New Mexico, Albuquerque), M.M. (University of Missouri, Columbia), D.M. (Florida State University), Associate Professor of Music, 1990. Research Interest: Baroque performance practice.

SANGHADASA, MOHAN, B.Sc (University of Colombo, Sri Lanka), M.S. (Bowling Green State University), Ph.D. (University of Alabama, Huntsville). Assistant Research Professor of Physics, 1996.* Research Interests: Nonlinear optical materials and biomedical optics.

SCHENKER, DANIEL, B.A. (Brandeis University), M.A., Ph.D. (Johns Hopkins University). Associate Professor of English, 1984.* Research Interests: Modern British and American literature.


SCHOENING, NILES C., B.A. (Columbia University), M.C.P. (Ohio State University), Ph.D. (University of Tennessee). Professor of Economics, 1983.* Research Interest: Public planning.

SCHOLZ, CARMEN, M.S., Ph.D. (University of Technology, Dresden, Germany), Assistant Professor of Chemistry, 1998. Research Interests: Polymers in biomedical applications, biodegradable, biocompatible polymers and environmentally suitable materials, bacterial synthesis.

SCHONBERG, WILLIAM P., B.S.E. (Princeton University), M.S., Ph.D. (Northwestern University), P.E. Chair and Professor of Civil Engineering, 1986.* Research Interests: Orbital debris impact of space structures, impact damage formation and growth in metallic and composite beams and panels, penetration mechanics, armor/anti-armor studies, linear and non-linear dynamic response of large space structures.

SCHROER, BERNARD J., B.S. (Western Michigan University), M.S. (University of Alabama, Tuscaloosa), Ph.D. (Oklahoma State University) P.E. Interim Vice President for Research and Professor of Industrial and Systems Engineering and Associate Vice President for Research, 1985.*

SEELEY, FREDERICK B., B.S. (University of Texas, El Paso), M.S. (Southeastern Institute of Technology). Lecturer in Physics, 1992.
SETZER, WILLIAM N., B.S. (Harvey Mudd College), Ph.D. (University of Arizona, Tucson). Professor of Chemistry and Adjunct Associate Professor of Biological Sciences, 1985.* Research Interests: Natural products drug discovery, phytochemistry, chemical ecology.

SEVERN, JOHN K., B.A. (University of Minnesota), M.A., Ph.D. (Florida State University). Associate Professor of History, 1991.* Research Interests: French revolution and Napoleon, 19th century Europe, modern Britain.

SHELTON, ROBERT B., B.S. (Wheaton College), M.S. (University of Maryland), M.A. (Westminster Seminary), Ph.D. (University of Maryland). Associate Professor of Physics, 1998. Research Interests: Space physics, invention, simulation, design, testing, and flight calibration of high resolution electrostatic mass spectrometer, characterization of scattering, energy loss and final charge state of ion beams penetrating carbon foil as a function of energy, charge state and foil thickness, model development and data analysis of the quiet terrestrial ring current ions.

SHEN, DASHEN, B.S. (Shanghai University), M.S., Ph.D. (Princeton University). Associate Professor of Electrical and Computer Engineering, 1991.* Research Interests: Thin film semiconductors, flat panel displays, rapid prototyping of electronic circuits.

SHERMAN, J. DANIEL, B.S. (University of Iowa), M.A. (Yale University), Ph.D. (University of Alabama, Tuscaloosa). Chair of Management and Marketing and Professor of Management, 1981.*


SHIH, CORNELIUS C., B.S. (National Taiwan University), M.S., Ph.D. (Michigan State University), P.E. Professor Emeritus, 1965.

SHIVA, SAJJAN G., B.E. (Bangalore University, India), M.S.E.E., Ph.D. (Auburn University). Professor of Computer Science, 1978.* Research Interests: Computer architecture, expert systems, software engineering, hardware/software co-design.

SHTESSEL, YURI B., M.S.E.E., Ph.D. (Chelyabinsk Polytechnical Institute, Russia). Associate Professor of Electrical and Computer Engineering, 1993.* Research Interests: Sliding mode control with application to reusable launch vehicle control and aircraft re-configurable control.

SIEGRIST, KYLE T., B.S., M.S., Ph.D. (Georgia Institute of Technology). Professor of Mathematical Sciences, 1980.* Research Interests: Probability, stochastic processes, reliability theory.

SIMPSON, JAMES T., B.S., M.B.A. (University of Southern Mississippi), Ph.D. (University of Alabama, Tuscaloosa). Associate Professor of Marketing, 1990.* Research Interests: Marketing channels and new product development in a high technology environment.


SINGH, VANITHA S., B.A. (Mysore University, India), M.A. (University of Iowa). Lecturer in English, 1986.

SITARAMAN, BHAVANI, B.A. (Stella Maris College), M.A. (Ohio University), Ph.D. (University of Massachusetts, Amherst). Assistant Professor of Sociology, 1993.* Research Interests: Marriage and family, cross-cultural perspectives on gender, social demography.
SLATER, PETER J., B.S. (Iona College), M.S., Ph.D. (University of Iowa). Professor of Mathematical Sciences, 1981.* Research Interests: Graph theory, combinatorics, domination theory in graphs, facility location in networks, analysis of algorithms.

SMALLEY, LARRY L., B.S., M.S., Ph.D. (University of Nebraska). Professor of Physics, 1967.* Research Interests: Gravitational physics, extension of general relativity, metric affine geometry, ceramics, impact mechanics.

SMITH, DAVID, B.M. (Wheaton Conservatory), M.M., Ph.D. (Indiana University), Assistant Professor of Music, 1997. Research Interests: Schumann, Gurney, song literature.


SMITH, JAMES E. JR., B.S.E., Ph.D. (University of South Carolina). Professor of Chemical Engineering, 1982.* Research Interests: Microgravity processing of ceramic and metallic composites, direct coal liquefaction, catalysis and reaction engineering, fiber optic chemical sensing, high temperature furnace development and modeling, high speed shear layer mixing.

SMITH, MATTHEW, B.S. (Rose Hulmann Institute of Technology), M.S., Ph.D. (University of Alabama, Huntsville). Assistant Research Professor of Physics, 1998.* Research Interests: Application of multiple scattering theory and phonon migration, theory to retinal vessel oximetry, optical and electronic design, eye oximetry.


SNEED, BONNIE B., B.M. (Furman University), M.M. (Southern Methodist University), D.M.A. (Michigan State University), Associate Professor of Music, 1991. Research Interests: Renaissance choral music, works of Victoria and Josquin.

SOUER, WILLIAM E., B.S. (Purdue University), M.B.A., Ph.D. (St. Louis University), Eminent Scholar in Management, Professor of Management Science and Professor of Engineering, 1990.* Research Interest: Management technology.

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.


SPEARMAN, AMY, B.S.N. (California State University), M.S.N, F.N.P. (University of California). Clinical Assistant Professor of Nursing, 1997.* Research Interests: Family nurse practitioner, pediatric nurse practitioner, women's health, colposcopy, endometrial biopsy, STDs, contraception (male and female).

SPITZ, ALLAN, B.A. (University of New Mexico), M.A., Ph.D. (Michigan State University). Chair and Professor of Political Science, 1985.*


STENSBY, JOHN, B.S.E.E. (University of Alabama, Tuscaloosa), M.S.E. (University of Alabama, Huntsville), Ph.D. (Texas A&M University). Professor of Electrical Engineering, 1984.* Research Interests: Communication theory and systems.

STEWART, DAVID A., B.A., M.A. (University of South Carolina), Ph.D. (Boston University). Associate Professor of Art History, 1989.


SULLINS, WALTER R., A.B. (Stetson University), B.D. (Southern Baptist Seminary), M.A., Ph.D. (Emory University). Associate Professor Emeritus, 1966.

SUNG, CHI-CHING, B.A. (National Taiwan University), Ph.D. (University of California, Berkeley). Professor Emeritus, 1972. Research Interests: Quantum optics, nonlinear optics, optical bistability, properties of polarization, maintaining fibers, optical wavelet transforms.

SWAIN, JAMES J., B.A., B.S., M.S. (University of Notre Dame), Ph.D. (Purdue University). Associate Professor of Industrial and Systems Engineering, 1992.* Research Interests: Applied statistics, computer simulation.


Takahashi, Yoshiyuki, B.S. (Saitama University, Japan), M.S. (Kanazawa University, Japan), Ph.D. (Osaka University, Japan). Research Professor of Physics, 1986.* Research Interests: High energy astrophysics, specifically particle and nuclei; laser plasma physics at very high densities; heavy-ion nuclear physics, Quark-gluon plasma.

Tanner, Elizabeth K.W., B.S., M.S. (University of Maryland, Baltimore), Ph.D. (University of Maryland, College Park). Associate Professor of Nursing, 1993.* Research Interests: Health promotion, aging, nursing image, rural health care.

Tarter, Donald E. B.S. (Middle Tennessee State College), Ph.D. (University of Tennessee). Associate Professor Emeritus, 1966.


Torres, Aurora, B.S. (University of Oklahoma), M.S., Ph.D. (University of Oklahoma Health Sciences Center). Assistant Professor of Psychology and Lecturer in Biological Sciences, 1995.* Research Interests: Hormones and behavior, stress and cardiovascular responses, health psychology.


UTLEY, DAWN R., B.S. (Tennessee Technological University), M.S. (University of Tennessee), Ph.D. (University of Alabama, Huntsville). P.E., Assistant Professor of Industrial and Systems Engineering, 1992.* Research Interests: Motivation in knowledge-based organizations, quality system implementations in knowledge-based organizations, strategy and core competencies in knowledge-based organizations.


VAN PARADUS, JOHANNES A., Ph.D. (University of Amsterdam). Pei-Ling Chan Chair in Physics and Professor of Physics, 1994.* Research Interests: Neutron stars, black holes, gamma-ray bursts.


VIKRAM, CHANDRA S., B.Sc. (Agra University, India), M. Tech. (Kampur Institute, India), M.Sc., Ph.D. (Indian Institute of Technology, Delhi, India). Research Professor of Optical Science and Engineering, 1989.* Research Interests: Application of holography to test measurement problems, holographic particle/bubble/aerosol/boundary layer analysis, speckle metrology, laser vibrometry, water and wind tunnel instrumentation.

WALKER, CYNTHIA, B.A., M.S. (University of Alabama, Huntsville), M.A. (University of North Carolina), Ph.D. (University of California). Assistant Professor of English, 1997.* Research Interests:

WALKER, JACK R., B.S. (Mississippi State University), M.S. (Georgia Institute of Technology), Ph.D. (Oklahoma State University), P.E. Associate Professor Emeritus, 1982.

WALLACE, DONALD B., B.S., M.S., Ph.D. (University of Wisconsin) P.E. Professor of Mechanical Engineering, 1974.* Research Interests: mechanics of materials, machine design, kinematics.


WARREN, IRIS, R.N. (Georgia Baptist Hospital School of Nursing), B.S.N. (Louisiana State University), M.S.N. (University of Alabama, Birmingham). Associate Professor of Nursing, 1973. Research Interests: Maternal infant care, breastfeeding.


WEIMER, JEFFERY J., B.S. (Pennsylvania State University), Ph.D. (Massachusetts Institute of Technology). Associate Professor of Chemistry and Chemical Engineering, 1990.* Research Interests: Characterization of chemistry and structure of molecular adsorbates on solid surfaces, determination of kinetics of surface processes using spectroscopic techniques in ultra-high vacuum or at process conditions.

WEISSKOPF, MARY E., B.A. (Vanderbilt University), M.S., Ph.D. (University of Alabama, Huntsville). Assistant Professor of Computer Science, 1983.*

WELCH, RONALD M., B.S., M.S. (California State University), Ph.D. (University of Utah). Chair and Professor of Atmospheric Science, 1997.* Research Interests: Remote sensing, radiative transfer, disease and climate.


WELLS, B. EARL, B.S.E.E., M.S.E.E., Ph.D. (University of Alabama). Associate Professor of Electrical and Computer Engineering, 1992.* Research Interests: Computer architecture, parallel processing, digital design.

WESSLING, FRANCIS C., B.S. (Washington University), M.S. (University of New Mexico), Ph.D. (University of Minnesota). Professor of Mechanical Engineering, 1988.* Research Interests: Materials processing in space; design of space flight hardware for materials processing; heat transfer.

WESTBROOK, JERRY D., B.E. (Vanderbilt University), M.S. (University of Tennessee), Ph.D. (Virginia Polytechnic Institute and State University). P.E., Professor, Director of Engineering Management Programs and Chair of Industrial and Systems Engineering, 1991.*

WHARRY, RHODA E., B.S.E. (University of Arkansas), M.S. (Memphis State University), Ph.D. (Purdue University). Professor Emerita, 1967.


WILD, FLORIANNE, B.A., M.A. (University of Iowa), Diplôme de l'Institut des professeurs de francais a l'étranger (Sorbonne), Ph.D. (University of Minnesota). Assistant Professor of French, 1992. Research Interests: French language films, travel and study in France and other francophone countries.


WILKERSON, WILLIAM, B.A. (Williamette University), Ph.D. (Purdue University). Assistant Professor of Philosphy, 1997. Research Interests: Twentieth century continental philosophy, philosophy of the mind, history of modern philosophy, philosophy or religion, feminist philosophy and gender studies.

WILLIAMS, LEE E., II, B.A. (Knoxville College), M.A. (East Tennessee State University), Ph.D. (Mississippi State University). Director of Multicultural Affairs and Professor of History, 1972.* Research Interests: African-American, southern and modern Alabama history.

WILLIAMSON, JOAN, R.N. (Birmingham Baptist Hospital), B.S.N. (University of Alabama, Tuscaloosa), M.S.N., D.S.N. (University of Alabama, Birmingham). Associate Professor of Nursing, 1973.* Research Interests: Nurse practitioner, primary care, acute care, sleep, program evaluation.

WILSON, GORDON R., B.S., Ph.D. (Brigham Young University) Assistant Research Professor of Physics, 1992.*


WOODWARD, WILLIAM B., JR., B.A. (University of North Alabama), J.D. (Cumberland School of Law at Samford University), LL.M. (New York University). Assistant Professor of Business Legal Studies, 1989.*

WREN, BRENT M., B.S., M.B.A. (University of Alabama, Birmingham), Ph.D. (University of Memphis). Assistant Professor of Marketing, 1994.* Research Interests: Marketing channels, marketing strategy, sales management.

WRIGHT, JOHN C., B.S. (West Virginia Wesleyan College), Ph.D. (University of Illinois), University Professor Emeritus, 1978.

WU, SHI TSAN, B.S. (National Taiwan University), M.S. (Illinois Institute of Technology), Ph.D. (University of Colorado). Distinguished Professor of Mechanical Engineering, Adjunct Professor of Chemical and Materials Engineering, and Director of Center for Space Plasma and Aeronomic Research, 1967.* Research Interests: Fundamentals of plasmadynamics and magnetohydrodynamics and their application to astrophysical flows; numerical simulation on solar energy thermal storage systems; heat exchange design, solar terrestrial environment, laser gasdynamics, hydrodynamics transient; heat transfer, boundary layer type flows, high speed and missile aerodynamics, numerical methods on engineering and physical systems.

WYSKIDA, RICHARD M., B.S.E.E. (Tri-State College), M.S.I.E. (University of Alabama, Tuscaloosa), Ph.D. (Oklahoma State University) P.E. Acting Dean, College of Engineering and Professor of Industrial and Systems Engineering, 1968.*

YOUUMANS, MADELEINE N., A.B. (Cornell University), M.A., Ph.D. (University of Southern California). Director, TESOL and ESL and Assistant Professor of English, 1997.* Research Interests: TESOL and Sociolinguistics.

YOUNG, CONNIE F., B.S.N. (Jacksonville State University), M.S.N. (University of Alabama, Birmingham). Clinical Assistant Professor of Nursing, 1995.* Research Interests: Psychiatric nursing, developing therapeutic nurse/patient relationships, working with the chronically mentally ill.

YOUNG, JERROD K., B.S. (Mississippi State University). Assistant Dean for Student Affairs in the College of Engineering and Lecturer in Engineering, 1995.

ZHANG, GUO-HUI, B.S. (Northeast Normal University, P.R. China), M.S., Ph.D. (Southern Illinois University, Carbondale). Associate Professor of Mathematical Sciences, 1993.* Research Interests: Graph theory, combinatorics.
Adjunct Faculty and Part-time Lecturers


ACOFF, VIOLA. Adjunct Assistant Professor of Materials Science, 1996.

ACOSTA, PATRICK, B.S.E. (Catholic University, Ecuador), M.S.E. (University of Virginia), P.E. Lecturer in Civil and Environmental Engineering, 1995.*


ADAMS, GARY, B.S. (Jacksonville State University), D.M.D., M.D. (University of Alabama, Birmingham). Adjunct Associate Professor of Nursing, 1996.


AGRESTI, DAVID G., Adjunct Associate Professor of Materials Science, 1988.

AHMED, NESAR U., B.S.E., M.S.E. (Bangladesh University of Engineering and Technology), Ph.D. (Vanderbilt University). Lecturer in Civil and Environmental Engineering, 1993.*

ALEXANDER, CHESTER JR., Adjunct Professor of Materials Science, 1988.


ANDREWS, BARRY J., Adjunct Professor of Materials Science, 1988.

ANDREWS, ROSALIA, Adjunct Associate Professor of Materials Science, 1988.


ASHLEY, PAUL, B.S. (Baylor University), M.A., M.S., D.Sc. (Washington University). Adjunct Professor of Physics, 1993.


BAILEY, CARMINE, B.A. (Rutgers University), M.S. (University of Dayton), Ph.D. (Lehigh University). Lecturer in Mathematical Sciences, 1991.*


BARNARD, JOHN A., Adjunct Associate Professor of Materials Science, 1993.

BARNETT, TIMOTHY, B.S.E., M.S.E. (University of Alabama, Huntsville), P.E. Lecturer in Civil and Environmental Engineering, 1996.

BECK, MARY JIM, B.S. (Samford University), M.S., Ph.D. (Auburn University). Adjunct Professor of Biological Sciences, 1991.


BERINATO, ROBERT J., B.S.E. (Georgia Institute of Technology), M.S.E., Ph.D. (University of Alabama, Huntsville). Lecturer in Electrical and Computer Engineering, 1995.


BOWDEN, CHARLES M., B.S. (University of Richmond), M.S. (University of Virginia), Ph.D. (Clemson University). Adjunct Professor of Physics, 1976.

BOWEN, LISA, B.S., M.S. (University of Alabama, Huntsville), Lecturer in Computer Science, 1997.


BRADT, RICHARD. Adjunct Professor of Materials Science, 1996.


BRINKHURST, RALPH O., B.Sc., Ph.D., D.Sc. (Kings College, University of London). Adjunct Professor of Biological Sciences, 1993.*

BROWN, LINDA, M.S.N. (University of Alabama, Huntsville). Adjunct Associate Professor of Nursing, 1996.

BRUCE, J. W., B.S.E. (University of Alabama, Huntsville), M.S.E.E. (Georgia Institute of Technology). Lecturer in Electrical and Computer Engineering, 1996.


BURKETT, 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.*


CAVA, MICHAEL P., Adjunct Professor of Materials Science, 1988.


CHRISTENSEN, ERIC R., B.S. (University of Maryland), M.S. (California Institute of Technology), Ph.D. (University of Maryland). Lecturer in Mechanical and Aerospace Engineering, 1993.*

CLARK, PETER E., Adjunct Associate Professor of Materials Science, 1988.


COLLINS, BETTY JO, B.S. (Mississippi State University), M.A. (Wright State University). Lecturer in English, 1993.


CORNELISON, JACK. Lecturer in H.P.E., 1982.


DELUCAS, L. J., Adjunct Associate Professor of Materials Science, 1988.


DIETERICH, ROBERT, (Shortline Community College). Lecturer in Civil and Environmental Engineering, 1993.


DIXON, HERBERT, B.B.A. (University of Texas at El Paso), M.S. (Shippensburg State College), Ph.D. (Nova University). Lecturer in Management, 1996.


DORSETT, MICHAEL J., B.S. (University of Georgia), M.S.E., Ph.D. (University of Alabama, Huntsville). Adjunct Associate Professor of Industrial and Systems Engineering, 1980.*

DOYLE, WILLIAM D., Adjunct Professor of Materials Science, 1993.


EL-KADDAH, NAGY H., Adjunct Associate Professor of Materials Science, 1988.

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.


FOGLE, FRANK R., B.S.E., M.S.E., Ph.D. (University of Alabama, Huntsville). Adjunct Assistant Professor in Industrial and Systems Engineering, 1990.


GRAHAM, NIA LL, 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.* Research Interests: Graph theory, theoretical computer science.

GRAY, GARY M., Adjunct Associate Professor of Materials Science, 1988.

GREGG, MARCUS W., B.S. (Mississippi State University), M.S. (Stanford University). Lecturer in Mechanical and Aerospace Engineering, 1995.

GRIFFIN, ROBIN S., Adjunct Assistant Professor of Materials Science, 1993.


HAMILTON, TRACY P., Adjunct Assistant Professor of Materials Science, 1993.


HARRELL, J.W., Adjunct Professor of Materials Science, 1988.

HARRISON, JOSEPH G., Adjunct Associate Professor of Materials Science, 1988.
HARTLEY, CRAIG, Adjunct Professor of Materials Science, 1988.

HEDAYAT, ALI, B.S. (Tabriz University, Iran), M.S. (University of Tennessee, Chattanooga), Ph.D. (University of Tennessee Space Institute). Lecturer in Mechanical and Aerospace Engineering and Civil and Environmental Engineering, 1994.

HICKEY, MICHAEL P., B.Sc., Ph.D. (La Trobe University, Australia). Senior Research Scientist in Atmospheric Science, 1995.* Research Interests: Properties of thermospheric and mesospheric gravity waves, their coupling with mesospheric chemistry, nightglow emissions, chemical exothermic heating.

HILL, JAMES L., Adjunct Professor of Materials Science, 1988.


HOUGH, GARY R., B.S. (Queen’s University, Canada), M.S. (Cornell University), Ph.D. (University of Michigan). Lecturer in Mechanical and Aerospace Engineering, 1995.*

HOWARD, TRUMAN, B.S., M.E. (Southern Methodist University), M.I.E. (Texas A&M University), M.S.E. (University of Virginia). Lecturer in Industrial and Systems Engineering, 1996.

HUDSON, JAMES R. JR., B.S., M.S. (University of Alabama, Tuscaloosa), M.S. (University of Alabama, Huntsville). Adjunct Professor of Biological Sciences, 1993.


HUNTER, MARY, B.A. (Cameron University), M.S. (University of California). Lecturer in English, 1993.


IZATT, J. R., Adjunct Professor of Materials Science, 1988.

JAMSHIDI, HOSSEIN, B.S. (North Carolina State University), M.S. (North Carolina A&T State University), M.S. (Clemson), Ph.D. (University of Alabama, Huntsville). Lecturer in Industrial and Systems Engineering, 1990.*

JANOWSKI, GREGG M., Adjunct Assistant Professor of Materials Science, 1993.

JEDLOVEC, GARY J., B.S., M.S. (St. Louis University), Ph.D. (University of Wisconsin, Madison). Adjunct Associate Professor of Atmospheric Science, 1991.* Research interests: Radiation, remote sensing.

JEFCOAT, IRVIN A., Adjunct Associate Professor of Materials Science, 1988.


JOHNSON, THOMAS M., B.A. (Emory University), M.A. (University of Georgia), Ph.D. (University of Florida). Adjunct Associate Professor of Psychology, 1996.

JONES, ALBERT, B.S. (North Georgia College), M.S., Ph.D. (Clemson University). Lecturer in Management Information Systems, 1992.*
JONES, CLYDE, B.S. (Tennessee Technological University), M.S. (Massachusetts Institute of Technology). Lecturer in Electrical and Computer Engineering, 1994.


JONES, STANLEY E., Adjunct Professor of Materials Science, 1988.


KEIF, MARK. Adjunct Assistant Professor of Materials Science, 1996.

KELLEY, SISTER JANE, B.S.N. (College of St. Catherine). Affiliate Faculty - Nursing, 1996.

KHAZANOV, GEORGE V., M.Sc., Ph.D. (Irkutsk State University, Russia). Senior Research Scientist in Mathematical Sciences, 1996.* Research Interests: Kinetic theory of superthermal electrons in the ionosphere and plasmasphere, hydrodynamic and kinetic theory of space plasma in the presence of wave activity.

KIM, YEON-TAIK. Adjunct Assistant Professor of Materials Science, 1996.


KISPERT, LOWELL D. Adjunct Associate Professor of Materials Science, 1988.


KRAMER, RICHARD D., B.S. (Auburn University), M.S. (University of Alabama, Tuscaloosa), M.S., Ph.D. (University of Alabama, Huntsville). Lecturer in Mechanical and Aerospace Engineering, 1992.

KRELL, JANIS, B.S. (Auburn University), M.A. (University of Alabama, Huntsville). Lecturer in English, 1996.

LACEFIELD, WILLIAM R., Adjunct Associate Professor of Materials Science, 1988.

LAMMERTSMA, KOOP, Adjunct Professor of Materials Science, 1988.


LAPENTA, WILLIAM M., B.S. (State University of New York, Oneonta), Ph.D. (Pennsylvania State University). Adjunct Assistant Professor of Atmospheric Science, 1993.*

LAWLER, PATRICK B., B.S.I.E. (Mississippi State University), M.S.E. (Texas A&M University), P.E. Adjunct Assistant Professor of Industrial and Systems Engineering, 1974.*

LAWSON, CHRIS. Adjunct Assistant Professor of Materials Science, 1996.

LAWTON, MARCY, B.A. (Chatham College), Ph.D. (University of Chicago). Adjunct Assistant Professor of Biological Sciences, 1989.*

LEMONS, JACK E., Adjunct Professor of Materials Science, 1988.


LOLLAR, LOUIS F., B.S. (Auburn University), M.S.E. (University of Alabama, Huntsville). Lecturer in Electrical Engineering, 1983.

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LONG, RANDY, B.S., M.Ed. (Middle Tennessee State University). Lecturer in Mathematical Sciences, 1987.

LOVELACE, CYNTHIA, B.S.I.E. (Auburn University), M.S.E., Ph.D. (University of Alabama, Huntsville). Lecturer in Industrial and Systems Engineering, 1995.*

LUCAS, LINDA C., Adjunct Associate Professor of Materials Science, 1988.

LUNDQUIST, CHARLES, B.S. (South Dakota State University), Ph.D. (University of Kansas). Lecturer in Management, 1984.*


MAJUMDAR, ALOK K., B.E., M.E. (Calcutta University), Ph.D. (Burdwan University). Adjunct Professor of Mechanical and Aerospace Engineering, 1987.*


MARSH, CHANTELL, B.S. (University of Houston). Lecturer in English, 1993.

MARTIN, JAMES, Adjunct Associate Professor of Materials Science, 1988.

MAYS, JIMMY W., Adjunct Assistant Professor of Materials Science, 1988.


MC CRACKEN, EDWARD, B.S.N., M.S.N. (University of Alabama, Birmingham). Adjunct Associate Professor of Nursing, 1996.


MEANS, DEBRA, B.S.N., M.S.N. (University of Alabama, Huntsville). Lecturer in Nursing, 1996.*


METZGER, ROBERT M., Adjunct Professor of Materials Science, 1988.

MILLER, TIMOTHY L., A.B. (Case Western Reserve University), M.S., Ph.D. (University of Arizona). Adjunct Assistant Professor of Mathematical Sciences, 1986.*


MOG, ROBERT ALAN, B.S. (University of Illinois, Urbana), M.S., M.S.E., Ph.D. (University of Alabama, Huntsville). Adjunct Assistant Professor in Industrial and Systems Engineering, 1990.*

MOHLERE, DOLORES, B.S., M.S.M. (University of Alabama, Huntsville). Lecturer in Accounting, 1993.*

MOHRI, MAMORU, B.S., M.S. (Hokkaido University), Ph.D. (Flinders University). Adjunct Professor of Physics, 1994.


MOORMAN, JO ANN, B.A. (Vanderbilt University), M.A.S. (University of Alabama, Huntsville), Ph.D. (Vanderbilt University). Adjunct Assistant Professor of Political Science, 1989.*

MORROBEL-SOSA, A.D.C., Adjunct Associate Professor of Materials Science, 1988.


OLIVER, JAMES M., B.S., M.S. (Louisiana State University), Ph.D. (University of Colorado). Lecturer in Mathematics and Mechanical and Aerospace Engineering, 1983.

OLSON-ZERINGUE, JAN E., B.S.N. (University of Florida), M.S.N. (University of Alabama, Huntsville). Lecturer in Nursing, 1996.*


PALMER, TERRY, Ph.D. (Vanderbilt University). Lecturer in Electrical and Computer Engineering, 1996.

PALTCHIKOV, TAMMY, B.A. (University of Alabama, Huntsville). Lecturer in Russian, 1995. 324
PARK, DUK-WON, Adjunct Professor of Materials Science, 1988.
PARKER, MARTIN, Adjunct Professor of Materials Science, 1993.
PATTERSON, BURTON R., Adjunct Associate Professor of Materials Science, 1988.
PATTERSON, CHARLES, M.D. (Ohio State University). Adjunct Associate Professor of Nursing, 1996.
PATTERSON, ROBERT, B.A. (University of Alabama, Huntsville), J.D. (Cumberland School of Law at Samford University). Lecturer in H.P.E., 1990.
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.* Research Interests: Diffractive and binary optics, refractive microlens array fabrication, plastic replication of optics and micro-optics.
PHILLIPS, EDITH, B.A. (University of Alabama, Huntsville). Lecturer in German, 1992.
PRESTON, KEVIN R., B.S. (Eastern Kentucky University), M.S. (University of Alabama, Huntsville). Lecturer in Computer Science, 1990.*
PUSEY, MARC L., B.S., Ph.D. (West Chester State College). Adjunct Professor of Biological Sciences, 1993.
RAMACHANDRAN, N., B.E. (University of Madras, India), M.S., Ph.D. (University of Missouri-Rolla). Lecturer in Mechanical and Aerospace Engineering, 1995.
REDMON, MELINDA W., B.S.N. (University of Alabama, Tuscaloosa), M.S.N. (Vanderbilt University). Lecturer in Nursing, 1996.
REYNOLDS, NATHANIEL D., B.A. (University of Kansas), M.S. (University of Wisconsin), Ph.D. (Florida State University). Adjunct Assistant Professor of Atmospheric Science, 1993.*
RIGNEY, DOUGLAS, Adjunct Assistant Professor of Materials Science, 1993.
RIGSBEE, J. MICHAEL, Adjunct Professor of Materials Science, 1993.
ROBEY, LAWRENCE, B.S. (University of Kentucky), M.D. (University of Kentucky, College of Medicine). Adjunct Professor of Nursing, 1996.
ROMINE, PETER L., B.S. (University of Alabama, Tuscaloosa), M.S., Ph.D. (University of Alabama, Huntsville). Lecturer in Electrical and Computer Engineering, 1994.*

ROGERS, JOHN S., B.S., M.S. (University of Alabama, Tuscaloosa), Ph.D. (University of Alabama, Huntsville). Lecturer in Mechanical and Aerospace Engineering, 1990.


RYDER, BRADLEY, B.S.B.A. (University of Alabama, Huntsville), J.D. (Samford University, Birmingham, AL). Lecturer in Business Legal Studies, 1995.

SAFIE, FAYSSAL, B.S. (Ohio University), M.S., Ph.D. (Cleveland State University). Adjunct Associate Professor of Industrial and Systems Engineering, 1986.*

SARKER, SANJOY K., Adjunct Assistant Professor of Materials Science, 1988.


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.

SHEA, DANIEL, B.S., B.S.E., M.S. (University of Alabama, Huntsville). Lecturer in Civil and Environmental Engineering, 1995.*

SHEALY, DAVID L., Adjunct Professor of Materials Science, 1988.

SHUTT, GAIL, B.S.N. (Texas Women’s University), M.S.N. (University of Alabama, Huntsville). Adjunct Assistant Professor of Nursing, 1996.


SMITH, SYLVIA, B.S.N., M.S.N. (University of South Carolina). Adjunct Assistant Professor of Nursing, 1996.


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.

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.

STINETT, GAYLE, B.S.N., M.S.N. (University of Alabama, Birmingham). Adjunct Associate Professor of Nursing, 1996.


STRICKLAND, RICHARD C. Adjunct Professor of Biological Sciences, 1991.


TAYLOR, ANDREW, M.D. (University of Alabama School of Medicine, Birmingham). Adjunct Associate Professor, 1996.

TEOH, NIHAIL, B.Sc. (University of Istanbul, Turkey), M.Sc. (Clarkson University). Lecturer in Mathematical Sciences, 1995.

THOMAS, DANIEL L., B.S., Ph.D. (Brigham Young University). Adjunct Associate Professor of Chemical and Materials Engineering, 1993.*

THOMAS, LAWRENCE DALE, B.S.E. (University of Alabama, Huntsville), M.S.E. (North Carolina State University), Ph.D. (University of Alabama, Huntsville), P.E. Adjunct Assistant Professor of Industrial and Systems Engineering, 1984.*

THOMPSON, RAYMOND G., Adjunct Associate Professor of Materials Science, 1988.

TUEBERT, BETH, B.S.N. (Vanderbilt University), M.S.N. (University of Alabama, Birmingham. Adjunct Assistant Professor of Nursing, 1996.


URRY, DAN W., Adjunct Professor of Materials Science, 1988.


VEKILOV, ROUMYANA, B.S.E., M.S.E. (University of Architecture, Civil Engineering and Geodesy, Bulgaria), M.S. (Technical University in Bulgaria). Lecturer in Civil and Environmental Engineering and Mathematical Sciences, 1994.


VISSCHER, P.B., Adjunct Professor of Materials Science, 1988.

VOHRA, YOGESH, Adjunct Associate Professor of Materials Science, 1993.

VON TIESENHAUSEN, GEORG, JR., Ph.D. (University of Alabama, Tuscaloosa). Lecturer in German, 1986.

WALCK, SCOTT D., Adjunct Assistant Professor of Materials Science, 1988.

WARREN, GARRY W., Adjunct Associate Professor of Materials Science, 1988.


WELSTEAD, STEPHEN T., B.S. (University of Notre Dame), M.S. (State University of New York, Stonybrook), Ph.D. (Purdue University). Adjunct Assistant Professor of Mathematical Sciences, 1987.*

WENDT, RICHARD L., B.S. (Florida State University), M.S., Ph.D. (University of Houston). Lecturer in Electrical and Computer Engineering, 1993.*

WERKHEISER, ARTHUR H., JR., B.S. (Lafayette College), M.S., Ph.D. (University of Tennessee). Lecturer in Physics, 1969.


WHITE, ELIZABETH, B.S.N. (Birmingham Southern), M.S.N. (University of Alabama, Birmingham). Adjunct Assistant Professor of Nursing, 1996.


WILLIAMSEN, JOEL, B.S. (University of Nebraska), M.S.E., Ph.D. (University of Alabama, Huntsville). Lecturer in Industrial and Systems Engineering, 1994.*


ZAHORCHAK, ROBERT. Adjunct Professor of Biological Sciences, 1996.


ZEHRT, WILLIAM, B.S.E., M.S.E. (University of Illinois, Urbana-Champaign), P.E. Lecturer in Civil and Environmental Engineering, 1994.*
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Should additional information be required, may be addressed to:

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