2005-2007 Undergraduate Catalog

University of Alabama in Huntsville

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The University of Alabama in Huntsville

Undergraduate Catalog 2005-2007
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ACADEMIC CALENDAR 2005-2006
(Prepared October 2004 - All dates tentative and subject to change without prior notice.)

Fall Semester 2005
August 17 Late Registration
August 19
August 24
August 27
September 5
October 6 – 8
November 23
November 24 – 26
December 5
December 5
December 6
December 6
December 7
December 7
December 8 – 14
December 12
December 15
December 17
December 23 – 31

Spring Semester 2006
January 1
January 5
January 8
January 13
January 15
March 20 – 25
April 11
April 21
April 24
April 25
April 26
April 26
April 27
April 27 – May 3
April 29
May 1
May 2
May 14

Summer 2006
May 26
May 29
May 30
May 30
June 27
June 28
June 29 – 30
July 3-4
July 5
July 31
July 31*
August 1
August 2
August 2 – 4**
August 3 – 4**

* Ten Week MW classes short one class
**No Study Day

Faculty Convocation/New Faculty Orientation
Classes Begin
First Saturday class
Labor Day Holiday
Fall Break
No Classes
Thanksgiving holidays - No classes
Last MW class
Last MW class
Last TR class
Last Tuesday only class/final exam
Last Wednesday only class/final exam
Study Day/Weather Day
Final Examinations
Last Monday only class/final exam
Last Thursday only class/final exam
Last Saturday class/final exam
Winter break - No Classes

New Year’s Holidays
Late Registration
Classes Begin
First Saturday class
Martin Luther King Jr. Holiday
Spring Break
Honors Day - No Classes
Last MWF class
Last MW class
Last TR class
Last Wednesday only class/final exam
Study Day/Weather Day
Last Thursday only class/final exam
Final Examinations
Last Saturday only class/final exam
Last Monday only class/final exam
Last Tuesday only class/final exam
Commencement

Registration
Memorial Day Holiday
Classes Begin – 10 week
Classes Begin – 1st 5 week
Last class - 1st 5 week
Study Day – 1st 5 week
Final Examinations - 1st 5 week
Independence Day Holidays
Classes begin - 2nd 5 week
Last MWF class – 10 week
Last MW class - 10 week
Last TR class - 10 week
Last class - 2nd 5 week
Final Examinations - 10 week
Final Examinations - 2nd 5 week
PROPOSED ACADEMIC CALENDAR 2006-2007
(Prepared February 2005 - All dates tentative and subject to change without prior notice.)

Fall Semester 2006
August 18  Late Registration
August 18
August 19
August 23
September 4
October 5 – 7
November 22
November 23 – 25
December 4
December 5
December 6
December 7
December 7 – 13
December 9
December 11
December 17
December 22 – 31
*Thursday Only Class short one session

Spring Semester 2007
January 1
January 5
January 8
January 15
January 17
March (To Be Arranged)
March (F/Wk of Spring Break)
April 10
April 20
April 23
April 24
April 25
April 26
April 26 – May 2
April 28
April 30
May 1
May 13

Summer 2007
May 25
May 28
May 29
May 29
June 26
June 27
June 28 – 29
July 2
July 4
July 26
July 30
July 30
July 31
July 31
August 1
August 1 – 3
August 2 – 3

Faculty Convocation/New Faculty Orientation
First Saturday class
Classes Begin (Wednesday)
Labor Day Holiday
Fall Break
No Classes
Thanksgiving Holidays - No Classes
Last MWF class
Last MW class
Last TR class
Last Tuesday only class/final exam
Last Wednesday only class/final exam
Study Day/Weather Day
Last Thursday only class/final exam*
Final Examinations
Last Saturday only class/final exam
Last Monday only class/final exam
Fall Commencement
Winter break - No Classes

New Year's Holiday
Late Registration
Classes Begin
First Saturday class
Martin Luther King Jr. Holiday
Spring Break
Staff Spring Break Holiday
Honors Day - No Classes
Last MWF class
Last MW class
Last TR class
Last Wednesday only class/final exam
Study Day/Weather Day
Last Thursday only class/final exam
Final Examinations
Last Saturday only class/final exam
Last Monday only class/final exam
Last Tuesday only class/final exam
Commencement

Registration
Memorial Day Holiday
Classes Begin - 10 week
Classes begin - 1st 5 week
Last class - 1st 5 week
Study day - 1st 5 week
Final examinations - 1st 5 week
Classes begin - 2nd 5 week
Independence Day Holiday
Last TR class - 10 week
Last MWF class - 10 week
Last MW class - 10 week
Study Day - 10 week
Last class - 2nd 5 week
Study Day 2nd 5 week
Final Examinations - 10 week
Final Examinations - 2nd 5 week
UNDERGRADUATE DEGREE/CERTIFICATE PROGRAMS

Major Degree/Certificate
Accounting B.S.B.A.
Accounting Certificate
Art B.A.
Biological Sciences B.A., B.S., Recommendation for 6-12 Certification
Chemistry B.S., Recommendation for 6-12 Certification
Communication Arts B.A.
Computer-Mediated Communication Certificate
Computer Science B.S.
Education, Elementary B.A., Recommendation for K-6 Certification
Education, Secondary Recommendation for 6-12 Certification
Education, Special (Collaborative Teacher) Recommendation for K-6 Certification
Education, Special (Collaborative Teacher) Recommendation for 6-12 Certification
Engineering - General B.S.E.
Aerospace Engineering – As an option in Mechanical Engineering
Chemical Engineering
Civil Engineering
Computer Engineering
Electrical Engineering
Industrial and Systems Engineering
Mechanical Engineering
Optical Engineering
English B.A.
English Language Arts Recommendation for 6-12 Certification
Environmental Science Certificate
Finance B.S.B.A.
Foreign Language, General B.A.
French Recommendation for 6-12 Certification
German Recommendation for 6-12 Certification
Russian Recommendation for 6-12 Certification
Spanish Recommendation for 6-12 Certification
Concentration in Foreign Languages and International Trade
General Science Recommendation for 6-12 Certification
History B.A., Recommendation for 6-12 Certification
Management - Human Resources Management B.S.B.A.
Management – Human Resource Management Certificate
Management Information Systems B.S.B.A.
Marketing Management B.S.B.A.
Marketing-e Business B.S.B.A.
Mathematical Sciences B.A., B.S., Recommendation for 6-12 Certification
Music B.A., Recommendation for P-12 Certification
Nursing B.S.N.
Philosophy B.A.
Physics B.S., Recommendation for 6-12 Certification
Political Science B.A.
Psychology B.A.
Social Science Recommendation for 6-12 Certification
Sociology B.A., Recommendation for 6-12 Certification
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 (SACS) to award bachelor’s, master’s, and doctoral degrees. SACS (1866 Southern Lane, Decatur, GA. 30033-4097; telephone: 404-679-4501) should be contacted only for information about UAH accreditation. Several UAH programs are accredited by their respective accrediting agencies. Academic programs in chemistry are accredited by the American Chemical Society. Eight undergraduate engineering programs (aerospace engineering option in mechanical, chemical, civil, computer, electrical, industrial and systems, optical, and mechanical) are accredited by the ABET, Inc. Both undergraduate and graduate programs in nursing are accredited by the National League of Nursing. Computer science holds accreditation from the Computing Accreditation Commission of ABET, Inc. Programs in music and music education are accredited by the National Association of Schools of Music. All programs, both undergraduate and graduate, in the College of Administrative Science are accredited by the American Assembly of Collegiate Schools of Business-The International Association for Management Education.
Facilities

The 376-acre UAH campus is situated in Cummings Research Park, which is located in northwest Huntsville. The University has 30 major buildings, all of which have been constructed since 1960. The buildings contain modern equipment and exemplify modern functional design.

Student housing consists of North Campus Residence Hall, Central Campus Residence Hall, and the nine-building Southeast Campus Housing Complex. Phase I of North Campus Residence Hall opened in fall 2002, and Phase II, a near replication of the existing residence hall, is expected to open in fall 2005.

Morton Hall, 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 accommodates the offices of Multicultural Affairs, the Honors Program, the Writing Center, and International Education.

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

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

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

The Offices of Human Resources, Accounting and Finance, Accounts Payable, Alumni Relations, University Advancement, University Development, and University Relations are located in Shelbie King Hall along with the Institute for Science Education.

Von Braun Research Hall contains offices for Research Administration, 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 Department of Computer & Network Services.

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

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

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

The University Center houses the Division of Student Affairs, Office of Admissions and Records, Student Financial Services, 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 and Art Gallery.

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

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

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

Marion Beirne Spragins Hall has classrooms and offices for Health and Physical Education and Athletics, a gymnasium with a seating capacity of 2,800, racquetball courts, and other physical education, recreational, and athletic training facilities.

The Central Receiving 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 Department of Facilities and Operations, which include administrative offices, custodial services, public safety, facilities maintenance, grounds management services, stockroom, and fleet services.

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 Department of Business Services including Purchasing Services, Telecommunications, and the Copy Center.

Olin B. King Technology Hall is located on the west side of 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 in Computer Science. It also houses the Center for Space Plasma and Aeronomic Research (CSPAR), the Propulsion Research Center, and the Information Technology & Systems Center.

The Robert “Bud” Cramer Research Hall which houses the National Space Science & Technology Center or NSSTC is also located on the west side of Sparkman Drive and contains offices for Atmospheric Science, research laboratories, meeting rooms, and the Global Hydrology Resource Center computer laboratory to support the extensive ongoing research between NASA, UAH, and the Universities Space Research Association. All three organizations have employees housed in the building.

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

Two new buildings will be under construction between 2005 and 2007. The Applied Sciences Building will provide state of the art lab facilities as well as teaching and resource facilities for
chemistry, physics, biology, and mathematical sciences. It will serve to make the campus more modern in facilities and design by helping to create a technology quadrangle that will consolidate engineering, math, and science. Also, scheduled for construction is a multi-level intermodal parking facility that will provide an additional 1,200 parking spaces in a centralized location adjacent to the technology quadrangle.

**M. Louis Salmon Library**

The M. Louis Salmon Library is housed in a 105,000 square feet facility which includes a state-of-the-art high-tech wing with an Information Arcade, five computer labs, including a math tutorial lab, a liberal arts lab, a nursing lab, and a Library/distance learning lab. Over 250 workstations are supported in the facility. A Media/Distance Learning support center is also housed in the Library.

The Library supports the academic and research programs of the University. It has a collection of over 325,000 print volumes, a selective collection of over 500,000 United States government publications, and over 600,000 materials in microform, and manuscript collections. In addition to books and microform materials, the Library offers a broad selection of books, journals, newspapers and other serials in electronic form. Approximately 15,000 electronic periodicals, over 40,000 electronic books and over 250 databases can be accessed both on and off campus via the Library website at [http://www.uah.edu/library](http://www.uah.edu/library). In addition, the University Archives/Special Collections offer a number of unique collections, including the papers of former Congressman Robert Jones, the personal Library of Willy Ley, the architectural research collection of Harvie P. Jones, and several space related collections involving such projects as the Saturn V rocket, Skylab and Apollo-Soyuz.

For students in science and engineering and technology, research at UAH is supported by the Redstone Scientific Information Center (RSIC), located five miles from campus. RSIC was developed to support the wide-ranging research interests of NASA and the United States Army Missile Command and is one of the finest technical libraries in the Southeast. UAH subscribes to numerous full-text and bibliographical data bases each of which supports specific colleges, including Liberal Arts, Nursing, Administrative Science, Engineering, and Science.

The Library is privileged to provide access to many major online resources including the entire Elsevier online collection of over 1845 journal titles through Science Direct as well as the IEEE collection. Many materials from the Library are available without charge to UAH faculty members and graduate students by request through the Salmon Library. Reciprocal borrowing agreements are also in force with over 100 academic libraries and particularly with the Network of Alabama Academic Libraries (NAAL). Also, the Library has a contract with the University of Illinois and its 10 million books and 100,000 serial titles. The Library is also a member of several consortia that provide access to research materials not owned by libraries in north Alabama. Its membership in the Online Computer Library Center (OCLC) and the Network of Alabama Academic Libraries (NAAL) facilitates rapid document delivery/interlibrary loan service to faculty and students without charge.

Reference services are provided both through electronic reference and onsite supported by subject specialist librarians, who are available to assist students in finding information in person, by e-mail, phone or through the Library’s virtual reference service. Group Library instruction sessions are provided to teach students how to locate, manage, and evaluate the information they need for class projects and papers. Other Library services include group study rooms, computers for writing papers, a scanner workstation, a digital audio/video room, and support for distance education and special computer accommodations for users with disabilities. A new and user-friendly printing system is also available in the Library InfoArcade and labs.

For additional information, inquire at the Circulation Desk, (256)824-6530, the Reference Desk, (256)824-6529 or Interlibrary Loan, (256)824-6124. Library home page: [http://www.uah.edu/library](http://www.uah.edu/library)
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. Student Affairs 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, counseling, and the Wellness Center.

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

Mathematics Learning Center
The Mathematics Learning Center (MLC), located on the second floor of the Salmon Library, is the center for computer assisted instruction in mathematics. Currently, MA 004, Basic Algebra, and MA 112, Precalculus Algebra are taught in a computer assisted format, with a mixture of traditional lecture and individual work in the MLC. The MLC is open approximately 40 hours per week and is staffed by mathematics faculty and graduate assistants.

Mathematics Tutoring Center
The Mathematics Tutoring Center provides tutoring in MA 107, MA 110, MA 113, MA 115, MA 120, MA 171, and MA 172. The tutoring center is conveniently located in Madison Hall, where most of the mathematics courses are taught, and is staffed by graduate assistants. The hours of the tutoring center vary from semester to semester. For more information, please call the Mathematical Sciences Department at 824-6470, or visit our web site at http://www.math.uah.edu.

Calculus Workshop
The Calculus Workshop is provided for students in MA 171, Calculus A, MA 172, Calculus B, and MA 201, Calculus C. The workshop is designed to follow the schedule of these classes, providing additional practice for current topics as well as emphasizing the connections and relationships to past topics. Students work on problems that range from basic to challenging. The methods employed are varied, from whole group and guided practice to small group and individual work. The goal of the workshop is to help improve students’ understanding of calculus concepts and improve problem-solving skills. Students who have attended the workshop in the past have consistently done better in their calculus classes than students who have not attended. For more information, please call the Mathematical Sciences Department at 824-6470, or visit our web site at http://www.math.uah.edu.

Writing Center
The Writing Center, located in Morton Hall, is designed to increase opportunities for student centered learning through peer tutoring. Students work one-on-one and in small groups to help each other understand college-level assignments; plan, organize, revise, and edit papers; prepare oral presentations; and develop critical thinking skills. The Writing Center is open to all students. For more information, call 824-2363.

Counseling Center
The Counseling Center at UAH provides specialized professional services designed to assist students in their academic, personal, and social development. Many students encounter personal difficulties that affect the course of their collegiate experience. The Counseling Center provides short-term therapy to help students cope with stress and/or learn new skills.
Counseling services are free of charge to all currently enrolled UAH students. Our staff has a commitment to meeting the needs of individuals from diverse backgrounds. Services are confidential and in accordance with the ethical guidelines of the American Psychological Association. Information about counseling sessions does not go on a student's academic record and is not released to any other individuals (on campus or off) without the student's written permission—except in rare situations as mandated by law.

Students come in for a variety of concerns such as relationships, self-esteem, time management, test anxiety, family concerns, depression, sleeping problems and stress management. See our webpage at www.uah.edu/counseling/ for more information.

To schedule an appointment, contact the Counseling Center at 824-6203 or come by Room 113 in the University Center.

Services for Students with Disabilities
The Student Development Services Office provides professional counselors for students with disabilities.

Services offered to students with disabilities include: classroom accommodations, assistance locating note-takers and readers, ordering textbooks on tape, counseling, auxiliary equipment, assistance during orientation, liaison to UAH faculty, liaison to admissions, housing and financial aid, and community resources.

In addition, the staff provides educational “awareness” programs for students, faculty and staff as well as in-service faculty training on accommodating students with disabilities. At least one month before enrolling, students with disabilities must contact this office so that preparation can be made in advance to provide assistance needed. Official documentation of stated disability is required. Appointments may be made in person or by calling the SDS office, Room 113, University Center, voice/TDD 824-6203.

Multicultural Affairs
The Office of Multicultural Affairs (OMA), 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 for students from diverse cultural backgrounds. 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 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) 824-6822, or oma@uah.edu.

Wellness Center (Student Health Services)
Currently enrolled UAH students with valid ID’s may be seen for many of their health care needs by appointment at the Wellness Center located in the University Center, Room 203. Office visits are charged a base fee, currently $5.00. However, other services will be billed to the student at a models charge. The Wellness Center is open Monday through Friday 8:15 a.m. to 5:00 p.m. The telephone number is 824-6775.

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

To assist students and graduates discover their individual abilities, interests and values and relate these factors to relevant career choices and college majors, Career Services offers several assessment tools. FOCUS, a computer assisted career guidance system, allows students to
determine individual values, skills, and interests. FOCUS also provides 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 Career and Occupational Preference System. This comprehensive, written inventory is comprised of three parts: Values, Abilities, and Interests. It is designed to increase self-awareness and facilitate connecting personal preferences with appropriate career choices. Other assessment tools are available. In addition to career assessment and individual career counseling, the office also offers a Career Exploration (ED 111) class twice each year. Career Services encourages students to start exploring possibilities early in their college tenure.

Career exploration resources are available in the Career Resource Center, including reference books, videos, articles, and other occupational information. In addition, the Career Resource Center houses numerous books on job search issues, salary information, company literature, employer directories, and graduate school information. On campus and off campus part-time employment opportunities are available for currently enrolled students. Gaining work experience while in school can be a big advantage upon graduation. The annual Fall and Spring Career Information Days offer an excellent exploration tool, as potential future employers talk with students about their companies, profession, and the types of employees they hire.

Each senior, degree-seeking graduate student, and UAH alumnus who wishes job search assistance may register with the office by submitting a copy of their resume and filling out a registration form. Students should register at least 9 months prior to graduation. Registered individuals have access to the Resume Referral program, the full-time employment job listings, and on-campus interviews. Held in conjunction with the Fall and Spring Career Information Days/Job Fairs, 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, 824-6612, between 8:15 a.m. and 5:00 p.m. Monday through Friday.

**University Housing**

The University of Alabama in Huntsville offers a variety of housing facilities to meet the needs of its diverse student population. All first-year students who apply for University housing are assigned to the Central Campus Residence Hall (CCRH) which opened in the fall of 1991. Second-year residents may apply to our newest residence halls, North Campus Residence Halls Phase I and Phase II (NCRH Ph. I & Ph. II). Residents who are of at least junior status or 21 years of age may apply to Southeast Campus Housing (SECH).

CCRH is a seven-story building that opened in the fall of 1991. This seven-story traditional residence hall located in the center of campus is connected the University Center by an enclosed walkway. The bridge connecting CCRH to the University Center provides all-weather access to the cafeteria, a convenience store, the game room, bookstore and various student activities, offices and meeting rooms.

Both CCRH and NCRH Ph. I & Ph. II are near the library, the gym and classrooms for liberal arts, nursing, administrative science and natural sciences. Each 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 study table and chairs, small sofa and easy chairs. CCRH has a mini kitchen with a small refrigerator, microwave and sink. NCRH has a mini kitchen with an apartment-size refrigerator, microwave and sink. Each resident has an extra-long twin bed, a wardrobe, a desk, a bookshelf and a three-position chair. Rooms for disabled students are available. NCRH Ph. II also contains 33 studio (one-bedroom) apartments. Access to the buildings is by electronic card access. Laundry facilities, a recreation room, a student room and mail service are available. NCRH Ph. I and CCRH also contain a computer lab.
Southeast Campus Housing consists of a cluster of nine three-story buildings located on John Wright Drive near Madison Hall, next door to the University Fitness Center 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 students who are at least juniors or at least 21 years of age. In addition, one-bedroom private apartments are available for graduate students or students with spouses and/or children. Several of the one-bedroom apartments are accessible to disabled students. Some unfurnished units are available.

Each three-bedroom suite in Southeast Housing has a living room, full kitchen with refrigerator, range, oven and sink, dining area, and double bathroom with an adjoining vanity area. The units are air-conditioned, carpeted and are furnished with a loveseat, lounge chairs, end tables, and a dining table and chairs. Bedrooms have extra-long twin beds, study desks and chairs, nightstands, and a built-in closet. All Southeast Campus Housing residents have the use of a laundry room with coin operated washers and dryers and a pay telephone, a mail room, 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 and North Campus Residence Hall Ph. I & Ph. II has a full time, live-in Resident Director and at least one Student Resident Advisor (RA) on each floor. Southeast Campus is staffed with a Resident Director and a team of RA's. RA's 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 housing lease (either academic year August-May or 12 month depending on location); housing charges are due when tuition is due each academic semester. Summer housing for single students is available in the Southeast area (not in CCRH) under a separate summer lease. The lease for family and graduate student apartments is for twelve months (late August through mid-August) and rent installments are due monthly.

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

**Preschool Learning Center**

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

**The University Center**

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

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

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

**Student Identification Cards**
The Charger Card is your official identification card, with your picture on the front and account information magnetically encoded on the back. The Charger Card may be used for access to:

- University Fitness Center
- Campus Athletic Events
- Salmon Library (in order to check out books)
- Wellness Center
- Residence Hall
- Computer Labs/Information Services
- Campus Entertainment Events

The Charger Card accounts are similar to a checking account (with a pre-deposit of funds), and can be used to make purchases at participating locations. Opening an account is free; there are no service charges. There are two types of charger card accounts: Charger Dining and Charger Flex.

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

**Game Room**
Located in the lower level of the Center, the game room has pool tables and ping-pong tables. 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 Art carved or Josten's class rings.

**University Food Service**
Through the delivery of an exceptional food program, the UAH community is provided with options, quality, and convenience.

The Charger Café is an “All You Can Eat” dining area. The menu program is known as Ultimate Dining and features rotating formats of food presentation: Classics, Pizzarette, The Grille, Performance Station, Soup’n Salad, Sub’n Sandwich, Vegetarian Selections, Desserts and Beverages. A spacious dining room with an adjacent patio is available for all guests.
Mom’s features two popular dining concepts - Freshens and Jazzman’s Café. Freshens is the largest custom-blended smoothie retailer in the country and one of the most popular smoothie and frozen yogurt and treats concepts in the United States. A perfect location for a healthy snack or meal. Jazzman’s Café provides a coffee shop menu and atmosphere; great for early morning meetings, quick lunches, or afternoon coffee breaks. Freshly brewed gourmet coffees, teas, fresh-baked gourmet muffins and cookies, salads and sandwiches provide a variety of choices for all to enjoy.

Catering is also offered in the University Center as well as other areas of campus. The hours of operation are posted near the entrance of each dining area.

The student ID card serves as a declining balance card for meals or snacks. Each time the card is used for payment, the amount spent is deducted resulting in a new balance. All resident students are required to purchase an academic year food contract in the form of a declining balance card.

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

**Student Government Association (SGA)**
The SGA is the supervising organization of student-led and -oriented clubs and organizations on the UAH campus. Students wishing to join or create a club need to contact SGA to determine if a club with their interest is already in place or to obtain help in creating an organization.

The SGA also advocates positive changes in the University system, seeking to continually improve student life by voicing student concerns and suggesting courses of action that will better serve the student body and the University as a whole. The SGA also focuses the leadership efforts of the student body to help create a united, cohesive campus.

The SGA may also be found on the web site at http://sga.uah.edu and is reachable via email at SGA@email.uah.edu.

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

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

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

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

4. **Special Events**
   The Special Events Committee is responsible for planning annual events such as Homecoming, Fallfest, and Springfest, which is the culmination of a year's activities. Springfest is mandatory for students seeking fun! Some events include “Extreme Air,” “Human Foosball,” concerts and comedians, and “Singled Out.” The Director of Student Activities can be reached at 824-2717 or in the UC 100B.
Student Organizations
UAH has more than 130 special-interest organizations and clubs. For a complete listing, see the Director of Student Activities in University Center 100B or call (256) 824-2717.

Greeks

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

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

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

Academic Honor Societies

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

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

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

Alpha Pi Mu (Industrial Engineering)
The national honor society for industrial engineers, Alpha Pi Mu was founded at the Georgia 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 Iota Theta Chapter of Beta Alpha Psi was chartered in 1999. Beta Alpha Psi is the national honor society for students majoring in accounting, finance, or information systems at schools accredited by AACSB International - The Association to Advance Collegiate Schools of Business. The organization especially encourages and recognizes high academic achievement, as well as service to one's profession and to the public. Members have the opportunity to interact with professionals in the various areas of financial management.
Beta Gamma Sigma (Business or Management)
Membership in Beta Gamma Sigma is the highest recognition a business student anywhere in the world can receive. To be eligible for nomination, a student must be in a program accredited by AACSB International - The Association to Advance Collegiate Schools of Business and rank in the upper seven percent of the junior class, upper ten percent of the senior class, or upper twenty percent of the master’s graduating class. Members are elected to membership. Beta Gamma Sigma encourages and honors high academic achievement and personal excellence in the study and practice of business.

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

Eta Kappa Nu (Electrical Engineering)
The Theta Eta Chapter of Eta Kappa Nu was chartered on April 29, 1978. The objectives of Eta Kappa Nu are to honor those students in electrical engineering who have excelled in scholarship, leadership, and exemplary character, and to unify them with graduates and faculty who have attained prominence in the field of electrical engineering. Membership is open by chapter invitation only to graduates, faculty, professionals, juniors in the top fourth of the electrical engineering class, and seniors in the top third of the electrical engineering class.

Omega Chi Epsilon (Chemical Engineering)
Omega Chi Epsilon is the Chemical Engineering Honor Society. OXE recognizes superior service and research of undergraduate and graduate majors in chemical engineering. UAH received its charter April 17, 2001.

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

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

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

Phi Kappa Phi (Multi-discipline)
The primary objective of the national honor society of Phi Kappa Phi is the recognition and encouragement of superior scholarship in all academic disciplines. The society is convinced that in recognizing and honoring those persons of good character who have excelled in scholarship in any field, it will stimulate others to espouse excellence. The society promotes an atmosphere conducive to academic excellence.
Phi Sigma Iota (Foreign Language)
Phi Sigma Iota recognizes outstanding ability and high standards in the field of foreign languages, literatures, and cultures, including classics, linguistics, philology, comparative literature, bilingual education, and other related areas. It promotes international communication and understanding, and a sentiment of amity among nations. Membership is open by nomination to any student who is at least a junior with a B average overall, as well as in foreign languages; has completed at least one foreign language course at the 300-level; is enrolled at UAH at the time of being offered membership; and who plans to take at least two 300-level courses in foreign languages.

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

Pi Tau Sigma (Mechanical Engineering)
Pi Tau Sigma is the national mechanical engineering honor society. Its purposes are to foster the high ideals of the engineering profession, to stimulate interest in departmental activities, to promote the mutual professional welfare of its members, and to develop in students of mechanical engineering the attributes necessary for effective leadership. Membership is open to those students in the top quarter of the juniors and the top third of the seniors in mechanical engineering.

Psi Chi (Psychology)
Psi Chi is a national recognition society for students in the field of psychology. Its purposes are to encourage, stimulate, and maintain scholarship of the individual members in all fields, particularly in psychology, and to advance the science of psychology. To achieve these goals Psi Chi offers a wide range of programs at the local, regional, and national levels. Membership is open to students with a 3.0 overall grade point average and a 3.0 in psychology having completed 12 hours of psychology courses toward a minor or 15 hours toward a major.

Sigma Pi Sigma (Physics)
The Sigma Pi Sigma honorary society operates within the Society of Physics. Student 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 undergraduate nursing students who have completed at least one-half of the professional nursing curriculum, who are in the upper 35 percent of their class and who have a grade point average of 3.0. Graduate students in nursing who have completed at least one-fourth of their required nursing course work and have a grade point average of 3.5 may be invited for membership.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The intramural sports program serves the recreational needs of UAH students through a planned program of intramural athletics and other forms of recreational activities. It provides opportunities for the development of positive attitudes toward recreational activities throughout life, thus deriving optimum benefits of enjoyment, health, social contacts, and sportsmanship. The philosophy of intramural activities at UAH is based on the concept that students should have freedom of choice and responsibility for sharing in planning, supervising, and administering the program.

All students and members of the faculty and staff are eligible to participate in intramural activities. The sports offered include basketball, 3-on-3 basketball, flag football, floor hockey, racquetball, indoor soccer, 6 pack soccer, softball, volleyball, sandpit volleyball, dodgeball, ping pong, badminton, disc golf and 2 man golf tournament.

Student Publications

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

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 the work to the Exponent office, Room 104, University Center.
Admissions Information

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

Application forms, detailed application instructions, relevant deadlines and information brochures are available from the Office of Admissions by calling (256) 824-2773, or can be accessed on the internet at http://www.uah.edu under the link for admissions. Applications can be submitted electronically at http://register.uah.edu.

UAH welcomes visitors to the campus. Campus tours on an individual or group basis may be arranged by calling the Office of Admissions at 256-824-2773. Faculty members and academic advisors are eager and available to confer with prospective students to discuss their enrollment plans and opportunities at UAH. Prospective students may contact the department or college of the major they intend to pursue, or call the Academic Advisement and Information Center at 256-824-6290 for more information.

Undergraduate Admissions Information

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

Students who are seeking degrees at UAH
- Freshmen: individuals who are enrolling directly from high school and have not attended another college or university since high school graduation
- Transfers: individuals who have attended one or more previous colleges since graduating high school
- GED Recipients: those who have passed the high school equivalency examination
- Second bachelor's seekers: students who have already earned a baccalaureate degree and are pursuing another baccalaureate degree

Academically talented high school students who are seeking enrichment opportunities
- Early Start Program: students who have not yet graduated high school, are academically talented and wish to concurrently enroll in courses at UAH
- Dual Credit 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

Students who are not seeking an undergraduate degree at UAH
- Transient: students currently enrolled in good standing at other collegiate institutions who wish to attend UAH on a temporary basis
- Post-Baccalaureate: students who have earned a bachelor's degree and are taking courses on a non-degree or preparatory basis for graduate school
- Non-Degree: Individuals who have no immediate degree plans

Admission Requirements

Credentials and documentation required for admission vary by type of application. See the appropriate section below and the application form for more specific details. Admission to the University does not guarantee admission to a specific degree program. The Colleges of Administrative Science, Nursing and Engineering, and programs in Teacher Education and music may have additional requirements. See the appropriate college or program section for more details. A one-time non-refundable $30 processing fee must accompany the admission application.

Freshman Admission Requirements for High School Graduates

Admission as a regular freshman at UAH requires substantial high school academic preparation. While grade point average (GPA) and ACT or SAT scores are the primary factors in the admission
decision, other factors are reviewed such as courses completed, AP, IB or honors courses, trend of high school grades and other achievements in the areas of leadership and scholarship. Current high school students will find it to their advantage to follow the advanced diploma or college preparatory curriculum.

Prospective freshmen currently attending high school should apply during the fall semester of their senior year in high school. Tentative admission will be granted on the basis of ACT or SAT scores and the high school record through the junior year. A final transcript showing work completed in the senior year and confirmation of graduation will be reviewed before a student’s final admission.

High school seniors are expected to present the following courses: a minimum of four units of English; three units of mathematics, including Algebra I, Algebra II and Geometry; three units of science; and four units of history and/or social studies. In addition, students should present sufficient academic electives to meet the required twenty Carnegie high school units. Academic electives may include foreign language, computer programming, religion, philosophy and other similar courses as well as higher-level science and math courses. When calculating the grade point average (GPA), the University uses core academic courses only. These include English, mathematics, science, history/social studies and foreign languages. Excluded from the GPA calculation and academic unit requirements are courses such as driver's education, art, health or physical education, athletics (sports), band, office aide and vocational courses.

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

Students with a high school GPA of 3.25 or higher in fourteen or more required academic units will be eligible for admission. Students with an ACT score of 23 or higher (or SAT of 1050 or higher) who have completed fourteen required academic units will be eligible for admission. (NOTE: The College of Engineering requires a minimum ACT of 21 or 990 on the SAT.) Students not satisfying either of the above criteria, but who present any combination of test scores and grade point averages shown in the table below along with successful completion of fourteen academic units will be eligible for admission.

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<th>If Act score is</th>
<th>If SAT score is</th>
<th>Minimum High School Grade Point Average in Academic Units Must Be</th>
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Students presenting ACT scores lower than 18 (SAT scores lower than 880), and/or successful completion of less than fourteen academic units, or less than a 2.0 high school GPA are considered for admission on an individual basis.

Applicants should present a minimum of 20 Carnegie high school units. These should include:
- 4 years of English
- 4 years of Social Studies and History
- 3 years of Mathematics
  - 1 year of Algebra
  - 1 year of Geometry
  - 1 year of Algebra II/Trigonometry (recommended by all Colleges; required by the College of Engineering)
- 3 years of Science
  - 1 year of Biology (recommended)
  - 1 year of Chemistry or Physics (both are required by the Colleges of Engineering and Science; recommended by all other Colleges)
- Sufficient academic electives to meet the required 20 units
Applicants having deficiencies in the required high school courses may be admitted in good standing. The deficiencies, however, must be removed during the first year of enrollment in a manner approved by the department concerned. Courses taken to remedy entrance deficiencies cannot be used to satisfy degree requirements. High school graduates who have been out of high school five or more years may not be required to submit ACT/SAT test scores.

**Home Schooled Applicants**

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

**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 500 is required for regular admission status. If out of high school less than 5 years, the applicant must also take the ACT or SAT and have a score report sent to the UAH Admissions office. An official transcript of completed high school courses is also required. UAH is a testing center for the GED program. Anyone seeking additional information or wishing to take the GED examination should contact the Office of Testing Services at (256) 824-6725.

**Conditional Admission for High School Graduates**

An individual who has applied for regular admission and who does not meet the admission criteria may be considered for admission on a conditional basis. The Director of Admission is authorized to offer conditional admission based on an evaluation of the student’s previous academic credentials and evidence of serious commitment to academic pursuits. Conditionally admitted students are normally limited to a maximum of a 12 semester hour course load until a total of 15 semester hours of work is completed with at least an overall C (2.0) average. Upon satisfactory completion of 15 or more hours of work, the conditional status will be removed. If the student at that time has earned at least a 2.00 GPA on all UAH coursework, the conditional classification will be changed to regular student status. Credits earned as a conditional admit are recorded on the student’s permanent record and may count if applicable in a regular undergraduate degree program.

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

**Early Start Program**

UAH welcomes inquiries from academically talented high school juniors and seniors who wish to earn college credits while still enrolled in high school. Students who have an ACT of 26 and a high school GPA of 3.5 may apply for admission into the Early Start Program. This option may be appropriate for students whose high schools do not participate in the Dual Credit program or who have completed all high school graduation requirements but have not yet graduated from high school. Applicants must submit the Early Start application form, a $30 non-refundable fee, official transcripts showing high school and any college level work, official ACT or SAT scores, written approval from school officials and written approval from a parent or guardian. Students enrolled in the program may register for a maximum of two courses per semester.

**Dual Credit Program**

Several local school systems have an agreement with UAH permitting high school juniors and seniors to take classes at UAH that may count for both high school credit toward graduation and college credit toward a degree at the University. High school juniors and seniors who meet regular UAH admission requirements with at least a 3.0 high school academic GPA may, with the approval of their school officials, take classes at UAH and receive credit at both the high school and college level for certain UAH classes approved by the school system.
Applying for the Dual Credit program at UAH requires: a completed Dual Credit application; the $30 non-refundable application fee; an official transcript of high school work; official ACT or SAT scores; written approval from high school officials; and written approval by the student’s parent(s) or guardian(s). Students enrolled in the program may register for a maximum of two courses per semester.

**Transfer Students**

Individuals who have completed 18 semester hours of transferable academic credit from accredited colleges or universities may be admitted to UAH as transfer students. Transfer students must submit official transcripts from all colleges previously attended. Transfer admissions decisions will be based on a full evaluation of transcripts from all colleges and universities attended with emphasis given to those courses in which the subject matter is acceptable and relevant to the desired UAH degree program. Applicants must have a minimum overall C average (2.0 GPA) as well as a minimum C average (2.0 GPA) in all courses transferable to UAH.

Students who have already completed a bachelor's degree and wish to earn a second bachelor's degree at UAH must meet regular transfer admission requirements. A prospective student who has completed fewer than 18 semester hours of transferable college-level work will be considered for admission on the basis of high school grades and ACT or SAT scores as well as previous college records. A student who is currently on suspension or dismissal from another college or university is not eligible for admission until his or her suspension period has ended or until the student is otherwise eligible to return to the prior institution.

Admission to the upper division of the College of Administrative Science or the College of Nursing is an independent action from admission to the University. Students interested in pursuing the BSBA or BSN should refer to the appropriate college section of this catalog for more information. Transfer students seeking admission to the College of Administrative Science are admitted with a pre-business classification and remain in this classification until they are admitted to the upper division of the College. Transfer students who intend to pursue the BSBA degree should read carefully the College's section on “Admission as a Transfer Student” and “Admission to the Upper Division.”

**Probational Admission for Transfer Students**

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

**Evaluation of Transfer Credit**

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. Transfer credit evaluations will be completed as early as possible, but no later than the first semester of enrollment.

Credits from an institution that is not yet accredited but has acquired candidate status from a regional accrediting agency are provisionally eligible for transfer to UAH. In order to obtain full credit for courses accepted as provisional credits, students must complete 30 semester hours at UAH and earn a “C” or better in each course attempted. Transfer credit will not be posted until this requirement has been met. Students with provisional credits should contact the Registrar upon completion of 30 semester hours at UAH.

Courses completed at unaccredited and non-candidate institutions are normally not accepted for credit at UAH. The student may appeal or challenge credit for these courses through the dean of the college in which the course is offered.
Credits for education completed in non-collegiate settings that have been evaluated and recommended for credit by the American Council on Education are accepted as transfer credit at UAH. As a member of Service Members Opportunity Colleges, UAH is committed to easing transfer of relevant course credits and crediting learning from appropriate military training and work experiences.

Acceptance of transfer credit by the Admissions Office and application of credits to a specific degree program by the academic department 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.

An individual who enrolls as a non-degree student and later decides to work toward a degree must apply for admission as a degree-seeking student and 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 admission to the desired degree program.

Once a student has enrolled at UAH 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 coursework. Requests for exceptions must be in writing and approved by the chair of the UAH department where the course would be taught and by the dean of the college in which the student is enrolled.

Transfer Students from Alabama Junior/Community Colleges
A student transferring from an Alabama junior or community college may choose to fulfill the degree requirements of the UAH catalog which was in effect at the time of the student's initial enrollment at the Alabama junior/community 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/community 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 junior or community colleges are encouraged to consult with their advisors, the UAH Office of Admissions, and obtain a STARS guide. This guide is also available via the Internet at http://www.uah.edu or http://stars.troy.edu. When planning their programs of study, this guide will identify courses for their major and will show equivalencies for community college courses.

A maximum of 64 semester hours of credit from a junior, community or two-year college may be transferred to UAH and applied toward a degree program. Requests for exceptions must be in writing and approved by dean of the college in which the student is enrolled.

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

An undergraduate international applicant must submit:
1. Completed International application form.
2. Non-refundable application fee of $30.
3. Official copies including English translations of secondary school and college or university transcripts forwarded to The University of Alabama in Huntsville directly from the institution(s) attended or approved accrediting agency. Personal copies are not accepted. English credits earned at international institutions must be evaluated by the Department of English at UAH.
4. Certificates of Foreign Credit Evaluation performed by an approved service, such as World Evaluation Services (WES), The College Board, Joseph Silney & Associates or Lisano
International, sent directly from the evaluation service. Copies are not accepted.

5. American College Test (ACT) scores or SAT scores sent directly to UAH from the testing service headquarters. (ACT/SAT is not required of an applicant who has earned more than 18 semester hours of college work or has graduated from high school more than five years ago.) The SAT may be used as a substitute for the ACT.

6. Scores from the Test of English as a Foreign Language (TOEFL) sent directly to UAH from the Educational Testing Service. A minimum score of 500 (173 computer-based score) is required.

7. A certified affidavit of financial support and financial statements/bank records as evidence of sufficient finances to cover university and personal expenses while attending UAH.

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.

**English Language Placement Test**

The UAH English Language Placement Test (ELPT) is required for all students whose native tongue is not American Standard English, regardless of nationality or prior English study. A student must complete any course work in English, as a Second Language (ESL) that the test indicates is required.

**Health and Immunization Policies**

International students are required to purchase UAH health insurance prior to enrollment. Proof of continued coverage must be presented each semester the student is enrolled. Foreign nationals must provide health information prior to enrollment.

**Tuberculosis Screening and Testing Policy**

All new international students must prove that they are free of active, infectious tuberculosis either through a negative skin test or negative chest x-ray. The only TB skin test accepted at UAH is a Mantoux purified protein derivative (PPD) test that is read within 48-72 hours from the time it is administered. Documented negative TB tests performed outside the United States are not acceptable. PPD testing will be part of orientation procedures and will be provided upon arrival on campus at the UAH Wellness Center (Student Health Services) free of charge.

Failure to comply with testing within seven days of the beginning of classes may result in the students' schedule being dropped. Dropped students will not be permitted to re-enroll at UAH until they have fulfilled the TB testing requirements.

**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 (256) 824-2773.

Any adult who has completed high school or completed the GED with a minimum score of 500 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 as a non-degree student must satisfy course prerequisites for each course taken and may be required to submit official transcripts from any prior collegiate institutions attended to show satisfactory completion of prerequisites. International students attending UAH on a student visa are not eligible for non-degree status.

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

Transient Students
Students who are currently enrolled at other colleges may apply for admission to take credit classes that will count toward a degree at their home institution. A completed application, a non-refundable $30 fee, and a “Letter of Good Standing” (LGS) from the current college are 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. Transient students should satisfy UAH course prerequisites for each course taken and may be required to submit official transcripts from the home institution showing satisfactory completion of prerequisites.

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.

Post-Baccalaureate
Students who have already earned a baccalaureate degree may enroll in this non-degree status. The student should submit official transcripts showing the earned degree and must meet UAH course pre-requisites. This status may be appropriate for students taking courses in preparation for graduate school.

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.

ACADEMIC COMMON MARKET OF THE SOUTHERN REGIONAL EDUCATION BOARD
The Academic Common Market (ACM) is an association of 16 states (AL, AR, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV) formed to permit out-of-state students to major in selected programs at participating institutions while paying in-state tuition rates. Each ACM state outside of Alabama typically allows its residents to participate in the University’s programs through ACM.

When it has been determined that UAH offers the desired program through the Academic Common Market, applicants should initiate application procedures by contacting his/her home state’s Commission on Higher Education (or the equivalent office) and requesting permission to pursue the desired program at UAH. Additional information and a listing of contacts by state may be obtained from the Southern Regional Education Board’s website (http://www.SREB.org) under Academic Common Market.

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

A “resident student” is one who, at the time of registration, is not a minor and:
• is a resident of the state of Alabama and has been a resident of the state for at least one year immediately preceding the date of registration; or
• is a full-time employee (not temporary) of UAH or is the spouse of such an employee; or
• is employed by UAH as a graduate assistant or fellow on at least a 0.50 FTE (half-time) basis; or

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Admissions Information
is able to verify full-time permanent employment within the state of Alabama and shall commence such employment not later than ninety days after registration, or is the spouse of such an employee; or

is a member or the spouse of a member of the U.S. military on full-time active duty stationed in Alabama under orders for duties other than attending school; or

is a resident of Bedford, Coffee, Franklin, Giles, Lawrence, Lincoln, Marion, Marshall, or Moore County in Tennessee and has been a resident of that county for at least one year immediately preceding the date of registration. For all purposes under this policy, an individual’s relationship with any of the foregoing Tennessee counties (such as, for example, residence or employment therein or connections therewith) shall be construed to satisfy a stated requirement that the individual have such a relationship with the state of Alabama.

A “resident student” is also one who, at the time of registration, is a minor and whose supporting person(s):

is a resident of the state of Alabama and has been a resident of the state for at least one year immediately preceding the date of registration; or

is a full-time employee (not temporary) of UAH; or

is able to verify full-time permanent employment within the state of Alabama and shall commence such employment not later than ninety days after registration, or is the spouse of such an employee; or

is a member of the U.S. military on full-time active duty stationed in Alabama under orders for duties other than attending school; or

is a resident of Bedford, Coffee, Franklin, Giles, Lawrence, Lincoln, Marion, Marshall, or Moore County in Tennessee and has been a resident of that county for at least one year immediately preceding the date of registration. For all purposes under this policy, an individual’s relationship with any of the foregoing Tennessee counties (such as, for example, residence or employment therein or connections therewith) shall be construed to satisfy a stated requirement that the individual have such a relationship with the state of Alabama.

The following definitions shall apply for the purposes of implementing this policy:

“Minor” means, under current Alabama law, a single individual under age nineteen or a married individual under age eighteen.

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

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

“Supporting person” means either or both parents of a student, if they are living together, or, if they are divorced or living separate, then either the parent having primary legal custody of the student, except that the noncustodial parent is the supporting person if he/she is providing the greater amount of financial support of the two.

A student who comes to Alabama from out-of-state primarily for the purpose of attending an institution of higher education will be regarded as a “non-resident” unless and until the requirements for residency can be established.

The foregoing information summarizes the Non-resident Tuition Policy of The Board of Trustees of The University of Alabama, which shall govern in the event of any conflict with or ambiguity in this summary.
### Financial Information

These fees are based on the 2005-2006 academic year fee structure. Current fees are available on the web at [www.uah.edu](http://www.uah.edu).

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Each additional hour over 12: $212 (resident), $438 (non-resident)

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Each additional hour over 20: $97 (resident), $211 (non-resident)

#### Laboratory and Studio Instruction Fees

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

#### Cooperative Education Fees

Parallel Work Semester is $40
Alternating Work Semester is $80

#### Engineering Equipment Fees

Equipment fees are assessed at $21 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 16 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 accepted as an Academic Common Market student, a student will be classified as in-state for tuition purposes. However, should the student later change to a different program that is not covered by the Academic Common Market agreement, he/she will no longer qualify for the in-state tuition rate at UAH.

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

BILLING AND PAYMENT PROCEDURE
Tuition and fees should be paid in full by the first day of the semester. Payments may be charged to VISA, MasterCard, American Express, or Discover by paying on the Web or calling (256) 824-7321. Students who do not pay bills in full by the first day of classes are assessed a $50.00 late fee. Students who do not pay bills in full by the end of the second week of classes for fall and spring semesters may be dropped from class rolls and enrollment will be canceled. The University assumes no responsibility for students who attend classes without official enrollment. For summer sessions, please check dates in the Schedule of Classes and on the UAH Website. Send payments to The University of Alabama in Huntsville, Cashier’s Office, University Center Room 213, Huntsville, AL 35899-5050.

DEFERRED PAYMENT PLAN
Students enrolling for at least three semester hours of credit are eligible for the deferred payment plan. This plan enables total tuition, housing, and other current charges to be divided into two payments each semester. The first payment of at least half of the total amount of charges is due by the first day of the semester. 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 (UC 214) and Charger Central (UC 118). 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.

BALANCES
Past due balances are a debt owed the State of Alabama and appropriate action will be taken to collect all balances. Holds will be placed on all students’ accounts that have a past due balance. This hold will prevent them from receiving grades, transcripts or registering for another semester at UAH. To the extent permitted by the laws of the State of Alabama, any costs to collect a past due account, to Include collection agency charges and attorney fees, will be charged back to the student who shall be liable for payment of those charges.

Other Charges
Credit by examination or validation, Per semester hour $10.00
Replacement of I.D. card $15.00
Transcript $4.00

Financial Information 32
Graduation Application fee (non refundable) $20.00
Duplicate Diploma $10.00
Thesis and Dissertation binding
Master’s thesis $55.00
Ph.D. dissertation $55.00
Vehicle registration
(Regulations concerning traffic and parking are available at the Campus Safety Office) $15.00
Summer only $5.00
Note: UMI Thesis/Dissertation publication fee: Master’s thesis - $45.00; PhD. Dissertation $55.00.

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

REFUNDS
Students may drop a class through the second week of classes and receive a 100% tuition refund. A student desiring to drop one or more classes must complete a drop request form at Charger Central, University Center Room 118. The date of the drop request is the date the written request is received at the Office of Student Records.

HOUSING CHARGES
SUITES
Single Students: Academic Year Room Rates, 9-Month Rates, & 12 Month Rates
Central Campus Residence Hall (CCRH) Available for Freshmen Only
Private Bedroom in 4-person suite, Central Campus Residence Hall (CCRH) $3,720

North Campus Residence Halls (NCRH I & II) Available for Sophomores, Juniors, and Seniors
NCRH I & II Fall & Spring Semesters: Private bedroom in 4-person suite $3,980
NCRH II Fall and Spring Semesters, Studio Suite (one bedroom suite) $4,300
NCRH II 9-Month Floor (floor remains open during semester break and spring breaks) $4,250
Private bedroom in 4-person suite $4,450
NCRH II 12-Month Floor (floor remains open for all breaks and summer sessions) $5,280
Private bedroom in 4-person suite $5,500

Southeast Campus Housing (SECH) Available for Juniors, Seniors and Graduate Students
Private Bedroom in 3-bedroom apartment, Southeast Campus Housing (SECH) $3,350
Shared Bedroom in 3-bedroom apartment, Southeast Campus Housing (SECH) $2,200

APARTMENTS
Graduate Students and Student Families: Full Year (12 Month) Lease
Southeast Campus Housing (SECH) Graduate Students and Student Families: Full Year Lease 1-bedroom furnished $5,580 (payable in 12 installments of $465)
1-bedroom unfurnished $5,220 (payable in 12 installments of $435)

NOTE: All Housing rates include basic utilities and basic television cable for each suite, telephone with local service, email and internet access in each bedroom.
Students assigned to suites (Central Campus Residence Hall or Southeast Campus Housing) must pay the full semester's rent at the beginning of the semester. A student who fails to complete payment of fees due or fails to file a payment deferment request with the Cashier's Office by the first day of the semester will have his or her registration canceled. Students assigned to private apartments (family units in Southeast Campus Housing) may pay their rent in equal installments on a monthly basis. Rent payments are due the first day of each month. If a student officially withdraws from the University while residing in University Housing, he or she may qualify for a prorated refund of rent. This is determined by the date of the student's official check-out from Housing.

During the first week of the academic semester  
During the second week  
During the third week  
During the fourth week  
After the fourth week

**FOOD CONTRACT RATE**

$1,600 minimum for the academic year (Fall & Spring semesters) payable in 2 semester installments of $800 each (minimum) for all on-campus freshmen. Sophomores, Juniors, and Seniors living in NCRH I & II are required to have a minimum of $200 per semester ($400 per academic year) on a meal card. The meal plan program is optional for Southeast Campus Housing residents Additional amounts may be added to the Declining Balance Card at any time.

These rates are effective beginning Fall Semester, 2005. The University reserves the right to adjust housing and meal plan rates 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 Student Financial Services, University Center, Room 212, or the Cashier's Office, Room 213.

**UNDERGRADUATE STUDENT AID**

UAH has several programs to assist students in financing their college education. Comprehensive, updated information on all financial aid offered through the Office of Student Financial Services 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 Student Financial Services.

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

Students should make financial plans well in advance of entering the University. There are two important priority dates for student aid—February 1 for scholarships and April 1 for federal aid. The priority dates are the dates by which completed applications are certain to be included in the first round of review. Applicants are advised to write the Office of Student Financial Services 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 Student Financial Services 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 Student Financial Services.

University-Wide Scholarships

Alpha Tau Omega Theta Pi Chapter-Fletcher Davis Scholarship. Established by the UAH chapter this scholarship is awarded to full-time students with preference given to active members of The Alpha Tau Omega Theta Pi chapter, and shall be based on academic merit, citizenship, and leadership.

Alumni Association - Jesse P. Stutts Scholarship. Established in honor of Jesse P. Stutts who is a 1974 UAH alumnus, Mr. Stutts also served as president of the Alumni Association Board of Directors from 1991 to 1992 and was honored as the 1995 Distinguished Alumnus. The scholarship is awarded to students based on academic merit, participation in extracurricular activities and community service.

Carolyne Pride Bell and Robert Kirk Bell Memorial Scholarship. 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.

Sam Bommarito Memorial Scholarship. Established by Ms. Fran Bommarito and is named for her husband Sam, who was a UAH Hockey Team supporter. Recipients of this scholarship must be a member of the UAH Hockey team and demonstrate leadership, sportsmanship and team spirit and participate in community and University volunteer service.

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

Pei-Ling Chan Presidential Scholarship. Established by Dr. Chia-Hwa (Tony) Chan, retired UAH physics department chair and professor, and his family in memory of his father, this scholarship is awarded to an incoming freshman based on academic achievement, citizenship, and leadership.

Bill Dale Wind Ensemble Endowed Scholarship. Established by 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.

Larry and Mary Lou Durkee Scholarship. Established by Larry and Mary Lou Durkee, this scholarship is to be awarded to one or more full-time students enrolled at UAH.

Erwin and Alberta Hanifl Scholarship. Established through a bequest of the donors, Mr. and Mrs. Hanifl were residents of Guntersville, Alabama and were active members of their community. This scholarship is awarded to graduating seniors with financial need from Guntersville High School who are full-time students enrolled at UAH.

The Jane Knight Lowe Memorial Scholarship. Named for one of Huntsville’s leading citizens, Jane Knight Lowe was a successful businesswoman and civic leader whose contributions to her community is most admirable. The scholarship is to be awarded to students who have received their high school diploma while residing in Madison County, Alabama.

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

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

**McKneely-Morgan Scholarship.** Established by Dr. and Mrs. J. Derald Morgan in honor of Mr. Eldridge Leighton and Mrs. Lucile McKneely, parents of June Morgan, and the Rev. Dr. John B. and Mrs. Avis Morgan, parents of Derald Morgan, this scholarship is awarded to an undergraduate student. The scholarship is based on academic merit, citizenship and leadership without regard to financial need.

**Pamela Mitchell Memorial Scholarship.** Established in memory of Pamela Mitchell, who served in the Madison County District Attorney’s Office for many years, the scholarship was established by Ms. Mitchell’s family and friends to benefit an outstanding female athlete at UAH each year.

**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.

**Jean-Marc Plante Memorial Scholarship.** This scholarship is named in memory of a UAH alumnus and a player on the Ice Hockey Team. “Frenchy,” as he was known to his friends and colleagues, returned to UAH as a member of the Athletics staff where he was also active in the Huntsville community. The Jean-Marc Plante Scholarship is awarded to full-time students who are members of the UAH Ice Hockey Team who demonstrate leadership, sportsmanship and team spirit and who participate in community and University volunteer service.

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

**M. Louis Salmon Scholarship.** The M. Louis Salmon Scholarship was established by members of the Watts family in recognition of Mr. Salmon’s distinguished service to higher education and leadership in civic affairs. Mr. Salmon served as chairman of the UAH Foundation and was a founding member of Research Sites Foundation, Inc. (later known as the UAH Foundation), which provided the groundwork for Cummings Research Park. This scholarship is awarded to juniors and is based on academic merit. Preference is given to pre-law majors.

**R. Wayne Sanders Memorial Scholarship.** Established in 1979 by family and friends of R. Wayne Sanders, UAH Alumnus (Class of 1972) and former employee of Teledyne Brown Engineering, this scholarship is awarded to junior or senior students who have a minimum GPA of 2.0 in any area of academic study.

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

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

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

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

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

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

**UAH Foundation Presidential Scholarships.** The UAH Foundation, which solely supports The University of Alabama in Huntsville, awards 22 four-year scholarships annually to students from Huntsville city and Madison County schools, based on academic merit.

**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. William P. Watts Memorial Scholarship.** The scholarship was established by his sister, Elisabeth Whitten. It is awarded to students based on academic merit, financial need and showing evidence of having made contributions to the community and the University or school.

**Dr. J. E. Whitaker Scholarship.** This scholarship was established in memory of long-time Huntsville physician, Dr. J.E. Whitaker, by his family. It benefits students who require financial assistance and preference is given to those who show evidence of leadership potential.

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

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

**Donald D. Zana Memorial Scholarship.** Established in 1998 by family, friends, and co-workers to memorialize Donald Zana, this scholarship is awarded to students with a minimum 2.5 GPA.

**College of Administrative Science Scholarships**

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

**Association of Government Accounts - Thomas A. Bair Scholarship.** Established in memory of Thomas A. Bair in recognition of his outstanding contributions to the Association of Government Accounts. North Alabama Chapter having served as their Chapter President and his leadership roles on a local and national level for many years, the scholarship is awarded to full-time students who are majoring in accounting based on academic merit and community service activities.

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

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

**Marie Alexander Bone Memorial Scholarship.** Established in loving memory of Marie Alexander Bone by her parents Mr. and Mrs. Howard C. Alexander, the scholarship is awarded to one or more full-time undergraduate students enrolled in the College of Administrative Science. It is based on academic merit, citizenship, and leadership, with demonstrated financial need a secondary criteria.

**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, in honor of her aunt and uncle, this scholarship benefits students enrolled in the College of Administrative Science who...
require financial assistance, are working on a first college degree, reside in Alabama, and are over
the traditional college student age.

Larry and Mary Lou Durkee Scholarship. Established by Larry and Mary Lou Durkee, this
scholarship shall be awarded to one or more full-time student(s) from the College of
Administrative Science, based on academic merit, citizenship, and leadership, without regard to
demonstrated financial need.

Dr. Stephen A. Floyd Memorial Scholarship. Established by Beth Floyd, in memory of her late
husband the scholarship is awarded to a junior enrolled in the College of Administrative Science
with preference for a MIS major who is a UAH Hockey Team member, based on academic merit,
demonstrates financial need, good citizenship and leadership qualities.

Benjamin and Hazeline Graves Scholarship. Established in recognition of former UAH President
Dr. Benjamin Graves and his late wife Hazeline, the scholarship is awarded to one or more full-
time junior or senior level undergraduate students enrolled in the College of Administrative
Science based on academic merit, citizenship, and leadership.

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

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

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

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

Jimmy and Donna Reed Scholarship. Established by Jimmy and Donna Reed to benefit students
at UAH majoring in Accounting and an Alabama resident, this scholarship is awarded based on
academic merit.

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

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

College of Engineering Scholarships

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

Boeing Presidential Scholarship. The Boeing Presidential Scholarship was established in 1994 to
be awarded to full-time Engineering or Science students. Awards are based on academic merit,
citizenship and leadership. The Boeing Company is a leading aerospace company and a global
market leader in satellites, commercial jetliners, military aircraft, missile defense, human space
flight and launch services.

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.

_brosemertime Family Scholarship._ This scholarship was established by Walter R. Brosemer this scholarship is awarded to an undergraduate student majoring in Math or Engineering with financial need and have contributed to the school and community.

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

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

_Harry C. Crews, Jr. Memorial Scholarship._ Established by friends and family in memory of Harry Crews, Jr., an engineer at Teledyne Brown Engineering. It benefits juniors and seniors enrolled in the College of Engineering who participate in the co-op program and have a minimum GPA of 3.2.

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

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

_Broadus Adair and Leila Roberts Fincher Scholarship._ Established by Dr. Samuel P. McManus and Mrs. Nancy Fincher McManus, ’72, in honor of her parents, it is awarded to students majoring in engineering and is based on academic merit. It is renewable for four years (eight semesters if a co-op student), provided students maintain a minimum 3.0 GPA.

_Valmore and Frank R. Fogle Scholarship._ UAH professor and alumnus, Frank Fogle, ’80, ’87, ’90, and his father, Valmore, 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._ Established by Dr. Kenneth Harwell and his wife, Dr. Sharon Harwell, to benefit students enrolled in the College of Engineering, and is based on academic merit.

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

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

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

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

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

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

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

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

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

NASA-MSFC Retirees Association Scholarship. This scholarship is awarded to full-time entering freshman students who are either a direct descendent of a MSFC retiree or direct descendent of a member of the NASA-MSFC Retirees Association. Recipients are selected based on academic merit to those who are majoring in engineering or the physical sciences at UAH.

NEC Electronics, Inc. Scholarship. Established in 1988 with a gift from NEC, this scholarship is available to incoming freshmen who plan to major in electrical and computer engineering. Its award is based on academic merit.

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

Roy J. Nichols Scholarship. Established by Roy J. Nichols whose ingenuity and entrepreneurial instincts resulted in the establishment of Nichols Research Corporation which merged with Computer Sciences Corporation in 1999 and more recently Torch Concepts which is a specialized software development company. This scholarship is awarded to full-time students who have graduated from high schools in the State of Alabama and are majoring in either engineering or physics and is based on financial need and academic merit.

Alexander and Barbara Poularikas Scholarship. This scholarship established by Alexander and Barbara Poularikas, in 2004, to benefit Engineering students pursuing a degree in Electrical Engineering. The award is based on academic merit, financial need, and potential to contribute leadership and service to the community and University specifically as a participant of an intercollegiate athletic team, and show evidence of interest in and ability to carry out research.

Albert E. Schuler Scholarship (By The North Alabama Section of ISA - The Instrumentation, Systems, and Automation Society). This scholarship was established to benefit students enrolled in the College of Engineering with preference of electronic and/or mechanical instrumentation or enrolled in the College of Science. Academic merit and extracurricular and/or community service activities during high school or college are preferred.

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

Society of American Military Engineers-Huntsville Post Scholarship. This scholarship is awarded to juniors or seniors enrolled in the College of Engineering and is based on academic merit, with a minimum GPA of 2.5.
Wendy D. Thompson Memorial Scholarship. As a 1996 Magna Cum Laude graduate of the UAH College of Engineering, Wendy Thompson’s achievements were just beginning. Her knowledge and solid work ethic helped her to advance into upper management positions with Cerro Wire and Cable Company and PPG Industries. This scholarship is awarded to students who are graduates of Northern Alabama high schools (with a preference for female students) who are enrolled in the College of Engineering. Recipients are selected based on academic merit, leadership potential and participation in community service activities.

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.

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.

M. Carl Ziemke Memorial Research Scholarship. Established in loving memory of M. Carl Ziemke by his wife, Betty, in 1999 to recognize outstanding research achievement, this scholarship is awarded to an undergraduate Engineering student who exhibits a commitment to research. It is divided equally between the senior design courses in Mechanical and Aerospace Engineering, and the Industrial and Systems Engineering, and Engineering Management Department.

College of Liberal Arts Scholarships

Dr. Deborah Edwards Barnhart English Scholarship. Established by Deborah Edwards Barnhart, ’74, to benefit UAH students pursuing a major or minor in English, and based on academic merit.

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

Professor D. Royce Boyer Scholarship. Established by Dr. Boyer who served on the music faculty at UAH for 31 years, the scholarship is awarded to full-time, upper-level undergraduate students who are studying music and participate in performing arts programs at the University and is based on academic merit.

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 Dr. 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. The 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.

Reg Glisson Jazz Scholarship. Mr. Glisson established this scholarship to help jazz students pursue a college education. The scholarship is awarded to full-time students majoring in music who participate in the jazz program at the University and is based on academic merit.

Dr. David L. Graves Memorial Scholarship. Established in 2002 in memory of Dr. David L. Graves who achieved great success as a musician and professor of music, the scholarship is awarded to a Music major who demonstrates excellence in musical performance and is active in community service activities.

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

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

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

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

**Robert E. James Communication Arts Scholarship.** Dr. James was the driving force behind the development of the Department of Communication Arts at UAH. This scholarship is awarded to full-time students who are majoring in Communication Arts and demonstrate good citizenship and leadership capabilities and is based on academic merit.

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

**Shelbie King Scholarship.** Established by Olin B. King in honor of his wife, Shelbie, to recognize her philanthropic achievements in the Huntsville community and her personal interest in art and art history, the scholarship is awarded to students who are pursuing majors in the College of Liberal Arts. Preference is given to students who are majoring in Art and Art History, are graduates of high schools located in the State of Alabama and is based on financial need and academic merit.

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

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

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

**Frances Cabaniss Roberts Scholarship.** Established initially by the History Department to honor the many contributions of Dr. Roberts, a professor who devoted 29 years of unreserved and dedicated service to the university dating from the time of its inception, it is available to full-time junior or senior students with preference given to history majors. The award is based on academic merit, and the award period is one year period.

**Gerald and Verna Smith Memorial Scholarship.** Established as a memorial to Gerald and Verna Smith, the 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.

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

**Ilse and Bernhard Tessmann Foreign Languages Scholarship.** Prior to his death, Mr. Bernhard
Tessmann, an original member of the Dr. Wernher von Braun rocket team, established this scholarship for juniors or seniors majoring in foreign language. Preference is given to students majoring in German, and the award is based on citizenship and evidence of contributions to school and community, and with demonstrated financial need.

*Ilse and Bernhard Tessman Music Scholarship.* Established with a gift by Mr. Bernhard Tessman prior to his death, this scholarship is awarded to juniors or seniors majoring in music. Preference is given to those whose primary area of concentration is piano, and the award is based on citizenship and evidence of contributions to school and community, and with demonstrated financial need.

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

*Harry H. Watters Memorial Scholarship for Excellence in Jazz.* Established in memory of Harry Watters, who was an aerospace engineer for NASA for 35 years, this scholarship recognizes his love and appreciation of music by recognizing students who demonstrate achievement in jazz and show potential to be future leaders in community service. The scholarship is awarded to full-time students who participate in the jazz program at UAH, who demonstrate excellence in jazz and participate in community service activities.

*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.* 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 Nursing 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.

*Margaret "Mac" Wright Scholarship.* Established in 2003 by Olin B. King in honor of Margaret "Mac" Wright, the scholarship is awarded to junior or senior level nursing students, and is based...
on academic merit, leadership potential, contributions to school and community, and financial need.

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.

Dr. Kendall Black Scholarship. Established by Dr. J. Kendall Black to benefit students in the College of Science with preference given to students enrolled in pre-med studies and will be based on academic merit, citizenship, and leadership.

Boeing Presidential Scholarship. The Boeing Presidential Scholarship was established in 1994 to be awarded to full-time Engineering or Science students. Awards are based on academic merit, citizenship and leadership. The Boeing Company is a leading aerospace company and a global market leader in satellites, commercial jetliners, military aircraft, missile defense, human space flight and launch services.

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.

Brosemer Family Scholarship. Established by Walter R. Brosemer this scholarship is awarded to an undergraduate student majoring in Math or Engineering with financial need and have contributed to the school and community.

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

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

Harry C. Fisher Memorial Scholarship. Established by Dr. B. Jeanne Fisher in memory of her father, Harry Fisher, this scholarship is awarded to students enrolled in the College of Science who require financial assistance. Preference is given to minority students.

Gerhard B. Heller Memorial Scholarship. 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. 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.

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

Jim Hudson - Research Genetics Scholarship. Established by the employees of Research Genetics, Inc., this scholarship honors the company founder, Jim Hudson. The scholarship is awarded to students whose parents were employees of Research Genetics with preference for students pursuing a degree in biology or chemistry, 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.

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

**Henry Plyler and Louise Sanders McManus Memorial Scholarship.** Named in memory of his parents, this scholarship was established by Dr. Samuel P. McManus and Mrs. Nancy F. McManus '72. It is awarded to students majoring in the sciences, based on academic merit.

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

**Roy J. Nichols Scholarship.** Established by Roy J. Nichols whose ingenuity and entrepreneurial instincts resulted in the establishment of Nichols Research Corporation which merged with Computer Sciences Corporation in 1999 and more recently Torch Concepts which is a specialized software development company. This scholarship is awarded to full-time students who have graduated from high schools in the State of Alabama and are majoring in either engineering or physics and is based on financial need and academic merit.

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

**Calvert Franklin Sammons Memorial Scholarship.** Established with a gift from Dr. Robert A. Sammons in memory of his wife, Calvert F. Sammons, a long-time resident of Huntsville who was a strong advocate of higher education, this scholarship is awarded to Huntsville city high school graduates who are enrolled in the College of Science. The award is based on academic merit, and preference is given to women who are U.S. citizens.

**Albert E. Schuler Scholarship (By The North Alabama Section of ISA - The Instrumentation, Systems, and Automation Society).** This scholarship was established to benefit students enrolled in the College of Engineering with preference of electronic and/or mechanical instrumentation or enrolled in the College of Science. Academic merit and extracurricular and/or community service activities during high school or college are preferred.

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

**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.

**Jia Ju Zhan Scholarship** This scholarship is named in memory of a great teacher, businessman and philanthropist from China. During his lifetime he was president of his family business, taught physics at the Shanghai Institute of Light Industry, had his wealth and position taken from him during the Cultural Revolution of the 1960's, and had both returned to him following the Revolution enabling him to retire as Vice Chancellor of that same institute in 1985. Dr. Zhan dedicated his life to helping others and this scholarship was established to honor his philanthropy. The scholarship is awarded to students who are majoring in Physics who show evidence of contributions to school and community and is based on academic merit.

**State Nursing Scholarships**

An act was passed by the Alabama legislature in 1957 to provide scholarships for basic nursing
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**

UAH participates in the William D. Ford Federal Direct Stafford Loan program. Student loan funds are made available directly from the U.S. Department of Education without the necessity of secondary marketers such as private lending institutions. 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. Additional information regarding eligibility amounts, loan limits, application procedures and suggested application timelines is published in the brochure Making College Affordable. This and other valuable information regarding the financial aid process are available in the Office of Student Financial Services as well as Charger Central.

**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. 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.irs.gov, 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 Student Financial Services 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 Student Financial Services.

**Federal Work-Study Program**

The College Work-Study Program provides employment for students who need financial aid. Information
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 Student Financial Services, Room 212, University Center.

It is the student’s responsibility to remain in good standing with the Veterans Administration and to respond to notification of changes in regulations. For additional information, write to: Veterans Administration Regional Office, 474 South Court Street, Montgomery, Alabama 36104. Many students who are children of veterans of World War I, World War II, or the Korean War may be eligible for benefits under the War Orphans Educational Assistance Act (PL 634). Write the nearest Veterans Administration Regional Office for additional information. The Alabama G.I. and Dependents Education Benefits Act grants tuition assistance to eligible veterans, their children, widows and wives. Tuition is paid directly to the school. For additional information, write to: Assistant to the Director, Department of Veteran’s Affairs, P.O. Box 1509, Montgomery, Alabama 36102.
Academic Information

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

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

The Academic Advisement and Information Center is staffed by a team of professional and peer advisors. They assist prospective and enrolled students in course and program planning, disseminate accurate information about academic programs and procedures, make referrals to appropriate offices and services, and advise a diverse population of students. Appointments may be made by calling 256-824-6290.

All Dual Enrollment (DE) students are required each semester to fax to the AAIC office (through their high schools) their registration forms signed by both the student and the high school counselor. The AAIC will register all DE students and process any needed schedule changes. No schedule changes may be made outside of the AAIC. Schedules and bills will be generated and mailed to the students by the AAIC.

All Early Start and Undeclared students are required to visit the AAIC at least once each semester to review their academic progress and to plan their schedule of courses for the next semester. These schedules must be signed by an advisor in the AAIC in order to be processed by the Office of Student Records. Undergraduates enrolled as Conditional students, regardless of their major, must also meet with an AAIC advisor each semester as long as they remain in the Conditional student category. All students in the Colleges of Administrative Science, Liberal Arts and Science who do not have a Program of Study on file must meet with the college advisors each semester to plan and sign schedules. All students in the Colleges of Engineering and Nursing must meet with an advisor every semester.

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 professional advisors for their colleges or department chairs who can aid them in program planning in their major fields of interest.

Transfer students will be advised by the appropriate professional advisor until a faculty advisor is assigned. Transfer students who are not enrolled in one of the colleges are advised in the Academic Advisement and Information Center until a major is declared.

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

The University of Alabama in Huntsville (UAH) is committed to making employment opportunities available to qualified applicants and employees without regard to race, color, religion, sex, national origin age, disability, citizenship, or veteran status. 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, individuals with a disability, and Vietnam-era, special disabled, 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, disability citizenship, or veteran status. 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, disability, citizenship, or veteran status. 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 sexual advances, requests for sexual favors, and other verbal or physical conduct that is unwelcome and is directed toward a person on the basis of that person’s sex 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 a significant change in employment or academic status; or such conduct is so severe or pervasive that it interferes with an individual’s performance as an employee or student or creating an intimidating, hostile, or offensive working/learning environment.

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

These commitments are designed to meet nondiscrimination/affirmative action requirements imposed by the following federal and state sources of legal obligation, as amended: Title VI and VII, Civil Rights Act of 1964; Executive Order 11246; Title IX, Education Amendments of 1972; the Rehabilitation Act of 1973; the Americans with Disabilities Act of 1990; the Equal Pay Act of 1963; the Age Discrimination in Employment Act of 1967; the Age Discrimination Act of 1975; the Vietnam Era Veterans’ Readjustment Assistance Act of 1974; the Immigration Reform and Control Act of 1986; contract and grant agreements with governmental agencies; the Alabama Age Discrimination Act of 1997; and the Alabama Constitution of 1901. The University’s equal opportunity policies pertaining to its employees and students include specific administrative procedures and implementing measures designed to carry out these pledges and to ensure compliance with the foregoing laws.
Inquiries or complaints concerning the application of this policy and these federal requirements should be directed to one of the following persons:

Ms. Delois Smith  
Student Equal Educational Opportunity Officer  
114 University Center  
The University of Alabama in Huntsville  
Huntsville, AL 35899 (256-824-6700)  

Dr. Fran Johnson  
Faculty Equal Employment Coordinator  
111 Madison Hall  
The University of Alabama in Huntsville  
Huntsville, AL 35899 (256-824-6767)  

Ms. Phyllis Hollins  
Staff Equal Employment Coordinator  
137 Madison Hall  
The University of Alabama in Huntsville  
Huntsville, AL 35899 (256-824-6545)  

Grievances alleging unlawful discrimination will be resolved according to the discrimination grievance procedures set forth in the Student Handbook.

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

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

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

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

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

A student’s privacy interest in the education record is further protected by the rule against unauthorized disclosure. Generally, the University may not, without the student’s consent, release the education record or personally identifiable information in it to other individuals or entities.

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

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

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

**Health and Immunization Policies**

All students, U.S. citizens and foreign nationals, must provide health information prior to enrollment.

**U.S. Citizens**

Students enrolled in Alabama colleges and universities must produce documentation of vaccination against measles prior to entrance. This documentation, for U.S. citizens, can be provided in one of four ways: medical documentation of having had measles; born prior to 1957; a blood test showing immunity; or documentation of having received two doses of the measles vaccine or one (1) dose within the last three years. Only medical documentation from a U.S. Health facility will be accepted.

**Academic Responsibility**

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

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

7. To file an "Application for Degree" in the Office of Student Records by the published deadline.

8. To be personally responsible for fulfilling all requirements for graduation and observing all regulations at UAH.

Academic Honesty
Plagiarism and other forms of cheating are subject to penalties as outlined in the Student Handbook.

Instructional and Testing Services
Melinda Lyles, Director
226 Administrative Science Building
Telephone: (256) 824-6725
Email: lylesm@uah.edu

The tests used for admissions, credit by examination, and placement which are administered through this office include: the ACT Assessment, the College Level Examination Program (CLEP), the UAH English Language Placement Test (ELPT), the General Educational Development (GED) Testing Program, the Graduate Record Examination Subject Test (GRE), the Miller Analogies Test (MAT), the Medical College Admissions Test (MCAT), and the UAH Chemistry, English and Mathematics Placement Tests. Applications and information pertaining to the following testing programs are also available: the Graduate Management Admissions Test (GMAT), the Law School Admission Test (LSAT), the PRAXIS Series for beginning teachers, and the Test of English as a Foreign Language (TOEFL).

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

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

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

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

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

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

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

1) Credit by Department Examination

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

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

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

- Contact Department Chair
- All 100 and 200 level courses
- CPE 112, CPE 212
- Contact Department Chair
- MU 100, 201, 202, 203, 204, 301, 302, 303, 304, 311, 312
- Contact Nursing Student Affairs Office
- PHL 201, 320

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. The award of AP credit at UAH requires a score report from the College Board; transcripts from other institutions with AP scores are not accepted at UAH.

**AP CREDIT**

- American History
  - Score of 4 = HY221 and 222 (6 hrs.)
  - Score of 3 = HY221 and 222 (6 hrs.)
- Art History
  - No credit awarded.
- Art Studio
  - No credit awarded.
- Biology
  - Score of 3 = BYS 119 (4 hrs.)
- Calculus AB
  - Score of 4 or 5 = BYS 119, 120 (8 hrs.)
- Calculus BC
  - Score of 3 = MA171 (4 hrs.)
- Chemistry
  - Score of 4 or 5 = MA171 and MA172 (8 hrs.)
- Computer Science A
  - Score of 3 or higher = CH 121, 125, 123, 126 (8 hrs.)
- Computer Science AB
  - (A student may receive credit for either CPE or CS courses, but not both)
  - Score of 4 = CPE 112 (3 hrs.)
  - Score of 5 = CPE 112 and CPE 212 (6 hrs.)
  - Score of 2 = CS 102 (3 hrs.)
  - Score of 3 or 4 = CS 102 (see advisor re: CS 121)
- English Language/Composition
  - Score of 3 = EH 101 (3 hrs.)
- English Literature/Composition
  - Score of 4 or 5 = EH 101 and 102 (6 hrs.)
- European History
  - Score of 3 = EH 101 (3 hrs.)
- Foreign Languages:
- French, German, Spanish:
  - Score of 3 = HY 102 (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 take these tests. The policy for CLEP credit varies with each institution. The policies listed herein are those of UAH. These tests are administered by appointment. Contact the Office of Instructional and Testing Services in Room 226, Administrative Science Building.

CLEP Examinations

Credit by CLEP examination is allowed if the appropriate academic department has approved the CLEP test for use by the University. Credit awarded for CLEP 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, no record is placed on his or her transcript. Examinations may be retaken six months after initial testing.

CLEP Credit for Free Electives

UAH will award credit for the following examinations for free elective hours: English Composition, Humanities, Mathematics, Natural Sciences and Social Sciences and History. Students should check with their program of study to determine if they are allowed to take a CLEP test for eligible free elective hours. Credit for CLEP examinations will be granted only under the following conditions: a) The examination was taken before entering college; b) The examination was taken during the first semester in college provided that the student has not been enrolled in a comparable course for more than three weeks.

CLEP Credit to meet degree requirements

The following courses may not be required of all programs. Your advisor can provide information about which courses you may CLEP to satisfy requirements. These exams may be taken before enrollment in a comparable course for three or more weeks. Listed below are UAH courses in which a student may receive CLEP credit, along with specific CLEP test titles and minimum score requirements.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>CLEP Subject Test Title</th>
<th>Minimum Score Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH 101</td>
<td>Freshman College Composition PLUS Analyzing and Interpreting Literature</td>
<td>Composite score of 65 and satisfactory performance on Analyzing and Interpreting Literature essay</td>
</tr>
<tr>
<td>EH 102</td>
<td>Freshman College Composition PLUS Analyzing and Interpreting Literature</td>
<td>Composite score of 65 and superior performance on Analyzing and Interpreting Literature essay</td>
</tr>
<tr>
<td>CH 121, 123, 125, 126</td>
<td>General Chemistry</td>
<td>48 (Recommend student take chemistry placement test first)</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>College French</td>
<td>48</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------</td>
<td>----</td>
</tr>
<tr>
<td>FL 101 (French)</td>
<td>College French</td>
<td>50</td>
</tr>
<tr>
<td>FL 101-102 (French)</td>
<td>College German</td>
<td>48</td>
</tr>
<tr>
<td>FL 101 (German)</td>
<td>College German</td>
<td>50</td>
</tr>
<tr>
<td>FL 101-102 (German)</td>
<td>College Spanish</td>
<td>48</td>
</tr>
<tr>
<td>FL 101 (Spanish)</td>
<td>College Spanish</td>
<td>50</td>
</tr>
<tr>
<td>FL 101-102 (Spanish)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History and Social Science</td>
<td>Western Civilization I</td>
<td>56 (plus A/B on departmental essay)</td>
</tr>
<tr>
<td>HY 101</td>
<td>Western Civilization II</td>
<td>56 (plus A/B on departmental essay)</td>
</tr>
<tr>
<td>HY 102</td>
<td>History of the United States, Part I</td>
<td>60 (plus A/B on departmental essay)</td>
</tr>
<tr>
<td>HY 221</td>
<td>History of the United States, Part II</td>
<td>60 (plus A/B on departmental essay)</td>
</tr>
<tr>
<td>HY 222</td>
<td>Introductory Sociology</td>
<td>50</td>
</tr>
<tr>
<td>SOC 100</td>
<td>American Government</td>
<td>50</td>
</tr>
<tr>
<td>PSC 101</td>
<td>Introductory Psychology</td>
<td>60</td>
</tr>
<tr>
<td>PY 101</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>Principles of Accounting</td>
<td>50</td>
</tr>
<tr>
<td>ACC 211-212</td>
<td>Principles of Macroeconomics</td>
<td>50</td>
</tr>
<tr>
<td>ECN 142</td>
<td>Principles of Microeconomics</td>
<td>50</td>
</tr>
<tr>
<td>ECN 143</td>
<td>Information Systems &amp; Computer</td>
<td>50</td>
</tr>
<tr>
<td>MIS 146</td>
<td>Applications</td>
<td>50</td>
</tr>
<tr>
<td>MGT 301</td>
<td>Principles of Management</td>
<td>50</td>
</tr>
<tr>
<td>MKT 301</td>
<td>Principles of Marketing</td>
<td>50</td>
</tr>
<tr>
<td>4) International Baccalaureate (IB)</td>
<td>BYS 119, 120, 464</td>
<td></td>
</tr>
</tbody>
</table>
| The University of Alabama in Huntsville recognizes International Baccalaureate (IB) credit with a score of 5, 6, or 7 on the higher-level examinations. Reports of IB scores should be sent to the UAH Office of Admissions for evaluation. Additional credit may be awarded on a course-by-course basis as approved by the department. (Some departments may award credit based on the subsidiary examinations.) The academic unit responsible for the student's program of study will determine the application of credits toward specific degree requirements. Credit, if awarded, will be recorded without grades or quality points, and will not, therefore, be included in the calculation of grade point average.
| IB Biology                       | CH 101, 105, 113  |      |
| IB Chemistry                     | ECN 142           |      |
| IB Economics                     | FH 101, 102, 201, 202, 301 |  |
| IB French                       | GN 101, 102, 201, 202, 301 |  |
| IB German                       | EH 101, 102 (Minimum test score 6) |      |
| IB Literature                   | H 101, 102, 201, 202, 301 |  |
| IB Spanish                      |                   |      |

For further information concerning CLEP, the AP program, the IB program, or department examinations, contact the Office of Instructional and Testing Services.

**Registration**

Dates, times, procedures and eligibility conditions for registration are published in the *Schedule of Classes*, which is available in Charger Central, the Academic Advising offices, and on the UAH website. After the published deadline, registration requires approval from the Office of the Provost. A student must submit a written petition with appropriate documentation to substantiate extenuating circumstances to the Office of the Provost. The petition must include signatures from the instructor, the chair of the department that offers the course, and the dean of the college in
which the student is enrolled. All financial obligations to the University must be cleared before a student may register for courses. Students should consult with their academic advisor prior to registration. Non-degree students have a lower registration priority.

Concurrent registration for multiple sections of a course is not allowed.

A student who schedules courses during registration makes a financial commitment to the University. Course adjustments, drops and withdrawals must be officially transacted in writing on a Registration/Schedule Adjustment form and recorded by the Office of Student Records by the published deadlines. Adjustments in fees, if any, will be made by the Office of the Bursar. The University assumes no responsibility for students who attend classes without proper registration.

The Semester System

The academic year is divided into two semesters and one summer session. The fall semester begins in late August and ends in December. The spring semester begins in January and ends in May. The summer term consists of 10 weeks with two 5-week mini-sessions. The summer session begins in June and ends in August. (See Academic Calendar.)

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

Student Course Loads

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

Prerequisite, Prerequisite with Concurrency, Co-requisite

Some courses offered at UAH require students to complete a prerequisite or prerequisites prior to registering for a course, to register for a prerequisite with concurrency, and to register for a co-requisite course. The definitions for these categories are as follows:

**Prerequisite** – a course must be taken before a target course, i.e., successful completion of EH 101 before registering for EH 102.

**Prerequisite with Concurrency** – a course must be taken before or at the same time as a target course, i.e., CH 101 and CH 105; PH 111 and PH 114; CE 271 and MA 201. A “W” or “F” grade in one course does not require that a student re-register for both courses. Prerequisite with concurrency courses do not have to be completed at the same time. A student may withdraw from a target course or a concurrent course and continue enrollment in the other course and vice versa. Note: A student may be asked to withdraw from a required course if in the judgment of the instructor/chair/advisor the student does not have the requisite knowledge to successfully complete the course (i.e., CE 271 and MA 201).

**Co-requisite** – a course must be taken simultaneously with a target course, i.e., BYS 119 and 119L; PH 102 and 102L; CPE 112 and 112L; CE 370 and 370L; CHE 442 and 442L; MAE 311 and 311L; NUR 660 and 661L, and etc. Co-requisite courses must be completed at the same time. A student may withdraw from a target course; however, the student must also withdraw from the co-requisite course and vice versa.

Orientation

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

Student Classification

An undergraduate is classified as indicated in the following table when a student has completed the number of semester hours shown.
Semester | Hours Earned
---|---
Freshman | 0-31
Sophomore | 32-63
Junior | 64-95
Senior | 96 up

Schedule Adjustments
Through the fifth day of classes, a student may add a course by registering on the web at www.uah.edu, meeting with their advisor, or submitting a Registration/Schedule Adjustment form to Charger Central. Students should consult with their academic advisor and other university officials as indicated on the Registration Form for advice and approval before making any schedule changes.

To add a class after the published deadline requires a written petition to the Office of the Provost with appropriate documentation to substantiate extenuating circumstances. The petition must include signatures from the instructor, the chair of the department that offers the course, and the dean of the college in which the student is enrolled. A request to change a section after the deadline must be approved by the instructor of the new section, the chair of the department that offers the course, and the dean of the college in which the student is enrolled.

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

Withdrawal Policy
Through the tenth week of the fall or spring semester, a student may withdraw from any course by executing a withdrawal on our website, meeting with their advisor, or submitting a Registration/Schedule Adjustment form to Charger Central. After the tenth 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. After the withdrawal deadline, the student must initiate a formal request for withdrawal through the college or Charger Central. 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 tenth week. Beginning the eleventh week, the student must give evidence of extenuating circumstances to justify withdrawal from a course. Avoidance of an undesirable grade does not justify withdrawal. The request for withdrawal approval in this situation must be submitted with a written explanation of the extenuating circumstances and any appropriate documentation to the dean of the college in which the student is enrolled, and it is the duty of the dean to verify that the circumstances justify withdrawal from a course. In addition, students participating in certain programs must secure approval or give adequate notification to the appropriate officers of these programs. It is the joint duty of these programs and the Office of Student Records to insure that students participating in these programs are aware of any such requirements.
Counseling
Students need to be aware that many potential employers, as well as graduate and professional schools, view an excessive number of W's on a transcript as a flag that the student cannot be counted on to complete demanding projects. Advisors should be informed of this fact and students should be encouraged to discuss with their advisors any plans to withdraw from a course, especially after the first two weeks of the semester.

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

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

Students may repeat any course an unlimited number of times in order to achieve a passing grade or an improved understanding. A maximum of five course repeats may be excluded from the calculation of the student’s grade point average. The student must declare the course repeat 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.

For all other courses repeated at UAH, both the original grade and the course repeat grade will show on the transcript and 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. An instructor has the prerogative to
impose an attendance requirement, which must appear in the course syllabus. A student’s final grade in each course is determined on the basis of identified course requirements; therefore, regular class attendance is important.

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

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

Grading System
The University of Alabama in Huntsville’s grading system includes grades of A, B, C, D, F, I, X, W, S, U, P, AU, N, and NC. Instructors have the option of augmenting the course grades of A, B, C, and D with symbols “+” and “-” signifying, respectively, high and low achievement within the assigned grade. These augmented letter grades become part of the student’s permanent record and appear on transcripts, but augmentation of a letter grade does not affect its value for the purposes of the GPA computation.

**A** Superior achievement. Four quality points given per semester hour.

**AU** Audit. Course attendance as a listener. No credit given, no quality points assigned, no attendance requirement.

**B** Above average achievement. Three quality points given per semester hour.

**C** Average achievement. Two quality points given per semester hour.

**D** Passing work. One quality point given per semester hour.

**F** Failing work. No credit given; no quality points assigned.

**I** Incomplete. Assigned by the instructor when a student, due to circumstances beyond his or her control, has not satisfied some requirement of the course. The deadline for a student to remedy a grade of I is the last day of class of the next semester enrolled or one calendar year from the date of the grade whichever occurs first. If the grade of I is on a student’s record at the time of graduation, it is treated as an F.

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

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

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

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

**U** Unsatisfactory work. Applicable to noncredit courses and to some specified credit courses.

**W** Withdrawal. (See Withdrawal Policy.)

**X** Excused absence from examination. Assigned by the instructor when a student completes all course requirements except the final examination. The final 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 listed on the Program of Study (major, minor, cognate, track, cluster, specialization, option and concentration) may not be taken P-F. Required courses in English composition and mathematics may not be taken P-F. Departments may limit the P-F to courses outside the department or college.

A grade of P may be changed to a regular grade only if the student changes his or her program to an area in which a regular grade is required. The change must be initiated at the dean’s office and must go through the normal grade change procedures. Once a P grade has been changed to a regular grade, the regular grade must remain. Under the P-F system, a grade of P will not be counted in a student’s grade-point average; a grade of F will be counted in a student’s grade-point average.

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

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

Grade Point Average
The grade point average (GPA) is computed by dividing the total number of quality points earned at UAH by the total number of semester hours attempted at UAH (transfer grades are not included). Courses in which a grade of NC, 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
Graduation with honors at the baccalaureate level requires a minimum of 60 semester hours at UAH. Honors will be determined by the grade-point average for the last 60 semester hours of coursework taken at UAH or the overall GPA for all coursework taken at UAH, whichever is
higher. The academic terms containing the last 60 hours of coursework taken at UAH will be identified and the GPA of all UAH courses taken during those terms to satisfy graduation requirements 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 term. 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 term. 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 completion of at least 15 semester hours at UAH. If the student at that time has earned a 2.00 on all UAH coursework, the conditional/Probational classification will be changed to regular student status. The deadline to submit a petition for readmission to Charger Central (UC 118) are July 1 for Fall, November 15 for Spring, and April 1 for Summer readmission.

**Nondegree to Regular Status**

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

**Academic Appeals Process**

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

A cooperative arrangement exists with Alabama A&M University, Athens State University, 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.

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 at a two-year institution. 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, AL35487.
Course Numbering System

<table>
<thead>
<tr>
<th>Range</th>
<th>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
- Concentration in Foreign Languages and International Trade
- Communication Arts
- Elementary Education
- History
- English
- Music
- Foreign Language
- Philosophy
- French
- Political Science
- German
- Psychology
- Russian
- Sociology
- Spanish

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

College of Engineering

Areas of study currently offered are:
- Chemical Engineering
- Civil and Environmental Engineering
- Mechanical and Aerospace Engineering
- Optical Engineering
- Electrical Engineering
- Industrial and Systems Engineering
- Computer Engineering
- Aerospace Engineering Option in Mechanical 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
- Mathematics
- Chemistry
- Physics
- Computer Science

Courses are also offered in atmospheric and environmental science, astronomy, optics, and statistics.
Degrees Offered

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

Bachelor of Arts
- art, biological sciences, communication arts, elementary education, English, foreign language, history, mathematics, music, philosophy, political science, psychology, sociology.

Bachelor of Science
- biological sciences, chemistry, computer science, mathematics, physics.

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

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

Bachelor of Science in Nursing
- unified professional curriculum.

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

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

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

Graduation with honors recognition for the second bachelor's degree requires a minimum of 60 semester hours of coursework taken at UAH above the requirements for the first bachelor's degree. Honors will be determined by the grade-point average for the last 60 semester hours of coursework taken at UAH above the requirements for the first bachelor's degree or all coursework taken at UAH above the coursework for the first baccalaureate degree, whichever is higher. Honors calculation for the second bachelor's degree follows the same procedures as graduation honors for the first baccalaureate degree (see Graduation with Honors, p. 64).

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, Liberal Arts, and Nursing assign advisors. Students in the College of Science and undecided students will be advised in the Academic Advisement and Information Center (AACIC), Room 118, University Center. When a student 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 AACIC to the relevant department chair for permanent retention. Sophomores who have not declared a major will continue to have their registration forms signed in the AACIC. For procedures in the Colleges of Administrative Science, Engineering, Liberal Arts, 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 faculty advisor, with 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 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.

Core Competencies for General Education Requirements
The University of Alabama in Huntsville is committed to four core competencies that serve as the foundation for undergraduate general education requirements. These four core competencies are:
Effective communication;
Ability to deal with questions of values, ethics, and aesthetics as represented in literature, the humanities, and the arts;
Understanding of the scientific method and application of quantitative or inductive reasoning; and
Understanding of human behavior and economic, social, and political structures as represented in the disciplines of history and social and behavioral sciences.
These core competencies are consistent with those of a State of Alabama mandated articulation agreement under ACT 94-303, which ensures the transferability of credits from the State's two-year institutions to its four-year institutions.

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

Total Degree Requirements
1. Minimum requirements for the Bachelor of Arts, Bachelor of Science, Bachelor of Science in Business Administration, and Bachelor of Science in Nursing degrees are 128 semester hours. For the Bachelor of Science in Engineering degree (Electrical Engineering option) 128 semester hours; (Industrial and Systems Engineering) 130 semester hours; (Chemical Engineering option) 132 semester hours; (Civil Engineering option) 131 semester hours; (Computer Engineering option) 129 semester hours; (Aerospace Engineering option in Mechanical Engineering) 134 semester hours; (Optical Engineering option) 128 semester hours; and (Mechanical Engineering option), 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 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 registers as a degree-seeking student at UAH. At any time during the student’s enrollment that requirements for graduation are changed, a student may elect to graduate under the new requirements. If the student does not complete requirements for graduation within seven years from the date of entry or seven years from the date of the catalog chosen, the student must then change to the catalog in effect and meet the requirements as specified. If a student breaks enrollment for a period of at least 24 months, the student must then change to the catalog in effect at the time of re-enrollment and meet the requirements as specified. The student’s advisor and college dean must approve any exceptions to this policy with the proper notation filed in the student’s program of study in the Office of Student Records. At any point at which a change in catalog becomes necessary, a new program of study must be completed and proper notation filed in the Office of Student Records.

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

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

The UAH Cooperative Education (Co-op) Program provides an 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
supplement the baccalaureate degree. 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. Students work a minimum of three complete work terms. Work experiences are progressive in responsibilities, monitored by the University, and related to the students' academic and career goals. Co-op students' job performance is evaluated, and completion of academic coursework is reviewed. 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 complete work assignments in the Huntsville area, while also providing unique opportunities in other locales. 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 3,400 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 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, science and nursing students.

The UAH Co-op Program is open to qualified UAH students, regardless of race, color, religion, sex, age, national origin, disability or veteran status.

**Honors Program**

Dr. John S. Mebane, Director  
336 Morton Hall  
Telephone: (256) 824-6450  
Email: mebanej@uah.edu

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

Students who wish to complete the Honors Diploma must earn a minimum of 24 hours in honors coursework by graduation and they must submit an approved honors senior project. Senior projects may be done either in H 499: Honors Senior Project or in conjunction with capstone or independent study courses in the student’s major or minor. A maximum of 6 semester hours in courses in which the student produces the Honors Senior Project may be included in the 24-hour minimum for the Honors Diploma. Honors courses typically serve in the students' curricula as courses to satisfy the GER, major and minor requirements, and electives, so they do not constitute additional hours overall. Individual courses of study will vary depending on the student’s discipline. However, to fully complete the Honors Program of Study, all students need to complete four hours of Honors Forum (H100); two honors courses (6 hours) at the 300-level or above, including at least one Honors Interdisciplinary Seminar (H399); and an honors senior project. All entering freshman honors students will enroll in EH 105: Honors English Seminar (3 hours). Students may complete additional hours by taking other designated honors courses in a wide variety of disciplines. Students may also contract for honors credit in other academic courses. With permission from the instructor, a student may elect to enter into a contract for honors credit for any regular academic course, including courses in his or her major and minor. The honors contract specifies that the course content will be appropriate to earn honors credit. Students who plan to complete the honors senior project through courses in their major or minor are encouraged to complete honors contracts in those classes so that they may count toward the honors diploma.

The Honors Program serves academically talented students in all the colleges. Entering freshmen are invited to participate based on an evaluation of their ACT or SAT scores and high school grades. Students are encouraged to join the Honors Program at the beginning of their freshman year to gain full advantage of the program's benefits and enhanced curriculum. Interested UAH
and transfer students who have maintained a grade-point average of 3.3 or higher and who have completed less than 29 hours of coursework can still complete all requirements of the Honors Program. Those who have more than 29 hours of credit may complete the Certificate for Completion of the Upper-level Requirements of the Honors Program. The Certificate requires 12 hours of honors course work, including 6 hours at the 300 level or above (including at least 3 hours of H 399: Honors Interdisciplinary Seminar), plus an approved honors senior project. Students are encouraged to contact the director to determine how they may best participate in the program.

To completely review the honors course offerings, students should check the catalog course listings for each department. Courses specifically developed for the Honors Program are listed below. University students who meet appropriate admissions standards for the Honors Program may enroll in honors courses.

**H 100 Honors Forum**
1 hr.
Regularly scheduled to enrich the experiences of Honors Program students using lectures, concerts, exhibits, and other events. Provides exposure to a broad range of academic disciplines. Prerequisite: admission to Honors Program.

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

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

**EH 251(H) Honors World Literature II**
3 hrs.

**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.

**H 499 Honors Senior Project**
1-3 hrs.
Individual research under direction of a faculty advisor. May be taken for up to 6 semester hours of credit.

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

**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, Philosophy, 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 minimum admission requirements does not insure acceptance.

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

2. General chemistry with laboratory 8 hrs.
3. Organic chemistry with laboratory 8 hrs.
4. General biology with laboratory 8 hrs.
5. General physics with laboratory 8 hrs.
6. Two semesters of mathematics may include statistics or computer science 6 hrs.

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

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

1. Biological sciences 12 hrs.
2. Inorganic chemistry (including qualitative analysis) 8 hrs.
3. Organic chemistry 8 hrs.
4. Biochemistry is strongly recommended 4 hrs.
5. Physics (including laboratory) 8 hrs.
6. Analytic geometry and calculus 6 hrs.
7. 30 semester hours of non-science courses to include English (6 hrs.), history, political science, economics, philosophy, psychology, and sociology. Courses to enhance manual dexterity (sculpture, painting, etc.) are encouraged.
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 30 hrs.
Students interested in preprofessional health programs are encouraged to contact the UAH preprofessional advisor early in their college career by calling the Office of the Dean, College of Science.

**Introduction to University Life**
Introduction to University Life (UNV 101) is a course designed to facilitate the successful transition of new students into the UAH community. This one credit hour elective course will assist students in the development of academic and personal skills that contribute to success in college, the workplace, and lifelong learning. The education strategy for the course includes cooperative learning, guided discovery activities, journal writing and various assessment measures.

**Career Exploration**
The Career Exploration (OCS 111) course is a one credit hour elective course designed to assist students in identifying their interests, abilities, values and personality traits, as they relate to the selection of both a major course of study and career opportunities. Students will also learn effective job search skills. Lab fee: $10.
College of Administrative Science

202 Administrative Science Building
Telephone: (256) 824-6735
Email: deanadsc@uah.edu

Dean:
C. David Billings, B.S., Ph.D., Professor of Finance

Associate Dean:
J. Daniel Sherman, BS, MA, PhD, Professor of Management

Director of Advisement:
Bernice Pitsis-Rush, B.S.B.A.

Mission
The College of Administrative Science serves business and society through the expertise of our alumni, students, and faculty. The College provides academically rigorous programs emphasizing the application of theory and skills in scientific, technological, and traditional business environments. The faculty develops and disseminates knowledge of business theories and practices.

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

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

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

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

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

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

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

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

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

**Center for the Management of Science and Technology (CMOST)**

350 Administrative Building  
Telephone: (256) 824-6407  
Email: cmost@uah.edu

The Center for the Management of Science and Technology's broadest goal is to improve the state-of-the-art in the management of organizations that are substantially impacted by science and technology. Specifically, CMOST is devoted to the development of new practices appropriate for the management of high technology commercial and governmental organizations. CMOST conducts research to develop new management strategies, techniques and competencies to help firms manage the high risks and uncertainties that characterize Huntsville's high technology industry. In addition, the Center's staff does contract research on business, management and economic problems for governmental organizations and private industry.

**NorthEast Alabama Regional Small Business Development Center**

225 Church Street  
Telephone: (256) 535-2061  
FAX: (256) 535-2050  
Email: smallbus@hsvchamber.org

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

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

**Executive Education Program**

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

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

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

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

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

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

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

Reflective of the academic environment of UAH and the Department of Accounting and Information Systems, distinguishing features of the program include an information systems emphasis and a focus on understanding the role of accounting in managing business processes.

Highly qualified undergraduate accounting graduates may be able to complete the requirements for the M.Acc. degree in one additional year of full-time course work beyond the bachelor's level. Individuals interested in the M.Acc. program should contact the M.Acc. Program Advisor, 102 Administrative Science Building, (256) 824-6024 For more information on the M.Acc. program, refer to the UAH Graduate Catalog.

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

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

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

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

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

*Students taking SOC 333, PY 300, MA 385, ISE 390 or equivalent introductory statistics should substitute a 300 or 400 level business elective.

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECN 142</td>
<td>Principles of Macroeconomics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ECN 143</td>
<td>Principles of Microeconomics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 211</td>
<td>Financial Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>ACC 212</td>
<td>Management Accounting</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MSC 287*</td>
<td>Business Statistics I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>FIN 301</td>
<td>Principles of Finance</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 301</td>
<td>Managing Organizations</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>
| MKT 301  | Principles of Marketing                    | 3 hrs.
MGT 450 International Business 3 hrs.
MKT 415 International Marketing 3 hrs.
FIN 454 International Economics & Finance 3 hrs.
Minimum of 12 hrs. of a foreign language 12 hrs.
*or SOC 333, PY 300 45 hrs.

Marketing Minors. Students who desire a minor in marketing to facilitate careers that involve managing exchange relationships between producers and consumers may choose between two marketing minors: Marketing Management and Electronic Business.

Marketing management minor includes the following courses:
MKT 301 Principles of Marketing 3 hrs.
18 hours selected from the following courses: 18 hrs.
MKT 315 Sales Management and Professional Selling
MKT 325 Legal & Ethical Issues of Marketing on the Internet
MKT 332 Buyer Behavior
MKT 342 Promotional Strategy
MKT 343 Marketing Research Design
MKT 345 Market Channel Structure & Strategy
MKT 400 Strategic Issues in Logistics
MKT 405 New Venture Strategies
MKT 414 Marketing Emerging Technologies
MKT 415 International Marketing
MKT 420 Services Marketing
MKT 470 Marketing in an Electronic Environment
MKT 475 Advanced Marketing Seminar
MKT 480 Marketing Management
MKT 490 Special Projects 21 hrs.

Electronic business marketing minor includes the following courses:
MKT 301 Principles of Marketing 3 hrs.
MKT 342 Promotional Strategy 3 hrs.
MKT 343 Marketing Research Design 3 hrs.
MKT 325 Legal & Ethical Issues of Marketing on the Internet 3 hrs.
MKT 470 Marketing in an Electronic Environment 3 hrs.
MIS 420 Electronic Commerce 3 hrs.
MIS 440 Web Programming & Data Base Integration 3 hrs.
21 hrs.

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

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

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

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The pre-law business minor includes the following courses:

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

**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**: Financial Accounting (3 hrs.)
- **ACC 212**: Management Accounting (3 hrs.)
- **BLS 211**: Legal Environment of Business (3 hrs.)
- **MSC 287**: Business Statistics I (3 hrs.)
- **MSC 288**: Business Statistics II (3 hrs.)
- **FIN 301**: Principles of Finance (3 hrs.)
- **MGT 301**: Managing Organizations (3 hrs.)
- **MKT 301**: Principles of Marketing (3 hrs.)
- **MSC 385**: Production/Operations Management (3 hrs.)

33 hrs.

**Management and Leadership Minor.** Students planning for careers that require management and leadership skills may consider a minor in Management and Leadership. The Management and Leadership minor is a campus-wide undergraduate minor. The minor includes required courses from the field of Management, and potential elective courses from Communications, Psychology, Sociology, Nursing, and Political Science. The 18 hour minor includes the following courses.

**Required courses:**

- **MGT 301**: Managing Organizations: Theory, Behavior and Communications (3 hrs.)
- **MGT 361**: Leadership and Organizational Behavior (3 hrs.)
- **MGT 363**: Human Resource and Management (3 hrs.)
- **MGT 462**: Employment Law for Managers (3 hrs.)

6 hours selected from the following courses:

- **CM 313**: Business and Professional Communication
- **CM 350**: Organizational Communication
- **MGT 404**: Negotiation Techniques
- **MGT 450**: International Business
- **MGT 460**: Employee Staffing and Development
- **MGT 461**: Strategic Compensation Management
- **MGT 470**: Special Topics in Management
- **MGT 490**: Special Projects
Leadership and Management in Nursing
Public Administration
American Presidency
Social Psychology
Industrial and Organizational Psychology
Sociology of Work and Occupations
Complex Organizations in Industrial Society

Leadership and Management in Nursing
Public Administration
American Presidency
Social Psychology
Industrial and Organizational Psychology
Sociology of Work and Occupations
Complex Organizations in Industrial Society

18 hrs.

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

ECN 142 Principles of Macroeconomics 3 hrs.
ECN 143 Principles of Microeconomics 3 hrs.
ECN 340 Macroeconomic Analysis 3 hrs.
ECN 345 Microeconomic Analysis 3 hrs.

6 hours selected from the following list of courses: 6 hrs.
ECN 352 Money and Banking (cross listed as FIN 352)
ECN 454 International Economics and Finance (cross listed as FIN 454)
ECN 470 Seminar in Economics
ECN 475 Labor Markets and Human Resources 18 hrs.

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

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

Economics - Taken as part of Area IV “History, Social and Behavioral Sciences” requirements
ECN 142 Principles of Macroeconomics
ECN 143 Principles of Microeconomics

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

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

Statistics - Taken as part of Area V “Electives” requirement
MSC 287 Business Statistics I (or MA 385-Introduction to Probability, or ISE-390 Probability and Engineering Statistics I)
MSC 288 Business Statistics II (or MA 487-Introduction to Mathematical Statistics, or IES 391 Probability and Engineering Statistics II)
Pre-MSM Minor (Science & Technology Business Minor)

ACC 211 Financial Accounting  3 hrs.
ACC 212 Managerial Accounting  3 hrs.
BLS 211 Legal Environment of Business  3 hrs.
MGT 301 Managing Organizations  3 hrs.
MKT 301 Principles of Marketing  3 hrs.
MSC 385 Production/Operations Management  3 hrs.

TOTAL MINOR HOURS 18 hrs.

Policies, Procedures and Assistance

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

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

Students who have had inadequate high school preparation or who are placed in certain lower-level classes because of the results of placement tests may have to take one or more of the following courses:

EH 003 Basic English  no credit
MA 004 Basic Algebra  no credit
MA 033 High School Geometry  no credit

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

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

Area I  English Composition  6 hrs.
Area II  Humanities and Fine Arts:
        Literature  6 hrs.*
        Fine Arts  3 hrs.
        Humanities Elective  3 hrs.
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.

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

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

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

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

**Admission to the Upper-Division**

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

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

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

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

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

1. Completed 62 semester hours comprising the lower-division requirement.
2. Earned a minimum grade of “C” in both English Composition courses (EH 101 and 102).
3. Earned a minimum average GPA of 2.0 out of 4.0 (“C” average) for the 24 hours comprising the pre-professional business administration core.

Note: For degree-seeking students in the College of Administrative Science, admission to the upper-division is a prerequisite for all upper-division courses (numbered 300-499) in the College. Degree-seeking students in the College registering in upper-division business courses without completing the prerequisites and without being admitted to the upper-division will be administratively withdrawn from those classes.
Student Advisement and Enrollment
Advising for B.S.B.A. degree candidates is handled by the Director of Advisement in the College. The College’s Office of Academic Assistance is a student’s point of contact for information concerning possible majors, declaring a major, transfer credit and degree requirements.

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

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

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

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

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

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

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

Schedule Building. Schedule building is the determination of specific courses the student should take in a given semester. Students should refer to the UAH Schedule of Classes and the undergraduate catalog in consultation with the faculty advisor or the Director of Advisement to determine a specific course of study. Selection of specific course sections and times is the student’s responsibility. The tentative schedule must be approved by the Director of Advisement, with certain exceptions explained above.

Program Planning. Students are encouraged to outline an entire plan of study early in their academic career. This program planning activity is provided by the College’s Director of Advisement and includes suggested model programs for each of the major fields of study offered by the College.

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

Where to Find Advising Assistance
College’s Office of Academic Assistance (102 Administrative Science Building). Students should come to this office for special advising assistance that cannot be resolved at other locations and to file appeals and waiver requests relative to College and University regulations.
This office will also refer students to the appropriate office should the student be unsure as to where to find assistance.

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

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

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

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

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

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

Internship Program Guidelines
The internship program is designed to provide professional work experience for students in a field relevant to their major. The program consists of active involvement in a project in a business enterprise, professional organization, or in a government agency that has particular interest and relevance to the student. The course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.

The prerequisites are junior standing, 9 semester hours of upper-division work in the student’s discipline, and approval of the department chair.
In addition to making a judgment on the merit, quality, and relevance of the proposed internship program, the chair will require the following academic prerequisites prior to approval:

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

An internship may be elected only once, i.e. a maximum of 3 semester hours toward the B.S.B.A. degree. The internship may count as an elective within the major. Internships include the following: ACC 495, FIN 495, MGT 495, MIS 495, MKT 495, MKT 496, and MSC 495.

The cooperative education program is different from an internship. An internship differs from cooperative education based on the fact that the experience is for the duration of a single semester, and if the student is receiving course credit, they may not receive compensation. Internships generally require 120 hours of on-site experience for the three credit hour course. For a 15 week semester this averages approximately 8 hours per week.

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

**Catalog Requirements and Changes**

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

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

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

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

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

**Bachelor of Science in Business Administration**

**Degree Requirements**

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

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

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

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

1. Complete the lower-division general education requirement;
2. Complete the lower-division pre-professional business administration core curriculum;
3. Complete the upper-division general education requirement;
4. Complete the upper-division business administration core curriculum;
5. Complete the courses required for the major;
6. Complete a minimum of 128 semester hours of work with a minimum of 39 semester hours in courses numbered 300 and above;
7. Attain a minimum grade point average of 2.0 (C) in all course work attempted;
8. Attain a minimum grade point average of 2.0 (C) in the business administration core curriculum (48 hours);
9. Attain a minimum grade point average of 2.0 (C) in the major.
10. Complete the business policy course (MGT 499) with a minimum grade of “C”; and
11. Comply with University and College of Administrative Science residence requirements.

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

Lower Division Requirements: 62 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

<table>
<thead>
<tr>
<th>Semester Hours</th>
<th>Lower Division General Education Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 hrs.</td>
<td>1. English Composition I &amp; II (EH 101-102)*</td>
</tr>
<tr>
<td>6 hrs.</td>
<td>2. Humanities and Fine Arts</td>
</tr>
<tr>
<td>3 hrs.</td>
<td>a. Survey of Literature**</td>
</tr>
<tr>
<td></td>
<td>(EH 205-206 or 240-241)</td>
</tr>
<tr>
<td></td>
<td>b. Fine Arts</td>
</tr>
<tr>
<td></td>
<td>Art History Survey: Ancient to Renaissance (ARH 100)</td>
</tr>
<tr>
<td></td>
<td>Art History Survey: Renaissance to Modern (ARH 101)</td>
</tr>
<tr>
<td></td>
<td>Introduction to Drawing (ARS 160)</td>
</tr>
<tr>
<td></td>
<td>Introduction to Music Literature (MU 100)</td>
</tr>
<tr>
<td></td>
<td>Theater Appreciation (CM 122)</td>
</tr>
</tbody>
</table>
c. Humanities Electives
   Recommended: Introduction to Ethics (PHL202)

3. Natural Sciences and Mathematics
   a. Laboratory Science***
      Choose biology, chemistry, environmental science or physics
   b. Mathematics (MA 107 and 120)****

4. History, Social and Behavioral Sciences
   a. History
   b. Psychology, sociology, or anthropology

Total General Education Requirements 38 hrs.

* A grade of C or higher must be obtained in EH 101 and 102.
** Must take a 6-hour sequence in any literature.
*** Students who have completed 10 quarter hours (or 6.6 semester hours) of laboratory science will be considered to have met this requirement.
**** Students may select MA 107 or 112. MA 107 is recommended for business students.

However, students should note that MA 107 may not be accepted as transfer credit by other institutions in Alabama if they transfer from UAH before completing MA120. If they transfer after completing MA, 120 there is no transferability problem. ACT Mathematics Placement: Students scoring below 20 on the quantitative section of the ACT will be required to pass MA 004 (Basic Algebra) before enrolling in MA107 or 112. Students scoring 26 or higher should enroll in MA 120 and choose 3 hours of electives outside the College of Administrative Science. Mathematics Placement Test: Students scoring sufficiently high on a mathematics placement test at UAH may skip MA 107, 112 and/or MA004. Students placing at Level III on the placement test should enroll in MA 120 and choose 3 hours of electives outside the College of Administrative Science. Students planning to emphasize quantitative methods, to minor in an area requiring at least two semesters of calculus, or to attend graduate school should choose the following mathematics sequence: MA 112, 120, 171.

II. Pre-professional Business Core Curriculum

Macro and Micro 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) 3 hrs.
Management Accounting (ACC 212) 3 hrs.
Total Pre-professional Business Administration Core Curriculum 24 hrs.
Total Lower-division Requirements 62 hrs.

* Refer to MIS placement policy.

Lower Division Schedule for Full-time Student

FRESHMAN

Fall Semester
   English (EH 101) 3 hrs.
   Economics (ECN 142 or ECN 143) 3 hrs.
   Microcomputer Applications (MIS 146*) 3 hrs.
   Mathematics I** 3 hrs.
   History (15 hours) 15 hrs.

Spring Semester
   English (EH 102) 3 hrs.
   Economics (ECN 143 or ECN142) 3 hrs.
   Humanities Elective 3 hrs.
   Mathematics II ** 3 hrs.
   Psychology, Sociology or Anthropology (15 hours) 15 hrs.

SOPHOMORE

Fall Semester
   Financial Accounting (ACC 211) 3 hrs.
   Business Statistics I (MSC 287) 3 hrs.
   Literature I *** 3 hrs.

Spring Semester****
   Management Accounting(ACC 212) 3 hrs.
   Business Statistics II (MSC 288) 3 hrs.
   Literature II *** 3 hrs.
Upper Division Requirements: 66 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.”

III. Upper Division General Education Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategies of Business Writing (EH 300)*</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Business and Professional Communications (CM 313)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Economics Requirement (ECN 340, 345, 454, 475)**</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Electives outside the College of Administrative Science</td>
<td>6 hrs.</td>
</tr>
</tbody>
</table>

Total Upper Division General Education Requirements 15 hrs

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

**For the Upper Division economics requirement a student may not choose an economics course required in the major.

IV. Upper Division Business Administration Core Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting requirement (ACC 307, 310, 313, 314)*</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Principles of Finance (FIN 301)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Managing Organizations (MGT 301)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Information Systems in Organizations (MIS 301)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Principles of Marketing (MKT 301)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Production Management (MSC 385)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>International Business (MGT 450)**</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Business Policy (MGT 499)</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

Total Business Administration Core Curriculum 24 hrs.

*ACC 307 is required for accounting and MIS majors.

**International Business Requirement. Business majors acquire a broad knowledge of international business and economic theories, problems and practices through taking MGT450 and through the weaving of global issues in the business administration core curriculum.

V. Major (each major is described below) 21 hrs.

VI. Free electives (May be selected from any college within the University) 6 hrs.

Total Upper Division Requirements 66 hrs.

Total minimum hours for a B.S.B.A. Degree 128 hrs***

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

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

The College offers the following majors: accounting, finance, management-business administration, management-human resource management, marketing management, marketing-e-business, and management information systems.
Department of Accounting and Information Systems

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

Professor Gupta (Chair and Eminent Scholar); Associate Professors Bryson, Mok, Patnayakuni, Pendley, Ruppel; Assistant Professors Allport, Boyle, Hartono, Li, Maddocks; Lecturer Whitten.

Mission
The Department of Accounting and Information Systems provides academically rigorous programs in Accounting and Management Information Systems with an emphasis on the application of theory and skills in scientific, technological, and traditional business environments. The departmental faculty develops and disseminates knowledge related to accounting and management information systems concepts and practices.

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

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

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

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

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

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

Upper Division Schedule for Full-time Student

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>JUNIOR YEAR</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH 300*</td>
<td>MSC 385</td>
<td></td>
</tr>
<tr>
<td>FIN 301</td>
<td>MGT 301</td>
<td></td>
</tr>
<tr>
<td>MKT 301</td>
<td>ACC 313 (Tax)</td>
<td></td>
</tr>
<tr>
<td>ACC 310 (Intermediate I)</td>
<td>ACC 311 (Intermediate II)</td>
<td></td>
</tr>
<tr>
<td>ACC 307 (Systems)</td>
<td>ACC 314 (Cost)</td>
<td></td>
</tr>
<tr>
<td>MIS 301</td>
<td>15 hrs.</td>
<td>33 hrs.</td>
</tr>
<tr>
<td>18 hrs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

College of Administrative Science 86
Management Information Systems

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

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

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 102</td>
<td>Intro to C programming or CS 103</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 310</td>
<td>Intro to Programming using Java</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 420</td>
<td>Databases for Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 460</td>
<td>Electronic Commerce</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 497</td>
<td>Telecommunications &amp; Networking</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS XXX</td>
<td>Information System Design &amp; Implementation</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Upper division MIS elective</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

MIS majors must complete three semester hours of computer programming. While MIS 210, CS 102 or CS 103 are recommended, students may select courses in C, C++, COBOL, JAVA or another procedural language.

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

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH 300 *</td>
<td>MSC 385</td>
</tr>
<tr>
<td>CS 102 or 103</td>
<td>FIN 301</td>
</tr>
<tr>
<td>ACC 307</td>
<td>MKT 301</td>
</tr>
<tr>
<td>MIS 301</td>
<td>MIS 310</td>
</tr>
<tr>
<td>MGT 301</td>
<td>MIS 340</td>
</tr>
<tr>
<td>Elective (3 hrs.)**</td>
<td>18 hrs.</td>
</tr>
<tr>
<td>15 hrs.</td>
<td>33 hrs.</td>
</tr>
</tbody>
</table>

SENIOR YEAR
Fall Semester
MIS 420
MIS 460
CM 313
MGT 450
Electives (6 hrs.)*
18 hrs.

Spring Semester
MGT 499
MIS 497
MIS Elective
ECN Requirement
Electives (3 hrs.)*
15 hrs.

Total 66 hrs.

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

**At least 6 of the 12-semester hours of electives must be outside the College of Administrative Science.

Department of Economics and Finance
333-D Administrative Science Building
Telephone: (256) 824-6590
Email: eco-fin@uah.edu

Professors Billings, Evans, Schnell, Schoening, Stafford, Wilhite (Chair); Associate Professors Allen, Burnett, Tseng; Assistant Professor Hall; Instructor Lovelace.

Mission
The Department of Economics and Finance provides academically rigorous instruction on the use of analytical tools and theoretical constructs of economics, finance, and management science to help students understand and apply them to practical business problems. The departmental faculty also develops and disseminates knowledge related to economics, finance, and management science concepts and practices.

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

To be successful, a finance student should be proficient in economic analysis, algebra, elementary calculus, and statistics. The finance major is offered only during the day. Requirements for the finance major within the B.S.B.A. degree are as follows:

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>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 454</td>
<td>International Economics and Finance</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

<table>
<thead>
<tr>
<th></th>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>JUNIOR YEAR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EH 300*</td>
<td></td>
<td>MSC 385</td>
</tr>
<tr>
<td>FIN 301</td>
<td></td>
<td>MIS 301</td>
</tr>
<tr>
<td>FIN 352</td>
<td></td>
<td>ACC 307***</td>
</tr>
<tr>
<td>MGT 301</td>
<td></td>
<td>FIN 470</td>
</tr>
<tr>
<td>Elective (3 hrs.)*</td>
<td></td>
<td>ECN Requirement****</td>
</tr>
<tr>
<td></td>
<td>15 hrs.</td>
<td>Elective (3 hrs.)*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SENIOR YEAR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

College of Administrative Science
### Fall Semester
- MKT 301
- FIN 361
- FIN 478
- FIN 431
- CM 313
- Elective (3 hrs.)**

18 hrs.

### Spring Semester
- MGT 450
- MGT 499
- FIN 461
- FIN 454
- Elective (3 hrs.)**

15 hrs.

33 hrs.

**Total 66 hrs.**

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

**At least 6 of the 12 semester hours of electives must be outside the College of Administrative Science.

***Or a 300-level accounting elective

****Finance majors are encouraged to take ECN 345 for their Upper Division economics requirement.

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### Department of Management and Marketing
- 355 Administrative Science Building
- Telephone: (256) 824-6680
- Email: simpsonj@uah.edu

Professors Gramm, Rhoades, Sherman, Simpson (Chair); Associate Professors Berkowitz, Wren; Assistant Professors Bao, Cates, Fong, Rieder, Weatherly, Woodward; Lecturer Scislaw.

#### Mission

The Department of Management and Marketing provides academically rigorous instruction on the use of analytical tools and theoretical concepts in management and marketing to help students understand and apply them to practical business problems in scientific, technological and traditional business environments. The departmental faculty also develops and disseminates knowledge related to the management of organizations, personnel and exchange relationships.

#### Management

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

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

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

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

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

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

**Business Administration Track:**

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

Accounting  
Economics  
Finance  
Management  
Management Information Systems  
Management Science  
Marketing

**Human Resource Management Track:**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT 361</td>
<td>Leadership and 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 363</td>
<td>Human Resource Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 461</td>
<td>Strategic Compensation Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 462</td>
<td>Employment Law for Managers</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 460</td>
<td>Employee Staffing and Development</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>
<tr>
<td></td>
<td></td>
<td>21 hrs.</td>
</tr>
</tbody>
</table>

**Business Administration Track**

**Upper Division Schedule for Full-time Student**

**Junior Year**

**Fall Semester**

- MGT 301
- MKT 301
- EH 300*
- ACC 307**
- Elective (3 hrs.)**

15 hrs.

**Spring Semester**

- FIN 301
- MSC 385
- MIS 301
- Discipline I
- Discipline I
- Elective (3 hrs.)**

18 hrs. 33 hrs.

**Senior Year**

**Fall Semester**

- MGT 450
- Discipline II
- Discipline II
- Discipline II
- CM 313
- Elective (3 hrs.)**

18 hrs.

**Spring Semester**

- MGT 499
- Discipline III
- Discipline III
- ECN Requirement
- Elective (3 hrs.)**

15 hrs. 33 hrs.

**Total 66 hrs.**

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

**At least 6 of the 12 semester hours of electives must be outside the College of Administrative Science.

***Or a 300-level accounting elective.

**Human Resource Management Track**

College of Administrative Science 90
Fall Semester
ACC 307***
EH 300*
FIN 301
MGT 301
MKT 301
MGT 363
18 hrs.

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

TOTAL 33 hrs.

Junior Year

Fall Semester
MGT 361
MGT 450
MGT 462
ECN 475
Electives (6 hrs.) **
18 hrs.

Spring Semester
MGT 499
MGT 461
MGT 460
ECN Requirement
Elective (3 hrs.)**
15 hrs.

TOTAL 33 hrs.

Senior Year

Fall Semester
MSC 385
MIS 301
CM 313
MGT 362
Elective (3 hrs.)**
18 hrs.

Spring Semester
MGT 499
MGT 461
MGT 460
ECN Requirement
Elective (3 hrs.)**
15 hrs.

TOTAL 33 hrs.

Total 66 hrs.

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

**At least 6 of the 12 semester hours of electives must be outside the College of Administrative Science.

***Or a 300-level accounting elective.

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

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

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

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

Marketing Management Track:

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

College of Administrative Science
Nine hrs. elective credit selected from the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 315</td>
<td>Sales Management and Professional Selling</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 325</td>
<td>Legal &amp; Ethical Issues of Marketing</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 342</td>
<td>Promotional Strategy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 345</td>
<td>Market Channel Structure &amp; Strategy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 400</td>
<td>Strategic Issues in Logistics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 405</td>
<td>New Venture Strategies</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 415</td>
<td>International Marketing</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 420</td>
<td>Services Marketing</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 470</td>
<td>Marketing in an Electronic Environment</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 475</td>
<td>Advanced Marketing Seminar</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 490</td>
<td>Special Projects</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 495</td>
<td>Marketing Internship</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 hrs.</td>
</tr>
</tbody>
</table>

E-Business Track:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 343</td>
<td>Marketing Research Design</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 480</td>
<td>Marketing Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 470</td>
<td>Marketing in an Electronic Environment</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 420</td>
<td>Electronic Commerce</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 440</td>
<td>Web Programming &amp; Database</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 325</td>
<td>Legal &amp; Ethical Issues of Marketing on the Internet</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 340</td>
<td>Databases for Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 460</td>
<td>Telecommunications</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 496</td>
<td>Internship in E-Business</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>CM 401</td>
<td>Computer-Mediated Communication</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 hrs.</td>
</tr>
</tbody>
</table>

Three hrs. elective credit selected from the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIS 340</td>
<td>Databases for Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MIS 460</td>
<td>Telecommunications</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MKT 496</td>
<td>Internship in E-Business</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>CM 401</td>
<td>Computer-Mediated Communication</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

E-Business Track:

<table>
<thead>
<tr>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Marketing in an Electronic Environment</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Electronic Commerce</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Web Programming &amp; Database</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Legal &amp; Ethical Issues of Marketing on the Internet</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Databases for Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Internship in E-Business</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Computer-Mediated Communication</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

Marketing Management Track:

Upper Division Schedule for Full-Time Student

JUNIOR YEAR

Fall Semester
MKT 301
MGT 301
FIN 301
EH 300*
ACC 307***
Elective (3 hrs.)**
(18 hrs.)

Spring Semester
MSC 385
MIS 301
MKT elective
MKT 332
MKT 343
(15 hrs.)

SENIOR YEAR

Fall Semester
MKT elective
MKT elective
MGT 450
CM 313
Electives (6 hrs) **
(18 hrs.)

Spring Semester
MGT 499
MKT 480
MKT 414
ECN Requirement
Electives (3 hrs)**
(15 hrs.)

Total 66 hrs.

*EH 300 is a co-requisite for administrative science courses with a number greater than 301 and a prerequisite for 400-level courses.
**At least 6 of the 12 semester hours of electives must be outside the College of Administrative Science.
***Or a 300-level accounting elective.

E-Business Track

College of Administrative Science
### Upper Division Schedule for Full-Time Student

#### JUNIOR YEAR

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 301</td>
<td>MSC 385</td>
</tr>
<tr>
<td>MGT 301</td>
<td>MKT 343</td>
</tr>
<tr>
<td>FIN 301</td>
<td>Elective (3 hrs.)**</td>
</tr>
<tr>
<td>EH 300*</td>
<td>MKT 325</td>
</tr>
<tr>
<td>ACC 307****</td>
<td>CM 313</td>
</tr>
<tr>
<td>MIS 301</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(18 hrs.)</td>
</tr>
</tbody>
</table>

#### SENIOR YEAR

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 470</td>
<td>MGT 499</td>
</tr>
<tr>
<td>MIS 420</td>
<td>MIS 440</td>
</tr>
<tr>
<td>ECN Requirement</td>
<td>MKT 480</td>
</tr>
<tr>
<td>MGT 450</td>
<td>e-Business Elective</td>
</tr>
<tr>
<td></td>
<td>(3 hrs.)***</td>
</tr>
<tr>
<td>Electives (6 hrs.)**</td>
<td>Electives (3 hrs.)**</td>
</tr>
<tr>
<td>(18 hrs.)</td>
<td>(15 hrs.)</td>
</tr>
</tbody>
</table>

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

**At least 6 of the 12 hrs. of upper level electives must be outside of the College of Administrative Science.

***Or a 300-level accounting elective.

### Possible Minors for the B.S.B.A. Degree

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

### Certificate in Accounting

Many individuals express a desire to pursue a career in accounting after having earned a bachelor’s degree in a discipline other than accounting. In order to meet the needs of such individuals, UAH offers a Certificate in Accounting program with three options, as described below:

1. **General Accounting Option**—For individuals with a career interest in accounting who do not plan to sit for professional certification examinations.
2. **Management Accounting Option**—For individuals with a career interest in management accounting who plan to sit for the Certified Management Accountant examination.
3. **Public Accounting Option**—For individuals with a career interest in public accounting who plan to sit for the Certified Public Accountant examination.

### Admission and Academic Standards for Accounting Certificate Candidates

Admission to the certificate in accounting program requires that the student hold a bachelor’s or master’s degree in any discipline. The student must seek counsel from the College’s Director of Advisement, and be admitted to UAH as a regular student before enrolling in the certificate in accounting program.

To receive a Certificate in Accounting, a student must complete the curriculum shown below for the applicable option. Credit for work done on a prior degree may be accepted for any course in any option. However, a minimum of 18 hours must be taken at UAH for the General Accounting Option and a minimum of 24 hours must be taken at UAH for the Management
and Public Accounting Options. At least 12 hours of the required UAH hours for any option must be in accounting courses. If necessary to meet the 18 or 24 hour requirement, electives may be selected from any 300 or 400 level course in the College of Administrative Science or may be selected from outside the College with the approval of the department chair.

**General Accounting Option**

**Business Curriculum:**

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

**Total Business Curriculum** 18 hrs.

**Accounting Curriculum:**

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

**Total Accounting Curriculum** 18 hrs.

<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>6 hrs.</td>
</tr>
</tbody>
</table>

**Total Hours Required** 48 hrs.

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

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

**Public Accounting Option**

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

**Total Hours Required** 69 hrs.

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

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

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

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

Admission Requirements for Certificate in Human Resource Management Candidates
Admission to the certificate in human resource management program requires that the student hold a bachelor’s degree in a discipline other than human resource management. The candidate must secure the approval of the Chair of the Department of Management and Marketing and must be admitted to UAH as a regular post baccalaureate student before enrolling in the human resource management certificate program.

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

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT 301</td>
<td>Managing Organizations: Theory</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 362</td>
<td>Behavior, &amp; Communications</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 363</td>
<td>Management and Labor Relations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 460</td>
<td>Human Resource Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 461</td>
<td>Employee Staffing and Development</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MGT 462</td>
<td>Strategic Compensation Management</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Business Electives</td>
<td>Employment Law for Managers</td>
<td>6 hrs.</td>
</tr>
</tbody>
</table>

Total Hours Required: 24 hrs.

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 (see above for requirements) and admission to UAH as a regular student. Any faculty member teaching an upper-division course in the College of Administrative Science may assume that all students have completed the specific courses listed under “Lower Division Requirements” above; and for courses with a number greater than 301, will have completed EH 300. Graduate students may take these courses for upper division credit, but not for graduate credit.

Accounting (ACC)

Lower Division Courses

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

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

Upper Division Courses (see requirements for upper division standing)

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

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

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

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

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.

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

415 Advanced Financial Accounting 3 hrs.
Analysis of financial accounting issues and alternatives concerning business combinations, intercorporate investments, international business, and partnerships. Prerequisite: ACC 311.

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

**431 Principles of Auditing** 3 hrs.
Conceptual foundations of auditing practice. Basic auditing concepts including professional ethics, legal liability, independence, and competence. Auditing of computer-oriented systems, audit sampling, and standards of reporting. Role of the internal and independent auditor. Prerequisites: ACC 307, 311, MSC 287.

**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.

**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 internships. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.

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**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.

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**Upper Division Course (see requirements for upper division standing)**

**400 Law, Ethics and Business** 3 hrs.
An analytical review of corporate ethics addressed from a legal and business standpoint. Focus on codes of ethics, integration of "integrity" into corporate cultures, top management commitment to ethics, civic involvement, employer-employee relations, consumer protection, and international business.

**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.

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**Economics (ECN)**

**Lower Division Courses**

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

**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 004.

**Upper Division Courses (see requirements for upper division standing)**

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

**345 Microeconomic Analysis**
3 hrs.
The purpose of this course is to provide students with an informed perspective of, and ability to use, microeconomic theory. Working through formal non-strategic and strategic decision-making exercises develops the analytical tools necessary to solve business and non-business decision problems. The logical foundations of the analytical tools are emphasized. Core topics include consumer behavior, production, exchange and markets, and using game theory to solve strategic decision problems. Prerequisite: ECN 143.

**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.

**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.

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

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

**Finance (FIN)**

**Lower Division Course**

**100 Personal Financial Planning – Web Based**
3 hrs.
An introduction to the study of personal money management. Topics include budgeting, home ownership, insurance, investments and retirement benefits. Not open for credit as a finance major.

**Upper Division Courses (see requirements for upper division standing)**

**301 Principles of Finance**
3 hrs.
In-depth study of the basic principles of modern finance: time value of money, security valuation, portfolio theory and net present value. Prerequisites: ECN 143, MSC 287, ACC 212.

**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.

**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.

400 Investment Practicum 1, 2, or 3 hrs.
Small number of students work closely with finance faculty to invest real funds in the stock market. Emphasis is placed on individual stock selection and management of the portfolio to meet objectives. Prerequisite: FIN 301 and permission of the instructor.

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.

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.

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

470 Commercial Bank Management 3 hrs.
A study of the financial management of commercial banks. Emphasis on asset and liability management and techniques such as hedging and financial engineering to manage interest rate risks. Prerequisite: FIN 352.

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

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

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

Management (MGT)

Lower Division Courses

100 Introduction to Business 3 hrs.
Career options for students interested in business are stressed. Fundamentals of business organizations, effective management and the functions of business are explored.

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

Upper Division Courses (see requirements for upper division standing)

301 Managing Organizations: Theory, Behavior, and Communications 3 hrs.
Elements of the managerial process fundamental to successful operation of various types of enterprises including a study of organization theory, behavior, and interpersonal communication. Prerequisite: junior standing.

361 Leadership and Organizational Behavior 3 hrs.
Behavioral science approach to the study of individual performance. Performance evaluation, job design, employee turnover, organizational culture, communication process, work motivation, group dynamics, and organizational development. Leadership theory and research, including the study of successful leaders in industry. Prerequisite: MGT 301.

362 Management and Labor Relations 3 hrs.
Examination of theory, institutions, and practice of union-management relations. Topics include environmental context of labor relations, the organizing process, the collective
bargaining contract negotiation process, the administration of the collective bargaining contract, union effects on organizations and society, and comparisons of the U.S. labor relations system with labor relations systems in other countries.

363 Human Resource Management 3 hrs.
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.

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

405 New Venture Strategies 3 hrs.
Theory and application of both marketing and management strategies for start-up, operation, and control of new ventures. Role of entrepreneurship in the economy. Prerequisites: MGT 301, MKT 301 and senior standing.

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

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.

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

461 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.

462 Employment Law for Managers 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.

470 Special Topics in Management 3 hrs.
In-depth study of a selected special topic relevant to contemporary management. Different sections of this course may address different topics. Prerequisite: senior standing.

490 Special Projects 3 hrs.
Active involvement in an on-going project in a business enterprise that has particular interest and relevance to the student, or an in-depth investigation of contemporary management problems. Prerequisites: senior standing and approval of department chair.

495 Internship in Management 1, 2, or 3 hrs.
Under the direction of a faculty advisor, experience is gained with an entrepreneur in a small business firm or a manager in a large firm. Prerequisite: Senior standing, approval of the department chair, and subject to the College's guidelines on internships. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.

499 Business Policy 3 hrs.
Strategic decision-making with an emphasis on analyzing complex business situations. Formulation and implementation of business and corporate level strategies with emphasis on defining the mission; setting goals and objectives; analyzing current operating conditions, the
general and industry environment and setting a unified strategic direction. This course should be taken with 12 or fewer semester hours. Prerequisites: Senior standing, EH 300, FIN 301, MGT 301, MKT 301 and completion of 50% of courses in the major.

Management Information Systems (MIS)

Lower Division Courses

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

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

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

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

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

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

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

110 Introduction to the Internet 1 hr.
Introduction to the Internet, the World Wide Web, and e-mail with emphasis on browsing, searching, and remote computer access. Prerequisite: MIS 101. (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. (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. (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. Usage of business software packages such as Windows, word processing, spreadsheets, presentation graphics, and databases. Applications and examples will generally be from administrative areas.

210 Introduction to Computer Programming in Business 3 hrs.
Fundamentals of structured design and programming using a procedural language. Table handling and hierarchical data structure. Prerequisites: MIS 146 or CS 108.

Upper Division Courses (see requirements for upper division standing)

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, 146, MSC 287, ACC 211, 212.

310 Advanced Computer Programming in Business 3 hrs.
Advanced business language 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: CS 102 or 103.

340 Databases 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.

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 310, 340.

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.

416 Supply Chain Management and E-Business 3 hrs.
Development and management of effective supply chain especially in the e-business environment including the cutting-edge tools and techniques of supply chain management, distribution and logistics network analysis, effective inventory control, value of integration, partnering with suppliers and customers to reduce costs and increase service levels. Integration of the supply chain components in a global context are emphasized using emerging information technologies. Prerequisites: MIS 301 and MSC 385.

420 Electronic Commerce 3 hrs.
Explores the benefits, capabilities, and related information technologies that comprise the current state of electronic commerce. Examines how to design and develop and operate electronic commerce transaction processing based applications. Primary emphasis of the course is on web-based e-commerce systems and the associate business models. Prerequisites: MIS 301 or MIS 108 and CM 100, MIS 340.

440 Web Programming and Database Integration 3 hrs.
Explores the use of scripting languages, such as Java Script, Active X controls, and Java Applets in web site development. Examines the use of relational databases to create dynamic web sites. Extensive exposure in lecture and lab to web-based application development tools. Students will develop a full-featured web-based business application that is interactive and requires database integration. Prerequisites: MIS 420.

460 Telecommunications and Networking 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.

465 Web Server and Internet Telecommunications Technology 3 hrs.
Examines the Internet telecommunications technologies required to implement, manage, and maintain an organization's web site. Topics include TCP/IP, IP addressing, subnet masks, routers, configuration and maintenance of web and DNS servers, and security issues. Prerequisites: MIS 301.

470 Management of the Microcomputer Environment 3 hrs.
Examines management issues, such as hardware and operating system selection, associated with operating in a distributed computing business environment. Emphasis is on micro computers using the Intel architecture and their operating systems. The course is designed for end user managers or professionals who need to understand hardware and software and their implications without necessarily wanting to build or maintain microcomputers. Prerequisites: MIS 301.

480 Current Topics in Management Information Systems 3 hrs.
Selected topics in management information systems. Topics will reflect the contemporary issues and current technological advancements which impact the development, implementation and management of effective information systems in organizations. Prerequisites: MIS 301.

490 Special Projects 3 hrs.

College of Administrative Science 102
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.

**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 internships. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.

**497 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 and 340.

**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 497.

**Management Science (MSC)**

**Lower Division Courses**

**287 Business Statistics I**
3 hrs.
Introduction to the concepts of probability and business statistics. Topics include tabular, graphical, and numerical methods for descriptive statistics; measures of central tendency, dispersion, and association for sets of data; probability; discrete and continuous probability distributions; the use of calculus in statistics; sampling and sampling distributions; an introduction to confidence intervals. The solution of problems using spreadsheets is integral and mandatory for this course. Prerequisite: MA 107 and 120 or other Level III mathematics.

**288 Business Statistics II**
3 hrs.
Inferential statistics for business decisions. Topics include: review of sampling distributions and interval estimation; inferences about means, proportions, and variances with one and two populations; goodness of fit tests; analysis of variance and experimental design; linear regression analysis. Prerequisite: MSC 287.

**Upper Division Courses (see requirements for upper division standing)**

**385 Production/Operations Management**
3 hrs.
Survey of the concepts, processes, and institutions involved with the production function of a firm and of the basic quantitative tools used to solve production problems. Topics include quality management, learning curves, assembly lines, linear programming, waiting lines, inventory, and others selected from operations scheduling, project management, facilities location, layout, supply chain management. Prerequisites: MSC 287 and 288.

**470 Special Topics in Management Science**
3 hrs.
In depth study of a selected topic relevant to contemporary management science. Different sections of this course may address different topics.

**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 internships. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.

**Marketing (MKT)**

**Upper Division Courses (see requirements for upper division standing)**

**301 Principles of Marketing**
3 hrs.
Integration and study of functional commodity, and institutional approaches from view point of consumer and marketing manager. Prerequisite: junior standing.

**315 Sales Management and Professional Selling**
3 hrs.
Integration of techniques and concepts of professional selling with problems of sales management. Objectives and policies for sales managers concerning managing sales force and methods of marketing analysis in terms of sales forecasts and budgeting. Problems faced by sales management in competition, pricing, and promotion. Prerequisite: MKT 301.

316 Retailing Policy and Management 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.

325 Legal and Ethical Issues of Marketing on the Internet 3 hrs.
Discussion of legal issues and ethical issues associated with e-commerce and business uses of the internet. Topics include privacy issues, security, intellectual property, and internet content licensing.

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 socio-cultural actions and reactions as they relate to better understanding of consumption. Prerequisite: MKT 301.

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.

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.

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, MKT 301, 343.

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.

400 Strategic Issues in Logistics 3 hrs.
The course introduces students to practical logistical challenges and planning issues that are important in reconciling and rationalizing both strategic and tactical problems. Prerequisites: MKT 301 and senior standing.

405 New Venture Strategies 3 hrs.
Theory and application of both marketing and management strategies for start up, operation and control of new ventures. The course also discusses the role of entrepreneurship in the economy. Prerequisites: MGT 301, MKT 301, and senior standing.

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.

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.

420 Services Marketing 3 hrs.
The course focuses on the unique challenges of managing services and delivering quality service to customers. The course is equally applicable to organizations whose core product is services (e.g., banks, hospitals, aerospace and defense firms, non-profit organizations) and to organizations that depend on service excellence and services for competitive advantage (high technology firms, industrial products). Prerequisite: MKT 301.

470 Marketing in an Electronic Environment 3 hrs.
This course focuses on the strategic implications of electronic commerce for both the consumer and business-to-business marketplace. Through a combination of lecture, readings, and application exercises the impact of the Internet and related technological developments are explored in relation to their effect on the firm’s marketing activities. Topics for discussion include: advertising and selling on the Internet, the use of web sites to provide service and support to customers, supply chain management in the digital world, and data mining. Prerequisite: MKT 301.

475 Advanced Marketing Seminar
3 hrs.
Investigation of advanced marketing topics that are relevant to contemporary marketing practices. The course will focus on current issues related to marketing in a high technology environment, relationship marketing, channel design and strategy, transportation, and logistics. Prerequisites: MKT 301 and senior standing.

480 Marketing Management
3 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, MKT 332, 343.

490 Special Projects
1, 2, or 3 hrs.
Independent study in an area of interest to the student in the field of marketing. Prerequisite: senior standing and approval of the department chair.

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

496 Internship in E-Business
1, 2, or 3 hrs.
Active involvement in an e-business project in a business enterprise, professional organization, or in a government agency that is of particular interest and relevance to the student. Prerequisites: Senior standing, approval of the department chair, and subject to the college’s guidelines on internships. Course grade will be given on a satisfactory (S)/unsatisfactory (U) basis.
Mission
The mission of the College of Engineering at The University of Alabama in Huntsville is to provide students with a quality educational experience that includes engineering theory, design, experimentation and application. The College is dedicated to achieving national and international recognition for excellence in engineering education, research and service.

Background
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 UAH 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, the Army Aviation and Missile Command, and much of Alabama’s fastest growing technological industry gives the College of Engineering a special character that leads to outstanding educational opportunities for its students. This special setting, combined with a high quality faculty, affords maximum growth potential for those desiring to pursue a career in engineering. The College of Engineering is strongly committed to the advising of both undergraduate and graduate engineering students.

Laboratory fees have been eliminated from engineering courses. An equipment fee (presently $21 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.

Accreditation
The chemical engineering, civil engineering, computer engineering, electrical engineering, industrial and systems engineering, mechanical engineering, and optical engineering options, together with the aerospace engineering option in mechanical engineering, are accredited by ABET, Inc. The degree awarded is the Bachelor of Science in Engineering (B.S.E.).

Engineering Student Affairs
The College of Engineering provides freshman, sophomore, and transfer students with academic counseling through the Engineering Student Affairs (ESA) Office located in EB 157. The ESA is the engineering student source for all advising and registration guidance until achieving the junior academic status in engineering curriculum hours earned. At this point, the student (and the respective ESA student record) is transferred to the appropriate engineering program for advising, monitoring, and mentoring purposes. The ESA Office maintains a web page of advising information for all UAH engineering students. This page may be accessed through the College of Engineering web page.
A file is maintained in ESA for each engineering student that is classified as a freshman or a sophomore. Each file contains a Program Check Sheet that identifies all academic courses required for the BSE degree in the chosen option. The Check Sheet is utilized for recording student progress toward the degree. A Flowchart of all courses (including prerequisites) required for the degree is also available to assist in student advisement. Academic files are also maintained and include records of grade changes, petition outcomes, copy of disciplinary actions, approved course substitutions, etc. The engineering undergraduate transcripts, together with supporting material, provide evidence that the advising and transfer processes and procedures are working.

Degrees and Programs
The College of Engineering offers the Bachelor of Science in Engineering degree with options in: aerospace engineering – an option in mechanical engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, industrial and systems engineering, mechanical engineering, and optical engineering. The undergraduate engineering programs are built around a core consisting of courses in mathematics, the physical sciences, humanities, and engineering. Students then take additional engineering courses in the areas of their specializations. The net result is that at UAH, engineering students first develop breadth in important fundamental areas and then depth in their particular field of specialization. This provides an added dimension to UAH engineering graduates that enhances their professional performance. The UAH engineering student is also able to obtain "real world" engineering experience through the Cooperative Education Program or by part-time employment with the many governmental and industrial employers in Huntsville.

Graduate degrees offered include: the Master of Science in Engineering, Master of Science in Operations Research, Master of Science in Software Engineering, 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.

Dual Degree Agreement
The University of Alabama in Huntsville College of Engineering has a dual degree agreement with Oakwood College in Huntsville. Under this agreement a student spends approximately three years at Oakwood College and approximately two years at UAH. Upon completion of all requirements, the student will be awarded the Bachelor of Science in Engineering degree from UAH in one of the following areas: aerospace engineering option in mechanical engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, industrial and systems engineering, mechanical engineering, or optical engineering. The student will also receive the Bachelor of Science in Applied Mathematics degree from Oakwood College. Students wishing to pursue a degree under this agreement should contact the Mathematics and Computer Science Department at Oakwood College.

Minors and Clusters
Engineering students wishing to obtain a minor in addition to their engineering major may do so in any program that provides the courses for a minor. Information on minors can be obtained from the respective program providing the minor.

Non-engineering students who wish to obtain an engineering cluster may do so in the following areas: circuits/digital electronics, electrical systems, music technology, mechanical engineering, and industrial and systems engineering. Information on engineering clusters can be obtained from the non-engineering student’s advisor.
Course Numbers
Course numbers are coded for engineering by prefixes as follows:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course</th>
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<tbody>
<tr>
<td>Aerospace Engineering in Mechanical Engineering</td>
<td>MAE</td>
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<tr>
<td>Chemical Engineering</td>
<td>CHE</td>
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<tr>
<td>Civil Engineering</td>
<td>CE</td>
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<td>Computer Engineering</td>
<td>CPE</td>
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<tr>
<td>Electrical Engineering</td>
<td>EE</td>
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<tr>
<td>Industrial and Systems Engineering</td>
<td>ISE</td>
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<tr>
<td>Mechanical Engineering</td>
<td>MAE</td>
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<tr>
<td>Optical Engineering</td>
<td>OPE</td>
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Bachelor of Science in Engineering Degree Program
The engineering program has as its primary objective the preparation of qualified students for careers in any one of many engineering disciplines, for research, and for advanced studies. It stresses a broad education in mathematics, physical sciences, humanities, social sciences, engineering science, and engineering design and synthesis.

The College of Engineering achieves this objective by offering a unified program of undergraduate engineering studies that serves as a foundation for creative participation in most areas of engineering, especially those associated with new evolving technologies. All engineering students follow a 12-hour core engineering curriculum with specialization in aerospace engineering in mechanical engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, industrial and systems engineering, optical engineering, or mechanical engineering.

Admissions Criteria
First year and transfer students admitted to the University of Alabama in Huntsville without any stipulations (i.e., pending, probation, etc.) are admissible directly into the College of Engineering. Students admitted with stipulations can be admitted after they have completed 12 semester hours (including a calculus course) at UAH and have a cumulative GPA of 2.0 or better. Credit for engineering courses taken in schools with ABET accredited programs is transferable to UAH. Credit for engineering courses taken at an institution that is in the process of becoming ABET accredited will be determined on a course-by-course basis. Engineering courses taken in non-ABET accredited programs may also be applied to a B.S.E. degree based on an appropriate examination (written or oral) at the discretion of the responsible department. All inquiries concerning applicability of credit should be made to the Associate Dean of 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.

Advising
The regular advising process involves several steps and ensures that the students meet the University, College, and Program requirements for graduation in pursuit of a degree in engineering. 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. A student then receives guidance from a Program advisor on matters pertaining to course selection, career opportunities, graduate studies, scholarship availability, etc. Each student is expected to meet with an advisor each semester at registration time for approval of courses for the next semester. Freshmen are required to meet with their advisor three times during the freshman year as part of the engineering student retention program.

At the initial advising session for a transfer student, the advisor ascertains from the student's records the eligibility of the student to pursue course work in the specified option. Then the advisor prepares a Transfer Credit Evaluation and initiates a course check sheet that reflects all courses and credit transferred. The advisor ensures that the student fully understands what courses
have been transferred and what courses have not been transferred. A copy of the Transfer Credit Evaluation and the check sheet is provided to the student for their records.

Prerequisites
The College of Engineering requires, after matriculation, that a grade of C or better be earned in each course that serves as a prerequisite to any course applied toward completing B.S.E. degree requirements. If a grade of less than C is received in a course taken at UAH which is a prerequisite course, the course must be repeated and a grade of C or better earned BEFORE a student enrolls in the subsequent course.

Probation and Dismissal
In order to remain in good academic standing in the College of Engineering, an undergraduate engineering student must maintain an average of 2.0 (C) or better on all work attempted at UAH. At any point that an engineering student's cumulative grade point average at UAH falls below 2.0 (C) the student will be placed on probationary status in the College of Engineering by the University. A beginning student will be reviewed for the first time at the end of the semester in which he or she has attempted at least 12 semester hours of work (or accumulated for part-time students). Once a student is placed on probationary status in the College of Engineering, such a student is reviewed in intervals of a minimum of 12 semester hours of work attempted or accumulated. At such review points, three actions are possible:

1. If the cumulative GPA is 2.0 or greater on all work attempted at UAH, the student is removed from probationary status.
2. If the cumulative GPA is less than 2.0 on all work attempted at UAH, but the GPA on the block of work being reviewed is 2.0 or higher, the student is continued on College of Engineering probation.
3. If the cumulative GPA is less than 2.0 on all work attempted at UAH and the GPA on the block of work being reviewed is less than 2.0, the student is suspended from the College of Engineering.

All students suspended from the College of Engineering must petition the College of Engineering Readmission Committee through the Engineering Student Affairs Office to be readmitted to the College. Students suspended from the College are not permitted to enroll in engineering courses without specific advance written permission from the Associate Dean of Student Affairs.

Any student who wants to take an engineering course and who is not in the College of Engineering must obtain prior approval from the College of Engineering either through a program of study which requires the course, through a cluster which lists the course, or by special permission (e.g., for transient students).

Any student admitted to the College of Engineering who is subsequently suspended from the University must, upon readmission to the University, reapply for admission to the College of Engineering.

All students must attain a C or better average in all engineering courses in the selected engineering option in order to graduate. Applications for graduation must be filled out at the Office of Student Records at least one semester prior to graduation.

Alabama Articulation Agreement
The College of Engineering is a strong participant in the Alabama Articulation Agreement and has strong ties to Calhoun Community College, the largest Community College in the State of Alabama. Calhoun has campuses in Huntsville and Decatur, and on Redstone Arsenal. The ties with Calhoun Community College have been developed over the past three decades with the first ever student transfer agreement between UAH and a community college occurring in the 1970's.

The articulation requirements for engineering programs throughout the State of Alabama are summarized in the material that appears on the website entitled stars.troy.edu.
General Engineering (ENG) Course Description

ENG 100 Introduction to Engineering

1 hr.

Introduction to a variety of engineering disciplines. Included are lectures, laboratory experiments, and hands on activities in civil engineering, chemical engineering, electrical engineering, computer engineering, optical engineering, industrial engineering, mechanical engineering, or aerospace engineering. Open only to students enrolled in the UAH Engineering Summer Camp. Prerequisite: Admission to the UAH Engineering Summer Camp.

Engineering BSE Course Requirements

Students must successfully complete courses in each of five categories. The normally required courses are shown; however, the Dean of Engineering may approve other courses which also meet ABET guidelines. Please note that the pass-fail grading option is not available to engineering students for any chemistry, computer science, engineering, mathematics, or physics courses required for the B.S.E. degree.

Semester Hours

1. Engineering core.......................... 12 hrs
   This requirement of 12 semester hours is met by completion of one course from each of four of the following eight areas as identified by the program faculty and shown in each individual engineering program section of this catalog: Digital Systems, Electrical Science, Engineering Economy, Information Sciences, Materials Science, Mechanics, Systems Analysis, or Thermal Sciences.

2. General Education Requirements......... 24 hrs
   The Alabama Articulation and General Studies Committee identified a statewide freshman and sophomore level general studies curriculum to be taken at all public colleges and universities. Students preparing to complete the B.S.E. degree must demonstrate in-depth study in a particular discipline of the humanities and fine arts or history, social, and behavioral sciences through completion of 6 semester hours in a particular discipline. The requirements for all UAH undergraduate engineering students are the following:

   Written Composition (6 hrs)
   Required: EH101 Freshman Composition
             EH102 Freshman Composition

   Humanities and Fine Arts (9 hrs)
   Required: PHL202 Introduction to Ethics
             Choose one of the following:
             ARH100 Art History Survey: Ancient to Medieval (Art)
             ARH101 Art History Survey: Renaissance to Modern (Art)
             CM122 Theater Appreciation (Art)
             MU100 Introduction to Music Literature (Art)
             Choose one of the following:
             EH205 Survey of English Literature
             EH206 Survey of English Literature
             EH230 Survey of American Literature
             EH240 World Literature I
             EH241 World Literature II

   History, Social, and Behavioral Sciences (9 hrs)
   Required: A 6 semester hour sequence in one the following disciplines (ECN, GY, HY, PSC, PY, or SOC). If the 6 semester hour sequence is not in History, the remaining 3 hours must be in History.
Choose from the following:

ECN142 Principles of Macroeconomics
ECN143 Principles of Microeconomics
GS 200 Global Systems and Cultures
GY 105 World Regional Geography
GY 110 Principles of Human Geography
HY101 Western Civilization Origins and Development of the Contemporary World, Part I
HY102 Western Civilization Origins and Development of the Contemporary World, Part II
HY103 World History to 1500
HY104 World History from 1500
PSC101 American Government
PSC102 Comparative Politics and Foreign Governments
PY101 General Psychology I
PY201 Life-Span Development
SOC100 Introduction to Sociology
SOC200 Introduction to Anthropology
WS200 Introduction to Women’s Studies

3. Mathematics 18(15)
   Calculus and Analytic Geometry - MA171, 172, 201 .......... 12
   Linear Algebra - MA244 (Except Chemical Engineering) .... 3
   Differential Equations – MA 238 ................................ 3

4. Basic Sciences .............................................12
   General Physics - PH 111, 114, 112, 115 ................... 8
   Chemistry - CH 121, 125 ................................... 4

Additional science courses may be listed under each option.

5. Engineering options
   Students are required to take one of the following options:
     Aerospace Engineering Option in Mechanical Engineering
     Chemical Engineering
     Civil Engineering
     Computer Engineering
     Electrical Engineering
     Industrial and Systems Engineering
     Mechanical Engineering
     Optical Engineering

Each of these options is described under the portion of the catalog devoted to the respective programs.

**CHEMICAL AND MATERIALS ENGINEERING**

130 Engineering Building
Telephone: (256) 824-6810
Email: che@uah.edu

Degree: Bachelor of Science in Engineering

Professors Cerro (Chair), Chen, Chittur, Smith; Associate Professors Banish, Weimer; Assistant Professor Taconi.

Chemical engineering deals with any situation in which changes in the chemical composition or the physical state of matter (or both) are involved and, hence, finds unusually wide application. Heat and mass transfer, fluid mechanics, thermodynamics, chemical reaction kinetics, and process control constitute the heart of chemical engineering. Chemical engineers work in many diverse fields ranging from production of many basic chemical products required by today’s industrial society to research on major technical and social problems, including energy resources development, space applications, pollution control, and biotechnology.
Mission
The Department of Chemical and Materials Engineering is dedicated to developing and maintaining undergraduate and graduate programs that educate students in the safe control and manipulation of matter in industrially important chemical and materials systems. The faculty will continue to educate students and maintain its programs by providing intellectual leadership, innovative teaching, university and community service, while conducting internationally recognized research. Undergraduate and graduate programs within the department are continuously refined based on national standards and are designed to encourage interdisciplinary education. Research objectives focus on technology important to the further development of the university, the community, the state of Alabama, and the nation.

Program Educational Objectives
The objectives of the chemical engineering program are to prepare graduates to be successful in their professional careers and to provide them with the skills needed to contribute to the economic advancement of firm, region, state, and nation and are achieved by:

1. Gaining a basic core competence in the fundamentals of engineering to be able to identify problems or areas for process and/or product improvement, analyze alternatives, properly communicate, and efficiently implement changes and improvements.
2. Understanding economic impacts, deadlines, and commitments while respecting ethical, environmental, health, and safety issues.
3. Recognizing that a lifetime of learning is essential for continuous improvement and a requisite for a successful engineer.

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>Additional Basic Sciences</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry-CH 123, 126, 331, 335, 332, 341</td>
<td>14</td>
</tr>
<tr>
<td>Biology – BYS 201</td>
<td>3</td>
</tr>
<tr>
<td>Advanced science electives from approved area</td>
<td>7</td>
</tr>
</tbody>
</table>

Engineering Core for Chemical Engineering

- CHE 197-Computer Methods for Chemical Engineers
- CHE 244 – Introduction to CHE Systems
- MAE /CHE 294 Nature & Properties of Materials
- CHE 344 - Chemical Engineering
- Thermodynamics

Chemical Engineering Option (excluding Engineering Core):

- EE 213 – Electrical Circuit Analysis
- MAE/CE 271- Statics
- CHE 295-Nature and Properties of Materials Laboratory
- ISE 321 – Engineering Economy
- CHE 347-Quant. Modeling for Chemical Engineers
- CHE 352-Fluid Mechanics I
- CHE 439- Unit Operations Laboratory I
- CHE 440-Unit Operations Laboratory II
- CHE 441-Chemical Kinetics and Reactor Design
- CHE 442-Introduction to Heat and Mass Transfer
- CHE 443-Mass Transfer Operations
- CHE 445-Chemical Process Control
- CHE 446-Anal. & Design of Transport Equip
- MAE 448-Chemical Engineering Design
- Advanced engineering electives from approved area.
Suggested Schedule of Courses for Full-time Chemical Engineering Student

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td><strong>CHE 197</strong> 3</td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td><strong>Spring</strong></td>
</tr>
<tr>
<td>3</td>
<td>CH 121 3</td>
</tr>
<tr>
<td>1</td>
<td>CH 125 4</td>
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<tr>
<td>4</td>
<td>MA171 1</td>
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<tr>
<td>3</td>
<td>CHE 197 4</td>
</tr>
<tr>
<td>5</td>
<td>HU/SS* 1</td>
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<tr>
<td>6</td>
<td>EH 101 3</td>
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<tr>
<td>5</td>
<td>CH 126 3</td>
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<td>MA172 3</td>
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<td>PH 111 1</td>
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<td>6</td>
<td>15</td>
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<tr>
<td>6</td>
<td>32</td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td><strong>Second Year</strong></td>
</tr>
<tr>
<td>3</td>
<td>CH 331 3</td>
</tr>
<tr>
<td>1</td>
<td>CH 335 1</td>
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<td>3</td>
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<tr>
<td>3</td>
<td>36</td>
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<tr>
<td><strong>Third Year</strong></td>
<td><strong>Third Year</strong></td>
</tr>
<tr>
<td>3</td>
<td>CH 341 3</td>
</tr>
<tr>
<td>3</td>
<td>CHE 294 3</td>
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<td>1</td>
<td>CHE 295 3</td>
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<td>Sci Elect** 3</td>
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<td>Sci Lab 3</td>
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<tr>
<td>3</td>
<td>16</td>
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<td>3</td>
<td>32</td>
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<tr>
<td><strong>Fourth Year</strong></td>
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<tr>
<td>4</td>
<td>CHE 442 4</td>
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<tr>
<td>3</td>
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<td>Engr Elect*** 3</td>
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<td>CHE 446 3</td>
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<td>2</td>
<td>CHE 439 3</td>
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<td>3</td>
<td>14</td>
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<tr>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td><strong>Total Hrs.</strong></td>
<td>132</td>
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</table>

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

**Sci Elec-Minimum of 7 hours from an approved area of concentration with courses 300-level or above.**

Approved areas of concentration currently include physical chemistry, biochemistry, polymer chemistry, and biophysical chemistry.

**Advanced engineering electives minimum of 6 hours of a 300-level or above course. The advanced engineering electives plus the 7 hours of advanced science electives are used to create two alternative sequences with a total of 13 credit hours each. These courses are necessary to develop depth in materials engineering and biotechnology.**

Undergraduate Chemical Engineering (CHE) Courses

**197 Computer Methods for Chemical Engineering**

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: Co-requisite MA112 or placement in MA113 or higher.

**244 Introduction to Chemical Engineering Systems**

Introduction to basic analysis of chemical engineering systems, emphasizing material balances on...
physical and chemical process systems. Analysis includes single-component and multi-component systems, single-phase and multi-phase systems, single unit operations and complete flow sheet systems. Prerequisites: PH 111, CH 123, CHE 197.

Introduction to the fundamental nature (chemistry and structure), and properties of materials, including metals, polymers, ceramics, and semiconductors. Bonding, composition, and phase diagrams, as well as the nano- and micro-structure of materials will be highlighted. How the nature and properties of materials are characterized or tested will be discussed. Composite materials and aspects of materials processing, including diffusion, nucleation, and transformation diagrams, will also be presented. Companion laboratory is CHE 295, to be taken concurrently with or after CHE/MAE 294. Prerequisites: CH 121, PH 111. (Same as MAE 294.)

295 Nature and Properties of Materials Laboratory 1 hr.
Typical experiments include characterizing structure, using x-ray diffraction and microscopy, testing mechanical properties using tensile and creep tests, and mapping phase diagram boundaries using cooling curves. Emphasis is placed on proper numerical and statistical analysis of the data. Written reports are required, and elements of materials design are presented. Prerequisite: CHE 294 or parallel.

344 Chemical Engineering Thermodynamics 3 hrs.
Thermodynamics of phase equilibria, chemical reactions and thermodynamic analysis of chemical processes, with emphasis on topics of special interest to chemical engineers. Prerequisites: CHE 244 and CH 341.

347 Quantitative Modeling for Chemical Engineers 3 hrs.
Modeling and analysis of physical phenomena that arise in chemical engineering and an introduction to computer-aided design. Prerequisites: CHE 197, 244, and MA 238

352 Fluid Mechanics I 3 hrs.
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: CPE 112 or CHE 197, MAE/CE 271, and MA 238. (Same as MAE 310.)

439 Unit Operations Laboratory I 2 hrs.
Experimental studies covering fluid mechanics and heat transfer in unit operations. Specific applications of standard laboratory practices, probability, and statistical data analysis. Emphasis placed on written and oral laboratory report presentation techniques. Prerequisite or parallel: CHE 441, 443, and 446.

440 Unit Operations Laboratory II 2 hrs.
Experimental studies covering reaction kinetics, mass separation, biotechnology, and special material properties. Specific applications of standard laboratory practices, probability, and statistical data analysis. Ethical issues in real situations taken from professional practice. Emphasis placed on written and oral laboratory report presentation techniques. Prerequisites: CHE 439, 441 and 443.

441 Chemical Kinetics and Reactor Design 3 hrs.
Fundamental principles of chemical kinetics and chemical reactor engineering along with the design of both thermal and catalytic reactors. Prerequisites: CHE 344, 347. (Same as CHE 541.)

442 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 and CHE 347. (Same as MAE 450.)

443 Mass Transfer Operations 4 hrs.
Theory of mass transfer phenomena, with applications to both stage-wise and diffusion controlled distillation, gas absorption/desorption, humidification, and extraction processes. Prerequisites: CHE 344, 352. Parallel CHE 442.

445 Chemical Process Control 3 hrs.
Fundamental principles of chemical process control; control system design for chemical processes. Prerequisites: CHE 347 and 441, MA 238.

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, Prerequisite or parallel: CHE 442 and 443.
448 Chemical Engineering Design
Individual design of chemical engineering components, concluding with an overall team design effort, using modern computer-aided design techniques. Overall design requires a preliminary design, simulation, and economic evaluation of a chemical production flow sheet. Ethical issues in real situations taken from professional practice will be examined. This capstone design course requires a written report detailing a preliminary plant design, requiring students to show evidence of organization, research, and presentation. Prerequisites: CHE 441, 443, 446, and parallel CHE 445.

449 Introduction to Environmental Engineering
Engineering aspects of air, water, and thermal pollution. Hydrologic cycle, water sources and uses; industrial and other sources of primary and secondary pollutants. Transport process in environmental problems and in their control. Prerequisite: CH 123 and 126, MAE 341, and parallel MAE 310/CHE 352. (Same as CHE 549, CE 449/549.)

450 Environmental Control
Engineering design and synthesis of environmental control systems. Control of multiphase systems with application to air and water pollution control. Prerequisite: MAE 310/CHE 442. (Same as CHE 550.)

459 Selected Topics in Chemical Engineering
460 Introduction to Bioprocess Engineering
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 362 and 363. (Same as CHE 560.)

461 Bioseparations
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 362, 363, and CHE 460. (Same as CHE 561)

494 Applied Materials Engineering
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, and either CH 342 or 348. (Same as CHE 594.)

495 Polymer Engineering
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: CH 341, 440. (Same as CHE 595.)

CIVIL AND ENVIRONMENTAL ENGINEERING
S201 Technology Hall
Telephone: (256) 824-6854
Email: cee@uah.edu

Degree: Bachelor of Science in Engineering

Professors Cruise (Chair), Toutanji; Associate Professors Anderson, Leonard; Assistant Professor Schwarz.

Civil engineers are involved in many aspects of modern life, such as structural engineering, transportation planning, environmental systems, and geotechnical analysis. The modern civil engineer uses traditional design and analysis methods as well as advanced experimental and computational techniques. At the University of Alabama in Huntsville, students are exposed to all of these areas of civil engineering and introduced to techniques that will make them competent practicing professional engineers. The Bachelor of Science in Engineering degree from the Civil and Environmental Engineering Department at UAH can be obtained by completing either a broad civil engineering curriculum or by specializing in structural, transportation, or environmental engineering.
engineering. The civil engineering curriculum consists of general engineering classes (required of all engineering students), the civil engineering core, and the civil engineering concentration selected.

The undergraduate structural engineering stem at UAH provides students with a strong background in many aspects of structural analysis, foundations, reinforced concrete, and advanced structural design. The student may take additional courses in such areas as advanced concrete design, advanced cementitious and composite materials, experimental mechanics, and finite element methods.

The undergraduate environmental engineering concentration provides an education necessary for many aspects of environmental management and remediation. Within the framework of the program, students will be introduced to many topics, including water quality, atmospheric pollution, environmental systems, and environmental sampling.

The transportation engineering concentration provides students with the skills necessary to tackle tomorrow's data and transportation issues. Students are introduced to various topics, including transportation modeling and simulation, application of GIS to transportation issues, use of traffic crash data, and urban transportation planning.

Mission
The mission of the Department of Civil and Environmental Engineering is to provide a high quality civil and environmental engineering education that instills in our students the fundamental knowledge, analytical skills, and practical abilities necessary to prepare them to be leaders in their profession. Through excellence in teaching, research, and service, the Department promotes opportunities for the intellectual, personal, and professional growth of our students, faculty, and alumni, while providing graduates who are prepared to support the diverse needs of Huntsville, the State of Alabama, the region, our nation, and the international community.

Program Educational Objectives
The objectives of the Civil and Environmental Engineering Program are to:
1. Produce graduates who successfully obtain professional positions requiring a strong understanding in the traditional knowledge and skills of the civil engineering profession.
2. Produce graduates who are prepared for their field of specialty and successful in future employment and academic opportunities.
3. Provide our graduates with the environment that facilitates professional, intellectual, and leadership skills necessary to lead a productive life and contribute to the economic advancement and quality of life of the region, state, and nation.

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>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry - CH 123, 126</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Engineering Core for Civil Engineering</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAE/CE 271 Statics</td>
<td>3</td>
</tr>
<tr>
<td>EE 213 Electrical Circuit Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>ISE 321 Engineering Economy</td>
<td>3</td>
</tr>
<tr>
<td>MAE 310 Fluid Mechanics I</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Civil Engineering Option (excluding Engineering Core):</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 101 - Prelude to Civil Engineering</td>
<td>1</td>
</tr>
<tr>
<td>CPE 112 - Computer Methods in Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MAE 110 - Introduction to Engineering</td>
<td></td>
</tr>
<tr>
<td>Computer Aided Design</td>
<td>2</td>
</tr>
<tr>
<td>CE 272 - Dynamics</td>
<td>3</td>
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<tr>
<td>CE 284 - Surveying</td>
<td>2</td>
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</tbody>
</table>
MAE 310 – Fluid Mechanics 1
CE 321 - Transportation Engineering Design 3
MAE 341 - Thermodynamics I 3
CE 370 - Mechanics of Materials 3
CE 381 - Structural Analysis I 3
CE 372 - Soil Mechanics 3
CE 373 - Soil Mechanics Laboratory 1
ISE 390 - Probability and Engineering Statistics I 3
CE 422 – Traffic Engineering Design 3
CE 441 - Hydraulic Engineering Design 3
CE 449 - Intro. to Environmental Engineering 3
CE 480 – Civil Engineering Materials 3
CE 483 – Reinforced Concrete Design 3
CE 485 - Foundation Engineering 3
CE 498 - Civil Engineering Design I 1
CE 499 - Civil Engineering Design II 2

Civil Engineering Concentration

Structural Engineering Concentration:
- CE 481 - Structural Analysis II 3
- CE 473 – Earth Structures or
- CE 487 – Bridge Design 3
- CE 484 - Structural Steel Design 3

Environmental Engineering Concentration
- CE 456 - Water Quality Control Processes 3
- CE 457 - Hydrology 3
- CE 458 - Environmental Engineering Design 3

Transportation Engineering Concentration
- CE 384 – Advanced Surveying 3
- CE 411 – Introduction to GIS 3
- CE 420 – Urban Transportation Planning 3

General Civil Engineering:
Choose 12 hours from CE 420, 454, 455, 456, 457, 458, 473, 481, 484, 487 subject to satisfactory completion of prerequisite requirements.

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.

Suggested Schedule of Courses for Full-time Civil Engineering Students

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
</tr>
<tr>
<td>MA 171</td>
<td>MA 172</td>
</tr>
<tr>
<td>CH 121/125</td>
<td>CH 123/126</td>
</tr>
<tr>
<td>CPE 112</td>
<td>PH 111/114</td>
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<tr>
<td>CE 101</td>
<td>EH 102</td>
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### Third Year

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### Fourth Year

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</table>

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

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**Undergraduate Civil Engineering Courses (CE)**

### 101 Prelude to Civil Engineering

1 hr.

Primer in the practice of civil engineering and engineering design concepts. Includes history and seminars on different branches of civil engineering by faculty and professionals. Exercises in planning and design of a team project. Students will be required to write a short design proposal and present their results. Prerequisites: CE major or consent of instructor.

### 271 Statics

3 hrs.

Topics include: forces, resultant forces, moments, couples equivalent force systems, equilibrium, distributed loads, two force members, trusses, centroids, moments of inertia, shear and bending moment diagrams, static and kinematic friction. Prerequisites: PH 111, parallel MA201. (Same as MAE 271.)

### 272 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: CPE 112, MAE/CE 271. (Same as MAE 272.)

### 284 Surveying

2 hrs.

Basic theory and practical field methods for engineering applications. Measurements and errors in surveying. Leveling, traversing, stadia, topographic surveys, mapping, and circular curves. 1.5 hour lecture and 2 hour lab. Prerequisite or parallel: CE101, MAE 110 or consent of instructor/advisor.

### 321 Transportation Engineering and Design

3 hrs.

Theory, design, and operation of various modes of transportation with emphasis on traffic flow. Prerequisite: CE 284, MA 171.

### 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: CPE 112, MAE/CE 271. (Same as MAE 370.)

### 372 Soil Mechanics

3 hrs.

Index properties and characteristics of soils. Compaction shear, compressibility and permeability. Application to analysis and design of foundation elements. Laboratory included. Prerequisite: CE 370; parallel MAE 310/CHE 352.

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College of Engineering
373 Soil Mechanics Lab  1 hr.

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: CE 271, CPE 112, and MA 238.

380 Engineering Design Project  1-3 hrs.
Individualized design project under supervision of instructor. Prerequisite: Junior standing.

381 Structural Analysis I  3 hrs.
Reactions, shears, moments in determinate structures. Influence lines, energy methods in computing deformations. Introduction to indeterminate structures. Prerequisites: CE 272, 370.

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

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.)

420 Urban Transportation Planning  3 hrs.
Planning of highway systems and terminals as part of a complete planning approach; public transportation system planning; transportation planning studies, projection analysis, plan formulation, and programming. Prerequisite: CE 321. (Same as CE 520.)

422 Traffic Engineering Design  3 hrs.
Driver, pedestrian and vehicle characteristics. Principles of traffic flow for improved highway traffic service and safety. Design freeways, rural roads, urban streets, traffic signals, signs, channelization, and other traffic control measures. Prerequisite: CE 321. (Same as CE 522.)

441 Hydraulic Engineering Design  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. Prerequisite: MAE 310/CHE 352.

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: CH 123, 126, MAE 341 and parallel MAE 310/CHE 352. (Same as CE 549 and CHE 449/549.)

454 Solid and Hazardous Waste Management  3 hrs.
Waste characterization, minimization, collection, treatment, transport, and disposal. Landfill design and incineration options. Leachate characteristics and potential groundwater contamination. Prerequisite: CE 449/549. (Same as CE 554.)

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 stream-flow with frequency analysis, flood routing, and unit hydrograph theory. Prerequisite: CHE 352/MAE 310. (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 or parallel: CE 449. (Same as CE 558.)

459 Selected Topics in Civil Engineering 1-3 hrs.
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.)

471 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 571.)

472 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 572.)

473 Earth Structures Engineering 3 hrs.
Principles of earth structure design. Theories of earth pressures and the design of retaining wall systems including gravity, cantilever, mechanically stabilized earth, flexible sheet pile, and anchored wall systems. Methods of stability analyses for retaining walls, earth slopes, and embankment design. Prerequisites: CE 372, CE 373. (Same as CE 573.)

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: 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: 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: CE 362, 370. (Same as CE 578 and MAE 478/578.)

480 Civil Engineering Materials 2 hrs.
A study of the performance properties and selection criteria of various materials used in the practice of civil engineering. These include aggregates, Portland cement, concrete, bituminous materials, and timber. Emphasis will be placed on standard methods of testing and characterization. Includes a three hour weekly lab. Prerequisite: CE 370, 372, 373. (Same as CE 580.)

483 Reinforced Concrete Design 3 hrs.
Theory and practice of reinforced concrete design. Theory and design of high strength concrete mixtures. Design of reinforced concrete beams, slabs, and columns using the ultimate strength design code of the American Concrete Institute. Prerequisite: CE 381.

484 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 381. (Same as CE 584.)

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 483. (Same as CE 585.)

486 Advanced Cementitious and Composite Materials 3 hrs.
Concrete structures, rheology, mechanical properties, environmental durability, dimensional stability, advanced concrete technologies (such as high strength, fiber reinforced, and fracture mechanics), advanced fiber polymer composites, and repair/rehabilitation of concrete structures.

College of Engineering
Prerequisites: CE 381. (Same as CE 586.)

487 Bridge Design
3 hrs.
Bridge loads, load distribution, composite beam bridges, bridge bearings, reinforced and prestressed concrete slab and T-beam bridges, bridge evaluations and ratings, and upgrade methodology. Prerequisites: CE 483. (Same as CE 583.)

498 Civil Engineering Design I
1 hr.
Planning and analysis of a conceptual civil engineering design project. Includes computer aided design (CAD), structural analysis and design software, cost estimation, environmental impacts, and ethical considerations. Part 1 of a 2-part course. Prerequisites: CE 381, ISE 321, Senior standing.

499 Civil Engineering Design II
2 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: CE 498.

ELECTRICAL AND COMPUTER ENGINEERING
272 Engineering Building
Telephone: (256) 824-6316
Email: eceinfo@ece.uah.edu

Degree: Bachelor of Science in Engineering

Distinguished Professor Johnson; Professors Adhami (Chair), Aunon, Fork, Ho, Jarem, Kulick, Lindquist, Nordin, Poularikas, Shen, Sh Tessel, Singh, Stensby, Wells; Professor Emeritus Audeh. Associate Professors Boykin, Gaede, Joiner, Jovanov, Yoo; Assistant Professors Coe, English, Milenkovic, Pan; Lecturer Bowman, Corsetti; Adjunct Professors Berinato, Budge, Moore, Schneider.

Mission
The mission of the Electrical and Computer Engineering Department is to develop and maintain high quality undergraduate and graduate programs in electrical, computer, and optical engineering to meet the needs of its constituents, and to participate in scholarly and productive research that contributes to the economic well being and quality of life for the residents of Huntsville, the State of Alabama, and the citizens of the United States of America.

Engineering Clusters in ECE
The ECE Department offers three clusters that contain a minimum of 21 credit hours in ECE courses. The request for a cluster is initiated with the non-engineering student's advisor.

Electrical Systems: EE 100, 213, 214, 313, 315, 382, 383, 384, 425

Double Majors in ECE
The ECE Department provides the opportunity for a double major with a primary major in CPE, EE, or OPE, and a distinctly different secondary major selected from EE, OPE, or CPE. None of the secondary major courses are permitted as primary major electives. The request for a double major should be submitted to the ECE Information/Advisory Office. Listed below are the possible double major combinations.

CPE-EE: 307, 313, and 3 courses from EE 425, 426, 424, 447, or 448.
EE-OPE: OPE 451, 454, 456, OPT 341, 342, and EE 447 as an EE option elective.
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. A broad background in engineering is developed through the engineering core curriculum and further courses from electrical and computer engineering. The program’s focus on computer engineering is developed through a blend of courses in computer engineering and computer science. The graduate computer engineer will be professionally qualified in a number of technical specialties that 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.

Program Educational Objectives

The program educational objectives of the computer engineering program are:

Objective 1. To prepare graduates for successful professional practice in computer engineering and graduate study.

Objective 2. To produce computer engineers skilled in teamwork and in designing systems with hardware and software components.

Objective 3. To produce computer engineers who can use their broad educational experience, ethics, and professionalism to make a positive impact on their local and professional communities.

The computer engineering faculty is committed to sustaining a vigorous academic environment that values quality and diversity in the educational experience. Program strengths include a major engineering design experience; integration of hardware/software and computer systems issues, especially in the context of real-time, embedded, and networked systems; use of contemporary engineering design and modeling tools throughout the curriculum; and advanced engineering design options in hardware, software and networking. The curriculum provides a thorough basis in mathematics, probability and statistics, physical sciences, engineering sciences, laboratory experience, and design experience. This background enables students to apply computer engineering principles to a variety of contemporary problems. An engineering approach is emphasized throughout computer related coursework.

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<tr>
<th>Engineering Core for Computer Engineering</th>
<th>Semester Hours</th>
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<tr>
<td>CPE 112 - Introduction to Computer Programming</td>
<td>3</td>
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<tr>
<td>EE 213 - Electrical Circuit Analysis I</td>
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<tr>
<td>EE 202 - Introduction to Digital Logic Design</td>
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<td>EE 310 - Solid State Fundamentals</td>
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<tr>
<th>Computer Engineering Option (excluding Engineering Core):</th>
<th>Semester Hours</th>
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<tr>
<td>EE 100 - Fundamentals of Computer, Electrical, and Optical Engineering</td>
<td>3</td>
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<td>EE 201 - Digital Logic Design Laboratory</td>
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<td>CPE 212 - Fundamentals of Software Engineering</td>
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<td>EE 214 - Electronic Measurement Laboratory</td>
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<td>CPE 321 - Computer Organization</td>
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<td>EE 315 - Intro. to Electronic Analysis and Design</td>
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<td>EE 305 - Electronic Devices and Design Laboratory</td>
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<td>CPE 381 - Fundamentals of Signals and Systems for Computer Engineering</td>
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<tr>
<td>EE 384 - Digital Signal Processing Laboratory</td>
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<td>CPE 336/337 - Operating Systems &amp; Laboratory</td>
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<td>CPE 421 - Microcomputers</td>
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<td>CPE 422 - Advanced Logic Design</td>
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<td>or CPE 427 - VLSI Design I</td>
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<td>CPE 431 - Introduction to Computer Architecture</td>
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<td>CPE 438 - Real Time &amp; Embedded Systems</td>
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College of Engineering 122
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<th>Undergraduate Computer Engineering Courses (CPE)</th>
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<tr>
<td>112 Introduction to Computer Programming in Engineering</td>
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<tr>
<td>Solution of engineering problems using a digital computer. Hardware structure of the stored-program computer; programming in a high level language such as C or C++, engineering approximation of dynamic systems; top-down design and algorithms. Practice in solving engineering problems. Prerequisite: MA 113 or MA 115 or equivalent. Students enrolling in CPE 112 must enroll concurrently in CPE 112L.</td>
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*HU/SS - 18 hours in humanities/social sciences.*
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<th>Course Code</th>
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<td>112L</td>
<td>Laboratory Component of Introduction to Computer Programming</td>
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<td>Students enrolling in CPE 112L must enroll concurrently in CPE 112.</td>
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<tr>
<td>212L</td>
<td>Laboratory Component of Fundamentals of Software Engineering</td>
<td>0 hrs.</td>
<td>Students enrolling in CPE 212L must enroll concurrently in CPE 212.</td>
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<tr>
<td>321</td>
<td>Computer Organization</td>
<td>3 hrs.</td>
<td>Functional organization of stored-program digital computers including number representation, assembly language programming, computer hardware, micro-operations, and control logic; microprocessor architecture. Prerequisite: EE 202. (Same as EE 321.)</td>
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<tr>
<td>336</td>
<td>Operating Systems</td>
<td>3 hrs.</td>
<td>Study of the fundamentals of operating systems. Emphasis on processes, file management, inter-process communication, input-output, virtual memory, networking and security. Prerequisites: CPE 212 and CPE/EE 321. Students must take this course concurrently with CPE 337.</td>
</tr>
<tr>
<td>337</td>
<td>Operating Systems Laboratory</td>
<td>1 hr.</td>
<td>Laboratory component of Operating Systems course. Experiments include implementation of device drivers, process and thread management, virtual memory management, dynamic memory management, file-systems. Students must take this course concurrently with CPE 336.</td>
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<tr>
<td>381</td>
<td>Fundamentals of Signals and Systems for Computer Engineers</td>
<td>3 hrs.</td>
<td>Introduction to the fundamental concepts in continuous and discrete signals and systems, and methods of signal and system analysis. Topics covered: Fourier series, Fourier and Laplace transforms, system representation by transfer functions and impulse response functions, convolution integrals, discrete time signals and system, sampling techniques, Z and discrete Fourier transforms. Prerequisite: EE 213 and MA 238. No credit for EE or OPE students.</td>
</tr>
<tr>
<td>412</td>
<td>Introduction to Parallel Programming</td>
<td>3 hrs.</td>
<td>Introduction to processing in parallel and distributed computing environments. General concepts of parallel machine models, processes, mutual exclusion, process synchronization, message passing, and programming languages for parallel computing and scheduling. Design and analysis of parallel algorithms. Parallel programming environments: Pthreads for shared memory multiprocessor systems and PVM/MPI for distributed networked computers. Prerequisites: CPE 212 and CS 317. CPE 336 Recommended. (Same as CPE 512.)</td>
</tr>
<tr>
<td>421</td>
<td>Microcomputers</td>
<td>3 hrs.</td>
<td>Microcomputer system design and use of microprocessors or single chip microcomputers as basic system components. Basic microcomputer design and the interface between the microprocessor and external devices. This course examines the software aspects of microcomputers using assembly language and C programming. Single chip microcomputers for embedded and power efficient applications. Experiments performed in the Microcomputer Laboratory provide considerable experience, allowing students to develop programs in Assembly and C and download them into a target microcomputer. Prerequisite: CPE/EE 321. (Same as EE 421, CPE 521, and EE 521.) Students enrolling in CPE 421 must enroll concurrently in CPE 421L.</td>
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<tr>
<td>421L</td>
<td>Laboratory Component of Microcomputers</td>
<td>0 hrs.</td>
<td>Students enrolling in CPE 421L must enroll concurrently in CPE 421.</td>
</tr>
<tr>
<td>422</td>
<td>Advanced Logic Design</td>
<td>3 hrs.</td>
<td>Advanced concepts in Boolean algebra, use of hardware description languages as a practical means to implement hybrid sequential and combinational designs, digital logic simulation, rapid prototyping techniques, and design for testability concepts. Focuses on the actual design and implementation of sizeable digital design problems using representative Computer Aided Design (CAD) tools. Prerequisite: EE 202, 315. (Same as CPE/EE 522 and EE 422.) Students enrolling in CPE 422 must enroll concurrently in CPE 422L.</td>
</tr>
<tr>
<td>422L</td>
<td>Laboratory Component of Advanced Logic Design</td>
<td>0 hrs.</td>
<td>Students enrolling in CPE 422L must enroll concurrently in CPE 422.</td>
</tr>
<tr>
<td>423</td>
<td>Hardware/Software Co-Design</td>
<td>3 hrs.</td>
<td>Study and design of Systems On a Chip (SOC). Emphasis on Field Programmable realizations of SOC systems. Prerequisite: CPE 422 or 426 or permission of instructor. (Same as CPE 523.)</td>
</tr>
<tr>
<td>426</td>
<td>VLSI Design Using Hardware Description Languages, Modeling, and Synthesis</td>
<td>3 hrs.</td>
<td>Modern VLSI design techniques and tools, such as silicon compilers, (V)HDL modeling.</td>
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</tbody>
</table>
languages, placement and routing tools, synthesis tools, and simulators. Students will design, simulate, and layout using both programmable logic families and ASIC libraries. Prerequisites: EE 202 and EE 315. (Same as CPE 526.)

3 hrs.

**427 VLSI Design I**

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 427. Prerequisites: EE 202 and 315. (Same as EE 427 and CPE 527.) Students enrolling in CPE 427 must enroll concurrently in CPE 427L.

**427L Laboratory Component of VLSI Design I**

Students enrolling in CPE 427L must enroll concurrently in CPE 427.

3 hrs.

**428 VLSI Design II**

Advanced experience with CAD tools for VLSI design, IC testing. Design Project from EE/CPE 427 to be fabricated and tested. Implementation and verification of test programs, IC testing and troubleshooting, legal, economic, and ethical design issue. Oral presentations and written reports are required. Prerequisite: CPE/EE 427. (Same as EE 428 and CPE 528.) Students enrolling in CPE 428 must enroll concurrently in CPE 428L.

**428L Laboratory Component of VLSI Design II**

Students enrolling in CPE 428L must enroll concurrently in CPE 428.

3 hrs.

**431 Introduction to Computer Architecture**

3 hrs.

Study of existing computer structures. Computer organization with emphasis on busing systems, storage systems, and instruction sets. Performance models and measures, pipelining, cache and virtual memory, introduction to parallel processing. Prerequisite: CPE 321. (Same as CPE 531.)

**436 Internals of a Modern Operating System**

3 hrs.

In-depth study of the design of modern operating systems such as Unix, NT and Linux. Emphasis on the internals and implementation details of interrupt processing, real-time clocks, device independent I/O, process management, memory management, file management. Prerequisites: CPE 336. (Same as CPE 536.)

**438 Real Time and Embedded Systems**

3 hrs.

Study of design methodologies for reliable real time systems. Prerequisites: CPE 336. (Same as CPE 538.)

**448 Introduction to Computer Networks**

3 hrs.

Introduction to the concepts and architecture of computer networks. Review of communication protocols using the Internet and the TCP/IP model as major examples. High-speed networking, congestion control, data compression, security and distributed processing. Prerequisites: CPE 112 and CPE/EE 321. (Same as EE 468, CPE 548, EE 548.)

**448L Laboratory Component of Introduction to Computer Networks**

0 hrs.

Students enrolling in CPE 448 must enroll concurrently in CPE 448L. Prerequisite: Parallel CPE 448.

**449 Introduction to Information Assurance Engineering**

3 hrs.

Introduction to cryptography and computer security through hardware and physical security to a knowledge of audit methods, security management, and public law. The course will introduce security engineering skills such as business process analysis, software security, IAE evaluation, and IAE testing. Prerequisite: CPE 448. (Same as CPE 549.)

**449L Laboratory Component of Introduction to Information Assurance Engineering**

0 hrs.

Students enrolling in CPE 449 must enroll concurrently in CPE 449L. Prerequisite: Parallel CPE 449.

**451 Software Design & Engineering**

3 hrs.

Basic concepts of software engineering. Software project management including specification, design, implementation, testing, and documentation. Software tools for project management. Includes a multi-student software project. Prerequisites: CS 317, CPE 212. (Same as CPE 551.)

**461 Translation Systems**

3 hrs.

Grammars, parsers, and lexical analyzers; implementation of translators via top-down and bottom up techniques; grammar analysis to identify ambiguities. Practical applications of translators including conversion of file formats and compilation of traditional computer languages. Prerequisites: CPE 212 and CPE 321. Recommended CPE 431. (Same as CPE 561.)
490 Special Topics in Computer Engineering  
Topics will vary. The course may be repeated when topics vary. Prerequisite: Consent of Advisor.  
495 Computer Engineering Design I  
First course in the senior capstone design sequence. The focus of this class is the application of  
techniques to the design of electronic systems that have digital hardware and software  
components. Students will apply the theory acquired from numerous engineering courses to solve  
real-world design problems. Prerequisites: CPE 336 or CS 317, EE 315, and CPE 421. Must be  
taken in the same academic year as CPE 496.  
496 Computer Engineering Design II  
Second course in the senior capstone design sequence. The focus of this class is the application of  
techniques to the design of electronic systems that have digital hardware and software  
components. Students will apply the theory acquired from numerous engineering courses to solve  
real-world design problems. Prerequisite: CPE 495. Must be taken in the same academic year as  
CPE 495.  
499 Project in Computer Engineering  
Individual design project under the direction of an ECE faculty member. Prerequisites: Senior  
standing and permission of instructor.  

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.  

Program Educational Objectives  
The program educational objectives of the Electrical Engineering Program are:  
Objective 1.  
To graduate electrical engineers with analytical and technical abilities to work effectively in  
their profession.  
Objective 2.  
To graduate electrical engineers capable of advancing in their chosen career fields.  
Objective 3.  
To graduate ethical and responsible electrical engineers.  
Objective 4.  
To graduate electrical engineers who contribute to the society and to the economy of the region  
and the nation.  
Objective 5.  
To graduate electrical engineers prepared for teamwork and leadership roles.  

Additional Basic Sciences  
General Physics with Calculus III - PH 113  
General Physics Laboratory III - PH 116  

Engineering Core for Electrical Engineering  
EE 213 - Electrical Circuit Analysis I  
ISE 321 – Engineering Economy  
EE 310 – Solid State Fundamentals  
EE 382 – Analytical Methods for Continuous Time Systems  

Electrical Engineering Option (excluding Engineering Core):  
EE 100 - Fundamentals of Computer, Electrical,  
and Optical Engineering  
CPE 112 - Computer Methods in Engineering  
EE 201 - Digital Logic Design Laboratory  
EE 202 - Introduction to Digital Logic Design  
EE 214 - Electronic Measurement Laboratory  
EE 305 - Electronics Devices and Design Laboratory  

College of Engineering 126
Suggested Schedule of Courses for Full-time Electrical Engineering Students

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
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<tr>
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*HU/SS* - 18 hours in humanities and social sciences.
Undergraduate Electrical Engineering Courses (EE)

100 Fundamentals of Computer, Electrical and Optical Engineering
Introduction to the fields of computer, electrical, and optical engineering. Students will become familiar with modern computational and design tools, engineering ethics, and modern library resources tools. Introduction to the fundamentals of voltage, current, power, Boolean algebra, binary arithmetic, logic gates, computer architecture, computer networks, and optics. Lab work provides hands-on experience with electrical, computer, and optical systems. Oral and written presentation of projects are required. Prerequisite: Freshman Standing. (Students enrolling in EE 100 must enroll concurrently in EE 100L.)

100L Laboratory Component of Concepts in Digital Signals and Systems

201 Digital Logic Design Lab
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
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: EE 100 and CPE 112.

213 Electrical Circuit Analysis I
Circuit elements, voltage-current characteristics for circuit elements; independent and dependent sources; Kirchhoff’s laws and circuit equations. Source transformations; Thevenin’s and Norton’s theorems and superposition. Introduction to operational amplifiers. Transient and forced response of RC, RL, and RLC circuits. Introduction to sinusoidal steady-state, phasors, and impedance. Prerequisites: PH 112; Prerequisite or parallel: MA 238, 244.

214 Electronic Measurement Laboratory
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 or parallel: EE 213.

305 Electronics Devices and Design Laboratory
Experiments in the measurement of electronic device characteristics. Design of biasing networks, small signal amplifiers and switching circuits. Prerequisites: EE 213, 214. Prerequisite or parallel EE 315.

307 Electricity and Magnetism
Basic concepts of electrostatics, electric potential theory, electric fields and currents, fields of moving charge, magnetic fields, Maxwell’s equations. Prerequisite: EE 213.

310 Solid State Fundamentals
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 metalinsulator-semiconductor field-effect transistors. Prerequisite: PH 112. Prerequisite or parallel: MA 238.

313 Electrical Circuit Analysis II
Continuation of EE 213. Use of phasors and impedance to analyze linear circuits at steady state. AC steady-state power for single and polyphase circuits. Properties and practical uses of resonant circuits, magnetically coupled circuits, and transformers for AC steady state. Introduction to two-port networks and low and high pass filter design. Prerequisite or parallel: EE 307.

315 Introduction to Electronic Analysis and Design
Diode, bipolar transistor and FET circuit models for the design and analysis of electronic circuits. Single and multistage analysis and design. Computer aided design calculations, amplifier operating point design, and frequency response of single and multistage amplifiers. High frequency and low frequency designs are emphasized. Prerequisite: EE 213, 214.

321 Computer Organization
Functional organization of stored-program digital computers including number representation, assembly language programming, computer hardware, micro-operations, and control logic; microprocessor architecture. Prerequisite: EE 202. (Same as CPE 321.)

382 Analytical Methods for Continuous Time Systems
Fourier Series, Fourier and Laplace transforms with emphasis on their physical interpretation.

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: CPE 381. 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.

410 Selected Topics in Electrical Engineering 1-3 hrs.
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 1-3 hrs.
Individual design project under the direction of an ECE faculty member. Prerequisites: Senior standing and permission of instructor.

414 Analog and Digital Filter Design 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 micro-devices 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 probability description of signals. Introduction to random processes: autocorrelations, cross correlation, power spectral density. Noise analysis: thermal, shot, white, and colored. Response of electrical systems to random inputs. Prerequisite: EE 382 or CPE 381.

421 Microcomputers 3 hrs.
Microcomputer system design and use of microprocessors or single chip microcomputers as basic system components. Basic microcomputer design and the interface between the microprocessor and external devices. This course examines the software aspects of microcomputers using assembly language and C programming. Single chip microcomputers for embedded and power efficient applications. Experiments performed in the Microcomputer Laboratory provide considerable experience, allowing students to develop programs in Assembly and C and download them into a target microcomputer. Prerequisite: CPE/EE 321. (Same as CPE 421, CPE 521, and EE 521.) Students enrolling in EE 421 must enroll concurrently in EE 421L.

421L Laboratory Component of Microcomputers 0 hrs.
Students enrolling in EE 421L must enroll concurrently in EE 421.

422 Advanced Logic Design 3 hrs.
Advanced concepts in Boolean algebra, use of hardware description languages as a practical means to implement hybrid sequential and combinational designs, digital logic simulation, rapid prototyping techniques, and design for testability concepts. Focuses upon the actual design and implementation of sizeable digital design problems using a representative set of Computer Aided Design (CAD) tools. Prerequisite: EE 202, EE 315. (Same as CPE/EE 522 and CPE 422.) Students enrolling in EE 422 must enroll concurrently in EE 422L.

422L Laboratory Component of Advanced Logic Design 0 hrs.
Students enrolling in EE 422L must enroll concurrently in EE 422.

423 Communications Systems and Simulation with Laboratory 3 hrs.
Modern test equipment and computer-based simulation methods are used to conduct experiments in the area of communication systems. Hands-on experiments are conducted using digital oscilloscopes, arbitrary waveform generators, vector impedance meters and other relevant test and measurement equipment. Methods are investigated for signal modulation and demodulation; studies are conducted on AM, FM, PSK, PCM and delta modulation circuits and systems. Several types of filters are investigated, both analytically and experimentally. Properties and behavior of
phase-locked loop are studied by using both hardware and numerical simulations. Prerequisites/Corequisite: EE 426, (Same as EE 523.)

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, modems, protocols, personal and mobile communications, digital modulation techniques. Prerequisite: EE 383. (Same as EE 504.)

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.
Review of elementary signals and systems including the Hilbert transform, cross and auto correlation, power density spectrum, and the Wiener-Khintchine theorem. Butterworth and Chebyshev low-pass filters. Band-pass signals and systems. The low-pass equivalent of a band-pass signal/system. Commonly used forms of linear and nonlinear modulation. Demodulation methods and circuits. Phase lock and frequency feedback techniques. Prerequisites: EE 382 or permission of instructor. (Same as EE 506.)

427 VLSI Design I 3 hrs.
Introduction to VLSI design using CAD tools, CMOS logic, switch level modeling, circuit characterization, logic design in CMOS, systems design methods, test subsystem design, design examples, student design project. Design project to be fabricated and tested in EE/CPE 428. Prerequisite: EE 202 and EE 315. (Same as CPE 427 and CPE 527.) Students enrolling in EE 427 must enroll concurrently in EE 427L.

427L Laboratory Component of VLSI Design I 0 hrs.
Students enrolling in EE 427L must enroll concurrently in EE 427.

428 VLSI Design II 3 hrs.
Advanced experience with CAD tools for VLSI design, IC testing. Design project from EE/CPE 427 to be fabricated and tested. Implementation and verification of test programs, IC testing and troubleshooting, legal, economic, and ethical design issue. Oral presentations and written reports are required. Prerequisite: EE/CPE 427. (Same as CPE 428 and CPE 528.) Students enrolling in EE 428 must enroll concurrently in EE 428L.

428L Laboratory Component of VLSI Design II 0 hrs.
Students enrolling in EE 428L must enroll concurrently in EE 428.

436 Digital Electronics 3 hrs.
Introduction to digital electronics. The Metal-Oxide-Semiconductor (MOS) transistor. MOS inverters and gate circuits. Bipolar junction transistors, ECL inverters, and bipolar digital gates. Semiconductor Memories. Prerequisites: EE 202 and 315. (Same as EE 516.)

437 Electronics Manufacturing Processes 3 hrs.
Current concepts, facilities, and technology utilized in the manufacture of electronic components and products. Includes printed wiring board fabrication and component mounting methods, automation, quality and reliability, product testing, and economic issues. Prerequisite: Senior standing. (Same as ISE 437 and 537.)

447 Electromagnetic Waves 3 hrs.
Review of Maxwell’s equations, uniform plane waves in different types of media, reflection, and transmission of uniform plane waves, transmission lines, waveguides, antennas. Prerequisite: EE 307. (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 heterodyning; acousto-optic, magneto-optic, and electro-optic modulation. Prerequisite or parallel: EE 307, 315. (Same as OPE 451.)

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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 OPE 453.)

454 Optical Fiber Communications
Introduction to optical fibers and their transmission characteristics, optical fiber measurements, sources and detectors, noise considerations for digital and analog communication, optical fiber systems. Prerequisite: EE 307 or PH 432. (Same as OPE 454.)

461 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 OPT/PH/OPE 441.)

462 Interference and Diffraction

494 EE Design Projects
Design, simulation, and construction of selected interdisciplinary projects. Review of legal, economic, and ethical issues. Students work as individuals or teams under the direction of a faculty member to design, implement, test, and evaluate their projects. Oral presentation and written reports are required. Prerequisite: ISE 321 and Senior standing.

Optical Engineering Option
The Department of Electrical and Computer Engineering administers the accredited undergraduate degree option in optical engineering. This program prepares students for careers in opto-electronics, including the design and application of systems for optical fiber communications, optical instrumentation, holography, image forming and processing, lasers and optical detection, as well as areas such as optical testing.

Program Educational Objectives
Objective 1.
Graduate individuals with analytical and technical abilities to work effectively in optical engineering or related fields.

Objective 2.
Graduate individuals capable of advancing successfully in optical engineering or related fields.

Objective 3.
Graduate individuals who are ethical and responsible engineers.

Objective 4.
Graduate individuals who contribute to the economy of the region and the nation.

Objective 5.
Graduate individuals prepared for both team and leadership roles in optical engineering or related fields.

Optical Engineering Option
Additional Basic Sciences
PH 113 - General Physics with Calculus III
PH 116 - General Physics Laboratory III

Engineering Core for Optical Engineering
CPE 112 – Introduction to Computer Programming
EE 213 - Electrical Circuit Analysis I
ISE 321 - Engineering Economy
EE 310 – Solid State Fundamentals

Optical Engineering Core (excluding Engineering Core)
EE 307 - Electricity and Magnetism
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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EE 313</td>
<td>Electrical Circuits II</td>
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<tr>
<td>EE 447</td>
<td>Electromagnetic Waves</td>
<td>3</td>
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<tr>
<td>OPE 451</td>
<td>Optoelectronics</td>
<td>3</td>
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<tr>
<td>OPE 453</td>
<td>Laser Systems</td>
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<tr>
<td>OPE 456</td>
<td>Photonics Laboratory</td>
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<td>OPE 459</td>
<td>Optical Engineering Design I</td>
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<tr>
<td>OPE 460</td>
<td>Optical Engineering Design II</td>
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<tr>
<td>OPT 341</td>
<td>Geometrical Optics</td>
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<tr>
<td>OPT 342</td>
<td>Physical Optics</td>
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<td>OPE 454</td>
<td>Optical Fiber Communications</td>
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<td>OPE Elective</td>
<td>*Courses at 300 level or above, approved by optical engineering advisor</td>
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**Electrical Engineering Requirements**

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<td>EE 100</td>
<td>Fundamentals of Computer, Electrical, and Optical Engineering</td>
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<tr>
<td>EE 201</td>
<td>Digital Logic Design</td>
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<tr>
<td>EE 202</td>
<td>Introduction to Digital Logic Design</td>
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<tr>
<td>EE 214</td>
<td>Electronic Measurement Laboratory</td>
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<td>EE 305</td>
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<td>EE 315</td>
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<td>Optical Fiber Communications</td>
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**Suggested Schedule of Courses for Full-time Optical Engineering Students**

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<tbody>
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<td><strong>First Year</strong></td>
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<td>MA 171</td>
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* Courses at 300 level or above, approved by optical engineering advisor
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<th>Course</th>
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<th>Prerequisites</th>
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<tr>
<td>441 Optical Systems Design</td>
<td>3 hrs.</td>
<td>Intermediate geometrical optics, first-order optics, linear transformations, paraxial optics, reflection and transmission at an interface, polarized light, Jones and Mueller calculi, matrix methods, ray tracing, apertures and stops, third-order optics and aberrations. Prerequisite: OPT 342. (Same as EE 461, and PH/OPT 441.)</td>
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<tr>
<td>451 Optoelectronics</td>
<td>3 hrs.</td>
<td>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 or parallel: EE 307, 315. (Same as EE 451.)</td>
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<tr>
<td>453 Laser Systems</td>
<td>3 hrs.</td>
<td>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.)</td>
<td></td>
</tr>
<tr>
<td>454 Optical Fiber Communications</td>
<td>3 hrs.</td>
<td>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.)</td>
<td></td>
</tr>
<tr>
<td>456 Photonics Laboratory</td>
<td>3 hrs.</td>
<td>Photonic devices, wave nature of light, diffraction, spectral measurements, refractive index, single mode and multimode optical fibers, simple optical communication systems, fiber optic sensors, case study. Prerequisite: OPE 451.</td>
<td></td>
</tr>
<tr>
<td>459 Optical Engineering Design I</td>
<td>3 hrs.</td>
<td>Identification, documentation, and presentation of proposed senior design project, followed by initial project design, analysis, and development, including the consideration of legal, economic, and ethical issues. Prerequisite: ISE 321. Prerequisite or concurrent: OPE 456.</td>
<td></td>
</tr>
<tr>
<td>460 Optical Engineering Design II</td>
<td>3 hrs.</td>
<td>Continuation of design project begun in OPE 459 to include prototype testing of the design optical or opto-electronic system. Prerequisite: OPE 459.</td>
<td></td>
</tr>
</tbody>
</table>
Vision and Mission

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 focuses on student development is strengthened by applicable research and faculty service. Creative problem solving and the ability to work in teams are considered critical skills for the students. Students will possess good verbal and writing skills and be able to articulate their ideas. The department recruits and attracts a diverse, academically superior student body. The mission of the department is to provide a high quality education to students both in the Huntsville area and beyond in industrial engineering, systems engineering, and engineering management.

Program Educational Objectives

1. To realize the mission of the department, the following program educational objectives have been adopted for the undergraduate program:
2. To produce graduates who can use their broad educational experience, ethical judgment, and systems thinking to impact the community in a positive way.
3. To produce graduates with core competencies in engineering fundamentals.
4. To produce graduates to successfully apply Industrial Engineering methodologies effectively to analyze, design, and implement integrated systems.
5. To produce graduates who can function effectively in the work environment through participation in teams, leadership and effective communication skills.
6. To produce graduates who are able to continue learning throughout their careers.

These objectives cover the fundamentals of both engineering and the humanities that characterize a university education, plus the specialized knowledge of industrial and systems engineering needed for a successful career in industry, the government, or academia.

Engineering Cluster in ISE

The ISEEM Department offers one engineering cluster that requires 21 credit hours of ISE courses: ISE 124, 321, 340, 390, 391, 423, 430. The request for a cluster is initiated with the non-engineering student's advisor.

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</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>CH 123 or BYS 119 or 300/400 level MA course</td>
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### Engineering Core for Industrial & Systems Engineering

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>MAE/CE 271 Statics</td>
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<tr>
<td>EE 213 Electrical Circuits I</td>
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<tr>
<td>ISE 321 Engineering Economy</td>
<td>3</td>
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<tr>
<td>MAE 341 Thermodynamics</td>
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Industrial Engineering Option (excluding Engineering Core):

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CPE 112 - Computer Methods in Engineering</td>
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</tr>
<tr>
<td>MAE 110 - Introduction to Engineering Computer Aided Design</td>
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</tr>
<tr>
<td>ISE 124 - Introduction to Industrial &amp; Systems Engr</td>
<td>3</td>
</tr>
<tr>
<td>ISE 340 - Operations Research</td>
<td>3</td>
</tr>
<tr>
<td>CE/MAE 370 - Mechanics of Materials</td>
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<tr>
<td>ISE/MAE 378 - Materials and Manufacturing Processes</td>
<td>3</td>
</tr>
<tr>
<td>ISE 390 - Probability and Engineering Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>ISE 391 - Probability and Engineering Statistics II</td>
<td>3</td>
</tr>
<tr>
<td>ISE 423 - Statistical Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>ISE 424 - Ergonomics and Methods Analysis</td>
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<tr>
<td>ISE 427 - Management Systems Analysis</td>
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<tr>
<td>ISE 428 - Systems Analysis and Design I</td>
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<td>ISE 429 - Systems Analysis and Design II</td>
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<tr>
<td>ISE 430 - Manufacturing Systems &amp; Facilities Design</td>
<td>3</td>
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<td>ISE 433 - Production and Inventory Control Systems</td>
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<td>ISE 447 - Introduction to Systems Simulation</td>
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<tr>
<td>*ISE Electives</td>
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<tr>
<td>**Technical Electives</td>
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* Choose from ISE 402, 403, 426, 437, or other upper-level courses approved by the Department, or MA 385. Students may select a maximum of 3 hours from: EH 301, ACC 211, MTK 301, or MGT 363, 462.
**Choose any 200-level or above engineering or science course.

### Suggested Schedule of Courses for Full-time Industrial and Systems Engineering Students

#### Fall

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<td>HU/SS</td>
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<tr>
<td>MA 172</td>
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<tr>
<td>CH 123 or BYS 119 or 300/400 MA course</td>
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<table>
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<td>PH 111/114</td>
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<td>HU/SS</td>
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### Third Year

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<td>ISE 340</td>
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<td>HU/SS</td>
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<td>MAE 341</td>
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### Fourth Year

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<tr>
<td>ISE 428</td>
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<tr>
<td>ISE 430</td>
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<td>ISE Elect.</td>
<td>3 34</td>
</tr>
<tr>
<td>ISE 447</td>
<td>3 34</td>
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</table>

**Total Hrs. 130**

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**Undergraduate Industrial and Systems Engineering Courses (ISE)**

**124 Introduction to Industrial & Systems Engineering**

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. Co-requisite: MA 113.

**321 Engineering Economy**

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**

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**

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**

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**

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.

**402 Industrial and Organizational Psychology**

Application of basic principles of learning, motivation, and perception to typical industrial and organizational problems. Prerequisite: Senior standing. (Same as PSY 402/502.)
403 Human Factors Psychology  
Study of human performance in human-technology-environment systems. 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 Standing. (Same as PSY 403/503.)

423 Statistical Quality Control  
Statistical theory and techniques to control quality of manufactured products. Includes laboratory exercises. Prerequisite or parallel: ISE 391. (Same as ISE 523.)

424 Work Design  
Introduces the portion of the design process that uses basic principles of methods analysis and ergonomics to fit a task and workstation to the human operator. 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  
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  
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  
Philosophy and methods of industrial and non-industrial systems analysis and design. Methods of systems definition, analysis, simplification, evaluation, and optimization. Design project required. Ethics and technical writing are emphasized. Prerequisites: ISE 224, 321, 340, 391, and senior standing.

429 Systems Analysis and Design II  
Continuation of design project begun in ISE 428. Prerequisite: ISE 428.

430 Manufacturing Systems and Facilities Design  
Overview of modern manufacturing systems design with emphasis on facility location and plant layout. Includes classical systems, just-in-time systems, basic principles of integrated manufacturing systems design, as well as analysis of process flow, process productivity, and available space to determine facility layout. Includes term project and laboratory exercise. Prerequisite: Senior standing. (Same as ISE 530.)

433 Production and Inventory Control Systems  
Inventory models including classical optimal economic order quantity models, manufacturing resource planning (MRP) systems, master production scheduling, material requirements planning, and purchase order control. Manufacturing system revisions, including business process reengineering (BPR), and continuous process improvement. Prerequisites: ISE 390. (Same as ISE 533.)

437 Electronics Manufacturing Processes  
Current concepts, facilities, and technology utilized in the manufacture of electronic components and products. Includes printed wiring board fabrication and component mounting methods, automation, quality and reliability, product testing and economic issues. Prerequisite: Senior standing. (Same as ISE 537, EE 437.)

439 Selected Topics in ISE

447 Introduction to Systems Simulation  
Philosophy and elements of digital, discrete-event simulation. Emphasis on modeling and analysis of stochastic systems, including probabilistic models, output analysis, and the use of simulation software. Prerequisites: CPE 112, ISE 391. (Same as ISE 547.)
MECHANICAL AND AEROSPACE ENGINEERING
N274 Technology Hall
Telephone: (256) 824-6154
Email: mae@uah.edu

Degree: Bachelor of Science in Engineering

Distinguished Professors Chung, Wu; Professors Coleman, Cost, Gilbert, Hawk, Karr, Wallace, Wessling; Associate Professors Bower (Chair), Frederick, Frendi, Landrum, Lin; Assistant Professor Richardson; Lecturer Skinner; Research Professors Blackmon, Snider; Associate Research Professor Moser; Assistant Research Professors Cassibry, Li; Adjunct Professor Ooi.

Mission Statement
The mission of the Department of Mechanical and Aerospace Engineering is to provide undergraduate and graduate education, research, and public service in the engineering profession in general and in the mechanical and aerospace engineering disciplines in particular and to support the diverse mechanical and aerospace engineering needs of Huntsville, the State of Alabama, the region, our nation, and the international community.

1. To accomplish this mission the department seeks to inspire students to attain the highest levels of intellectual and personal growth throughout their lives;
2. enable students and faculty to make lasting contributions to the advancement of knowledge and the creative practice of engineering;
3. equip students with the ability to use modern engineering tools for design, analysis, experimentation, and development;
4. engage the faculty in service that enhances the public's understanding of technology for the betterment of society;
5. provide leadership in engineering education, research, and practice;
6. promote equality of opportunity for engineering education;
7. produce graduates who are well prepared to meet the challenges of a modern, dynamic engineering environment; and
8. capitalize on the unique opportunities for collaboration with the local high technology community.

Aerospace Engineering Option in Mechanical Engineering
Aerospace engineering is a diverse and rapidly changing field that 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.

Program Educational Objectives
The program educational objectives of the Aerospace Engineering Option in Mechanical Engineering are to produce graduates who will:

1. Successfully apply their knowledge in their careers as aerospace engineers.
2. Respect societal and ethical considerations of their profession.
3. Continue to learn, and pursue advanced studies if they so choose.
4. Work effectively in multi-disciplinary teams by providing technical expertise and effective communication.

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

<table>
<thead>
<tr>
<th>Engineering Core for Aerospace Engineering Option in Mechanical Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester Hours</td>
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<tr>
<td>-----------------</td>
</tr>
<tr>
<td>MAE/CE 271 Statics</td>
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<tr>
<td>EE 213 Electrical Circuit Analysis I</td>
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<tr>
<td>ISE 321 Engineering Economy</td>
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<tr>
<td>MAE/CHE 294 Nature &amp; Properties of Materials</td>
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<tr>
<th>Aerospace Engineering Option in Mechanical Engineering (excluding Engineering Core)</th>
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<tbody>
<tr>
<td>Semester Hours</td>
</tr>
<tr>
<td>MAE 100 - Introduction to Mechanical &amp; Aerospace Engineering</td>
</tr>
<tr>
<td>CPE 112 - Computer Methods in Engineering</td>
</tr>
<tr>
<td>MAE 110 – Introduction to Engineering Computer Aided Design</td>
</tr>
<tr>
<td>MAE 200 – Principles of Aeronautics and Astronautics</td>
</tr>
<tr>
<td>CHE 295 - Nature &amp; Properties of Materials Laboratory</td>
</tr>
<tr>
<td>MAE 311 - Principles of Measurement &amp; Instrumentation</td>
</tr>
<tr>
<td>MAE 341 - Thermodynamics I</td>
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<td>MAE 342 - Thermodynamics II</td>
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<tr>
<td>MAE 310/CHE 352 - Fluid Mechanics I</td>
</tr>
<tr>
<td>MAE 370 - Mechanics of Materials</td>
</tr>
<tr>
<td>MAE 371 - Aerospace Structures</td>
</tr>
<tr>
<td>MAE 372 - Aerospace Structures Laboratory</td>
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<tr>
<td>MAE 385 - Numerical Methods &amp; Computations</td>
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<tr>
<td>MAE 420 – Compressible Aerodynamics</td>
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<td>MAE 430 – Fundamentals of Aerodynamics</td>
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<tr>
<td>MAE 431 – Aerodynamics Laboratory</td>
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<tr>
<td>MAE 440 - Aerospace Propulsion</td>
</tr>
<tr>
<td>MAE/CHE 450 - Introduction to Heat &amp; Mass Transfer</td>
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<tr>
<td>MAE 441 - Propulsion Laboratory</td>
</tr>
<tr>
<td>MAE 468 – Elements of Spacecraft Design</td>
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<tr>
<td>MAE 480 - Aircraft Stability &amp; Control</td>
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<tr>
<td>MAE 488 - Analysis of Engineering Systems</td>
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<td>MAE 492 – Aerospace Design</td>
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<td>MAE 493 – Introduction to Engineering Design</td>
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<thead>
<tr>
<th>Suggested Schedule of Courses for Full-Time Aerospace Engineering Option in Mechanical Engineering</th>
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<tr>
<td>Fall</td>
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<tr>
<td>MA 171</td>
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<tr>
<td>CH 121/125</td>
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<td>MAE 110</td>
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<td>EH 101</td>
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<td>HU/SS*</td>
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</tbody>
</table>
### Mechanical Engineering Program

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, analysis, fabrication, 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.

### Program Educational Objectives

The program educational objectives of the Mechanical Engineering Program are to produce graduates who will:

1. Successfully apply their knowledge in their careers as mechanical engineers.
2. Respect societal and ethical considerations of their profession.
3. Continue to learn, and pursue graduate studies if they so choose.
4. Work effectively in multi-disciplinary teams by providing technical expertise and effective communication.

### Engineering Cluster in MAE

The MAE Department offers one engineering cluster that requires 23 credit hours of MAE courses: MAE 110, 271, 294, 295, 341, 310, 272, 370. The request for a cluster is initiated with the non-engineering student’s advisor.

### Additional Basic Sciences

CH 123, 126 - Chemistry II

<table>
<thead>
<tr>
<th>Semester Hours</th>
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<tr>
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</tbody>
</table>
### Engineering Core for Mechanical Engineering
- MAE/CE 271 Statics: 3 units
- EE 213 Electrical Circuit Analysis I: 3 units
- ISE 321 Engineering Economy: 3 units
- MAE/CHE 294 Nature & Properties of Materials: 3 units

### Mechanical Engineering Option (excluding Engineering Core)
- MAE 100 - Introduction to Mechanical & Aerospace Engineering: 2 units
- MAE 110 - Introduction to Engineering Computer Aided Design: 3 units
- CPE 112 - Computer Methods in Engineering: 3 units
- MAE/CE 272 - Dynamics: 3 units
- CHE 295 - Nature & Properties of Materials Laboratory: 3 units
- MAE/CHE 310 - Fluid Mechanics I: 1 unit
- MAE 311 - Principles of Measurement & Instrumentation: 3 units
- MAE 341 - Thermodynamics I: 3 units
- MAE 342 - Thermodynamics II: 3 units
- MAE 364 - Kinematics & Dynamics of Machines: 4 units
- MAE/CE 370 - Mechanics of Materials: 4 units
- MAE/ISE 378 - Materials and Manufacturing Processes: 3 units
- MAE 385 - Numerical Methods and Computations: 2 units
- MAE 410 - Fluid Mechanics II: 2 units
- MAE 411 - Fluid Mechanics Laboratory: 1 unit
- MAE/CHE 450 - Introduction to Heat and Mass Transfer: 4 units
- MAE 455 - Design of Thermal Systems: 3 units
- MAE 466 - Mechanics and Design of Machine Elements: 3 units
- MAE 488 - Analysis of Engineering Systems: 3 units
- MAE 490 - Introduction to Engineering Design: 2 units
- MAE 491 - Engineering Design: 3 units
- Technical Electives*: 6 units

*MAE courses at 300 level or above approved by the Department.

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

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<td>MAE 341: 3</td>
<td>MAE 342: 3</td>
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<tr>
<td></td>
<td>MAE 370: 4</td>
<td>MAE 310: 3</td>
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<td>MAE 385: 2</td>
<td>MAE 378: 3</td>
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<td>EE 213: 3</td>
<td>MAE 311: 3</td>
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<tr>
<td></td>
<td>HU/SS*: 3</td>
<td>MAE 364: 4</td>
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College of Engineering
### Undergraduate Mechanical and Aerospace Engineering Courses (MAE)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Introduction to Mechanical and Aerospace Engineering</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>110</td>
<td>Introduction to Engineering Computer Aided Design</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>115</td>
<td>Introduction to Machining</td>
<td>1 hr.</td>
</tr>
<tr>
<td>200</td>
<td>Principles of Aeronautics and Astronautics</td>
<td>1 hr.</td>
</tr>
<tr>
<td>271</td>
<td>Statics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>272</td>
<td>Dynamics</td>
<td>3 hrs.</td>
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<tr>
<td>310</td>
<td>Fluid Mechanics I</td>
<td>3 hrs.</td>
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### Fourth Year

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<td>MAE 410</td>
<td>MAE 491</td>
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<tr>
<td>MAE 466</td>
<td>MAE 488</td>
<td>3</td>
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<tr>
<td>MAE 490</td>
<td>Tech Elective</td>
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<tr>
<td>HU/SS*</td>
<td>HU/SS*</td>
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<tr>
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<td>Tech Elective</td>
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</table>

Total Hrs. 134

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

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Undergraduate Mechanical and Aerospace Engineering Courses (MAE)

100 **Introduction to Mechanical and Aerospace Engineering**

Introduction to engineering in mechanical and aerospace fields; introduction to the various tools and facilities used to design and analyze engineering systems and present the results to others. Includes working with appropriate computer software. A project is performed and the results are presented in both written and oral form. One credit hour laboratory, MAE 100L, is included. Co-requisite: MA 112 or placement in MA 113 or higher.

110 **Introduction to Engineering Computer Aided Design**


115 **Introduction to Machining**

Safety and familiarity with the machine shop environment, equipment, tools, and practices. Correlate student design with consequences of design choice. Basic turning, milling, welding, and sheet metal operations. Programming and operation of numerically controlled machines. Design and fabrication of a semester project. Prerequisite: MAE 110.

200 **Principles of Aeronautics and Astronautics**

An introductory course in the theory and practice of atmospheric flight, propulsion, rocket performance, space flight, satellite systems and uses, and other topics in the field of astronautical engineering. It is designed to prepare the beginning aerospace engineering student for future studies, and to develop good engineering practices. Prerequisite: MAE 100.

271 **Statics**

Topics include: forces, resultant forces, moments, couples equivalent force systems, equilibrium, distributed loads, two force members, trusses, centroids, moments of inertia, shear and bending moment diagrams, static and kinematic friction. Prerequisites: PH 111; Parallel MA 201. (Same as CE 271.)

272 **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: CPE 112, MAE/CE 271 (Same as CE 362.)

294 **Nature and Properties of Materials**

Introduction to the fundamental nature (chemistry and structure), composition, and properties (mechanical and chemical) of solid materials, including metals, polymers, ceramics, and semiconductors. Bonding, composition, and phase diagrams, as well as the nano- and micro-structure of materials will be highlighted. How the nature and properties of materials are characterized or tested will be discussed. Composite materials and aspects of materials processing, including diffusion, nucleation, and transformation diagrams, will also be presented. Companion laboratory is CHE 295, to be taken concurrently with or after MAE 294. (Same as CHE 294)

310 **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. Prerequisites: CPE 112 or CHE 197, MAE/CE. 271, and MA 238. (Same as CHE 352.)
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. Calibration, standards, computerized data acquisition, error analysis, signal conditioning, dynamic response, and experimental design. One credit hour laboratory is included. Prerequisite: EE 213.

341 Thermodynamics I 3 hrs.
Basic laws of energy that apply in all branches of engineering and science. Properties of matter, state variables, reversible processes, first and second laws of thermodynamics with applications to closed and open systems. Availability of energy and irreversibility. Prerequisite: MA201, CH 121, CH 125, PH 112.

342 Thermodynamics II 3 hrs.
Continuation of ME 341. Thermodynamic cycles, thermodynamic relations among properties, chemical reactions, and phase and chemical equilibrium. Prerequisite: MAE 341 and CH 123/126.

364 Kinematics and Dynamics of Machines 4 hrs.
Kinematics and dynamics of planar machinery. Principles of mechanisms, design of cams, fundamentals of gears and epicyclic gear trains, methods of determination of velocity and acceleration in mechanisms. Inertia forces in machines, balancing of rotating masses and reciprocating masses, and vibration analysis. Prerequisite: MAE 110, 272.

370 Mechanics of Materials 4 hrs.
Topics include: theory of stress and strain, Hooke's law, analysis of stresses and deformations in bodies loaded by axial, torsional, bending, and combined loads, and analysis of statically indeterminate systems. Laboratory includes: determination of selected properties of various engineering materials, experimental verification of theories presented, use of strain measuring devices, test procedures, instrumentation, and interpretation of results. Prerequisite: CPE 112, MAE/CE 271. (Same as CE 370.)

371 Aerospace Structures 3 hrs.
Analysis and design of lightweight aerospace structures including sandwich structures, stiffened panels, and tubing stress and deflection analysis. Design of members in tension, torsion and bending. Space structures. Prerequisites: MAE 110, 272, MAE/CE 370.

372 Aerospace Structures Laboratory 1 hr.
Experimental studies of the behavior of aerospace structures. Investigation of column and plate instabilities, stiffened thin panels, and composite structures. Prerequisites: MAE/CE 370; Co-requisite: MAE 371.

378 Materials and Manufacturing Processes 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 included. Prerequisite: MAE/CE 370. (Same as ISE 378.)

385 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: CPE 112, MA244, and prerequisite or parallel MA 238.

395 Selected Topics in Mechanical and Aerospace Engineering 1-3 hrs.
Continuation of MAE 310, external incompressible viscous flows, steady one dimensional compressible flows, and fluid machinery. Concurrent registration in MAE 411 (Fluid Mechanics Laboratory) required. Prerequisite: MAE 310. Prerequisite or parallel MAE 311.

411 Fluid Mechanics Laboratory 1 hr.
Experimental determination of fluid properties; losses in internal flows; structure of external boundary layers; drag of bluff bodies. Introduction to and use of experimental uncertainty analysis and statistical data analysis. Prerequisites: MAE 310.

420 Compressible Aerodynamics 3 hrs.
Principles of compressible flow including area change, friction, and heat transfer. Fundamentals of acoustic waves, one and two-dimensional shock and expansion waves, shock-expansion theory, and linearized flow with applications to inlets, nozzles, wind tunnels, and supersonic flow over aerodynamic bodies and wings. Prerequisites: MAE 341 and MAE 310. (Same as MAE 520.)

430 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 420. (Same as MAE 530.)

431 Aerodynamics Laboratory
Experimental investigation of airfoils and other bodies in subsonic flow. Pressure distributions, boundary layer studies, and vortex formation. Computer simulations. Prerequisites: MAE 420.

440 Aerospace Propulsion
Introduction to the operation and analysis of liquid and solid rockets, nuclear and electric propulsion systems, and airbreathing engines used in aerospace applications. Prerequisite: MAE 342, 420 and parallel MAE 441, 450.

441 Propulsion Laboratory
Experimental investigation of the performance of various aerospace propulsion systems. Prerequisite: MAE 311 and concurrent registration in MAE 440.

450 Introduction to Heat and Mass Transfer
Principles of heat and mass transfer; application of principles to problems in conductive, convective, and radiative-heat transfer and mass transfer; laminar and turbulent flow processes; boiling and condensation; heat exchangers. One credit hour laboratory included. Prerequisites: MAE 310, MAE 385. (Same as CHE 442.)

455 Design of Thermal Systems
Principles of heat transfer, thermodynamics, and fluid mechanics applied to analysis and design of systems for storage and transport, and exchange of thermal energy. Modeling of thermal equipment, simulation of system performance, optimization of system design, and comprehensive design of thermal systems. Prerequisites: MAE 342, MAE 450 and MAE 490 recommended.

461 Vibrations of Elastic Systems
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.)

463 Intermediate Dynamics
Kinematics and dynamics of particles, system of particles, and rigid-bodies. Variational principles and Lagrangian mechanics. Prerequisite: MAE 272. (Same as MAE 563.)

466 Mechanics and Design of Machine Elements
Detailed design and selection of machine elements such as gears, shafts, and bearings. Analysis of stresses and deformations under combined static and dynamic loads, stress concentrations, and fatigue. Prerequisites: MAE 364, MAE/CE 370.

468 Elements of Spacecraft Design
Fundamentals of spacecraft engineering and design. Topics include: orbital mechanics, space environment, attitude determination and control, communications, space structures, thermal control, propulsion and power, and systems and mission design. Prerequisites: MAE 272, 450, 370, and MA 238. (Same as MAE 568.)

470 Mechanics of Materials II

474 Applied Mechanics of Solids
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
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 371 or 466.

477 Experimental Techniques in Solid Mechanics
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.)

College of Engineering
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 420. (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 385. (Same as MAE 585.)

486 Numerical Engineering Analysis 3 hrs.
Finite elements and finite differences in solving various engineering problems. Numerical applications to fluid mechanics, heat transfer, structural mechanics, and machine design. Prerequisite: MAE 385. (Same as MAE 586.)

488 Analysis of Engineering Systems 3 hrs.
Development of mathematical engineering models of physical systems including: mechanical, electrical, and fluid systems and combined systems. Determination of the dynamic response of physical systems. Prerequisites: EE 213, MAE 310, 272, and 385.

489 Computer-Aided Engineering 4 hrs.
Application of computer methods in the analysis and design of structural, thermal, and dynamical systems. Use 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 385. (Same as MAE 589.)

490 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 272, EE 213.

491 Mechanical Engineering Design 3 hrs.
Senior design project. Prerequisites: MAE 490 or equivalent, senior standing, and permission of instructor.

492 Aerospace Design 3 hrs.
Senior design project. Prerequisite: MAE 490 or equivalent, senior standing and permission of instructor.

495 Selected Topics in Mechanical and Aerospace Engineering 1-3 hrs.

496 Independent Study in Mechanical and Aerospace Engineering 1-3 hrs.

499 Undergraduate Thesis 3 hrs.
Required for students completing an Honors Program Bachelors Thesis. Prerequisites: Senior Standing and Permission of Thesis Advisor
College of Liberal Arts

256 Morton Hall
Telephone: (256) 824-6200
Email: dean-la@uah.edu

Dean:
Sue W. Kirkpatrick, B.Sc., M.Sc., Ph.D., Professor of Psychology

The College of Liberal Arts provides educational experiences and programs of study in the major fields of the arts, humanities, and social sciences. These programs are designed to contribute to the intellectual development of students and to assist them in preparing for successful careers by emphasizing the development of written and oral communication skills, critical analysis, and problem solving abilities. They also promote an understanding of relationships among people as well as an awareness of the relationship between human beings and elements of the physical and biological world.

The arts and the humanities, encompassing art, history, languages and literatures, music, and philosophy, lead to a cognizance and appreciation of life as humankind has perceived it and as individuals have lived it. This study leads to heightened critical faculty, cultivation of taste, and the ability to be more effective in utilizing language and in appreciating, using, and evaluating values and ideas. The study of the arts and the humanities is essential to a broad and sensitive awareness of humankind as it has been, is, and aspires to be.

The social sciences encompass the knowledge that deals with the behavior of humankind and the culture it has created, knowledge that becomes more necessary as the world grows more complex and interrelated. Social scientists perform a dual function, assembling and ordering complex systems of technical knowledge related to human relationships and providing a continual appraisal of the value systems in our society. The social science programs at UAH (political science, psychology, and sociology) are designed to prepare the student to value and perform both of these roles. Since these disciplines are concerned with a social milieu that is both possible and desirable, the approach involves both the understanding and use of the scientific method and an appreciation of and a sensitivity to questions of values.

The College of Liberal Arts offers courses of study that provides its students, and those in the sciences, with 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. 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.

Mission
The College of Liberal Arts is committed to excellence in teaching, research, and service in the following disciplines: fine arts, humanities, the social and behavioral sciences, and teacher education. For its own majors, as for those in the professional schools, the College strives to provide superior liberal arts education characterized by close interaction between teachers and learners. Its goals are to impart to each student a spirit of intellectual curiosity, critical thinking, abilities in writing and oral communication, aesthetic awareness and creativity, familiarity with human history and behavior, knowledge of languages and cultures, and an understanding of the bases of ethical behavior and the duties of citizenship. Believing in the centrality of liberal learning to the mission of a university, the College is committed to maintaining a diverse community of teacher-scholars of the highest quality and to providing an environment that
encourages personal and professional growth. It considers teaching and research mutually enriching activities and strives to make its knowledge and expertise available to professional programs on campus and to the educational needs of society. Through its graduates and programs, the College contributes to the cultural, intellectual, and economic growth of the state and nation.

Accreditation

The University of Alabama in Huntsville is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools, and the College of Liberal Arts thus offers baccalaureate and graduate programs under the auspices of that accrediting body. In addition, the University of Alabama in Huntsville is an accredited institutional member of the National Association of Schools of Music. Teacher education programs 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 College of Liberal Arts utilizes the facilities and resources of the entire University. However, the College is housed primarily in two buildings, namely Morton Hall and Roberts Hall. Critical to study of the liberal arts is the Salmon Library, located in close proximity to both Morton and Roberts Halls. Supporting facilities include the Writing Center located on the second floor of Morton Hall, a student computer laboratory on the first floor of Morton Hall, an instructional computer laboratory on the second floor of Salmon Library, an art gallery in the University Center, and Union Grove Gallery and Meeting Hall, an historic church moved to campus in 1974 and currently used as an art gallery and a meeting place for student and faculty.

The Humanities Center

The Humanities Center was established in 1991 with the aid of an award from the National Endowment for the Humanities (NEH). The NEH award took the form of a challenge grant that was subsequently matched by funds from other sources, including public, corporate, and private giving, to create the three endowments that support the Center’s activities in five areas: hiring of eminent and visiting scholars, library enhancement grants, public programming grants, faculty travel, and faculty research. The Humanities Center is located on the third floor of Roberts Hall.

Degrees and Programs

UNDERGRADUATE DEGREES AND PROGRAMS

The College of Liberal Arts awards the Bachelor of Arts degree. A student’s Program of Study must total at least 128 hours of coursework and is comprised of four components: 1) general education requirements, 2) a major, 3) either a second major, minor, or supporting cognate studies and 4) electives. The minimum requirement for a major is 30 semester hours of coursework with at least 21 semester hours at the 300 level or above. The minimum requirement for a minor is 18 hours of coursework with at least 12 semester hours at the 300-level or above. The cognate studies option must be formed from two or more closely aligned disciplines and must be comprised of at least 21 hours with at least 12 semester hours at the 300-level or above. Specific requirements of each major and minor are provided in the appropriate departmental section of the catalog. At least 39 semester hours of a student’s Program of Study must be at the 300-level or above.

Students initiate a Program of Study with the College of Liberal Arts Academic Advisor who works in consultation and cooperation with departmental chairs to tailor a student’s Program of Study. Elements of the Program of Study are subject to approval of the chairs of the student’s major and minor departments. 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.
Availability of majors, minors, and cognates are summarized below. Please see the Department of Education section of the catalog for complete information about teacher certification programs.

<table>
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<th>Discipline</th>
<th>Major Available</th>
<th>Minor/Cognate Available</th>
<th>Possible Foci</th>
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</thead>
<tbody>
<tr>
<td>Art &amp; Art History</td>
<td>Yes</td>
<td>Yes</td>
<td>Studio (including Graphic Design) and Art History</td>
</tr>
<tr>
<td>Classical Studies</td>
<td>No</td>
<td>Yes</td>
<td>Rhetoric, Technical Communications Cognate Studies Available</td>
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<td>Computer-Mediated Communication (Web Design)</td>
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<td>Elementary, Collaborative-Special Education</td>
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<td>Elementary Education (Teacher Preparation)</td>
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<td>Secondary Education* (Teacher Preparation)</td>
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<tr>
<td>Women’s Studies</td>
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</tr>
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</table>

*Graduate programs also available (see Graduate Catalog)

**Graduate program available in Public Affairs (see Graduate Catalog)

**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.
Admission to the College of Liberal Arts
Entering students who meet all university admission requirements for regular admission status may be admitted to the College of Liberal Arts upon designation of a discipline major that is housed within the College, with the exception of the disciplines of music and teacher education preparation programs. Students planning to major in either music or teacher preparation programs should refer to the appropriate departmental section of the catalog for specific admission requirements for those programs. Students seeking transfer to the College of Liberal Arts from other colleges on the UAH campus must have earned a 2.0 overall GPA to be admitted to the College of Liberal Arts.

Students from Alabama community colleges who plan to transfer to the College of Liberal Arts at UAH are advised to consult the STARS advisement website (http://stars.troyost.edu) or to contact the College of Liberal arts Academic Advisor for assistance. Additionally, such prospective UAH students are advised to read the Transfer Student section of this catalog.

Academic Advising in the College of Liberal Arts
College of Liberal Arts Academic Advisor: Frank E. Bell, B.A., M.A.

The College of Liberal Arts provides academic advising for its students through the various academic departments and through the office of the Academic Advisor for the College of Liberal Arts. All students are strongly encouraged to seek advising assistance at the beginning of their academic careers and to continue working with their advisors throughout their academic experience. All freshmen and most sophomores with an expressed interest in liberal arts are advised by the Academic Advisor for the College of Liberal Arts, who is located in Room 216 Morton Hall; phone 824-2867; email: bellf@uah.edu. In addition, a Prelaw Advisor is available to assist those who plan to apply for admission to law school.

The goals of academic advising include: 1) assisting students in planning academic and life goals; 2) assisting students in their personal adjustment to the UAH campus; 3) aiding students in the assessment of academic needs and in developing appropriate educational plans; 4) explaining and clarifying graduation requirements as well as academic policies; and 5) facilitating student success.

The College of Liberal Arts Academic Advisor assists students in fulfilling the General Education Requirements and, in concert with faculty advisors, provides information about possible major fields. An official declaration of major should be filed by the end of the sophomore year. When a student decides on a specific major and minor, the student will then initiate a Program of Study with the College of Liberal Arts Academic Advisor. Subsequent to completion of a Program of Study, the student is advised by faculty within the declared major(s) and minor(s). These faculty members are specialists in their fields of interest.

REQUIREMENTS FOR PROGRAMS OF STUDY LEADING TO THE B.A. DEGREE

COMPONENT 1:
GENERAL EDUCATION REQUIREMENTS FOR B.A. DEGREE SEMESTER HOURS
NOTE: COURSES TAKEN TO SATISFY REQUIREMENTS FOR ONE AREA ARE NOT APPLICABLE TO A SECOND AREA.

ENGLISH COMPOSITION 6 Semester Hours
EH 101 and 102 (Note: Honors students take EH 105H only, if the Honors Program is completed) 6 hrs.
HUMANITIES AND FINE ARTS  25 Semester Hours
(Students may take no more than 6 semester hours in a single discipline.)

**Fine Arts** Choose one course
- ARH 100 - Art History: Ancient to Medieval  3 hrs.
- ARH 101 - Art History: Renaissance to Modern  3 hrs.
- ARH 103 - Survey of Art in Non-Western Traditions  3 hrs.
- ARS 160 - Introduction to Drawing  3 hrs.
- CM 122 - Theater Appreciation  3 hrs.
- MU 100 - Music Literature  3 hrs.

**Literature** Choose one course from Area I and one course from Area II
Area I Choose one course
- EH 205 - English Literature to Renaissance  3 hrs.
- EH 240 - World Literature to Renaissance  3 hrs.
- EH 250 - Honors Literature to 1700  3 hrs.
Area II: Choose one course
- EH 206 - English Literature (Restoration to Present)  3 hrs.
- EH 230 - American Literature  3 hrs.
- EH 241 - World Literature (Enlightenment to Present)  3 hrs.
- EH 251 - Honors Literature: 1700 to Present  3 hrs.

**Humanities and Fine Arts** Choose two courses
- ARH 100 - Art History: Ancient to Medieval  3 hrs.
- ARH 101 - Art History: Renaissance to Modern  3 hrs.
- ARH 103 - Survey of Art in Non-Western Traditions  3 hrs.
- ARS 160 - Introduction to Drawing  3 hrs.
- CM 122 - Theater Appreciation  3 hrs.
- MU 100 - Music Literature  3 hrs.
- PHL 101 - Introduction to Philosophy  3 hrs.
- PHL 201 - Introduction to Logic  3 hrs.
- PHL 202 - Introduction to Ethic  3 hrs.
- WS 200 - Introduction to Women's Studies  3 hrs.
- FL200 level course in a foreign language  3 hrs.

Note: Education major must take CM 113 - Speech in this area.

**Foreign Language and Literature** Choose one language; 10 Semester Hours
- FL101  5 hrs.
- FL102  5 hrs.

Placement is required for native speakers and for students planning to continue a language taken in high school.

NATURAL SCIENCE AND MATHEMATICS  11 Semester Hours
Elementary education majors must complete 12 semester hours in science and 12 semester hours of college level mathematics. See Education Department for specific science course options for elementary education majors.

**Natural Science** Choose two courses
- AST 106 - Exploring the Cosmos I  4 hrs.
- AST 107 - Exploring the Cosmos II  4 hrs.
- BYS 119 - Principles of Biology  4 hrs.
- BYS 120 - Organismal Biology  4 hrs.
- CH 101/CH 105 - Introduction to Chemistry plus laboratory  4 hrs.
- CH 113 - Elementary Organic Chemistry  4 hrs.
- CH 121/125 - General Chemistry plus laboratory  4 hrs.
- CH 123/126 - General Chemistry plus laboratory  4 hrs.
- ES 102 - Planetary/Atmospheric Science II  4 hrs.
- PH 100 - Conceptual Physics  4 hrs.
PH 101 - General Physics I 4 hrs.
PH 102 - General Physics II 4 hrs.
PH 111/PH 114 - Physics I with Calculus plus laboratory 4 hrs.
PH 112/PH 115 - Physics II with Calculus plus laboratory 4 hrs.

Mathematics 3 hrs.

HISTORY, SOCIAL AND BEHAVIORAL SCIENCES 18 Semester Hours
(Students may take no more than 6 semester hours in a single discipline.)

History
Choose one sequence
HY 101 & HY 102 - Western Civilization I and II 6 hrs.
HY 103 & HY 104 - World History I and II 6 hrs.

Social and Behavioral Sciences Choose four courses
GS 200 - Global Systems and Cultures 3 hrs.
GY 105 - World Regional Geography 3 hrs.
GY 110 - Principles of Human Geography 3 hrs.
PSC 101 - American Government 3 hrs.
PSC 102 - Comparative Politics and Foreign Governments 3 hrs.
PSC 260 - International Relations 3 hrs.
PY 101 - General Psychology I 3 hrs.
PY 201 - Lifespan Development 3 hrs.
SOC 100 - Introduction to Sociology 3 hrs.
SOC 200 - Introduction to Anthropology 3 hrs.
ECN 142 - Principles of Macroeconomics 3 hrs.
ECN 143 - Principles of Microeconomics 3 hrs.

COMPONENT 2:
MAJOR REQUIREMENTS FOR B.A. DEGREE 30 or more, dependent upon major
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.

COMPONENT 3:
MINOR REQUIREMENTS FOR B.A. DEGREE 18 or more, dependent upon major
A minimum of 18 semester hours in a single discipline with a minimum of 12 hours at the 300-level or above. In lieu of a minor, students may choose a second major or a minimum of 21 semester hours in cognate studies drawn from two or more closely related disciplines. Majors in art and some major emphases in music (performance, jazz, music technology, and music education) are not required to have a minor. See above section entitled Undergraduate Degrees and Programs for semester hour requirements.

COMPONENT 4:
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. No more than 6 hours of HPE may be counted towards the B.A. degree.

Minimum upper level degree requirements 39
Minimum Degree Requirements, Bachelor of Arts 128
MISSION
The Department of Art and Art History is dedicated to preparing students with the knowledge and skills necessary for pursuing lives as artists, designers, and art historians, who will be creative, inquisitive, and well-rounded individuals, conscious of the important role that artistic endeavor and intellectual pursuit plays within their lives and throughout our culture. The department is an integral part of the interdisciplinary experience within the university and by virtue of its commitment to the highest standards in teaching, research and service, is dedicated to supporting and strengthening the mission of the College of Liberal Arts.

PROGRAM
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. Students pursuing a program of study in Art may focus on either the studio discipline or the art history discipline. The studio focus allows a student to specialize at the upper division in drawing/painting, graphic design, printmaking, or sculpture.

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. Please note however, that due to increasing enrollment demands, placement in all art and art history courses is initially reserved for art majors and minors. All others will be admitted and welcomed if space is available.

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Roberts Hall, Room 313) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

Transfer credit for equivalent coursework and advanced placement in art courses will be determined by the departmental chair. 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, who are not majoring in art, must take at least 6 semester hours of art courses at the 300-level or above.

I. The Studio Discipline: (Drawing, Graphic Design, Painting, Printmaking, Sculpture)

A. Lower Division Requirements

1. Art Studio Requirements
ARS 123 Two-Dimensional Design and Color Theory
ARS 140 Three-Dimensional Design
ARS 160 Introduction to Drawing
ARS 260 Intermediate Drawing
Three additional 200-level ARS courses

2. Art History Requirements (Choose two.)
ARH 100 Art History Survey: Ancient to Medieval
ARH 101 Art History Survey: Renaissance to Modern
ARH 103 Art History Survey: Art in Non-Western Traditions

Note: There are no prerequisites for ARH 100, 101 and 103, ARS 123, 140, and 160, which introduce the student to basic concepts and skills in the visual arts.
B. Upper Division Requirements

Five ARS courses at the 300 level
Two ARS courses at the 400 level
ARH 309 - Contemporary Art and Issues

Note: A student choosing to specialize in a specific studio area may take no more than four upper-level courses in an individual area.

| Graphic Design | ARS 331, 332, 430, 431 |
| Painting/Drawing | ARS 360, 375, 376, 377, 475, 476, 477 |
| Printmaking | ARS 380, 381, 383, 480, 481, 483 |
| Photography | ARS 353 |
| Sculpture | ARS 340, 341, 342, 346, 440, 441, 442 |
| Other | ARS 393, 493, 495, courses at Alabama A&M (see Note 3) |

Note 1: 400-level courses are to be taken only after successful completion of the appropriate 300-level courses.

Note 2: Majors with a studio art focus must satisfy an exit exhibition or portfolio requirement. Students emphasizing graphic design must successfully present a comprehensive portfolio as part of the coursework for their final 400-level Advanced Graphic design course. All other art majors with a studio art focus must successfully mount a senior exhibition of their work. Contact the Department of Art and Art History for specific requirements.

Note 3: ARS 230 and 331 should be taken in sequence. ARS 332, 430, and 431 may be taken in any order after successful completion of ARS 230 and 331. No other 300-level ARS courses need be taken in sequence.

Note 4: 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 Glassblowing.

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

An Illustrative Plan for Completing the B.A. Degree
With A Focus in Studio Art *

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>Academic Year Semester Hours</th>
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<tbody>
<tr>
<td><strong>Year 1</strong></td>
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<td>EH 101</td>
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College of Liberal Arts
**II. The Art History Discipline**

**A. Lower Division Requirements**

1. Art History Survey Courses (Choose two)
   - ARH 100 Art History Survey: Ancient to Medieval
   - ARH 101 Art History Survey: Renaissance to Modern
   - ARH 103 Art History Survey: Art in Non-Western Traditions

2. Art Studio Courses
   - Any two 100-level ARS courses
   - One 200-level ARS course

**B. Upper Division Requirements**

1. Art History Courses
   - ARH 309 Contemporary Art and Issues
   - Five additional ARH courses at the 300 level or above
   - ARH 400 Art History Seminar

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

*Note 1: An additional 3 hr. upper-level studio, art history, or approved related discipline is required for art history majors with a studio minor. Please consult with advisor or chair.

*Note 2: All students with an art history focus must satisfy an exit requirement that is included in the ARH 400 coursework.

*Note 3: To fulfill an upper-level art history requirement, a student may substitute PHL 310, Philosophy of Art, for a 300-level art history course.

**C. Total Number of Hours: 39 semester hours within the Department of Art and Art History**

(42 hours for art history majors with an art studio minor)
### An Illustrative Plan for Completing the B.A. Degree With A Focus in Art History *

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semester Hours</th>
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<th>Semester Hours</th>
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<td>Total Hours 129</td>
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</table>

*This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a focus in Art History. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.

### Minors and Cognate Studies Programs

**1. Art History Minor: 21 semester hours within the Department of Art and Art History**

Two ARH 100 level Art History Surveys  
ARH 309 Contemporary Art and Issues  
One 300 level art history before 1800  
One 300 level art history after 1800  
Two 300 level or above art history electives

Note: Students focusing on the studio discipline 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 disciplines

Two ARH 100-level Art History Surveys 6 hrs.
Three 300-level or above ARH 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

ARS 160 Introduction to Drawing 3 hrs.
Two 200 level studio courses 6 hrs.
Four 300 level studio courses 12 hrs.

4. Cognate in Computer-Mediated Communication (Web Development)

Students majoring in Art may minor in an interdisciplinary cognate in computer mediated communication (Web Development). This program combines courses in graphic arts, communication, and MIS to prepare students for work in the growing field of computer-mediated communication, especially those involving the design, development, and management of Websites.

See more information on this program under this catalog’s section on “Computer-Mediated Communication Program.”

Art Studio (ARS)

Lower Division Courses

Lower division studio courses stress the development of visual and manual skills, problem solving abilities, critical thinking, and an awareness of the tools and materials used in the making of art.

123 Two-Dimensional Design and Color Theory 3 hrs.
Principles and elements of composition including color theory. Problem-solving assignments explore formal and intuitive design concepts and the analytical and expressive understanding and application of color. Prerequisites: NONE. Lab Fee: $40.

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. Prerequisites: NONE. Lab Fee: $40.

160 Introduction to Drawing 3 hrs.
Introduction to the principles, tools, materials, techniques, and concepts of drawing. Through exercises in rendering from observation, studies in perspective, and problem solving, students develop strong visual skills, consider the role of aesthetics, and begin to explore a variety of means for artistic expression. Prerequisites: NONE. Lab Fee: $40.

230 Introduction to Graphic Design 3 hrs.
Introduction to graphic design theories, principles, and tools, with instruction in the basics of graphic design through practical understanding of visual communication and logistics of advertising media, stressing traditional and electronic techniques. Students will also become familiar with the Macintosh platform and digital layout methods, using software applications currently used in the industry. Prerequisites: ARS 123 and 160. Lab Fee: $40.

240 Introduction to Sculpture 3 hrs.
Introduction to basic concepts employed to create sculptural forms. Students will develop and explore their ideas using a variety of traditional and non-traditional tools, materials and processes. Making of sculpture through assemblage, subtraction, modeling, and casting processes will be addressed to gain an understanding of the relationship between the formal, conceptual, and aesthetic concerns that are integral to the making of all art. Prerequisite: ARS 140 Lab Fee: $40.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
<th>Lab Fee</th>
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</thead>
<tbody>
<tr>
<td>250</td>
<td>Introduction to Photography</td>
<td>3 hrs.</td>
<td>Understanding and practice of photography through its use as a fine art medium. Introduction to camera use and darkroom techniques. Students are required to provide their own 35 mm camera. Prerequisite: NONE. Lab Fee: $40.</td>
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<tr>
<td>260</td>
<td>Intermediate Drawing</td>
<td>3 hrs.</td>
<td>Further development of drawing skills and individual expression through the study and practice of selected drawing approaches, with an emphasis on the figure. Nude models will be used. Prerequisite: ARS 123 and 160. Lab Fee: $40.</td>
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<tr>
<td>270</td>
<td>Introduction to Painting</td>
<td>3 hrs.</td>
<td>Introduction to formal and technical problems of painting. Experimentation with basic painting media, techniques, preparation of grounds, and other mechanics of painting. Problem solving assignments emphasizing two-dimensional design and color theory concepts and practices. Prerequisites: ARS 123 and 160. Lab Fee: $40.</td>
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</tr>
<tr>
<td>280</td>
<td>Introduction to Printmaking</td>
<td>3 hrs.</td>
<td>Introduction to the basic printmaking processes of monotype, relief, stencil, and intaglio for generating ideas and images. Emphasis on improving two-dimensional design concepts, color theory ideas, and drawing skills. Prerequisites: ARS 123 and 160. Lab Fee: $40.</td>
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</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
<th>Lab Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>331</td>
<td>Graphic Design II</td>
<td>3 hrs.</td>
<td>Continuation of ARS 230 with close attention to contemporary graphic design production techniques, problems, and solutions. Students will learn effective methods of page layout, print production, and logistics using current software applications. Prerequisites: ARS 230. Lab Fee: $40.</td>
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<tr>
<td>332</td>
<td>Graphic Design III</td>
<td>3 hrs.</td>
<td>A beginning to intermediate course in web design that emphasizes the aspects of planning and creativity. Focus is on learning how to build effective and creative websites. Current web software is taught in this course. Prerequisites: ARS 230. Lab Fee: $40.</td>
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<tr>
<td>340</td>
<td>Sculpture: Assemblage</td>
<td>3 hrs.</td>
<td>Exploration of a variety of assemblage processes including wood construction and metal fabrication. Emphasis is placed on idea development and investigating a wide range of forms and materials. Prerequisite: ARS 140. Lab Fee: $40.</td>
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<tr>
<td>341</td>
<td>Sculpture: Carving</td>
<td>3 hrs.</td>
<td>Stone and wood carving are investigated with emphasis placed on developing the ability to see and release hidden form and on the unique relationship formed between maker and material. Prerequisite: ARS 140. Lab Fee: $40.</td>
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<tr>
<td>342</td>
<td>Sculpture: Casting</td>
<td>3 hrs.</td>
<td>Investigation of foundry processes and materials involved in mold making and lost-wax bronze casting, metal chasing, and patination. Prerequisite: ARS 140. Lab Fee: $40.</td>
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<tr>
<td>346</td>
<td>Sculpture: Figure Modeling</td>
<td>3 hrs.</td>
<td>Study of the human form through direct clay modeling from life including anatomical studies, armature construction, mold making and casting. Prerequisite: ARS 140 and 260. Lab Fee: $40.</td>
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<tr>
<td>353</td>
<td>Advanced Photography</td>
<td>3 hrs.</td>
<td>Advanced use of black/white and color photography as a means of expression in the production of fine art. Prerequisite: ARS 123 and 250. Lab Fee: $40.</td>
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<td>360</td>
<td>Advanced Drawing</td>
<td>3 hrs.</td>
<td>Drawing as a vehicle for personal expression utilizing traditional and contemporary methods and materials. Nude models will be used. Prerequisites: ARS 260. Lab Fee: $40.</td>
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<td>375</td>
<td>Painting: Traditional Approaches</td>
<td>3 hrs.</td>
<td>Investigation of figure painting, focusing on its relationship to technical and philosophical approaches from various periods of art history. Nude models will be used. Prerequisite: ARS 270. Lab Fee: $40.</td>
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</tbody>
</table>
376 Painting: Contemporary Approaches 3 hrs.
Contemporary approaches toward painting are explored through technical and conceptual exercises based on contemporary painting practices. Prerequisite: ARS 270. Lab Fee: $40.

377 Painting: Mixed Media 3 hrs.
Exploration of painting with mixed and non-traditional media as vehicles of expression including the use of assemblage and collage processes, shaped or contoured canvasses, and related media. Prerequisite: ARS 270. Lab Fee: $40.

380 Printmaking: Intaglio 3 hrs.
Beginning studio practice in etching, engraving, aquatint, photo-etching and dry-point. Prerequisite: ARS 123 and 160. Lab Fee: $40.

381 Printmaking: Lithography 3 hrs.
Beginning studio practice in autographic and photographic lithography processes utilizing aluminum plate and stone. Prerequisite: ARS 123 and 160. Lab Fee: $40.

383 Printmaking: Screenprinting 3 hrs.
Investigation of silkscreen processes, including autographic and photographic methods. Prerequisite: ARS 123 and 160. Lab Fee: $40.

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, video, or performance; usually developed along strong conceptual or thematic lines. Prerequisites: Art major and minors must have completed all lower-division foundation requirements. Lab Fee: $40.

Entry into a 400-level course must be preceded by successfully completing the appropriate 300-level course.

430 Advanced Graphic Design I 3 hrs.
An advanced-level course that emphasizes page layout, special design applications, and advertising campaign projects. Focus is on the development of a comprehensive print-oriented portfolio, utilizing the latest software applications. Prerequisites: ARS 331. Lab Fee: $40.

431 Advanced Graphic Design II 3 hrs.
An advanced-level course that emphasizes web animation, interactive media, and advanced web design. Focus is on the development of a comprehensive interactive portfolio, utilizing the latest software applications. Prerequisites: ARS 332. Lab Fee: $40.

440 Advanced Sculpture: Assemblage 3 hrs.
Continued exploration of assemblage processes. Prerequisites: ARS 340. Lab Fee: $40.

441 Advanced Sculpture: Carving 3 hrs.
Continued exploration of subtractive processes. Prerequisites: ARS 341. Lab Fee: $40.

442 Advanced Sculpture: Casting 3 hrs.
Continued exploration of casting and foundry processes. Prerequisites: ARS 342. Lab Fee: $40.

475 Advanced Painting: Traditional Approaches 3 hrs.
Continued exploration of oil painting processes. Prerequisites: ARS 375. Lab Fee: $40.

476 Advanced Painting: Contemporary Approaches 3 hrs.
Continued exploration of contemporary painting approaches. Prerequisites: ARS 376. Lab Fee: $40.

477 Advanced Painting: Mixed Media 3 hrs.
Continued exploration of mixed and non-traditional media. Prerequisites: ARS 377. Lab Fee: $40.

480 Advanced Printmaking: Intaglio 3 hrs.
Continued exploration of intaglio processes. Prerequisites: ARS 380. Lab Fee: $40.

481 Advanced Printmaking: Lithography 3 hrs.
Continued exploration of lithographic processes. Prerequisites: ARS 381. Lab Fee: $40.

483 Advanced Printmaking: Screenprinting 3 hrs.
Continued exploration of silkscreen processes. Prerequisites: ARS 383. Lab Fee: $40.

493 Advanced Multi-Media 3 hrs.
Continued exploration of multi-media art works. Prerequisites: ARS 393. Lab Fee: $40.

495 Technical Problems 3 hrs.
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: $40.
Art History (ARH)

Lower Division Courses
Lower division art history courses explore the major monuments of art, ancient through contemporary, in their historical and cultural contexts. These courses introduce the student to the basic analytic tools of art history.

100 Art History Survey: Ancient to Medieval 3 hrs.
Survey of the material culture, including architecture, sculpture, painting, mosaic, jewelry, and ceramics, produced by Pre-historic European, Near Eastern, Egyptian, Bronze Age Aegean, Greek, Roman, Byzantine East, and Medieval European cultures. Course emphasizes study of the cultural contexts that fostered the creation of art.

101 Art History Survey: Renaissance to Modern 3 hrs.
Survey of the major works of art and architecture produced since the Renaissance, their major themes, the artists, and the critical issues that affected the cultures in which they were created.

103 Art History Survey: Art in Non-Western Traditions 3 hrs.
Survey of visual culture in India and Southeast Asia, China, Japan and Korea, the Americas, the Pacific, and Africa. Lectures, readings, and discussions will focus on relationships among works of art, religious belief systems, political conventions, and cultural practices.

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. Prerequisites: ARH 100 and 101 required for majors and recommended for non-majors.

302 Medieval Art 3 hrs.
Art and architecture of the medieval period from the transformation of the Roman Empire into a Christian state at the beginning of the fourth century to the late Gothic period around AD 1400. Cultural contexts in which art and architecture were produced in Europe and the Greek East. Examine architecture, sculpture, manuscripts, metalwork, stained glass, and other media. Prerequisites: ARH 100 and 101 required for majors and recommended for non-majors.

303 Renaissance Art 3 hrs.
Art and architecture within the context of fourteenth through sixteenth century western Europe, marked by the rise of art theory and criticism and new concepts of the artist’s role in society. Prerequisites: ARH 100 and 101 required for majors and recommended for non-majors.

304 Twentieth Century Art 3 hrs.
Developments in European and American art from 1890 to World War II, covering major movements including Cubism, Dada, Surrealism, Expressionism, Russian Constructivism, and Abstract Expressionism. Prerequisites: ARH 100 and 101 required for majors and recommended for non-majors.

305 Ancient Roman Art 3 hrs.
Art and architecture of the ancient Romans, from the Etruscans through the fourth century AD in their religious, political, and social context. Special attention given to focused study of specific periods, such as the age of Augustus, or physical contexts, such as Pompeii. Prerequisites: ARH 100 and 101 required for majors and recommended for non-majors.

307 Impressionism and Post-Impressionism 3 hrs.
European and American art from 1860 to 1900 will be examined through historical, political, social, philosophical, and literary perspectives. Impressionism, Post-Impressionism, Symbolism, and the “Art for Art’s Sake” movement will be studied through the works of artists such as Monet, Renoir, Van Gogh, Rodin, and Whistler. Prerequisites: ARH 100 and 101 required for majors and recommended for non-majors.
309 Contemporary Art and Issues 3 hrs.
Major movements since World War II, including abstract expressionism, neo-dada, pop, photorealism, minimalism, conceptual art, earth works, new realism, neo-expressionism, performance, and post-modernism. Prerequisites: ARH 100 and 101 required for majors and recommended for non-majors.

310 Nineteenth Century Art 3 hrs.
European and American art from 1780 to 1860 will be examined through historical, political, social, philosophical, and literary perspectives. Neoclassicism, Romanticism, the Hudson River School, and Realism will be studied through the works of artists such as David, Goya, Turner, Cole, and Courbet. Prerequisites: ARH 100 and 101 required for majors and recommended for non-majors.

320 Special Topics in Art History 3 hrs.
Special topics on periods of art history selected from ancient to contemporary as offered. Prerequisites: ARH 100, 101 and 309 required for majors and recommended for non-majors.

400 Art History Seminar 3 hrs.
Directed study for the development of a scholarly research paper on special topics in art history as offered. Required for all students with an Art History focus. Prerequisites: 18 semester-hours of upper-level ARH courses and approval of instructor.

500 Special Problems in Art History 3 hrs.
Directed reading and research. Prerequisites: 18 semester-hours of upper-level ARH courses and approval of instructor.

Communication Arts Department
342 Morton Hall
Telephone: (256) 824-6645
Email: comm@uah.edu
Associate Professor Rountree (Chair); Assistant Professors Ferris and Givens; Lecturer Travis

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, communication research, nonverbal communication, and other specialized communication contexts.

Mission
Department of Communication Arts offers a variety of classes that critically examine the public, professional, cultural and personal dimensions of human communication. Our comprehensive program strategically weaves together core courses in the humanistic tradition of rhetorical theory and practice with social-scientific perspectives on communication. This curriculum capitalizes on the field's far-reaching theoretical span, having roots in ancient Greco-Roman civilizations, where rhetoric became the capstone of education and the lifeblood of civic activity, and having fecund branches in the communication media of the present and future.

Our department features teacher-scholars who support majors seeking work in professional communication, in business, and in other areas, or attending graduate school; minors who wish to supplement their majors with a focus on communication; and students from various colleges who rely on us to teach them practical communication skills or to learn to appreciate theatre. Our faculty will continue to serve student groups, the university, the community, and our profession.

Major in Communication Arts
Students wishing to major in communication arts should make that declaration at or before the beginning of the sophomore year.* Students need to work closely with a faculty advisor to plan a program of study.

College of Liberal Arts
A major in communication arts consists of either 33 (Rhetoric) or 40 (Technical Communication) hours of coursework in the major, at least 21 hours of which must be at or above the 300-level. Transfer students must take at least 12 hours of upper-level coursework in the major at UAH. All majors are required to take the following three core courses:

CM 113 Introduction to Rhetorical Communication  
CM 231 Foundations of Human Communication  
CM 370 Communication Research Methods  

Additionally, majors must elect one of the following tracks and take the required core of courses listed under that track:

**Rhetoric Track**
- CM 309 History of Rhetoric or CM 331 Communication Theory  
- CM 375 Rhetorical Criticism  
- CM 431 Senior Seminar in Communication Theory and Research  
- 15 hours of electives from CM or other approved courses in allied disciplines.

**Technical Communication Track**
- CM 301 Technical Writing  
- CM 302 Technical Editing  
- CM 309 History of Rhetoric  
- CM 320 Practicum in Writing or CM 400 Communication Arts Internship  
- CM 501 Theory and Practice in Technical Communication  
- 15 hours of electives from CM or other approved courses in allied disciplines, including 6-9 hours of technical courses.

*Please schedule a meeting with the chair of communication arts after filing the appropriate forms in the Office of Student Records.*

**Minor in Communication Arts**

Students in major courses of study, which might be complemented by rhetorical or technical communication studies are invited to consult the chair of communication arts about developing a minor. Among those whose studies might be complemented by a minor in communication arts are: liberal arts students seeking to enhance their career opportunities through an understanding of practical discourse; English majors interested in rhetorical perspectives on literature; psychology and sociology majors who believe communication will be central to their work; engineering and science students who need to know how to present their ideas effectively to both technical and non-technical audiences (especially if they enter management positions); political science students interested in understanding communication processes central to political life, administrative science majors planning to enter a field where effective communication skills are highly valued, and pre-law majors.

A minor in communication arts consists of 21 hours of coursework taken within the department, at least 12 hours of which must be taken at or above the 300-level. At least half of the upper-level requirement must be taken at UAH. All minors are required to take the following:

- CM 113 Introduction to Rhetorical Communication  
- CM 231 Foundations of Human Communication  
- CM 309 History of Rhetoric or CM 331 Communication Theory  
- 12 hours of electives from CM (or approved courses in an allied discipline)

Those choosing a minor emphasizing technical communication should take CM 309 (rather than CM 331) in the core above, and elect to take CM 301, 302, 320, and one approved technical course.

**Cognate in Computer-Mediated Communication (Web Development)**

Students majoring in communication arts may minor in an interdisciplinary cognate in computer-mediated communication (or Web development). This program combines courses in communication, graphic arts, and management of information systems to prepare students for
work in the growing field of computer-mediated communication, especially those involving the
design, development, and management of Web sites. See more information on this program in the
catalog section “Computer-Mediated Communication Program.”

An Illustrative Plan for Completing the B.A. in Communication Arts

Communication Arts Major, Rhetoric Track

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Communication Arts Major, Technical Communication Track

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Total Hours 128
| Year 2 | Literature 3 | Literature 3 |
| Year 2 | Natural Science 4 | Natural Science 4 |
| Year 2 | Technical elective 3 | Technical elective 3 |
| Year 2 | CM 231 3 | Social Science elective 3 |
| Year 2 | Elective 3 | Course for Minor 3 |

| Year 3 | CM 309 3 | CM or technical elective 3 |
| Year 3 | CM 301 4 | CM 302 3 |
| Year 3 | CM 370 3 | Social Science elective 3 |
| Year 3 | Course for Minor 3 | Course for Minor 3 |
| Year 3 | Social Science elective 3 | CM elective (300+) 3 |

| Year 4 | CM 501 3 | CM 320 3 |
| Year 4 | Social Science elective 3 | Hum/Fine Arts elective 3 |
| Year 4 | Course for Minor 3 | Course for Minor 3 |
| Year 4 | Course for Minor 3 | 300-level elective 3 |
| Year 4 | CM elective (300+) 3 | Fine Arts elective 3 |

Total Hours 128

Communication Arts (CM)

### 100 Introduction to Computer-Mediated Communication

3 hrs.

This course weaves a practical introduction of internetworking tools into an overview of the dynamic context of pioneers, events, and innovations that led to the creation of the Internet. Students will be introduced to computer-mediated communication theory that asks them to critically reflect on the World Wide Web as a technical and artistic medium for human communication. The course teaches the HTML scripting and Web authoring software skills necessary to build a simple Web site that reflect sound communication principles. Lab Fee: $40. Prerequisite: Working knowledge of Windows© operating system and word processing such as that gained in MIS 146.

### 110 Voice and Diction

3 hrs.

Language, speech, and hearing as part of developmental training in vocal skills. (Does not satisfy College of Engineering HU/SS requirement.)

### 113 Introduction to Rhetorical Communication

3 hrs.

Develops public speaking skills through an examination of rhetorical theory, training, and practice.

### 122 Theater Appreciation

3 hrs.

Introductory survey of theater art focusing on understanding performance components and genres. (Satisfies fine arts elective.)

### 205 Media Writing

3 hrs.

Basic news writing, learning how to identify news, develop leads, organize information, develop stories, revise drafts, and copyedit articles, all while working under simulated deadline pressure.

### 214 Oral Performance of Literature

3 hrs.

Theory and practice in intellectual, artistic, and communicative skills required to read prose, poetry, and drama aloud effectively.

### 221 Acting

3 hrs.

Fundamentals of acting, including physical, vocal, and intellectual skills. Theory and practice in script analysis, scene study, improvisation, and mime.

### 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

163
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. Prerequisite: EH 101-102 and junior standing. (Same as EH 301.) Lab Fee: $40.

302 Technical Editing 4 hrs.
Clarifying, expanding, reducing, and rewriting technical reports and other documents created by others. Emphasis on elements of style and usage, revision, proofreading, and application of rhetorical techniques to the work of engineers, scientists, and technicians. Involves collaborative project with professional writers in industry. Prerequisite: EH 300 or EH 301 or CM 301. Offered spring semester only. (Same as EH 302.) Lab Fee: $40.

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.)

316 Legal Argument 3 hrs.
Examines argumentation in legal communities, that is, the way lawyers and judges provide reasoned support for the positions they defend concerning what the law requires in a given case. It considers common forms of legal argument, sources and forms of evidence, and legal values that underlie legal argument. It provides students with a critical perspective from which to judge legal arguments and a basic set of tools for developing legal arguments. Prerequisite: Junior standing or consent of instructor.

320 Practicum in Writing 1-3 hrs.
Writing and editing under the supervision of professionals. May be repeated up to 3 times for no more than 3 hours total credit. Prerequisites: CM 301, 302, enrollment in the Technical Writing Track, and a successful interview with the participating technical supervisor. Enrollment requires advance planning.

322 Theater History I 3 hrs.
Explores the development of theater art from its origins to French neoclassicism and Moliere with particular emphasis on the Greeks, Shakespeare, and his contemporaries.

323 Theater History II 3 hrs.
Traces the development of world theater from French neoclassicism to contemporary drama with emphasis on changes in the twentieth century.

330 Nonverbal Communication 3 hrs.
Examines the diversity of human nonverbal behavior and its influences on everyday communication experiences. (Same as PY 330.)

334 History of American Cinema 3 hrs.
Investigates the American cinema as a cultural artifact by studying cultural and historical context of representations, audiences, aesthetics and industry practices in American cinema from its beginnings (1895) to present.

340 Special Topics in Communication Arts 3 hrs.
Topics announced in advance. Representative topics include Media Effects, Intercultural Communication, and Corporeal Theory and Cultural Politics. May be repeated twice for credit.

345 Media Representation 3 hrs.
This course examines some of the relationships between media systems in the U.S. and their role.
in the social construction of cultural identities. This class will focus on media representations of race, gender, beauty, sexuality, body image and power, audience interpretations of such media portrayals, critical analyses of media culture and content, and what to do about these concerns: media literacy, activism & advocacy. Prerequisite: Junior standing or consent of instructor.

**370 Communication Research Methods**

Examines social scientific concepts, theories and designs commonly used in interpersonal communication research. Develops knowledge and skills necessary for employment in fields involving the study of communication behavior and perception. Provides preparation for senior seminar in communication theory and research. Prerequisites: CM 231 or CM 250.

**375 Rhetorical Criticism**

This course is an introduction to the critical analysis of public discourse. Specifically, it focuses on understanding how the variables of situation, audience, and rhetoric influence the production and reception of public messages. Prerequisites: CM 113 or approval of instructor.

**400 Internship**

Practical experience in the workplace allows the student to apply principles, theories, and skills learned in communication arts courses. Arranged by the student with consent of the chair, the student meets regularly with a faculty advisor, keeps a log of activities, and submits a report on the internship. Prerequisite: Senior standing with CM major.

**401 Computer-Mediated Communication**

Critically explores the social and practical impact of new communication media on rhetorical processes such as writing, organizing information, making arguments and building community. Applies communication theory to the information architecture of Web sites, including site navigation and organization, audience adaptation and labeling systems. Prerequisites: CM 100, 113 or permission of instructor. Lab Fee: $40.

**405 Advanced Media Writing**

Introduces and investigates a variety of media writing genres through the generation of advertising, public relations, magazine, and multimedia copy. Prerequisite: CM 205 or permission of instructor.

**410 Political Communication**

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.

**416 Women Orators**

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.

**430 Mass Media in America: Theory and Criticism**

This course encourages students to recognize the role media play in our everyday lives and in our construction of culture. The class also works to critically trace a media product through its production, content, audiences and social impact. The course emphasizes current research perspectives in media and its contemporary texts, primarily film, television, and mass marketed magazines. The course requires attention to and development of a media literacy campaign. (Same as SOC 430.)

**431 Senior Seminar in Communication Theory and Research**

Research and public presentation of original work demonstrating the ability to carry out a complete scholarly project. Prerequisites: CM 370, 375, and senior standing. Offered spring semester.

**499 Senior Project Management**

Students will develop and/or manage a Web site for a business or organization. Projects are arranged with the help of the instructor.

**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, 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.)
Computer-Mediated Communication Program
(The Web Cognate)
Dr. Clarke Rountree, Director
342 Morton Hall
Telephone: (256) 824-6646
Email: comm@email.uah.edu

The Computer-Mediated Communication Program offers an interdisciplinary cognate in computer-mediated communication, with an emphasis on Web design, development and management. This program combines courses in communication, graphic arts, and management of information systems (MIS) to prepare students for work in the growing field of Web-based communication. When combined with an appropriate major, the program prepares students for work in a number of increasingly Web-reliant fields, including marketing, public relations, journalism, graphic design, technical communication, corporate communication, and publishing.

The number of courses required for the cognate is quite large at 36 semester hours; however, students may complete cognate courses as part of their major and their general education requirements. Students majoring in communication arts, art studio, and MIS are particularly well positioned to complete cognate courses in their major degree programs, with only 21-24 hours of cognate courses normally required outside of the major. Students with other majors should contact the program director to determine the number of hours they can complete outside the cognate. A certificate in Computer-Mediated Communication will be awarded to students who complete at least half of the cognate’s coursework at UAH and maintain a minimum 2.5 grade point average in the cognate.

Students lacking computer skills in Windows© operating system, word processing, and database applications are encouraged to take MIS 146 prior to taking any of the technical courses in the cognate. Familiarity with the Macintosh© operating system is useful for students entering ARS 230 and higher level ARS courses in the cognate. The director of the CMC Program can advise you on what level of skill is required for various courses.

Cognate in Computer-Mediated Communication (Web Development)
The cognate in computer-mediated communication consists of 36 semester hours of required coursework in communication, art studio, and MIS, consisting of the following:

Introductory Course (3 hours)
CM 100 Introduction to Computer-Mediated Communication

MIS Courses (9 hours)
MIS 420 Electronic Commerce
MIS 440 Web Programming and Database Integration
MIS 465 Web Server and Internet Telecommunications Technologies

Communication Arts Courses (9 hours)
CM 113 Introduction to Rhetorical Communication
CM 301 Technical Writing
CM 401 Computer-Mediated Communication

Art Studio Courses (12 hours)
ARS 123 Two-dimensional Form in Design
ARS 230 Introduction to Graphic Design
ARS 332 Graphic Design III
ARS 431 Advanced Graphic Design II

Senior Project Management Course (3 hours)
CM 499 Senior Project Management

College of Liberal Arts
Course descriptions for the Web cognate courses can be found under the program description for Communication Arts (CM), Art Studio (ARS), and Management of Information Systems (MIS).

Students interested in the cognate should contact the program director who will coordinate their major and general education courses to develop an integrated program of study which best meets their educational and professional needs.

An Illustrative Plan for a Computer-Mediated Communication Minor

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<td></td>
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<td>2</td>
<td>17</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Total Hours 128</td>
</tr>
</tbody>
</table>

Education Department
232-K Morton Hall
Telephone: (256) 824-6180
Email: educ@uah.edu

Associate Professors Enger, Johnson, and Piersma (chair); Assistant Professors Confer, Coward, Dillihunt, Eaker; Lecturer Raines

MISSION
The Department of Education defines its mission through three focal elements: 1) to prepare teachers and other school personnel who are academically strong, competent in both theory and practice, and prepared to contribute to the needs of a dynamic, complex world; 2) to provide an environment that encourages the department faculty to model sound pedagogy, engage in research and scholarly activities, and become leaders within their area of expertise; and 3) to make our teaching, research, and service available to the entire community in order to meet the changing needs of schools, organizations, and professional communities in our region, state, nation, and international community.
The mission of the Department of Education is communicated through our shared vision and articulated in our theme, *Through Teaching, We Lead*. The establishment of this theme codifies the major purpose of our department: to graduate teachers who are exceptionally well-prepared in disciplinary, pedagogical, and professional knowledge, who understand and are prepared to address the needs of all learners, and who are committed to serving as leaders in the educational community to ensure that all students receive a high-quality public or private education.

**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 Elementary and Secondary Teacher Resource Centers in Morton Hall and a Computer Education Laboratory in the Salmon Library where current teaching materials are available and where laboratory classes are held. The Institute for Science Education, a resource center for teaching and research in science and mathematics, is located in Shelbie King Hall.

**SERVICES**
In addition to its teaching function, the department provides in-service education for schools, agencies, and institutions of higher learning; conducts and disseminates research to solve educational problems; and provides consultative service to all types and levels of educational institutions.

**DEGREES AND PROGRAMS OFFERED**
Under the State of Alabama plan, there are five levels of teacher certification programs, namely, P-3, K-6, 4-8, 6-12, and P-12. The Department of Education offers all options except P-3. In conjunction with the College of Liberal Arts and the College of Science, the department offers both undergraduate and graduate certification programs. Candidates who complete the following undergraduate certification programs meet the requirements for the Highly Qualified Teacher in Alabama.

- **Elementary Education (K-6)**
- **Secondary/High School Education (6-12)** with majors in biology, chemistry, English language arts, foreign language (German, French, Spanish), general science, history, mathematics, physics, social science.
- **Collaborative Teacher – Special Education K-6 or 6-12**
- **Middle School Endorsement (4-8)** with teaching fields biology, chemistry, English language arts, foreign language (German, French, Spanish), general science, history, mathematics, physics, and social science.
- **Music Education (P-12)**

A minor is not available in education.

**ACADEMIC ADVISING**
Students who plan to enroll in the Teacher Education Program and qualify for teacher certification should contact the chair of the Department of Education to be assigned an advisor as early as the freshman year. Students are expected to consult their advisors about curricular and degree requirements. In addition, students are expected to consult with advisors from their teaching field departments to coordinate the planning of programs of study.

**CAREER SERVICES AND PLACEMENT**
The Career Services Office, 117 Engineering Building, assists all students who have completed an approved Teacher Education Program at UAH and who are eligible for an Alabama professional career.
certificate, in seeking teaching positions. All teacher education students are encouraged to file their credentials with the Career Services Office during their senior year.

THE STATE BOARD OF EDUCATION PERIODICALLY REVISES THE REQUIREMENTS GOVERNING CERTIFICATION IN THE STATE OF ALABAMA. THEREFORE, REQUIREMENTS FOR DEGREES LEADING TO CERTIFICATION ARE SUBJECT TO CHANGE FROM THOSE PUBLISHED IN THIS CATALOG. THE STUDENT IS REQUIRED TO SEEK ADVISEMENT FROM THE EDUCATION DEPARTMENT (AS EARLY AS POSSIBLE IN THE PROGRAM OF STUDY) TO ENSURE THAT BOTH DEGREE REQUIREMENTS AND CERTIFICATION REQUIREMENTS ARE MET.

GENERAL INFORMATION

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.

Course Substitution. When a course substitution in professional studies or the teaching field is desired, permission must be obtained prior to enrolling in the course. Students should contact the Certification Officer in the UAH Department of Education for appropriate forms. Written approval from the Department Chair is required. 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 who receive a D in professional education or teaching field courses will be required to repeat the course 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 to UAH, the Department of Education will modify the student’s program to bring it into alignment 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.

PREADMISSION REQUIREMENTS

File an Intent to Apply to the Teacher Education Program (TEP) with the Certification Officer as soon as a decision is made to seek teacher certification but no later than the end of the sophomore year. Apply for a Program of Study (POS) with the college advisor prior to the end of the sophomore year. In addition, students must meet the following requirements:

1. No more than 2 courses of the General Education Requirements remain to be taken.
2. Minimum GPA of 2.5 and grades of C or higher in EH 101 & 102 (or EH 105), CM 113, and PY 201.

169 College of Liberal Arts
ADMISSION TO THE TEACHER EDUCATION PROGRAM

Admission to the university does not qualify a student for admission to the Teacher Education Program. Students must submit an Application for Admission to the Teacher Education Program during the Block I semester of the education courses. They must also verify that an approved Program of Study (POS) is on file in the UAH Department of Education. In addition, students must meet the following requirements:

1. Minimum 2.75 GPA in Block I Education courses (ED 301, 305, 308, and 350) with no grade lower than a C.
2. Minimum 2.5 GPA in major or second area of study with no grade lower than C.
3. Satisfactory completion of required Block I Field Experiences.
4. Satisfactory completion on Application Essays.
5. Three Letters of Recommendation.

Admission for transfer students. Transfer students who have completed two years of undergraduate study may be eligible to apply for admission to the TEP if they have a grade point average of 2.5 for 9 semester hours of coursework at UAH and meet other preadmission requirements.

Admission by reciprocity. Students who have been admitted to a teacher education program at an accredited university or college in Alabama may apply for reciprocal admission to the Teacher Education Program (TEP) with the Certification Officer or the Department Chair.

CONTINUATION IN THE TEACHER EDUCATION PROGRAM

Requirements include:
Minimum 2.75 GPA in Education courses with no grade lower than C. Minimum grade of C is also required for MA 230.

1. Minimum 2.5 GPA in second area of study or teaching field with no grade lower than C.
2. Satisfactory ratings on Dispositions Assessments.
4. Passing Score on APTT.

If the above requirements are not met, a Personalized Professional Development Plan (PPDP) will be initiated. Candidates who do not meet the conditions of the PPDP may be dismissed from the Teacher Education Program.

Field Experiences
The Alabama State Department of Education requires that all teacher candidates complete a minimum of 150 hours of field experiences in diverse settings prior to the internship. To meet this requirement, candidates will systematically be placed in area schools for approximately 40 hours of experience each semester.

INTERNSHIP PLACEMENT REQUIREMENTS

In addition to satisfactory completion of required coursework and satisfactory completion of 150 hours of field experiences, candidates must meet the following requirements:

1. Minimum 2.75 GPA in Education courses with no grade lower than C.
2. Minimum 2.5 GPA in second area of study or teaching field with no grade lower than C.
3. Satisfactory ratings on Dispositions Assessments.
5. Passing Score on Praxis II.

Application Dates: January 31 for the following Fall Semester and June 30 for the following Spring Semester. Internships must be taken the last semester before graduation. All internship placements are coordinated by the Department of Education faculty. At UAH, the internship is a full-time, full semester assignment of 15 weeks. Candidates should not expect to enroll in other courses during the internship semester.

1. Elementary Education students must complete a primary and intermediate grade assignment.
2. Secondary Education students will complete a middle and high school assignment.
3. P-12 music education students must complete an early childhood/elementary and a middle/high school assignment.
4. Candidates adding the Collaborative Teacher certification will complete part of the internship in a special education setting.

GRADUATION
The student must have met all general University and degree program requirements as outlined in the catalogue. The student must have maintained a 2.5 grade-point average in all teaching field courses and a 2.75 in all professional education courses at UAH and/or all other institutions attended.

CERTIFICATION REQUIREMENTS
Alabama teaching certificates are the legal responsibility of the Alabama State Department of Education. Colleges and universities cannot issue professional certificates. In order to be recommended for a professional teacher's certificate, candidates must complete a state approved program. Approved undergraduate programs offered by the UAH Department of Education are designed to prepare candidates for professional Class B certification with a bachelor’s degree.

Initial Certification
It is the candidate's responsibility to initiate the application for the initial certificate. To be recommended for an initial certificate, candidates must:
1. Meet all program requirements including satisfactory completion of the internship.
2. Satisfactory completion of the UAH Exit Portfolio Review and Praxis II.
3. Submit a fingerprint card to the Alabama State Department of Education with the appropriate fee in the form of a money order or cashier's check made payable to the Alabama Department of Education and successfully pass a background review conducted by the Alabama Bureau of Investigation and the Federal Bureau of Investigation. Anyone convicted of a felony and/or misdemeanor other than a minor traffic violation may be denied certification or have certification revoked by the State Superintendent of Education.
4. Individuals who hold a valid Alabama substitute teacher's license must submit to the certification officer a copy of the substitute license along with all certification application paperwork.
5. Candidates who expect to teach in states other than Alabama are responsible for knowledge of licensure requirements of those states. Such candidates should inform the certification officer of their intentions.

Certificate Renewal
1. The initial Class B certificate is valid for five years. This certification may be renewed upon verification of successful teaching for three years and completion of an approved professional development program or earning upper division or graduate level credit in the certification area.
2. Individuals who allow their certificates to lapse for more than 6 months will be required to renew their certificates, obtain another background clearance, and meet requirements of the Alabama Professional Teacher Testing (APTT) program for issuance of a renewed certificate or license. The UAH Department of Education in accordance with the Alabama State Board of Education provides courses for persons who wish to renew their certificates.

ENSURING THE COMPETENCE OF GRADUATES
For a period of two years of the valid date of the Professional Educator certificate, the University of Alabama in Huntsville, through the Department of Education, shall warranty and provide remediation at no cost to students who are evaluated to be unsatisfactory or deficient in any area of preparation. Remediation in professional education and/or teaching field departments will be based upon recommendations from the performance evaluations conducted by public school administrators who use the Alabama Professional Education Personnel Evaluation (PEPE) or comparable evaluations recognized and approved by the State Board of Education. This policy is consistent with the Alabama State Code of Education.
General Education Requirements

B.A. and/or B.S. programs are available for the following certification programs: biology, chemistry, collaborative teacher, elementary education, English-language arts, French, general science, German, history, mathematics, music, social science, and Spanish. (Students seeking teaching certification will find additional requirements and modification of requirements indicated in italics.)

GER Requirements for B.A.

Courses

English Composition: EH 101 and EH 102 (Students in the Honors Program may substitute EH 105H)
Humanities and Fine Arts (No more than 6 hours may be taken in any single discipline.)
Fine arts ARH 100, 101, 103, ARS 160, CM 122, MU 100
Literature EH 205, 240, or 250 and 206, 230, 241, or 251
Humanities and fine arts ARH 100, 101, 103, ARS 160, CM 122, FL 200 Level, MU 100, PHL 101, 201, 202,
WS 200 (Exception for students seeking teacher certification: CM 113 must be completed in lieu of one course in this area).
Foreign language and literature: FL 101, 102, or dependent on placement
Natural science

Elementary education (12 hours).

Secondary education (8 hours), two courses, one of which must be biology

Mathematics: Choose from MA 107, 110, 112, 113, 115, or 120 See advisor for appropriate course.

Elementary Education

Secondary Education

History, Social and Behavioral Sciences (No more than 6 hours may be taken in any single discipline.)
6 hours history

12 hours social science

Semester Hours

6
24 to 25
6 hrs.
6 hrs.
6 hrs.
10 hrs.
Hours and courses dependent upon elementary or secondary program (see details below)
Select one biology course (BYS 119 or 120) and then choose two additional courses from AST 106, 107, ES 102, CH 101/105, 113, PH 100, 101, 102 or a second biology course

Choose from: AST 106, 107, BYS 119, 120, 214, CH 101/105, 113, 121/125, 123/126, PH 100, 101, 102, 106, 107, 111/114, 112/115

Hours and courses dependent upon elementary or secondary program (see advisor). 12 hours including MA 230 - Math for Elementary Teachers 3 hrs.

18 hrs.
HY 101, 102 or HY 103, 104
ECN 142, 143, 239,
PSC 101, 102, 260,
PY 101, 201, SOC 100, 200.
Education students should select PY 201 as one of their courses.
GER Requirements for B.S.

AREA I
English Composition: EH 101 and 102 (Honors EH 105H)

AREA II
Humanities and Fine Arts (No more than 2 courses in any one discipline)
Fine Arts (1 course): ARH 100, 101, 103, ARS 160, MU 100, 101, or CM 122
Literature (1-2 courses):* EH 205-206, 205-241, 240-206, 240-241, 205-230, or 250-251
Humanities and Fine Arts (1-2 courses): CM 113 is required; additional course as needed from PHL 101, 202, WS 200, ARH 100, 101, 103, CM 122, MU 100, 101, FL 101, 102 chosen from FH, GN, JE, LN, RN, or SH.

AREA III
Humanities and Fine Arts (No more than 2 courses in any one discipline)

AREA IV
History, Social and Behavioral Sciences (No more than 2 courses in any one discipline)
History (1-2 courses):* HY 101-102 or HY 103, 104
Social and Behavioral Sciences (2-3 courses): Chosen from PSC 101, 102, 260, PY 100, SOC 100, 200, ECN 142, 143

AREA V
Preprofessional and Elective courses (See individual major for specific requirements.)
One science or engineering course outside major and not in minor requirements.
Mathematics and computer science majors must take a laboratory science (AST, ATS, BYS, CH, ES, PH) to meet this requirement.
One computer science course: CS 100, 102, 104 or higher. See major department for specific requirement.
Technical Writing: EHT 301
Electives: Mathematics must be taken here if not taken in AREA III or in major or minor.
* Education majors in the College of Science must take two literature and two history courses.

ELEMENTARY EDUCATION (K-6 certification)
The curriculum in elementary education provides a broad liberal education base, professional studies and includes the study of a single discipline. The curriculum prepares the teacher candidate 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 candidate 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 assist in planning an effective course of study. This planning also requires the student to seek counseling from an adviser in the department of the student's second area of study. Once admitted to the Teacher Education Program, the program must be completed within four years.

Upon successful completion of the elementary education program and all related requirements, students will be awarded a B.A. degree and may request recommendation for the Alabama Class B Elementary Professional Teachers Certificate for grades K-6.

The illustrative plan that follows is one example of the many ways elementary education majors may schedule coursework to complete the B.A. degree. A student's schedule may differ slightly, namely 1) in order of some coursework and 2) number of coursework taken each semester. Students should speak with their advisor regarding the optimum sequence for education courses. To the extent possible, schedules will be designed to fit the scheduling needs of the student.
### An Illustrative Plan for Completing the B.A. Degree with a Major in Elementary Education

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Fall</th>
<th>Spring</th>
<th>Academic Year Semester Hours</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>EH 101</td>
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<td>EH 102</td>
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<tr>
<td></td>
<td>FL 101</td>
<td>5</td>
<td>FL 102</td>
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<tr>
<td>Math</td>
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<td>Math</td>
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<tr>
<td>Social Science</td>
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<td>Fine Arts</td>
<td>3</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Social Science</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td>Year 2</td>
<td>EH 200 level</td>
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<td>EH 200 level</td>
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<tr>
<td></td>
<td>HY 101 or 103</td>
<td>3</td>
<td>HY 102 or 104</td>
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<tr>
<td>Math</td>
<td>3</td>
<td>PY 201</td>
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<td>Lab Science</td>
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<td>Lab Science</td>
<td>4</td>
</tr>
<tr>
<td>CM 113</td>
<td>3</td>
<td>Humanities</td>
<td>3</td>
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<td>Year 3</td>
<td>ED 301</td>
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<td>ED 309</td>
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<tr>
<td></td>
<td>ED 305</td>
<td>3</td>
<td>EDC 301</td>
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<td>ED 308</td>
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<td>ED 350</td>
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<td>Lab Science</td>
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<td>2nd Area of Study</td>
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<td>Summer</td>
<td>ED 310</td>
<td>3</td>
<td>MA 230</td>
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<td>Year 4</td>
<td>ED 373</td>
<td>3</td>
<td>ED 371</td>
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<tr>
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<td>ED 374</td>
<td>3</td>
<td>ED 372</td>
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<td>ED 405</td>
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<td>ED 315</td>
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<td>2nd Area of Study</td>
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<td>Year 5</td>
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**Total Hours 141**

### Program of Study—Elementary Education Major

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<th>Semester Hours</th>
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<tbody>
<tr>
<td>ED 301 - Introduction to Education</td>
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<tr>
<td>ED 305 - Foundations of Education</td>
<td>3</td>
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<tr>
<td>ED 308 - Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>ED 309 - Classroom and Behavior Management</td>
<td>3</td>
</tr>
<tr>
<td>ED 310 - Integrating Creative Arts</td>
<td>3</td>
</tr>
<tr>
<td>ED 315 - Educational Evaluation Measurement</td>
<td>3</td>
</tr>
<tr>
<td>ED 350 - Technology in the Classroom</td>
<td>3</td>
</tr>
<tr>
<td>ED 301 - Teaching Exceptional Children</td>
<td>3</td>
</tr>
<tr>
<td>EDC 311 - Instructional Strategies</td>
<td>3</td>
</tr>
<tr>
<td>ED 371 - Teaching Language Arts</td>
<td>3</td>
</tr>
<tr>
<td>ED 372 - Teaching Social Studies</td>
<td>3</td>
</tr>
<tr>
<td>ED 373 - Teaching Elementary Science</td>
<td>3</td>
</tr>
<tr>
<td>ED 374 - Teaching Elementary Math</td>
<td>3</td>
</tr>
<tr>
<td>ED 375 - Teaching Reading in Primary and Grades</td>
<td>3</td>
</tr>
<tr>
<td>ED 405 - Reading Strategies in Intermediate Grades</td>
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</tr>
<tr>
<td>ED 490 - Senior Seminar</td>
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</tr>
<tr>
<td>ED 493 - Elementary School Internship</td>
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</tbody>
</table>

**Total Hours 53**

### Second Area of Study for Elementary Education Teacher Candidates

A student planning to teach in an elementary school must select a second area consisting of a minimum of 15 hours. Available programs in the College of Liberal Arts are: English, communication arts, history, foreign language (French, German, Spanish), music, political science, or any other program approved by the academic department.
science, philosophy, psychology and sociology. Students may also select the Collaborative Teacher Cognate. Approved programs in the College of Science are biology, chemistry, mathematics and physics. Other cognate fields may be approved by petitioning for special consideration.

### History

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>HY 221,222 - U.S.</td>
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<td>HY</td>
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<tr>
<td>HY 225 - History of Ala.</td>
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</tr>
<tr>
<td>HY 392 - Europe</td>
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<tr>
<td>HY 300 Elect.</td>
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</tr>
<tr>
<td>HY 400+Elect.</td>
<td>3</td>
</tr>
<tr>
<td>*HY 101, 102 or 103, 104 in GER 6 hrs; HY 300, 400 level one US &amp; one non US history</td>
<td>6</td>
</tr>
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### Biology

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>BYS 219* Gen. Genetics</td>
<td>4</td>
</tr>
<tr>
<td>*CH 121, 125 Prereq. (4)</td>
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</tr>
<tr>
<td>BYS 312 - Prin. of Ecology</td>
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### RECOMMENDED:

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<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>BYS 301* Elementary Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>*CH 201 Prerequisite (4) or BYS 340 Basic Cellular</td>
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</tr>
<tr>
<td>*CH 121 Prerequisite (4)</td>
<td>4</td>
</tr>
<tr>
<td>BYS 300+Elective</td>
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</tr>
<tr>
<td>*BYS 119,120 in GER 8 hrs.</td>
<td>8</td>
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### Collaborative

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EDC 301 - Teaching Exceptional. Child</td>
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<tr>
<td>EDC 302 - Intro. Low Incident Pop.</td>
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<tr>
<td>EDC 311 - Instructional Strategies</td>
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<tr>
<td>EDC 321 Collaborative/Consultation</td>
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<tr>
<td>EDC 331 - Critical Issues in Education</td>
<td>3</td>
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<tr>
<td>EDC 351 - Behavior Analysis and Intervention</td>
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### English

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>EH 300+American Literature</td>
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</tr>
<tr>
<td>EH 360 - Shakespeare</td>
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</tr>
<tr>
<td>EH 307 - Structure of Mod. Eng.</td>
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<tr>
<td>EH 400 - Comp. for Teachers</td>
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<tr>
<td>EH 300 English Literature</td>
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### The Novel

<table>
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<th>Course</th>
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### Mathematical Science

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<tr>
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<td>MA 330 - Foundations of Mathematics</td>
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<td>MA 333 - Geometry</td>
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<td>MA 385 - Probability</td>
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<td>MA 442 - Alg. Structures</td>
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<td>MA 452 - Real Analysis</td>
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<td>MA/ST 487 Intro Mathematical Statistics</td>
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<td>*MA 171- Calculus A, MA 172 - Calculus B</td>
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### Music

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<td>MUA – Studio Instruction Ensembles</td>
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### Philosophy

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### Political Science

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Communication Arts 21 hours
CM 221 - Acting 3
CM 231 - Foundations of Communication 3
CM 309 or 310 3
CM 205- Media Writing 3
CM 430 - Mass Media 3
*CM 113 and CM 122 in the GER 6

Psychology 18 hours
PY 102 - General Psych. II 3
PY 315 - Developmental Psychology 3
Psychology
PY 375 - Social Psychology 3
PY 301 - Personality or 3
PY 433 - Psychology of Abnormal Behavior
PY 314 - Learning or
PY 380 Cognition 3
*PY 101 in GER 3 hrs. 3

Sociology 18 hours
SOC 102 Social Problems 3
or SOC 106 Marriage and Family
SOC 300+Electives 12
*SOC 100 in GER 3 hrs. 3

Foreign Language 25 hours
French, German, Spanish 3
FL 200 Intermediate Foreign Language 3
FL 301 Conversation 3
FL 302 Composition 3
FL 304 Culture 3
FL 305 Introduction to Literature 3
*FL 101, 102 in GER -10 hrs 10

COLLABORATIVE TEACHER PROGRAM
(K-6 or 6-12 certification options)
The Collaborative Teacher Program is designed to prepare teachers to better meet the diverse needs of all children, including those who have been determined to be exceptional and who receive services under the Individuals with Disabilities Education Act. Students in the Collaborative Program take courses that introduce them to a variety of exceptionalities and that help them become aware of the critical issues relevant to the delivery of services to exceptional children. Methods courses in this cognate focus on developing assessment, instructional, and behavioral management strategies tailored to the unique needs of the exceptional child. Students who complete the courses in the Collaborative Program are eligible to apply for dual certification in Special Education and in their chosen certification area (either K-6 Elementary Education or 6-12 Secondary Education teaching field). Each of the courses in the program includes a practicum in an inclusive classroom. The Collaborative Teacher Program is not a stand-alone program for either elementary or secondary education students.

Elementary Education-Collaborative Teacher Certification Program (K-6)
An Illustrative Plan for Completing the B.A. Program with Dual Certification

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Year 3
ED 301 1
ED 305 3
ED 308 3
ED 350 3
Social Science 3

Summer
ED 310 3
EDC Course 3

Year 4
ED 373 3
ED 374 3
ED 405 3
ED 315 3
EDC course 3

Year 5
Internship 9
ED 490 1

Total Hours 139

Program for Collaborative Teacher Area of Study
EDC 301 - Teaching Exceptional Children 3 hours
EDC 302 - Introduction to Low Incidence Populations 3 hours
EDC 311 - Instructional Strategies 3 hours
EDC 321 - Collaborative Consultation 3 hours
EDC 331 - Critical Issues in Education 3 hours
EDC 351 - Behavior Analysis and Intervention 3 hours

Secondary Education - Collaborative Teacher Certification Program (6-12)
Students who are seeking teacher certification for grades 6-12 may also add the Collaborative Teacher-Special Education program as a second area of study. Because programs of study for students seeking 6-12 certification vary greatly, students who choose to add the Collaborative Teacher area of study to their first teaching field (English, history, biology, etc.) should consult with the Certification Officer and the special education advisor in the Education Department. It is not possible to design an illustrative plan that would be appropriate; therefore individual programs of study will be developed for any student choosing to add the collaborative teacher area of study to their major teaching field. Students should be aware that adding dual certification in the Collaborative Teacher at the secondary level will lengthen the time to degree.

SECONDARY/HIGH SCHOOL EDUCATION (6-12 Certification)
The curriculum in high school education is planned to provide a broad liberal base, professional studies in high school teaching, and an in-depth study of a comprehensive field for the purpose of preparing teachers for service in senior high schools. Students may, at their option, also seek certification in middle/junior high school education, with additional coursework and internships. Preparation will be rigorous and will equip the teacher to work in the high school setting and to deal with adolescents. Students should seek advisement as early as possible. Advisors will be assigned in both professional education and in the teaching field(s). The student will earn a B.A. or B.S. depending on the field chosen. Upon successful completion of the program and all related requirements, the student may request recommendation for the Alabama Class B High School Certificate for grades 6-12.

SECONDARY EDUCATION 6-12 TEACHER PREPARATION PROGRAMS OFFERED
Biology B.A., B.S.
Foreign Language B.A.
(German, French, Spanish)
Mathematics B.A., B.S.
Chemistry B.S.
English Language Arts B.A.
General Science B.A., B.S.
History B.A.
Physics B.S.
Social Science B.A.

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The following pages contain illustrative plans for completing B.A. or B.S. degree programs with majors in the above listed teaching fields. These plans are provided as examples of the many ways a student may schedule coursework to complete a B.A. or B.S. degree with a teaching field major. A student’s schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student. The major teaching field departments have selected specific courses as most appropriate for the preparation of teachers. The programs, including those courses listed for each major, have been approved by the Alabama State Department of Education for teacher certification in grades 6-12; therefore students choosing to teach in a high school setting should seek early advisement from the Education Department and the teaching field department in order to register for courses within the state approved program.

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Program for Biology B.A. Certification

- BYS 119 - Principles of Biology 4 hrs. (GER)
- BYS 120 - Organismal Biology 4 hrs. (GER)
- BYS 219 - Genetics 4 hrs.
- BYS 312 - Principles of Ecology 4 hrs.
- BYS 321 - General Microbiology 4 hrs.
- BYS 340 - Cell & Developmental Biology 4 hrs.
- BYS 490 - Senior Seminar 2 hrs.
- BYS 300+ Electives 10 hrs.

Total 36 hours
Ancillary requirements:
Chemistry:
Option 1
CH 101, 105 (4) (GER); 201 (4); 301 (3)
Option 2
CH 121, 125 (4); 123, 126 (4), 223, 224 (4); 331, 336 (4); 332, 336 (4); 361, 362 (4)

Physics:
PH 101, 102 - General Physics I and II OR 8 hours (GER)
PH 111, 114 - Physics with Calculus I & Lab
PH 112, 115 - Physics with Calculus II & Lab
Total 19-32 hours
*CH 113 AND 301 if beginning with CH 101, 105—CH 331, 335 & CH 361, 362 if beginning with CH 121, 125

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Total Hours 139-143

Program for Biology B.S. Certification

BYS 119 - Principles of Biology
BYS 120 - Organismal Biology
BYS 219 – Genetics
BYS 312 - Principles of Ecology
BYS 321 - General Microbiology
BYS 340 - Cell & Developmental Biology
BYS 490 - Senior Seminar
BYS 300+ - Electives

Ancillary requirements:
Chemistry:
Option 1

11 hrs.

College of Liberal Arts
### Program for Chemistry Certification

**Chemistry Courses:**
- CH 121, 125 - General and Inorganic Chemistry I and Lab  
  - 4 hrs.
- CH 123, 126 - General and Inorganic Chemistry II and Lab  
  - 4 hrs.
- CH 223, 224 - Quantitative Analysis & Lab  
  - 2 hrs.
- CH 315 - Chemical Demonstration  
  - 4 hrs.
- CH 331, 335 - Organic Chemistry I and Lab  
  - 4 hrs.
- CH 332, 336 - Organic Chemistry II and Lab  
  - 3 hrs.
- CH 347 - Biophysical Chemistry I  
  - 5 hrs.
- CH 348 - Biophysical Chemistry II  
  - 4 hrs.
- CH 361, 362 - General Biochemistry I and Lab  
  - Total 32 hours

**Ancillary Courses:**
- PH 111, 114 (4); 112, 115 (4); 113, 116 (4)  
  - 12 hrs.
- MA171 (4); 172 (4); 201(4)  
  - 4 hrs.
- BYS 119 or 120 (4)  
  - Total 28 hours

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**Spring**

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**Total Hours 135-136**

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### English-Language Arts (6-12 Certification)

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**Academic Year Semester Hours**

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**Program for English Language Arts Certification**

- Sophomore Survey (as described in the GER)
- Shakespeare (EH 360)
- Structure of Modern English (EH 307)
- Composition Studies for Teachers (EH 400)
- American Literature (EH 330, 331, 339, 430, 431, 530, 532, 533; 340 or 540 with topic in American Literature)
- English Literature (EH 380, 381, 390, 391, 418, 421, 450, 460, 470, 492, 493, 520, 522, 551, 571, 572, 592; 340 or 540 with topic in English Literature)
- The Novel (EH 339, 340, 430, 431, 492, 493, 530, 540 with topic covering the novel)
- Literature elective (must be 300 level or above)
- One course in creative writing (EH 310, 311, or 412) may serve as the literature elective.
- Speech and Communication
- CM 113 and 231
- Communication Arts Elective (CM 309 or 310)
- Drama and Theatre (CM 122 and 221)
- Media Writing (CM 205)
- Mass Media (CM 430)

Total 48 hours
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**Program for Foreign Language Certification (French, German, or Spanish)**

- **FL 101, 102** - Introductory Foreign Language I and II
- **FL 200** - Intermediate Foreign Language
- **FL 204** - International Cinema
- **FL 301** - Conversation
- **FL 302** - Composition
- **FL 303** - Foreign Language for Life and Professions
- **FL 304** - Culture
- **FL 305** - Introduction to Literature
- **FL 404** - Texts and Contexts: Seminar in Literature
- **FL 410** - Comparative Languages & Culture in Practice

Total 37 hours

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| Spring                            |                                            |
|-----------------------------------|                                            |
| Year 1                            |                                            |
| EH 102 3                         |                                            |
| BYS 120 4                       |                                            |
| CS 100, 102 or 103 3             |                                            |
| Social Science 3                  |                                            |
| Fine Arts 3                      |                                            |
| 3                                |                                            |
| 3                                |                                            |

**Academic Year Semester Hours**

- Year 1: 129 hours
- Year 4: 10 hours (GER)
- Total: 129 hours

**College of Liberal Arts**
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**Program for General Science B.A. (6-12 Certification)**

- **Biology Courses:**
  - BYS 119 (4); 120 (4) (GER); 219 (4); 321 (4) 340 (4); 490 (2); BYS 300+elect.

- **Chemistry**
  - Option 1
    - CH 101, 105 (4) (GER); 201 (4); 301 (3)
  - Option 2
    - CH 121, 125 (4); 123, 126 (4), 223, 224 (4); 331,335 (4); 332, 336 (4); 361, 362 (4)

- **Physics**
  - PH 101, 102 (4) (GER); PH 111, 114, (4); 112, 115 (4) 113, 116 (4) AST 106 (4) (GER); 107 (4) (GER)

- **Environment Science**
  - ES 101 (4) (GER), 102 (4) (GER); ES 312 / BYS - 312 (4)

**General Science B.S. (6-12 Certification)**

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<th>AcademicYear Semester Hours</th>
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183 College of Liberal Arts
Year 2
EH 200 level 3  
HY 101 or 103 3  
BYS 219 4  
PH 112, 115 4  
CM 113 3  
MA201 4  

Summer CM 113 3  

Year 3
ED 301 1  
ED 305 3  
ED 308 3  
ED 350 3  
BYS 321 4  
CH 331, 335 or 201 3-4  

Summer ED 410 3  
ES 101 4  

Year 4
ED 408 3  
BYS 340 3  
BYS 300+elect. 3-4  
PH 106 4  
EH 301 3  

Year 5
Internship 9  
Senior Seminar 1  

Program for General Science B.S. (6-12 Certification)

Biology 32 hours
BYS 119 (4); 120 (4) (GER); 219 (4); 321 (4) 340 (4); 490 (2); BYS 300+elect. 10
Chemistry
Option 1
CH 101, 105 (4) (GER); 201 (4); 301 (3) 11 hours
Option 2
CH 121, 125 (4); 123, 126 (4); 223, 224 (4); 331, 335 (4); 3 20 hours
32, 336 (4); 361, 362 (4)
Physics
PH 101, 102 (4) (GER); PH 111, 114, (4); 112, 115 (4) 113, 116 (4) AST 106 (4) (GER); 107(4) (GER) 24 hours
Environment Science
ES 101 (4) (GER), 102 (4) (GER); ES 312 / BYS - 312 (4) 12 hours
Mathematics
MA 171 (4), 172 (4), 201 (4) 12 hours

History (6-12 Certification)

Fall
Year 1 HY101 3  
FL101 5  
HY101 or 103 3  
Fine Arts 3  

Spring
HY102 3  
FL102 5  
HY102 or 104 3  
MA 3  
Social Science 3  

Total Hours 169-172
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**Program for History Certification**

HY 101, 102 Western Civilization OR HY 103, 104 World History
HY 221-222 - American History
HY 225 - Alabama History
HY Elective at 200 or above
HY300+ electives
HY 400+ electives
HY 490 - Research Seminar in History

Note requirements for electives: 6 hours of American history beyond 221, 222. 6 hours of non-American history beyond 101, 102. 21 hours must be at the 300+ level

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185 College of Liberal Arts
Program for Social Science-History Certification

History Courses:
- HY 101, 102 - Western Civilization or
- HY 103, 104 World History (GER) 6 hrs.
- HY 221-222 - American History 6 hrs.
- HY 225 - Alabama History 3 hrs.
- HY Elective 200 or above 3 hrs.
- HY 300 + electives 9 hrs.
- HY 400 + elective 6 hrs.
- HY 490 - Research Seminar in History 3 hrs.

Other Social Science Courses:
- GEOG 6 hrs.
- ECON 142, 143 6 hrs.
- PSC 101, 102, 260 6 hrs.
- PY101, 375 6 hrs.
- SOC 100, 200 6 hrs.

Note requirements for electives: 6 hours of American history beyond 221, 222. 6 hours of non-American history beyond 101, 102. 21 hours must be at the 300+ level

Mathematics B.A. (6-12 Certification)

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>Academic Year Semester Hours</th>
</tr>
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<tbody>
<tr>
<td>Year 1</td>
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<tr>
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Total Hours 154
### Program for Mathematics Certification (B.A.)

**Mathematics Courses:**
- MA 171 - Calculus A
- MA 172 - Calculus B
- MA 201 - Calculus C
- MA 244 - Linear Algebra
- MA 330 - Foundations of Mathematics
- MA 385 - Introduction to Probability.
- MA 442 - Algebraic Structures with Applications.
- MA 452 - Introduction to Real Analysis.
- MA 333 - Introduction to Geometry.
- MA/ST 487 - Introduction to Mathematical Statistics
- MA electives, including one at 500 + level

**Ancillary Courses:**
- PH 111, 114 (4); PH 112, 115 (4)

### Mathematics B.S. (6-12 Certification)

<table>
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<tr>
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</table>

Total Hours 142
Year 5
ED 490
12
ED 497
9
Total Hours 137

Program for Mathematics Certification (B.S.)

Mathematics Courses:
MA 171 - Calculus A
MA 172 - Calculus B
MA 201 - Calculus C
MA 244 - Linear Algebra
MA 330 - Found. of Math
MA 385 - Intro. to Probability.
MA 442 - Algebraic Struct. With Applications
MA 452 - Intro. to Real Analysis
MA 333 - Intro. to Geometry.
MA/ST 487 - Intro. to Math Statistics
MA elective, including one at 500+ level

Ancillary Courses:
PH 111, 114 (4); PH 112, 115 (4); CS 102 (3)

Physics B.S. (6-12 Certification)

<table>
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<th>Fall</th>
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<tr>
<td>Year 1 EH 101</td>
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<td>MA 171</td>
<td>MA 172</td>
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<td>PH 110</td>
<td>PH 111, 114</td>
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<td>Year 2 PH 112, 115</td>
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<td>PH 337</td>
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<td>Fine Arts</td>
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<td>ED 497</td>
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<td>Physics Courses:</td>
<td>Ancillary Courses:</td>
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<tr>
<td>PH 110 - Frontiers in Science</td>
<td>3 hrs. MA171, 172, 201 – Calculus</td>
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<tr>
<td>PH 111, 114 - Physics with Calculus I</td>
<td>4 hrs. EH 301 - Technical Writing</td>
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<td>PH 112, 115 - Physics with Calculus II</td>
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<td>PH 113, 116 - Physics with Calculus III</td>
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<td>AST 106 - Exploring the Cosmos I</td>
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<td>PH 351 - Introduction to Modern Physics</td>
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<td>PH 499 - Physics Practicum</td>
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<td>PH 305 - Math Methods in Physics</td>
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<td>Total 33 hours</td>
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**Program of Study for Physics**

**Ancillary Courses:**
- 3 hrs. MA171, 172, 201 – Calculus
- 4 hrs. EH 301 - Technical Writing
- 4 hrs. CS 102, 103 or 121 -3 hrs.
- Computer Science
- 4 hrs. BYS 119 - Principles of Biology
- 4 hrs. BYS 120 - Organismal Biology
- 4 hrs. MA324 - Differential Equations
- 3 hrs. MA 244 - Linear Algebra
- 3 hrs.

**MIDDLE/JUNIOR HIGH SCHOOL ENDORSEMENT (4-8 certification)**

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 it is not a stand alone 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.

For individuals with K-6 certification, adding middle school endorsement would also permit teaching in grades 7 and 8 in the teaching field(s) for which the person has completed the requirements as otherwise outlined in this catalog. Students with a major in elementary education (K-6 certification) must meet the following additional requirements: (1) ED 416 Middle and High School Methods Block, (2) the second area of study must be equivalent to the approved hours for the major*, (3) additional internship in grades 4-8.

*In order to meet the Highly Qualified Teacher status as a middle school teacher, the second area of study or teaching field would have to include a minimum of 32 hours with at least 19 at the upper division.

For a person with high school certification, adding middle school endorsement would also permit teaching in grades 4-5 in the teaching field(s) for which the person has completed the requirements. Additional requirements for students enrolled in the high school program (6-12) and seeking middle school endorsement are as follows: (1) ED 405 – Reading Strategies in Intermediate grades and (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 and all related requirements, the student may request recommendation for the Alabama Class B Middle/Junior High School Certificate for grades 4-8.

**MIDDLE SCHOOL (4-8) ENDORSEMENTS OFFERED**

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<thead>
<tr>
<th>Biology</th>
<th>Chemistry</th>
<th>English</th>
<th>Language Arts</th>
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<tbody>
<tr>
<td>Foreign Languages</td>
<td>General Science</td>
<td>History</td>
<td>Social Sciences</td>
</tr>
<tr>
<td>Mathematics</td>
<td>Physics</td>
<td></td>
<td></td>
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</tbody>
</table>

189 College of Liberal Arts
P-12 CERTIFICATION

Individuals who want to teach music may enroll in one of two music education programs (instrumental or vocal/choral). These programs lead to an Alabama Class B Certification for grades P-12. Individuals enrolled in a music program leading to certification will complete both music and education coursework. Preparation in the arts has traditionally been rigorous and extensive and these programs are no exception. Students should expect to take more than the minimum of 128 hours required for graduation. Early counseling with advisors is strongly recommended.

An Illustrative Plan for Completing the B.A. Degree with a Major in Music and a Music Education Emphasis

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>Academic Semester Hours</th>
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<tr>
<td><strong>Year 1</strong></td>
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<td></td>
</tr>
<tr>
<td>MU 100 3</td>
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<tr>
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<tr>
<td>MU 202 3</td>
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<td><strong>Year 4</strong></td>
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<td>MU 401 2</td>
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<tr>
<td>PSC 101 3</td>
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<tr>
<td>MUE 326 2</td>
<td>MUE 428 or 429 3</td>
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<td>ED 408 3</td>
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<td>PSC 102 3</td>
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College of Liberal Arts 190
# Program for Music Education Emphasis

<table>
<thead>
<tr>
<th>MUSIC CORE</th>
<th>MUSIC EDUCATION EMPHASIS</th>
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<tbody>
<tr>
<td>Principal Instrument (4x1.5) + (2x2) 10</td>
<td>Secondary Instrument (4x1)</td>
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<tr>
<td>Upper Level Elective 2</td>
<td>Includes MU 322 for vocal students 4</td>
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<tr>
<td>MU 100 - Intro. to Music Literature 3</td>
<td>MU 302 Form and Analysis 3</td>
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<tr>
<td>MU 201 - Music Theory I 3</td>
<td>MU 304 - Musicianship Skills IV 1</td>
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<td>MU 203 - Musicianship Skills I 1</td>
<td>MU 401 - Musical Materials of the Modern Era 2</td>
</tr>
<tr>
<td>MU 202 - Music Theory II 3</td>
<td>MU 416 - Orchestration 2</td>
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<td>MU 204 - Musicianship Skills II 1</td>
<td>MU 425 - Advanced Conducting 2</td>
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<td>MU 301 - Music Theory III 3</td>
<td>MUA 39X Ensembles (2x1) 2</td>
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<td>MU 303 - Musicianship Skills III 1</td>
<td>MUE 326 - Gen. Music/Elementary 2</td>
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<td>MU 311 - Music History I 3</td>
<td>MUE 327 - Gen. Music/Secondary 2</td>
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<tr>
<td>MU 312 - Music History II 3</td>
<td>MU 325 - Conducting 2</td>
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<td>MU 325 - Conducting 2</td>
<td>MUE 428 - Choral Meth/Secondary</td>
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<td>MUA 39X - Ensembles 4</td>
<td>or MUE 429 - Instrumental Meth/</td>
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<tr>
<td>MU 106 Intro. to Music Technology 1</td>
<td>Piano Proficiency 1</td>
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<tr>
<td>TOTAL CREDIT HOURS 40</td>
<td>TOTAL HOURS 64 hrs.</td>
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<tr>
<td>TOTAL MUSIC HOURS 64</td>
<td>Music + 54 hrs. GER + 29 hrs. Education = 147 hrs.</td>
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</table>

NOTE: Students should consult the Education Department for advisement on professional education course requirements and refer to music section of this catalog.

## Education (ED)

### 115 Effective Reading and Study Skills

Developmental course focusing on acquisition of strategies to expand an individual's ability to read and study materials encountered in higher education. Effective reading and study strategies which incorporate reading, writing, and listening skills are taught and applied, using college texts and related readings.

**3 hrs.**

### 301 Introduction to Education Practicum

Initial practicum experience designed to provide the opportunity to explore the role of the classroom teacher in today's diverse school settings. The five-day observation will be integral to the content and objectives of ED 305 and 308, and will provide a foundation for the coursework and activities. Required for all students, including transfer students, students adding an endorsement, and certification-only student. Prerequisite: Permission of the department chair.

**1 hr.**

### 305 Foundations of Education in the United States

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. Prerequisite: Permission of the department chair. Intensive field experience required. To be taken concurrently with ED 301 and 308.

**3 hrs.**

### 308 Educational Psychology

Psychological principles basic to an understanding of the learner, the learning process, and the learning situation. Intensive field experience required. Prerequisites: Permission of the department chair. To be taken concurrently with ED 301 and 305.

**3 hrs.**

### 309 Classroom and Behavior Management

This course focuses on instructional options that learners need in order to be successful. It takes a broad approach to classroom and behavior management that is grounded in both theory and reflective practice. Content will emphasize the study and implementation of a variety of classroom and behavior management strategies that are necessary for working with diverse populations.

**3 hrs.**
populations. Prerequisite: Admission to the Teacher Education Program or permission of the chair. Intensive field experience in an assigned public school required. To be taken concurrently with EDC 301 and 311.

325 The Sociology of Education  3 hrs.
Sociological approach to the study of education as a social institution; its structure, function and role in contemporary life. Prerequisite: SOC 100 or approval of instructor. (Same as SOC 325.)

350 Technology in the Classroom  3 hrs.
Introduces prospective teachers to current state of the art in educational technology. Designed as a laboratory course providing extensive hands-on experiences with microcomputers and other emerging technology. Emphasis is on enabling the student to effectively integrate technology into instructional settings. May be taken prior to or concurrently with ED 301, 305, and 308.

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

Elementary Education

310 Integrating the Creative Arts in Elementary School Classrooms  3 hrs.
This course is designed to serve as an introduction to the basic principles of visual and performing arts education for the elementary school setting. Emphases will be placed on methods for enhancing student learning and creative thinking through integration of the creative arts (art, music, drama, and movement-dance) into K-6 classroom instruction. Prerequisites: Admission to the Teacher Education Program. Intensive school and community-based practicum required.

315 Educational Evaluation and Measurement  3 hrs.
This course is designed to help prospective teachers use and construct a range of assessments that will help them plan and teach more effectively, improve learning and meet state and national standards. The class will focus on more traditional assessment issues such as validity and reliability, as well as the alternative assessments that are likely used in today's classrooms. Furthermore contextual issues such as educational accountability testing, the No Child Left Behind Act, and teacher testing and evaluation (PEPE) will be explored. Intensive field experience required. Taken concurrently with ED 373, 374, 405. Admission to the Teacher Education Program or permission of the chair.

371 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 or permission of the chair. Intensive field experience required. To be taken concurrently with ED 372 and 375.

372 Teaching Elementary Social Studies  3 hrs.
Teaching social studies in grades K-6. Helping beginning teachers acquire background skills in organizing and teaching units of work. Prerequisite: Admission to the Teacher Education Program or permission of the chair. Intensive field experience required. To be taken concurrently with ED 371, and 375.

373 Teaching Elementary Science and Health  3 hrs.
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 or permission of the chair. Intensive field experience required. To be taken concurrently with ED 374 and 405.

374 Teaching Elementary Mathematics  3 hrs.
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 or permission of the chair. Intensive field experience required. To be taken concurrently with ED 373 and 405.

375 Teaching Reading in Primary Grades  3 hrs.
This course will provide an introduction to basic principles of early literacy instruction in culturally and linguistically diverse classrooms, including theoretical bases for literacy instruction in grades K-2, methods of instruction and organization, the major components of primary grade reading instruction, developmentally appropriate strategies and materials, and assessment of
children's literacy needs. Prerequisite: Admission to the Teacher Education Program or permission of the chair. Intensive field experience in an assigned public school required. To be taken concurrently with ED 371 and 372.

**400 Literature for Children and Adolescents**
3 hrs.
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. Prerequisite: Permission of the chair. Intensive field experience required.

**405 Reading Strategies in Intermediate Grades**
3 hrs.
This course provides an in-depth study in and application of the process of reading and reading instruction, theoretical approaches, instructional strategies, classroom organization, and the formal/informal assessment of reading in intermediate grades. This course is required of all elementary education majors and secondary education candidates who are pursuing a middle school endorsement. Prerequisite: Admission to the Teacher Education Program or permission of the chair. Intensive field experience required. To be taken concurrently with ED 315, ED 373, and ED 374.

**490 Senior Seminar in Education**
1 hr.
This course provides an opportunity for reflection and discussion of the student teaching experiences. Students will explore critical issues facing classroom teachers and the teaching professions, such as professionalism, classroom management, inclusive classrooms, ESL students, teacher evaluation models, and professional development. Resumes, the certification process, and interview protocols will also be discussed. To be taken concurrently with student teaching ED 493, 497, and 499. Prerequisite: Permission of the chair.

**492 Observation and Participation in Teaching**
3-6 hrs.
Selected observation and participation in elementary schools. For students in curricula designed for both elementary and secondary schools and for experienced teachers. Prerequisites: ED 305, 308, 309, three methods courses or equivalent approved courses, and an approved application for student teaching. Prerequisite: Permission of the chair.

**493 Elementary School Internship**
9 hrs.
Student teaching is learning the art of teaching with guidance and support from a mentor teacher. Student teachers are expected to integrate, synthesize and apply theoretical knowledge from previous courses in realistic, planned, professional settings. They are expected to effect current research-based practices and strategies that provide for growth in pupil learning and growth in the professional knowledge, skills, and dispositions of novice teachers. Elementary education majors will complete a primary and an intermediate grade assignment. Collaborative teacher candidates will complete an assignment in a special education setting and a K-6 classroom. Students must complete a minimum of 20 full-time teaching days, of which at least 15 must be consecutive. Prerequisites: Completion of all professional education courses, including collaborative teacher courses and permission of chair. To be taken concurrently with ED 490.

**494 Elementary School Internship**
3 hrs.
Essentially the same as ED 493. However, it will require a minimum of 100 total clock hours, including a minimum of some 30 hours of responsible teaching. It is to be used by persons seeking dual certification or by post-graduate students seeking additional areas of endorsement. Prerequisite: Permission of the department chair.

**Collaborative Teacher - Special Education (EDC)**

**301 Teaching the Exceptional Child (Survey Part I)**
3 hrs.
Examines special education laws and methodology used in teaching special education students. Focus primarily on those students with mild learning disabilities. Also examines requirements needed in the regular classroom for special teachers. Prerequisites: Admission to the Teacher Education Program or permission of the chair. Intensive field experience required. To be taken concurrently with ED 309 and EDC 311.

**302 Introduction to Low Incidence Populations (Survey Part II)**
3 hrs.
Students will learn about low incidence disabilities through reading, research, discussion, and the integration of specific learning strategies during class activities. Students are expected to complete a case study/practicum with a disabled student in addition to 15 hours of observation in classrooms for low incidence exceptional students. Prerequisite: Admission to the Teacher Education Program.
Education Program and completion of EDC 301. Intensive field experience required.

311 Instructional Strategies: Dimensions of Learning for K-12 Students 3 hrs.
This course focuses on instructional options that learners need in order to be successful. It takes a broad approach to the multiple teaching models that are necessary for working with diverse populations. The study of various models is grounded in the theory and research of effective teaching. Students will analyze lessons through a “model of instruction” lens and will develop lessons that reflect selected models. Prerequisites: Admission to the Teacher Education Program or permission of the chair. Intensive field experience required. To be taken concurrently with EDC 301 and ED 309.

321 Collaborative Consultation (Parents, Teachers, Teams) 3 hrs.
This class will focus on the description and rational for collaboration, including communication skills, group work, problem solving, and co-teaching. Each student will participate as a member of a collaborative team during the practicum. This course will also provide an examination of selected school district issues involving collaboration within traditional K-12 educational settings. Prerequisites: Admission to the Teacher Education Program or permission of the chair. Intensive field experience required.

331 Critical Issues in Education: Behavioral, Medical, and Legal Issues 3 hrs.
Provides an in-depth discussion and evaluation of current issues in special education such as litigation, legislation, personnel preparation, and research. School-based practicum required. Prerequisites: Admission to the Teacher Education Program or permission of the chair. Intensive field experience required.

341 Transition of K-12 Students 3 hrs.
Examines student transition during school implementation of programming transition into society. Also looks at functional and vocation knowledge and skills. Examines and discusses educational programs along with public and private transitional agencies. School-based practicum required. Prerequisites: Admission to the Teacher Education Program or permission of the chair. Intensive field experience required.

351 Behavior Analysis and Intervention 3 hrs.
This course focuses on the concepts of applied behavior analysis and how to implement those concepts in classrooms and other settings. Students will learn how to conduct a functional behavior assessment and will design, implement, and evaluate a behavioral-change project with an appropriate subject in a public school setting Prerequisite: Admission to the Teacher Education Program or permission of the chair. Intensive field experience required.

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Prerequisite: Admission to the Teacher Education Program.

416 Middle and Secondary Methods Block
The methods course provides background for middle school and secondary teaching from the perspective of theory, research, and practice. It is designed to provide an introduction to and practice in ways in which to engage students in learning in the humanities, mathematics, science, and social studies in middle and secondary classrooms. Topics include constructivism, planning, instructional strategies, and student assessment within and across the specific content areas. Applications will include microteaching and school-based experiences in area schools. Prerequisites: Admission to the Teacher Education Program or permission of the chair. Intensive field experience required.

490 Senior Seminar in Education
This course provides an opportunity for reflection and discussion of the student teaching experiences. Students will also explore critical issues facing classroom teachers and the teaching professions, such as professionalism, classroom management, inclusive classrooms, ESL students, teacher evaluation models, and professional development. Resumes, the certification process, and interview protocols will also be discussed. Prerequisites: Completion of all professional education courses and a minimum of two-thirds of the teaching field courses and permission of the chair. To be taken concurrently with student teaching ED 493, 497, and 499.

495 Middle School Internship
Focuses on apprenticeship training in a natural teaching-learning environment. During the assignment the role of the student teacher/intern will vary from that of being an interested observer to that of being responsible for the day-to-day teaching and learning activities within an assigned classroom. The student teacher/intern is expected to assimilate university training and on-site activities in order to synthesize methods and strategies for future professional use. A minimum of 100 clock hours of actual teaching and some 300 hours overall is required. This corresponds to the State Department of Education requirement for 20 total teaching days of which at least 15 must be consecutive. Prerequisites: completion of all professional educational courses and permission of the chair.

496 Middle School Internship
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
Student teaching is learning the art of teaching with guidance and support from a mentor teacher. Student teachers are expected to integrate, synthesize and apply theoretical knowledge from previous courses in realistic, planned, professional settings. They are expected to effect current research-based practices and strategies that provide for growth in pupil learning and growth in the professional knowledge, skills, and dispositions of novice teachers. Secondary education majors will complete a middle school and a high school teaching assignment. Students must complete a minimum of 100 clock hours of actual teaching as part of the 300 in-school hours required by the State Department of Education, including a total of 20 full-time teaching days, of which at least 15 must be consecutive. Prerequisites: Completion of all professional education courses and a minimum of two-thirds of the teaching field courses and permission of the chair. To be taken concurrently with ED 490.

498 High School Internship
Essentially the same as ED 497. However, it will require a minimum of 100 total clock hours, including a minimum of some 30 hours of responsible teaching. It is to be used by persons seeking dual certification or by post-graduate students seeking additional areas of endorsement. Prerequisite: Permission of the department chair.

Other Internships

499 P-12 Internship (Music)
Student teaching is learning the art of teaching with guidance and support from a mentor teacher. Student teachers are expected to integrate, synthesize and apply theoretical knowledge from previous courses in realistic, planned, professional settings. They are expected to effect current research-based practices and strategies that provide for growth in pupil learning and growth in the professional knowledge, skills, and dispositions of novice teachers. Secondary education majors...
will complete an elementary and a middle/high school teaching assignment. Students must complete a minimum of 100 clock hours of actual teaching as part of the 300 in-school hours required by the State Department of Education, including a total of 20 full-time teaching days, of which at least 15 must be consecutive. Prerequisites: Completion of all professional education courses and a minimum of two-thirds of the teaching field courses and permission of the chair.

To be taken concurrently with ED 490.

**English Department**

222 Morton Hall  
Telephone: (256) 824-6320  
Email: eh@uah.edu  

Professors Mebane, Neff (Chair), Norman; Associate Professors Bell, Bollinger, Early, Moore, Nelson, Schenker, Szilagyi; Associate Professor Emeritus Munson; Assistant Professors Kennedy, Lecturers Gunn, McPherson, Onega, Roper, Sharp, Singer, Singh, Word-Allbritton.

**Mission Statement:** The Department of English is committed to excellence in teaching, research, and service in the following disciplines: British, American, and global literature in English; business writing and technical communication; writing pedagogy and composition theory; applied linguistics (English as a Second Language and Teaching English to Speakers of Other Languages); teacher education; and creative writing. The department serves non-majors, majors, and graduate students by providing a wide array of courses that foster sound research; intellectual curiosity; critical thinking and reading; and clear, graceful, and persuasive writing and speaking. Through its programs, graduates, and faculty, the department contributes significantly to the cultural and academic enrichment and the quality of life of the campus, community, state, and region.

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.

**CLEP Examinations.** EH 101: Freshman College Composition PLUS Analyzing and Interpreting Literature (composite score of 50 or above and satisfactory performance on Analyzing and Interpreting Literature essay). EH 102: Freshman College Composition PLUS Analyzing and Interpreting Literature (composite score of 65 or above and superior performance on Analyzing and Interpreting Literature essay).

**DECLARING THE MAJOR**

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Morton Hall, Room 222) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

**English Major**

Curriculum One (for students not seeking teacher certification)  
Sophomore Survey (as described in GER)  
Shakespeare (EH 360)  
American literature (EH 330, 331, 339, 340 [with a topic in American literature], 430, 431, 530, 540 [with a topic in American literature], 532, 533)  
English Literature (340 [with a topic in English literature], 380, 381, 390, 391, 418, 421, 450, 460, 470, 492, 493, 520, 522, 540 [with a topic in English literature], 551, 571, 572, 592)  
Electives (Includes EH and EHL courses)

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The following further requirements and conditions apply to Curriculum One:

(1) one course devoted entirely to the novel
(2) one upper-level single-author course (excluding EH 360 [Shakespeare])
(3) Two courses (6 semester hours) in 400- or 500-level courses
(4) No more than three sophomore literature surveys (9 semester hours)
(5) For transfer students, 12 semester hours in upper-level
   (numbered 300 or above) at UAH
(6) No more than three courses (9 semester hours) in creative writing

Curriculum Two: English / Language Arts (for students seeking teacher certification)

Sophomore Survey (as described in GER) 6
Shakespeare (EH 360) 3
Structure of Modern English (EH 307) 3
Composition Studies for Teachers (EH 400) 3
American literature (EH 330, 331, 339, 340 [with a topic in
American literature], 430, 431, 530, 540 [with a topic in
American literature], 532, 533) 3
English Literature (340 [with a topic in English literature], 380,
381, 390, 391, 418, 421, 450, 460, 470, 492, 493, 520, 522, 540
[with a topic in English literature], 551, 571, 572, 592) 3
The Novel (EH 339 [with a topic covering the novel], 340
[with a topic covering the novel], 430, 431, 492, 493, 530
[with a topic covering the novel], 540 [with a topic covering the novel]) 3
Literature elective (must be 300 level or above) 3

One course in creative writing (EH 310, 311, or 412) may serve as the literature elective. Speech
and Communication
(CM 113 and 231) 6
Communication Arts Elective
(CM 309, 310, or 315) 3
Drama and Theatre (CM 122 and 221) 6
Media Writing (CM 205) 3
Mass Media (CM 430) 3

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The following further requirements and conditions apply to Curriculum Two:

(1) Two courses (6 semester hours) in 400- or 500-level courses
(2) For transfer students, 12 semester hours in upper-level
   (numbered 300 or above) at UAH
(3) No more than one course (3 semester hours) in creative writing
(4) No more than three sophomore literature surveys (9 semester hours)

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.

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

Semester Hours

6

College of Liberal Arts
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 22 hour cognate studies curriculum brings together all three. All students must take EH 301 (Technical Writing), EH 302 (Technical Editing), and EH 320 (Practicum in Writing) in sequence. Students with non-technical majors should plan early to take courses in technical or scientific fields. Students with technical majors should consult the Business and Technical Writing Director for current requirements. A typical program for a non-technical major is as follows:

Technical Writing (EH 301)  
Technical Editing (EH 302)  
Practicum in Writing (EH 320)  
Directed elective (e.g. CM 305, EHL 307, and others)  
Technical courses approved by Director

English for Second Area of Study for Elementary Education Teacher Candidates
Students majoring in elementary education may select English as their second area of study. This area consists of a minimum of eighteen hours beyond the freshman composition requirement (EH 101 and 102) and the sophomore literature requirement. These hours must be in courses numbered 300 or above and must be selected from the courses listed below with the approval of a faculty advisor in the Education Department and the chair of the English Department.

American literature (EH 330, 331, 339, 340 [with a topic in American literature], 430, 431, 530, 540 [with a topic in American literature], 532, 533)  
Shakespeare (EH 360)  
Structure of Modern English (EH 307)  
English Literature (340 [with a topic in English literature], 380, 381, 390, 391, 418, 421, 450, 460, 470, 492, 493, 520, 522, 540 [with a topic in English literature], 551, 571, 572, 592)  
The Novel (EH 339 [with a topic covering the novel], 340 [with a topic covering the novel], 430, 431, 492, 493, 530 [with a topic covering the novel], 540 [with a topic covering the novel])  
Composition Studies for Teachers (EH 400)  
One 3-hour course in creative writing (EH 310, 311, or 412) may be substituted for any course in the pre-1800 or post-1800 categories.

An Illustrative Plan for Completing the B.A. Degree With a Major in English
The following is one possible four-year program of study for an English major who is not seeking teacher certification. A possible sequence for English / Language Arts may be found in the Department of Education section of this catalog. Please note that the number of free electives listed below suggests that students could elect two majors, rather than a major and a minor.

<table>
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<th>Fall</th>
<th>Spring</th>
<th>Academic Year Semester Hours</th>
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**Total Hours 129**

**English (EH)**

**003 Basic Writing**
Emphasis on intensive review of paragraph and essay writing; individualized review of sentence-level basics. Placement: ACT/SAT English score or class performance. Grading scale: S, NC (No credit).

**101 Freshman Composition**

**102 Freshman Composition**

**105 Honors English Seminar**
Interpretive and comparative readings in texts of enduring intellectual, esthetic, and ethical importance; critical and analytic reading and research. Grading Scale: A, B, C, NC (No Credit). 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 from the earliest written texts to the European Renaissance.

**241 World Literature II**
Selected major contributions with focus on western civilization: Enlightenment to the present.

**242 Mythology**
Archetypal, metaphorical, and historical significance of deities and myths.

**250 Honors World Literature Seminar I**
Major texts from the ancient world to 1700. Prerequisite: EH 105 or admission to Honors Program.
251 Honors World Literature Seminar II: 3 hrs.
Major texts from 1700 to the present. Prerequisite: EH 105 or admission to Honors Program.

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

310 Fiction Writing 3 hrs.
Practice in writing of fiction from conception to revision. Prerequisites: GER literature requirement and approval of instructor.

311 Poetry Writing 3 hrs.
Practice in writing of poetry from conception to revision. Prerequisites: 6 hours of sophomore literature or permission of instructor.

330 American Literature through the Civil War 3 hrs.
Selected authors, forms, and issues.

331 American Literature from the Civil War to the Present 3 hrs.
Selected authors, forms, and issues.

339 Special Studies in American Literature and Culture 3 hrs.
Topics announced in advance.

340 Special Topics in Literature 3 hrs.
Theme, writer, or historical movement to be announced in advance.

360 Shakespeare 3 hrs.
Renaissance background and at least six plays, including history, comedy, and major tragedies.

380 Restoration and Early Eighteenth Century 3 hrs.
Poetry, drama, and various emergent prose forms in the early modern period, 1660-1744, with attention to cultural contexts.

381 Later Eighteenth Century 3 hrs.
Poetry, drama, the novel, and other emergent prose forms in the early modern period, 1744-1799, with attention to cultural contexts.

390 Romantic Poetry and Prose 3 hrs.
Poetry and prose (excluding the novel), 1780-1832. Emphasis may vary.

391 Victorian Poetry and Prose 3 hrs.
Poetry and prose (excluding the novel), 1832-1901. Emphasis may vary.

400 Composition Studies for Teachers 3 hrs.
Introduction to effective strategies for the teaching of writing. Strategies include creating and implementing writing prompts, fostering writing as process, working with grammar in context, investigating response strategies for teachers and students, and developing and implementing assessment rubrics. Prerequisite: junior standing.

412 Special Topic in Creative Writing 3 hrs.
A creative writing workshop class in a selected topic. Prerequisites: 6 hours of sophomore literature or permission of instructor.

418 Representative Texts by Women Writers 3 hrs.
Focus on women's contribution to the literary tradition.

421 Modern Drama 3 hrs.
New movements in drama from Ibsen to the present.

430 The American Novel 3 hrs.
The American novel from the beginning through James.

431 The American Novel 3 hrs.
The American novel from James to the present.

450 Chaucer 3 hrs.
Emphasis on the Canterbury Tales and Troilus and Criseyde.

460 Sixteenth-Century Poetry and Prose 3 hrs.
Works chosen from the following: More, Wyatt, Sidney, Spenser, and others.

470 Milton 3 hrs.
Milton's minor poems, selected prose, and the major poems Paradise Lost, Paradise Regained, and Samson Agonistes. Recommended prerequisite: one upper level English course.

492 The Early English Novel 3 hrs.
Emergence and development of the genre as evident in representative eighteenth-century texts.
493 The Victorian Novel 3 hrs.
Dickens through Hardy: critical reading of representative novels accompanied by historical survey of major trends.

499 Senior Research Project 3 hrs.
Individual investigation into significant literary issues under direct supervision of instructor. For seniors in the Honors Program and senior majors. Prerequisite: instructor's approval of a project prospectus.

The following courses are for advanced undergraduates.

500 Literary Criticism and Theory 3 hrs.
Major texts and approaches from Plato to the present.

510 Advanced Fiction Writing 3 hrs.
Workshop in advanced fiction writing. Prerequisite: approval of instructor.

511 Poetry Writing 3 hrs.
Workshop in advanced poetry writing. Prerequisite: EH 311 or approval of instructor.

520 Modern Poetry 3 hrs.
American and British poetry from the 1890's to the present: Yeats, Pound, Eliot, Frost, Stevens, and others. Poets will be studied against the background of the social, political, and technological revolutions that characterize the modern world.

522 Modern Novel 3 hrs.
Considers responses to the experience of modernity; focus on English and American but in different years; texts will also be drawn from Continental, Latin American, Asian, or African traditions.

525 Literature and Technology 3 hrs.
Considers the relation between technology and culture as it has been understood since the classical period through a broad range of literary texts.

530 Special Studies in American Literature 3 hrs.
Topics announced in advance.

532 Literature of the American South 3 hrs.
Selected figures and movements from colonization to the present.

533 William Faulkner 3 hrs.
Critical study of the major novels.

540 Special Studies in English Literature 1-3 hrs.
Topics announced in advance.

551 Middle English Literature 3 hrs.
Emphasis on literature of later medieval England, excluding Chaucer, chosen from the Gawain poet, Piers Plowman, romance, drama, religious meditation, the short poem, and Margery Kempe.

571 Renaissance Drama 3 hrs.
Major plays of the sixteenth and early seventeenth centuries, including Marlowe, Jonson, and others. Excludes Shakespeare.

572 Seventeenth-Century Poetry 3 hrs.
Emphasis on major figures (Donne, Jonson, Herbert) their followers, and major themes and genres of the period. Excludes Milton.

592 The Literature of Transition 3 hrs.
Considers literature in all genres, including intellectual and philosophic works, from 1890-1915 to explore the transition from Victorianism(s) to Modernism.

Linguistics and English Language Studies

The department offers a variety of courses related to General Linguistics, English Language, Grammar, and the Teaching of English to Speakers of Other Languages (TESOL). For those who are interested in the Teaching of English to Speakers of Other Languages (TESOL), the department offers a certificate in TESOL in conjunction with the M.A. degree and an independent TESOL certificate at the graduate level. Interested undergraduates may take courses, which would be helpful should they eventually want to go on for the TESOL certificate and M.A. degree. Such students should consult with the department chair or the director of the TESOL Program.
Linguistics and English Language Studies (EHL)

307 Linguistic Structure of Modern English
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.

505 Survey of General Linguistics: Applied English Linguistics I
Survey of phonology, morphology, and syntax, language universal and typology, history of English and other major world languages, topics in psycho- and socio-linguistics such as language acquisition, situational language change, and the study of regional and ethnic varieties as they reflect and construct the linguistic and cultural diversity of the United States.

507 Advanced English Grammar Studies: Applied English Linguistics II
In-depth study of English syntax within contemporary theoretical paradigms. Comparisons between modern syntactic analyses and traditional methods, comparisons between Standard American English and regional and ethnic varieties, the inevitable historical changes in English grammar, and pedagogical contexts/teaching issues. Prerequisite: EHL 307 or 505 recommended but not required.

508 History of the English Language: Applied English Linguistics III
History of English from the pre-Anglo-Saxon period to the contemporary period, focusing on analysis and description of the grammatical systems, including major aspects of the phonetic, phonological, morphological, syntactic, and semantic components of Old English, Middle English, and Modern English; overview of language acquisition and development as they relate to language change; analysis of mechanisms of language change; development of regional and ethnic dialects as expressions of cultural diversity in American and other former colonies of England; historical events that have influenced and surrounded the language. Prerequisite: EHL 307 or 505 (or the equivalent) is recommended.

509 Special Topics in Applied English Linguistics
Special topics in linguistics. Focus and emphasis of topics announced in advance. Some topics may meet the English M.A. language requirements; consult Department Chair.

English Technical and Business Writing (EH)

300 Strategies for Business Writing
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
Practical writing, especially technical or scientific reports and proposals, with emphasis on organization, research, and presentation. Prerequisites: EH 101 and EH 102; 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
Clarifying, expanding, reducing, and rewriting technical reports and other documents created by others. Emphasis on elements of style and usage, revision, proofreading, and application of rhetorical techniques to the work of engineers, scientists, and technicians. Prerequisites: EH 300 or EH 301 or CM 301. Qualifies as elective in English major. Does not count toward English minor except for Cognate Studies in Technical Writing. Does not count toward certification in secondary education. Offered spring semester only. Lab Fee: $40.

320 Practicum in Writing
Writing and editing under the supervision of professionals. May be repeated up to three separate terms for no more than 3 hours total credit. Prerequisites: EH 301, 302, enrollment for Cognate Studies in Technical Writing, permission of the Director of Business and Technical Writing, and a successful interview with the participating technical supervisor. Enrollment requires advance

Explores the relationships between common practices in technical communication and the theories that legitimize those practices. Introduces students to research and theories about fundamental issues in technical communication which may then become the basis for further graduate study in technical communication. Prerequisites: advanced undergraduate standing; EH 301 and 302 are strongly recommended.

502 Problems in Technical Editing  3 hrs.
Advanced study of research and practice in common problems of technical editing, including documentation standards, document design, and management of complex editorial projects. Involves collaborative project with professional writers in industry. Prerequisites: EH 302 or 501.

English as a Second Language (ESL)
The English Department offers courses in English as a Second Language (ESL) for those nonnative 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. Course work emphasizes acquisition of listening comprehension and improved speaking proficiency. Course materials are academically focused. Attention given to increasing comprehensibility of students' spoken English. Prerequisite: Beginning to advanced beginning English ability as determined by placement on the ELPT. Grading scale: A, B, C, D, NC (No Credit)

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: ESL100 or intermediate English ability as determined by placement on the ELPT. Grading scale: A, B, C, D, NC (No Credit)

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. Grading scale: A, B, C, D, NC (No Credit)

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. Grading scale: A, B, C, D, NC (No Credit)

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. Grading scale: A, B, C, D, NC (No Credit)
The acquisition of a second language, and through it an understanding of another country’s literature and culture, is a rich academic experience for all students, particularly for liberal arts students. Because our foreign language courses are designed to teach the effective use of both oral and written foreign languages as well as to provide knowledge about culture and literature, students in all majors will benefit their personal, academic, business, and professional lives through the study of foreign languages. In fact, in today’s world of global markets, political interdependence, and international scientific collaborations, knowledge of foreign cultures enhances one’s career opportunities and contributions as a citizen.

Mission Statement
The Department of Foreign Languages and Literatures is dedicated to teaching students the language skills and cultural knowledge necessary for succeeding in today’s multilingual world of cultural diversity, global markets, political interdependence, and international scientific and cultural collaboration. Within the B.A. in Foreign Languages, students may choose French, German, Russian, or Spanish as focus language, and may also concentrate in Foreign Languages and International Trade. Minors and foreign language teacher certification are also offered, while Japanese, classical Greek and Latin can be taken at the introductory and intermediate levels. Language clubs and extracurricular activities contribute to a rich campus life. Internships, which can be taken locally or abroad, give students a professional experience that greatly enhances their career opportunities after graduation.

The Department offers an integrated curriculum comprising the teaching of linguistic proficiency; the promotion of a critical awareness of other cultures; the development of writing skills in a non-native language; and an aesthetic appreciation of literary and cinematic media in their social and historical contexts. In these efforts, the Department is aided by the cutting-edge technology of its digital language laboratory. Committed to the integrated triad of teaching, research, and service in the areas of foreign languages, literatures and other cultural media, such as film, in their historical, social, and interdisciplinary contexts, the Department promotes academic pluralism by fostering a variety of interpretive and pedagogical approaches.

By virtue of its commitment to the highest standards in teaching, research, and service, the Department of Foreign Languages and Literatures aims to uphold and further strengthen the national and international standing of UAH.

French, German, Greek, Japanese*, Latin*, Russian, Spanish
The Department of Foreign Languages and Literatures offers the B.A. in Foreign Languages. A student may choose a focus language of French, German, Russian, or Spanish, and may also choose to concentrate in Foreign Languages and International Trade (in cooperation with the College of Administrative Science, and Departments of History and Political Science).

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

General Education Requirements and Placement Procedures
Ten semester hours of credit in one foreign language are required for the B.A., unless the student can demonstrate a competence at a level more advanced than the beginning 101 course. The introductory sequence begins in the fall and continues in the spring semester so that students can complete the 10-hour general education requirements in one academic year. Native and quasinaire speakers of foreign language may not take introductory and intermediate courses, nor the first advanced conversation course in that language. Students in this category must make an
appointment with the appropriate language coordinator to take a departmental placement examination. They must still take a minimum of three additional hours of course work to complete General Education Requirements.

Placement Procedures
Students with a prior knowledge of French, German or Spanish may demonstrate competence at an advanced level in five ways: 1) performance on a computer based placement test, 2) high school coursework, 3) CLEP examination, 4) AP examination, and 5) native language experience.

Placement test. The Department of Foreign Languages & Literatures administers a computer-based placement test. The test may be scheduled by phoning the Department or by visiting the language lab located in Morton Hall, Room 300.

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

<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>0-2 units*</td>
<td>101, 102 (5 hours each)</td>
</tr>
<tr>
<td>2nd level (102)</td>
<td>3-4 units</td>
<td>102 (5 hours)</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.

CLEP Examination. Students with a prior knowledge of French, German or Spanish may take the CLEP examination for the equivalent of FL101 and FL102. Irrespective of the resultant placement, the student will have to take a minimum of three additional hours of course work to fulfill the language requirement. The test is administered by the UAH Testing Services, located in the Administrative Science Building, Room 226, and must be taken prior to enrollment in foreign language classes. Tests are given once each semester and monthly during the summer, see Testing Services for dates. Interested students should contact the respective foreign language coordinator for further information. By taking the CLEP test, a student may receive credit hours with no quality points depending on placement level and score. Since there is no CLEP test for Russian, students of that language may take a special departmental test under the same conditions as the CLEP examination. See the Russian language coordinator.

Advanced Placement Examination. The Foreign Language Department will award credit to students who have earned a score of three or higher on Advanced Placement (AP) Program examinations of the College Entrance Examination Board according to the following scale: Score of 3: 10 hours credit (i.e. through 102, 5 hours each course) Score of 4: 13 hours credit (through 200) Score of 5: 16 hours credit (through 301) The credit thus awarded will be recorded without grades or quality points and will not therefore, be included in the calculation of the grade point average. Moreover, regardless of the student’s AP score, he or she will be required to complete successfully one additional course (3 credit hours) of the appropriate language.

Native Language Experience. Native and quasi-native speakers of foreign language may not take introductory and intermediate courses, nor the first advanced conversation course in that language. Students in this category must make an appointment with the appropriate language coordinator to take a departmental placement examination. Those planning to major or minor in the language may earn up to sixteen (16) hours of credit with no grade or quality points.

Description of the Foreign Language Major
The major is comprised of 11 courses of which nine will be taught in the focus language (French, German, Russian, Spanish) and two (FL204 and FL410) will utilize English for in-class discussions.
FL 101 and FL 102
Comparative Languages and Cultures in Practices
Communicating in a Second Language and Culture:
Introductory Foreign Language I & II

FL 200
Further Explorations in a Second Language and Culture:
Intermediate Foreign Language

FL 204
International Cinema

FL 301
Conversation

FL 302
Composition

FL 303
Foreign Language for Life and Professions

FL 304
Culture

FL 305
Introduction to Literature

FL 404
Texts & Contexts: Seminar in Literature

FL 410
International Internship:
Comparative Languages and Cultures in Practice

Total 37 hours

Additional Foreign Language Programs

Foreign Language and International Trade
Foreign Language majors interested in enhancing their preparation for participation in the global
economy may wish to consider a focus in international trade, which combines courses in business
with a study of world history and international politics. The Foreign Language and International
Trade Program includes the following courses. No minor is required for students who major in
foreign languages with the international trade focus.

FL 101 and FL 102
Comparative Languages and Cultures in Practices
Communicating in a Second Language and Culture:
Introductory Foreign Language I & II

FL 200
Further Explorations in a Second Language and
Culture: Intermediate Foreign Language

FL 204
International Cinema

FL 301
Conversation

FL 302
Composition

FL 303
Foreign Language for Life and Professions

FL 304
Culture

FL 305
Introduction to Literature

FL 404
Texts & Contexts: Seminar in Literature

FL 410
International Internship: Comparative Languages and Cultures in Practice

10 hrs.

ECN 142
Principles of Macroeconomics

MGT 301
Managing Organizations

MKT 301
Principles of Marketing

MKT 450 or PSC 450
International Business

MKT 415
International Marketing

PSC 102
Comparative Politics and Foreign Governments

PSC 260
Introduction to International Relations

HY 392
Europe since 1815

One course from the following:

HY 374
Foreign Relations of the US Since 1920

HY 391
Europe, 1500-1815

HY 478
Europe in the Nineteenth Century

HY 479
Europe in the Twentieth Century

One course from the following:

PSC 340
Governments and Politics in Industrializing & Post
Industrial Countries

PSC 341
Government and Politics of Modernizing Countries

PSC 464
American Foreign Policy

Total 64 hours
Foreign Language Minor

Foreign language minors are offered in French, German, Russian, and Spanish. Foreign language majors are permitted to minor in a second foreign language. The Foreign Language Minor Program is comprised of seven courses.

FL 101 and FL 102
Comparative Languages and Cultures in Practices
FL 200
Comparative Languages and Cultures in Practices: Communicating in a Second Language and Culture:
Introductory Foreign Language I & II
Further Explorations in a Second Language and Culture:
Intermediate Foreign Language
FL 301
Conversation
FL 302
Composition
FL 305
Introduction to Literature

One course from the following:
FL 303
Foreign Language for Life and Professions
FL 304
Culture
FL 404
Texts & Contexts: Seminar in Literature

Total 25 hours

Supporting Minors and Cognates for Foreign Language Majors

Foreign Language majors may select any minor or approved cognate offered within the University of Alabama in Huntsville. However, certain minors may enhance the student’s opportunities for certain career choices. Two of these are a minor in international business and the teacher certification designation. Information for these supporting groups of coursework follows.

Minor in International Business

Students in the College of Liberal Arts who are interested in pursuing a career in international business may wish to combine a foreign language major with a minor in international business through the College of Administrative Science. For more information on the international business minor, consult the catalogue pages for the College of Administrative Science. For such a minor, ECN 142 and ECN 143 count in the general education requirement, and in no case may the Administrative Science courses included in a student’s program of study exceed 25 percent of the student’s program. A minor in international business includes the following courses:

ECN 142
Principles of Macroeconomics
ECN 143
Principles of Microeconomics
ACC 211
Financial Accounting
ACC 212
Management Accounting
MSC 287*
Business Statistics I
FIN 301
Principles of Finance
FIN 454
International Economics and Finance
MGT 301
Managing Organizations
MKT 301
Principles of Marketing
MKT 415
International Marketing
MGT 450
International Business

*or SOC 333

Total 33 hours

Foreign Language Teacher Education and Certification

Students seeking state teacher certification in elementary or secondary education may choose to pursue foreign language study. Those majoring in elementary education may utilize a foreign language (French, German, Russian, or Spanish) as a Second Area of Study for Elementary Teacher Education Candidates. The cognate area in foreign languages includes the following courses:
FL101 and FL102

Comparative Languages and Cultures in Practices

FL 200

Communicating in a Second Language and Culture:
  Introductory Foreign Language I & II

FL 305

Further Explorations in a Second Language and Culture:
  Intermediate Foreign Language

FL 301 Conversation
FL 302 Composition
FL 304 Culture

FL 301 Conversation
FL 302 Composition
FL 304 Culture

FL 305

Introduction to Literature

Total 25 hours

Students seeking state teacher certification in middle/junior high school education or high school education, and whose primary field is foreign language, must conform to the requirements of a foreign language major. The teacher exit exam is the equivalent of successfully passing FL 404 with a grade of C or better. The chair writes a memo to the Department of Education, the student, and the student’s file. For a second teaching field, students are required to complete the cognate area. Education students are advised to see the Department of Education’s catalog pages, and to consult the teacher certification officer in the UAH Department of Education.

One Possible Schedule of Courses for a Foreign Language Major

Students interested in majoring in a foreign language might take the following schedule of courses:

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Fall</th>
<th>Spring</th>
<th>Academic Year Semester Hours</th>
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</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>FL101 5</td>
<td>FL102 5</td>
<td>33</td>
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<tr>
<td></td>
<td>EH 101 3</td>
<td>EH 102 3</td>
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<td></td>
<td>Fine Arts 3</td>
<td>Human. or Fine Arts 3</td>
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<td></td>
<td>Natural Science 4</td>
<td>Social Science 3</td>
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<td></td>
<td>15</td>
<td>Natural Science 4</td>
<td></td>
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<tr>
<td>Year 2</td>
<td>FL200 3</td>
<td>FL204 3</td>
<td>33</td>
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<tr>
<td></td>
<td>Math 3</td>
<td>FL301 3</td>
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<tr>
<td></td>
<td>Humanities or Fine Arts 3</td>
<td>HY102 or 104 3</td>
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<td></td>
<td>HY 101 or 103 3</td>
<td>Sophomore Literature 3</td>
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<td></td>
<td>Sophomore Literature 3</td>
<td>Social Science 3</td>
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<td>18</td>
<td>15</td>
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<tr>
<td>Year 3</td>
<td>FL302 3</td>
<td>FL303 3</td>
<td>33</td>
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<td></td>
<td>FL304 3</td>
<td>FL305 3</td>
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<td></td>
<td>Social Science 3</td>
<td>Minor 3</td>
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<td>18</td>
<td>15</td>
<td>33</td>
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<tr>
<td>Year 4</td>
<td>FL404 3</td>
<td>FL410 3</td>
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<td>15</td>
<td>15</td>
<td>30</td>
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<tr>
<td>Total Hours 129</td>
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</tbody>
</table>

The following courses will be offered in the fall semester: FL101, FL 200, FL 302, FL 304 and FL404.
The following courses will be offered in the spring semester: FL 102, FL 204, FL 301, FL 303, FL 305 and FL 410.

Foreign Languages (FL)

101 Communicating in a Second Language and Culture: 5 hrs.
Introductory Foreign Language I (Available in French, German, Greek, Japanese, Latin, Russian, and Spanish). This is the first course in the introductory foreign language sequence; no previous foreign language study is expected, and no prerequisite is required. Students will actively practice and be tested on all four language skills (listening, speaking, including correct pronunciation of the foreign language, reading and writing) within culturally authentic contexts. Students will begin the process of learning to communicate and function in a second language and culture. Class is conducted in the target language. Language laboratory attendance is required. Lab Fee $50 (except for Greek and Latin)

102 Communicating in a Second Language and Culture: 5 hrs.
Introductory Foreign Language II (Available in French, German, Greek, Japanese, Latin, Russian, and Spanish) This is the second course in the introductory foreign language sequence. Students will actively practice and be tested on all four language skills (listening, speaking, including correct pronunciation of the foreign language, reading, and writing) within culturally authentic contexts. Students will continue the process of learning to communicate and function in a second language and culture. Class is conducted in the target language. Language laboratory attendance is required. Prerequisites: FL 101 (or the equivalent or placement by examination). Lab Fee $50 (except for Greek and Latin)

200 Further Explorations in a Second Language and Culture: 3 hrs.
Intermediate Foreign Language (Available in French, German, Greek, Japanese, Latin, Russian, and Spanish) Students will continue to practice and be tested on all four language skills (listening, speaking, including correct pronunciation of the foreign language, reading and writing) within culturally authentic contexts. Students will continue the process of learning to communicate and function in a second language and culture. To broaden and intensify their knowledge of the second language and culture, students will read representative samples of foreign language literature and other publications (such as newspaper and magazine articles, business and personal correspondence and commercial documents). Upon completion of this course, students will be prepared to move to advanced (300-level) study of the foreign language, culture and literature. Class is conducted in the target language. Language laboratory attendance is required. Prerequisites: FL 101 and 102 (or the equivalent or placement by examination). Lab Fee $30 (except for Greek and Latin)

204 International Cinema (Taught in English) 3 hrs.
Students will view, discuss, and analyze approximately eight to ten foreign language films centered on a theme, that will change from year-to-year (for example, gender issues, family, religion, children and society, the arts). Multicultural and cross-cultural issues will be highlighted. No prerequisite is required. Class is conducted in English.

301 Conversation (Available in French, German, Russian, and Spanish) 3 hours
Given that oral skill development and writing skill development complement each other, students will continue to practice and be tested on all four language skills (listening, speaking, reading and writing) within culturally authentic contexts, but with emphasis on oral skills (listening and speaking). Readings and materials of topical interest (such as newspaper and magazine articles, comic strips, advertisements, political propaganda, brochures, songs and films) will serve as the basis for oral presentations, dialogues, discussion, debate and oral questions. Class is conducted in the target language. Prerequisites: FL 200 (or the equivalent or placement by examination).

302 Composition (Available in French, German, Russian, and Spanish) 3 hrs.
Given that writing skill development and oral skill development complement each other, students will continue to practice and be tested on all four language skills (writing, reading, listening and speaking) within culturally authentic contexts with emphasis on writing. Students will study and practice writing various types of compositions (such as description, narration, exposition, definition, analysis and classification, comparison and contrast, cause and effect, persuasion, summary, research paper and business and persona correspondence), including related grammar and vocabulary. Class is conducted in the target language. Prerequisites: FL 200 (or the equivalent or placement by examination).
303 Foreign Language for Life and Professions  
(Available in French, German, Russian, and Spanish)  
This course is designed to prepare students for content-specific applications of the second language in various contexts, such as: 1) business and technology, 2) government and law enforcement, and 3) health professions. Class is conducted in the target language. Prerequisites: FL 200 (or the equivalent or placement by examination).

304 Culture (Available in French, German, Russian, and Spanish)  
This course focuses on the artistic, historical, intellectual, political and social life of the culture(s) where the foreign language is used, so that the US student can gain greater insight into the development of the foreign culture(s) and civilization(s). Class is conducted in the target language. Prerequisites: FL 200 (or the equivalent or placement by examination).

305 Introduction to Literature (Available in French, German, Russian, and Spanish) 
In this panoramic course, students will study representative texts, trends and movements in the foreign language literature from its beginnings through the contemporary period. Class is conducted in the target language. Prerequisites: FL 200, 301 or 302 (or the equivalent or placement by examination or permission of the instructor).

404 Texts and Contexts: Seminar in Literature  
(Available in French, German, Russian, and Spanish)  
This course will provide students with the opportunity for in-depth study of a specific author, genre or topic (for example, women writers, poetry, narrative and memory in the construction of national identity). This course may be repeated for credit with permission of the instructor. Class is conducted in the target language. Prerequisites: FL200, 301 or 302 (or the equivalent or placement by examination or permission of the instructor).

410 International Internship: Comparative Languages & Cultures in Practice  
(Taught in English) The Huntsville area provides many opportunities for students to combine classroom study with work in a wide range of government, international, business, educational and private organizations. The experience will enable students to use their second language skills, as well as to develop interdisciplinary, multicultural and cross-cultural knowledge. Students will work in an off-campus (or when feasible, overseas) organization and meet with faculty and other students to report on their work and compare and analyze experiences. The course combines practical experience with discussion of the theoretical, historical and cultural ramifications of foreign language study. Class is conducted in English. At least three (3) credit hours are required for majors. Prerequisites: FL200 and 303 (or the equivalent or placement by examination or permission of the instructor). Majors will receive first enrollment priority and minors will receive second priority in this course.

499 Independent Studies (Available in French, German, Russian, Spanish and Latin)  
Independent study and/or study abroad under the supervision of an instructor. Prerequisites: FL 200 (or the equivalent or placement by examination) and permission of the instructor.

History Department  
409 Roberts Hall  
Telephone: (256) 824-6310  
Email: history@uah.edu

Distinguished Professor Boucher; Professors Dunar (Chair), Gerberding, Williams; Professor Emerita Shields; Associate Professors Martin, Severn, Waring; Assistant Professors Johnson, Shuck-Hall; Adjunct Assistant Professor Isbell.

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.
Mission
The Department of History is committed to excellence in the areas of teaching, research and service. It offers an undergraduate B.A., as well as a minor, and a Master’s degree aimed primarily at fostering stronger middle and secondary school education in history. Since historical study embraces the entire record of human accomplishments and failures, the department’s traditional Western Civilization sequence (HY 101, 102) and new World History offerings (HY 103, 104) are a fundamental component of the General Education Requirements of the Colleges of Liberal Arts and Science. The department’s commitment to these courses reflects its belief that history’s very scope makes it an invaluable tool in interpreting the present. It illustrates the interdependence of all forms of knowledge and bridges gaps among disciplines by putting ideas into a social context and their place in time. For students who choose to pursue history as a course of study, the curriculum seeks to provide depth and perspective on complex social problems, and its critical approach to the human past cautions against simplistic solutions. Through an examination of the flow of events, historical study demonstrates how the forces of continuity and change intersect. By demonstrating the role of chance and contingency, and of purposeful activity in human affairs, historical study assists students in acquiring discrimination, understanding and balanced judgment. Students are taught that because the sheer abundance of historical documentation demands selection, interpretation, creativity, and clarity of expression to make them meaningful to the current generation, history is both an art and a science.

The History curriculum is also a component of the Foreign Language and International Trade program, as well as the new Global Studies cognate. The department’s majors who complete Class A & B certificates in education meet all the requirements of the “No Child Left Behind” law. Beyond offering classes, the department actively pursues links with county and city schools for pedagogical and recruitment purposes through on-campus programs and off-campus collaboration. To sustain excellence in teaching and to foster individual professional growth, the department expects faculty to pursue activities in research and publication and to participate actively in professional organizations.

History Major
A student majoring in history must include in the academic program a minimum of 33 semester hours in history beyond HY101-102 or HY 103-104 (GER). The U.S. survey courses, HY 221-222, and the history methods course, HY 290, are required. A student 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 beyond HY 101-102 or HY 103-104 (GER). Students are encouraged to complete as many upper division courses as possible before enrolling in HY 490.

A student majoring in history will find a variety of programs of study enabling her or him to develop depth and breadth in history and 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 in the following: graduate school preparation, general, pre-professional and prelaw preparation, international studies, secondary school teaching, and the fine arts.

Students are advised to declare a major officially and to obtain a Program of Study by the beginning of the junior year, if not before. Students may initiate the Program either by meeting with the departmental chair (Roberts Hall, Room 409) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

History Minor
A student interested in establishing a history minor must take a minimum of 21 semester hours of history beyond HY 101-102 or HY 103-104 (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 for Elementary Education Teacher Candidates
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 HY221 and HY222 at UAH. Under no circumstances may AP American History be used as a substitute for HY 101 and/or HY 102, and/or HY 103 and/or HY 104. 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 credit hours will be granted for this examination. In order to fulfill GER requirements, such students will still have to take HY 101 or its equivalent as approved by the department.

Transfer Credit
With the exception of those community colleges covered within the Alabama Articulation and General Studies agreement, only in exceptional circumstances will the History Department accept transfer credit for non-interactive telecommunications courses or correspondence courses in HY 101, 102, 103, 104, 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), World Civilization (HY 103 and/or 104) or U.S. History (HY 221 and/or HY 222) may petition the History Department requesting an essay examination on the subject for which credit is desired. The petition will not be reviewed until a satisfactory CLEP score has been reported. After consultation with a faculty member designated by the department chair, the student may take an essay examination. If he or she also receives B or better on the essay, credit will be granted for the appropriate course(s).

An Illustrative Plan for Completing the B.A. Degree
With a Major in History

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>Academic Year</th>
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<tbody>
<tr>
<td></td>
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<tr>
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College of Liberal Arts 212
| Year 3 | HY 200 level class | 3 | HY 300+ | 3 |
| Social and Behavioral Science | 3 | HY 300+ | 3 |
| Elective | 4 |
| Additional Requirement | 3 |
| HY 300 level class | 3 | Minor course | 3 |
| HY 300+ | 3 | Minor course | 3 |
| Minor course | 3 |
| Total Hours | 16 | 18 | 34 |

| Year 4 | HY300+ | 3 | HY 400+ | 3 |
| HY400+ | 3 | Minor course | 3 |
| HY400+ | 3 | Minor course | 3 |
| Minor Course | 3 |
| Total Hours | 18 | 15 | 33 |

Total Hours 130

*This plan is provided as one example of many ways a student may schedule coursework to complete a B.A. degree with a major in History. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs or the student.

History (HY)

101 Western Civilization Origins and Development of the Contemporary World, Part I
Major western civilizations to 1560. Taught every semester.

102 Western Civilization Origins and Development of the Contemporary World, Part II
Major western civilizations since 1560. Taught every semester.

103 World History to 1500
This course is a comparative survey of the historical development of peoples and cultures from their beginnings to 1500. It explores cross-cultural interactions among societies, states, and economies of Asia, Europe, Africa, the Americas and Oceania.

104 World History from 1500
This course is a comparative survey of the global interdependence of the world from the period of transoceanic exploration to the present. It explores cross-cultural interactions among societies, states, and economies of Asia, Europe, Africa, the Americas and Oceania.

Courses below are open to all students other than beginning freshmen, with exceptions as indicated.

202 Current World Issues in History
Selected topics in world history during the twentieth century designed to foster a historical awareness of present day problems.

221 The United States to 1877
Discovery of America through the Civil War and Reconstruction.

222 The United States Since 1877
United States from the end of the Civil War era to the present.

229 Survey of Ancient Times
Ancient Near East, Greece, and Rome. Prerequisites: HY 101-102 or approval of instructor.

230 The Rise of Medieval Civilizations
Survey of the origins and development of medieval society in the West, with attention given to Byzantium and the Islamic world as well as to the Latin west. Prerequisites: HY 101 and 102 or permission of instructor.

290 Historical Methods
Introduction to historical methodology and historiography, designed to prepare history majors for
upper-level coursework. Required of all history majors, including transfer students. Open to non-history majors.

Courses listed below are open to students who have completed 9 semester hours in history or have junior standing and permission of the instructor.

318 Constitutional History of the United States
Growth and development of the American constitutional system with emphasis on those aspects, which relate to the fundamental structure of American government and social order.

325 History of Alabama
The state’s past from colonial times to the present with emphasis on its place in United States history.

326 Colonial America
Political, social, economic, and religious developments in the North American colonies, 1607-1783.

329 Imperial Rome
Roman Empire from the Principate to the barbarian invasions.

341 Modern France
Political, economic, social, and cultural developments from the opening of the reign of Louis XIV to the post-de Gaulle era of the Fifth Republic. Prerequisites: HY 101-102.

343 Modern Germany
German history from mid-nineteenth century to the present, emphasizing the connections between Germany’s internal politics and its role in international affairs. Includes reunification and its consequences.

347 English History to 1660
English history and society from Anglo-Saxon times to the Restoration with attention to the origins and evolution of governmental and legal institutions such as monarchy, common law, parliament, and the judiciary. Prerequisites: HY101 and 102.

348 English History since 1660
Impact of revolution, industrialization and war on English society, the expansion of English liberties, and the development of the cabinet, political parties, the empire and the welfare state. Prerequisites: HY101 and 102.

363 Native American History
Surveys Native American history from pre-history to the present, emphasizing the dynamics of European contact, accommodation, resistance, and ethnogenesis from Native perspectives.

364 The Westward Movement in American History since 1803
Pioneering society, Indian relations, land policies, expansion, and politics of the trans-Mississippi frontier.

365 American Labor History
American labor relations from colonial times but concentrating on post-Civil War topics.

366 African-Americans in Twentieth Century America
Interrelationship of the African-American and the industrial-urban environment of the United States.

367 Women in U.S. History
Women in the United States from the colonial period to the present.

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

374 Foreign Relations of the U.S. since 1920
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.

375 Imperial Russia
Survey of the social, political and cultural history of Russia from its beginnings to 1917, with particular emphasis on the imperial period of the 18th and 19th centuries. Major themes include the evolution of the Russian state, state-society relations, and the multiethnic nature of the empire.

376 Soviet Russia
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, the multi-national nature of the state, and the successes and failures of the post-1945 era. Prerequisites: HY 101and 102.

380 China since 1600 3 hrs.
Survey of Chinese history from the late Ming Dynasty through Mao’s Communist regime. Focus on political culture, Confucianism, Maoism, relations with the West, women, and society.

HY 390 Women in Modern European History 3 hrs.
Survey of European women’s history from the Enlightenment to the present. Focus on how women have supported, challenged, and revised expected roles for women in different historical contexts, as well as how nationality, social class, and ethnicity have shaped women’s lives.

391 Europe, 1500-1789 3 hrs.
Examination of the economic, scientific, social, political, and cultural developments in Europe from the Renaissance to the French Revolution.

392 Europe Since 1789 3 hrs.
Europe from the French Revolution to the present.

399 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 have senior standing or have permission of the instructor.

HY 410 Public History 3 hrs.
Public history and its application in areas such as public policy, historical editing, local and community history (including historical societies), archival collection (including electronic databasing) and historic preservation, oral history, museum programs, and historical sites interpretation.

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

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

424 The Atlantic World 3 hrs.
Comparative survey of the western European colonial empires from 1450 to 1763, emphasizing the cultural interactions of African, Native American and European peoples in the Americas. This course meets the requirements for either American or non-American credit in the history major.

427 The Age of the American Revolution 3 hrs.
Politics, society, economy, culture, and international conflicts from 1700 through the Revolutionary War to 1812.

428 The Republic in Crisis 3 hrs.
Political, social, and economic changes in the United States and its sections from 1812 through the Civil War and Reconstruction.

437 The Rise of Modern America 3 hrs.
Economic and social changes, imperialism, and the growth in government in the United States from 1877 to the 1920s.

438 Modern America 3 hrs.
American society, politics, economics, and foreign affairs from the end of World War I to the origins of the Cold War.

439 Recent America 3 hrs.
Contemporary America from the 1950s to the present, analyzing both domestic and foreign affairs.

473 The High Middle Ages 3 hrs.
Political, economic, and cultural features of Europe when medieval civilization was at its height.

474 The Renaissance and Reformation 3 hrs.
Selected topics in the Italian Renaissance and European Reformation.

475 Crisis in Europe, 1560-1660 3 hrs.
Europe in an age of anxiety, religious wars, political upheaval, witch-hunts, and the early scientific revolution.

476 Absolutism and Enlightenment, 1660-1763 3 hrs.
Europe from Louis XIV to the Peace of Paris, an age of political stability and intellectual innovation.
477 The French Revolution and Napoleon 3 hrs.
European ideas, institutions, and events from the beginning of the French Revolution to the demise of the Napoleonic Empire.

478 Europe in the Nineteenth Century 3 hrs.
Major political, social, economic, and intellectual developments in Europe from the Congress of Vienna to World War I.

479 Europe in the Twentieth Century 3 hrs.
Major developments in Europe from 1914 to the present, including the two World Wars and post-war reconstruction.

490 Research Seminar in History 3 hrs.
Historiography, research and writing, and recent interpretations in the field of history. Required of all history majors. Taught once annually.

Music Department
206 Roberts Hall
Telephone: (256) 824-6436
Email: music@email.uah.edu

Professor Emeritus Boyer; Professor Sanders; Associate Professors Bowyer, Whatley (Chair), Wray; Assistant Professors Conran, Coward; Adjunct Faculty I. Weaver, P. Weaver.

The University of Alabama in Huntsville is an accredited institutional member of the National Association of Schools of Music.

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Roberts Hall, Room 206) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

Mission
The Department of Music at the University of Alabama in Huntsville has two interrelated curricular goals. First, the department seeks to provide for music majors a program of superior quality, one that enables students to begin their musical careers upon graduation, or to pursue studies at the graduate level. It is also a suitable program of study for students who have not established specific professional aspirations, but who desire the benefits of a broad liberal arts education.

Second, the department seeks to contribute to the general education curriculum opportunities for students to experience both the academic discipline and the art of music. Its academic courses seek to develop in students an appreciation for the best literature and the knowledge necessary to make intelligent musical choices. Its performance-related curriculum (studio and ensemble) provides students with opportunities to experience the artistic and communicative values of music. In the broader sense, the department views this mission as a contribution to the cultural enlightenment of the academic community and region.

The curriculum for music majors emphasizes three major aspects of music: (1) It provides students with knowledge of our musical heritage and the great master works of literature. (2) It provides a foundation in theoretical studies and musicianship skills that enables the student to interact with music in an intelligent and competent way. (3) It provides performance experiences that enable students to develop musical skills and artistic sensitivity. Additionally, music education offerings provide interested students with the knowledge of the appropriate materials, teaching strategies, and organizational skills necessary to become effective educators; and music technology courses provide students with experience and expertise in using computer software and hardware that enhance their musical endeavors.

The music program is 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. In the pursuit of program goals the department maintains an attitude of sensitivity and concern for the individual and commitment to the student’s musical, intellectual, and personal growth.

The department seeks to support its teaching through the selected artistic and research endeavors of its faculty. These activities provide leadership in the musical life of the region, support for arts education in the schools, and cultural enrichment for the academic community, the Huntsville-North Alabama region, and in national and international forums.

Courses for the General Student (Non-Music Majors)
The following courses and ensembles are open to all university students; some ensembles require an audition. 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
MU 106 Introduction to Music Technology
MUA 390 UAH Concert Choir
MUA 392 Tenor-Bass Chorale
MUA 393 Women’s Choir
MUA 394 University Chorale
MUA 396 Chamber Ensembles
MUA 398 Jazz Ensemble
MUA 399 UAH Wind Ensemble
MUJ 301 Jazz Improvisation I
MUJ 396 Jazz Chamber Ensemble

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 the 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.

Entry Requirements for Music Majors and Minors
Admission to the University of Alabama in Huntsville does not guarantee admission to the UAH Music Department. Auditions are required for all applicants majoring or minoring in music. The audition is one of the most important factors in the admission process. It will determine admission to the Department of Music as well as eligibility for a music scholarship. Following the audition, a student may be either fully accepted or accepted on a probationary basis until the performance jury at the end of his or her first semester, excluding summer. Those who audition will receive written notification regarding acceptance into the music degree program. Those who are unable to audition prior to the beginning of their first semester will also be accepted on a probationary basis until the performance jury at the end of their first full semester, excluding summer. All applicants are strongly encouraged to audition in person. Taped auditions are acceptable if travel distance precludes a personal audition. For audition dates, please consult the audition application or visit our website at www.uah.edu/music.

Music Major with Emphasis in Liberal Arts
The major in music, with emphasis in liberal arts, is a degree program of 128 credit hours. This degree requires a minor (or second major) in another discipline. Students with dual interests and abilities will benefit from this degree offering.
Music Major with Emphasis in Performance

The major in music, with emphasis in performance, is a degree program of 128 credit hours. Students desiring additional performance studies beyond the standard music major will benefit from this degree offering.

Music Major with Emphasis in Jazz

The major in music, with emphasis in jazz, is a degree program of 128 credit hours. The core of this program is a traditional music degree, with the same "classical" performance requirements as in the other music programs. Students desiring additional studies in jazz beyond the standard music major will benefit from this degree offering.

Music Major with Emphasis in Music Technology

The major in music, with emphasis in music technology, is a degree program of 128 credit hours. The core of this program is a traditional music degree, with the same "classical" performance requirements as in the other music programs. Students with dual interests in music and computer technology will benefit from this degree offering.

Music Major with Emphasis in Music Education

The emphasis in music education is a 147 credit hour degree program built upon a broad liberal arts base. The course of study integrates music and professional education courses to develop a superior music teacher, certified to teach at all levels P-12 (Class B Professional Teacher's Certificate) with emphasis 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.

I. General Education Requirements 54 hrs.

GER for the B.A. degree are listed at the beginning of the College of Liberal Arts section of the catalog. The student should include MU 100 and 201 to fulfill the fine arts options. Music education students must include at least one course in political science for the social science requirement, and CM 113; other music majors should choose at least one course in philosophy. Students pursuing majors or minors in engineering or computer science should consult the catalog sections for those departments to determine appropriate science and mathematics requirements.

II. Major

The first component of the degree plan consists of a Music Core, the set of courses that is included in every Bachelor of Arts degree in Music. In addition to the course requirements, all music majors must perform a solo Senior Recital during their final year of study.

- The Liberal Arts Music Emphasis includes the Music Core as the major, a minor in a discipline other than music, 54 General Education hours, and elective hours to total 128 hours.
- The Performance Emphasis includes the Music Core, an additional 21 hours of music coursework, 13 hours of electives, plus 54 General Education hours. An audition is required, usually at the end of the second year of study, for students who wish to pursue the Performance Emphasis. In addition to the Senior Recital required of all music majors, students pursuing the Performance Emphasis must perform a Performance Emphasis Recital.
- The Jazz Emphasis includes the Music Core, an additional 25 hours of music coursework, 9 hours of electives, plus 54 General Education hours.
- The Music Technology Emphasis includes the Music Core, an additional 22 hours of music technology, electrical engineering and computer engineering courses, 12 hours of electives, and 54 General Education hours.
The Music Education Emphasis includes the Music Core, an additional 24 hours of music and professional music education courses, 29 hours of courses within the Department of Education, and 54 General Education hours (total of 147 credit hours). This option leads to a public school teaching certificate (N-12 certification in either Choral/Vocal or Instrumental music).

### The Music Core

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<th>Course</th>
<th>Credits</th>
<th>Upper Level Credits</th>
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<td>Studio Instruction (4 x 1.5) + (2 x 2)</td>
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<tr>
<td>Upper level elective</td>
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<td>Introduction to Music Literature (MU 100)</td>
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<td>Introduction to Music Technology (MU 106)</td>
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<td>Music Theory (MU 201, 202, 301)</td>
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<td>Musicianship Skills (MU 203, 204, 303)</td>
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<td>Music History I and II (MU 311, 312)</td>
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<td>Conducting (MU 325)</td>
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<td>Concert Choir, Wind Ensemble, or Guitar Ensemble</td>
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### The Liberal Arts Emphasis

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<td>General Education Requirements</td>
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<td>Minor &amp; Electives</td>
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### The Performance Emphasis

(in addition to Music Core)

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<td>Upper level elective</td>
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<td>Musical Materials of the Modern Era (MU 302)</td>
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<td>Musicianship Skills IV (MU 304)</td>
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<td>Form and Analysis (MU 401)</td>
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<td>Advanced Conducting (MU 425)</td>
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<tr>
<td>Ensembles (MUA39X) (4 x 1)</td>
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<td>(in addition to core) 4</td>
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<td>Piano proficiency</td>
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### The Jazz Emphasis

(in addition to Music Core)

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<td>Jazz Piano (MUJ 13x) (2 x 1)</td>
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<td>The Technology Emphasis</td>
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<td>Orchestration (MU 416)</td>
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<td>Ensembles (MUA39X) (2 x 1) +2 (in addition to core)</td>
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| Music Core (see above) | 40 | 22 |
| General Education Requirements | 54 | 8 |
| Electives | 12 | 39 |

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<tr>
<th>Music Minor</th>
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<tr>
<td>Students may select music as a supportive minor to their major discipline. A total of 27 hours of music are necessary (11 hours upper-level), including the following courses:</td>
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</table>
Music Technology Minor
Students may select music technology as a supportive minor for computer engineering, electrical engineering and computer science. The music technology minor includes the following courses:

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<tr>
<th>Course</th>
<th>Credits</th>
<th>Upper Level Credits</th>
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<td>Music Theory I (MU 201)</td>
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<td>Musicianship Skills I (MU 203)</td>
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<tr>
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<td>Ensemble (MUA 39x)</td>
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<tr>
<td>Total Credit Hours</td>
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Music for Second Area of Study for Elementary Education Teacher Education Candidates
Students majoring in elementary education may select music as their second area of study. See major requirements in Education section. 16 hours in music are required:

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<tr>
<th>Course</th>
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<th>Upper Level Credits</th>
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<tr>
<td>Studio Instruction or Ensembles (4 x 1)</td>
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<td>Introduction to Music Theory (MU 101)</td>
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<td>(include in GER)</td>
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<td>Music Theory I (MU 201)</td>
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</tr>
<tr>
<td>Musicianship Skills I (MU 203)</td>
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An Illustrative Plan for Completing the B.A. Degree with a Major in Music and a Liberal Arts Emphasis

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<th>Academic Year</th>
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221 College of Liberal Arts
An Illustrative Plan for Completing the B.A. Degree with a Major in Music and a Performance Emphasis

<table>
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Total 128

An Illustrative Plan for Completing the B.A. Degree with a Major in Music and a Jazz Emphasis

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Total 128
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**Total 128**

An Illustrative Plan for Completing the B.A. Degree with a Major in Music and a Music Education Emphasis

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223 College of Liberal Arts
An Illustrative Plan for Completing the B.A. Degree with a Major in Music and a Music Technology Emphasis

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</tbody>
</table>

College of Liberal Arts 224
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 Introduction to Music Technology 1 hr.
Introduction to computer sound options, with an overview of computer-assisted instruction in music, an introduction to music sequencing and digital audio software, and an in-depth tutorial in music notation.

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.

205 Jazz Theory 2 hrs.
This course serves as an introduction to the theoretical analysis of jazz harmony, with an emphasis on styles from the bebop era and later. Prerequisite: MU 201.

301 Theory of Music III 3 hrs.
Continuation of studies on a more advanced basis than MU 201-202. Prerequisites: MU 202 and 204.

302 Musical Materials of the Modern Era 3 hrs.
Systems of tonal organization, compositional procedures, terminology, and analytical methods that relate to music since 1900. Prerequisites: MU 301 and 303.

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

304 Musicianship Skills IV 1 hr.

306 Music Technology 3 hrs.
An exploration of music technology hardware and software, including an overview of acoustics, MIDI and digital audio data structures, and an introduction to multimedia authoring. Prerequisites: MU 106 and EE 100.

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 100 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 100 and 301, or approval of the instructor.

316 History and Appreciation of Jazz 3 hrs.
This course is designed to explore the history and development of jazz as an art form, from its origins as popular music to its evolution into an "Art Music." Improvisation will be explained and explored in the context of the different styles of jazz. The course will focus on understanding through listening to jazz. Prerequisite: MU 100.
317 Jazz Arranging 2 hrs.
This course provides the student with instruction in arranging for small and large jazz ensembles, both instrumental and vocal. Prerequisite: MU 205.

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.

322 Diction for Singers 1 hr.
Intended as an overview for vocal and choral students who wish to learn the diction requirements for singing in Latin, Italian, German, French and English. Prerequisite: MUA 111 or permission of the instructor.

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

399 Special Topics in Music 3 hrs.
Special topics in music. Focus and emphasis of topics announced in advance.

401 Form and Analysis 2 hrs.
Musical forms and analysis. Prerequisites: MU 303 and 312 or approval of instructor.

406 Internship in Music Technology 3 hrs.
An internship of eight hours per week working in the music technology industry. Prerequisite: MU 306

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.

416 Orchestration 2 hrs.
Instruments of the band and orchestra, their ranges, transpositions, and capabilities. Practical experience in arranging for instruments. Prerequisite: MU 302.

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.

**Studio Instruction in Vocal and Instrumental Music (MUA)**
Students must fill out a “Request for Studio Instruction” in the Music Department prior to each semester they are enrolled. Transfer students who plan to take studio instruction for music credit must demonstrate their level of proficiency to the instructor before registration. Instruction varies from 30 to 50 minutes weekly. Generally, students not intending to major in music should enroll in MUA 111, 121, 131, 141, 151, 161, 171, or 181; however, advanced students may enroll in MUA 211, 221, and other numbers, with permission of the instructor. A special studio instruction fee is charged (see Fees). Students enrolled in studio music at the 100 level should enroll for the subsequent number each semester, i.e. 111-112-113-114, et cetera. For those students enrolled at the 200 and 400 levels, advancement to the next level of studio instruction (i.e. from 231 to 232 or 242 to 243) is based on performance before a faculty jury. The jury may retain students at any level until proper achievement is reached for advancement or completion of degree performance competencies. The instructor’s grade may be raised or lowered to reflect jury performance. Non-majors may enroll in 100-level studio instruction as long as the instructor agrees that satisfactory progress is made; no jury is necessary. Students taking studio instruction must attend performances, the monthly student recital program and special performance classes. A student may be excused only with written permission of the department chair. As a part of studio instruction, students enrolled as full-time music majors must attend at least eight approved concerts a semester; other enrolled students must attend four. Prerequisites 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.

211-214 Studio Instruction in Voice 1.5 hr.
For music majors’ principal instrument. Studio instruction fee: $90.

For music majors’ principal instrument. Studio instruction fee: $90.

411-419 Studio Instruction in Voice 2 hrs.
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.

221-224 Studio Instruction in Organ 1.5 hr.
For music majors’ principal instrument. Studio instruction fee: $90.

225-229 Studio Instruction in Organ 2 hrs.
For music majors’ principal instrument. Studio instruction fee: $90.

421-429 Studio Instruction in Organ 2 hrs.
For music majors’ principal instrument. Studio instruction fee: $90.

130 Piano Class 1 hr.
Techniques of performance, note reading, and basic musicianship.

131-138 Studio Instruction in Piano 1 hr.
For non-music majors, music minors, and music majors’ secondary instrument. Studio instruction fee: $70.

231-234 Studio Instruction in Piano 1.5 hr.
For music majors’ principal instrument. Studio instruction fee: $90.

235-239 Studio Instruction in Piano 2 hrs.
For music majors’ principal instrument. Studio instruction fee: $90.

431-439 Studio Instruction in Piano 2 hrs.
For music majors’ principal instrument. Studio instruction fee: $90.

140 Beginning Guitar Class 1 hr.
The course objective is to provide basic guitar instruction for students who have had little or no experience playing the guitar. The course will cover note reading, posture, chords, strumming patterns, simple arpeggios, scales, and simple to intermediate solo playing.

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

241-244 Studio Instruction in Guitar 1.5 hr.
For music majors’ principal instrument. Studio instruction fee: $90.

244-249 Studio Instruction in Guitar 2 hrs.
For music majors’ principal instrument. Studio instruction fee: $90.

441-449 Studio Instruction in Guitar 2 hrs.
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.

251-254 Studio Instruction in Strings 1.5 hr.
For music majors’ principal instrument. Studio instruction fee: $90.

255-259 Studio Instruction in Strings 2 hrs.
For music majors’ principal instrument. Studio instruction fee: $90.

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.
261-264 Studio Instruction in Woodwinds
For music majors’ principal instrument. Studio instruction fee: $90.
265-269 Studio Instruction in Woodwinds
For music majors’ principal instrument. Studio instruction fee: $90.
461-469 Studio Instruction in Woodwinds
For music majors’ principal instrument. Studio instruction fee: $90.
171-177 Studio Instruction in Brass
For non-music majors, music minors, and music majors’ secondary instrument. Studio instruction fee: $70.
178-179 Class Instruction in Brass
For secondary instrument, instrumental music education students. Studio instruction fee: $70.
271-274 Studio Instruction in Brass
For music majors’ principal instrument. Studio instruction fee: $90.
275-279 Studio Instruction in Brass
For music majors’ principal instrument. Studio instruction fee: $90.
471-479 Studio Instruction in Brass
For music majors’ principal instrument. Studio instruction fee: $90.
181-188 Studio Instruction in Percussion
For non-music majors, music minors, and music majors’ secondary instrument. Studio instruction fee: $70.
189 Class Instruction in Percussion
For secondary instrument, instrumental music education students. Studio instruction fee: $70.
281-284 Studio Instruction in Percussion
For music majors’ principal instrument. Studio instruction fee: $90.
285-289 Studio Instruction in Percussion
For music majors’ principal instrument. Studio instruction fee: $90.
481-489 Studio Instruction in Percussion
For music majors’ principal instrument. Studio instruction fee: $90.
401-403 Studio Instruction in Music Technology
Three-semester sequence for students enrolled in music technology majors and minors. Students will create individual projects in MIDI, sound creation and editing, and multimedia. Prerequisite: MU 306 and permission of instructor.

Studio Instruction in Jazz (MUJ)
131-139 Jazz Studio Instruction in Piano
For non-music majors, music minors, and music majors’ secondary instrument. Studio instruction fee: $70.
231-234 Jazz Studio Instruction in Piano
For music majors’ principal instrument. Studio instruction fee: $90.
235-239 Jazz Studio Instruction in Piano
For music majors’ principal instrument. Studio instruction fee: $90.
431-439 Jazz Studio Instruction in Piano
For music majors’ principal instrument. Studio instruction fee: $90.
141-149 Jazz Studio Instruction in Guitar
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For music majors’ principal instrument. Studio instruction fee: $90.
244-249 Jazz Studio Instruction in Guitar
For music majors’ principal instrument. Studio instruction fee: $90.
441-449 Jazz Studio Instruction in Guitar
For music majors’ principal instrument. Studio instruction fee: $90.
161-169 Jazz Studio Instruction in Woodwinds
For non-music majors, music minors, and music majors’ secondary instrument. Studio instruction fee: $70.
261-264 Jazz Studio Instruction in Woodwinds
For music majors’ principal instrument. Studio instruction fee: $90.
265-269 Jazz Studio Instruction in Woodwinds 2 hrs.
For music majors' principal instrument. Studio instruction fee: $90.

461-469 Jazz Studio Instruction in Woodwinds 2 hrs.
For music majors' principal instrument. Studio instruction fee: $90.

171-179 Jazz Studio Instruction in Brass 1 hr.
For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.

271-274 Jazz Studio Instruction in Brass 1.5 hr.
For music majors' principal instrument. Studio instruction fee: $90.

275-279 Jazz Studio Instruction in Brass 2 hrs.
For music majors' principal instrument. Studio instruction fee: $90.

471-479 Jazz Studio Instruction in Brass 2 hrs.
For music majors' principal instrument. Studio instruction fee: $90.

181-189 Jazz Studio Instruction in Percussion 1 hr.
For non-music majors, music minors, and music majors' secondary instrument. Studio instruction fee: $70.

281-284 Jazz Studio Instruction in Percussion 1.5 hr.
For music majors' principal instrument. Studio instruction fee: $90.

285-289 Jazz Studio Instruction in Percussion 2 hrs.
For music majors' principal instrument. Studio instruction fee: $90.

481-489 Jazz Studio Instruction in Percussion 2 hrs.
For music majors' principal instrument. Studio instruction fee: $90.

301 Jazz Improvisation I 2 hrs.
This course provides the student with an introduction to jazz improvisation.

302 Jazz Improvisation II 2 hrs.
This course provides the student with advanced instruction in jazz improvisation. Prerequisites: MUJ 301 or permission of instructor.

396 Jazz Chamber Ensembles 1 hr.
Discussion, evaluation, and performance of literature available for selected small jazz combos. Prerequisite: Approval of instructor.

Ensembles (MUA)
The UAH music ensembles are open to all students; some ensembles require an audition. Ensemble participation is essential for all music majors and minors, and an appropriate ensemble must be selected each semester a music major is enrolled for degree requirements.

390 UAH Choir 1 hr.
Mixed voices singing the serious choral repertoire. Open to all students by audition. Required attendance at rehearsals and performances.

391 Chamber Choir 1 hr.
Solo-ensemble performance specializing in early and contemporary music. Required attendance at rehearsals and performances.

392 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.

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.

394 University Chorale 1 hr.
Mixed voices singing the serious choral repertoire. Open to all students. Required attendance at rehearsals and performances.

396 Chamber Ensembles 1 hr.
Discussion, evaluation and performance of literature available for selected small ensembles. Piano trios, quartets, quintets, string quartets, woodwind, brass, percussion and vocal ensembles. Prerequisite: Approval of instructor.

398 Jazz Ensemble 1 hr.
Open to all students by audition with the director. Provides the participant with opportunities to perform a wide variety of jazz styles in varied settings. Required attendance at rehearsals and performances.
399 UAH Wind Ensemble 1 hr.
Preparation of the finest literature for wind ensemble and concert band. Open to all students by audition with the conductor. Required attendance at rehearsals and performances.

Music Education (MUE)
326 Teaching General Music in Elementary Schools 2 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 2 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 3 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 3 hrs.
Repertoire, procedures for administering and teaching school bands, orchestras and instrumental ensembles. Prerequisites: MUE 326, 327, 425 or permission of instructor.

Philosophy Department
332 Morton Hall
Telephone (256) 824-6555
Email: philos@uah.edu

Professor Martine; Associate Professors Cling (Chair), Heikes, Wilkerson; Assistant Professor Mackintosh.

Mission
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 any one chosen from PHL 401, 402, or 403. Philosophy majors must also complete a minor consisting of a minimum of 18 hours in a single discipline (with other requirements as specified by the minor department) or a minimum of 21 semester hours in a cognate area of closely related courses approved by the Philosophy Department, with 12 of these hours at the 300-level or above. Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Morton Hall, Room 322) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216)

Philosophy Minor
Students minoring in philosophy must complete at least 21 semester hours in philosophy including PHL 201 and 202. Recommendations concerning which courses might best complement a student's major and related interests are available from the philosophy faculty upon request. Appropriate philosophy courses may also be used as part of a program of cognate studies with
other disciplines. Such a program must include at least 12 semester hours in courses numbered 300 or above.

**An Illustrative Plan for Completing the B.A. Degree With a Major in Philosophy**

The following is one possible four-year program of study for a Philosophy major. (It is intended only to demonstrate that a Philosophy major can easily be completed within four years of matriculation. It should not be taken to be a recommended curriculum.) Many students majoring in Philosophy opt to do a second major in a related area of study and the following scheme also shows that doing so is readily possible. The many free electives sketched below could be used to turn the minor area of study into a second major.

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>Academic Year Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 1</strong></td>
<td></td>
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<tr>
<td>EH 101</td>
<td>EH 102</td>
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<tr>
<td>PHL 101</td>
<td>PHL 202</td>
<td>3</td>
</tr>
<tr>
<td>HY 101 OR 103</td>
<td>HY 102 OR 104</td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>Social Science</td>
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<tr>
<td>Natural Science</td>
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<td></td>
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<td><strong>Year 2</strong></td>
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<td>PHL 201</td>
<td>Sophomore Literature</td>
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<td>Social science</td>
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<td>3</td>
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<td>Foreign Lang.</td>
<td>Foreign Language</td>
<td>5</td>
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<tr>
<td>Sophomore Literature</td>
<td>Social science</td>
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<td>Fine Arts</td>
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<td></td>
<td></td>
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<td><strong>Year 3</strong></td>
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<tr>
<td>PHL 301</td>
<td>PHL 302</td>
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<td>PHL Elective</td>
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<td>Minor</td>
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<tr>
<td>Free Elective</td>
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<td><strong>Year 4</strong></td>
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<td>PHL 395</td>
<td>PHL 4*</td>
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<td>Free Elective</td>
<td>Free Elective</td>
<td>3</td>
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<tr>
<td>Free Elective</td>
<td></td>
<td>18</td>
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</tbody>
</table>

*This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a major in Philosophy. A student’s schedule may differ in order of course work and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.

**Philosophy (PHL)**

101 Being, Knowledge, and Value 3 hrs.
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 3 hrs.
Methodology of correct formal and informal reasoning.

202 Introduction to Ethics 3 hrs.
Major ethical positions in both classical and modern thought. The course will include a consideration of case studies drawn from practical contexts in engineering, medicine and other areas.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>301</td>
<td>Ancient Philosophy</td>
<td>3 hrs.</td>
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<tr>
<td>302</td>
<td>Modern Philosophy</td>
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<tr>
<td>303</td>
<td>Contemporary Philosophy</td>
<td>3 hrs.</td>
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<tr>
<td>310</td>
<td>Philosophy of Art</td>
<td>3 hrs.</td>
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<tr>
<td>311</td>
<td>Philosophy of Science</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>312</td>
<td>American Philosophy</td>
<td>3 hrs.</td>
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<tr>
<td>314</td>
<td>Philosophy of Eastern and Western Religions</td>
<td>3 hrs.</td>
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<tr>
<td>316</td>
<td>Computation and Cognition</td>
<td>3 hrs.</td>
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<td>320</td>
<td>Symbolic Logic</td>
<td>3 hrs.</td>
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<td>330</td>
<td>Classical Political Philosophy</td>
<td>3 hrs.</td>
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<tr>
<td>332</td>
<td>Modern Political Philosophy</td>
<td>3 hrs.</td>
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<tr>
<td>335</td>
<td>Feminist Philosophy</td>
<td>3 hrs.</td>
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<tr>
<td>385</td>
<td>Selected Topics in the History of Philosophy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>395</td>
<td>Junior Research Seminar</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

Survey of classical philosophy from the Pre-Socratics through Aristotle. Prerequisite: PHL101 or permission of instructor.

Survey of the British and Continental traditions from Descartes through Kant. Prerequisite: PHL101 or permission of instructor.

Examination of some of the most important trends in late nineteenth and twentieth century thought. Prerequisite: PHL101 or permission of instructor.

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

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

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.

Philo logical 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.

From philosophers to computer and brain scientists, cognition has become a central area of philosophical and scientific inquiry. This course examines the various models, theories, and arguments generated by this research. Prerequisite: PHL 101 or permission of instructor.

Symbolic deductive logic, including propositional calculus (truth-functional logic), predicate calculus (propositional functions and quantification), and the logic of relations. Prerequisite: PHL201.

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.)

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.)

Philosophical examination of the status of women in contemporary society, dealing with basic issues in feminist epistemology, the debate between essentialist and constructionist views on the nature of femininity, and the intersections of gender issues with other forms of oppression. May also cover issues in feminist political theory and feminist ethics. Prerequisite: PHL101 or permission of instructor.

Intensive examination of particular problems, periods, or movements in the history of philosophy. Prerequisite: Determination in accordance with course content.

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 PHL201.
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 PHL201.

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 PHL201.

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.

415 Biomedical Ethics 3 hrs.
Introduces basic concepts of biomedical ethics; fosters careful reflective thought about the
challenging value questions raised by advances in biology, medicine, and medical technologies.
Prerequisite: 6 hours of PHL.

Political Science Department
250 Morton Hall
Telephone: (256) 824-6192
Email: polsci@uah.edu
Professors Emeriti Meek, Spitz; Associate Professors Hawk (Chair), Pottenger, Reeves, Williams;
Assistant Professor Marcus.

Mission
The Department of Political Science, along with the Departments of Sociology and Psychology,
represent the Social Sciences in the College of Liberal Arts. Our curriculum provides a major and
a minor in traditional political science with courses offered on American government, comparative
politics, international relations, political theory, and American law. The department also offers a
graduate program in public affairs. Faculty members are committed to effective teaching, active
public service, and both traditional and applied scholarship.

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

Political science is the study of government, governance, politics, and the state. The major sub-
fields of the discipline include political theory and philosophy, international relations, foreign
governments and comparative politics, public law, research methods, public policy, and American
politics. The latter includes national, state, and local political institutions and processes,
federalism, and intergovernmental relations.

General Education Requirements
PSC 101 (American Government), PSC 102 (Comparative Politics and Foreign Governments),
and PSC 260 (Introduction to International Relations) are the courses that may be used to fulfill
General Education Requirements (GER).

Political Science Major
Students wishing to major in political science must complete a minimum of 33 semester hours in
political science, including:
- PSC 101 - American Government
- PSC 102 - Comparative Politics and Foreign Governments
- PSC 103 - State and Local Government
- PSC 260 - Introduction to International Relations
- PSC 330 - Classical Political Philosophy or
- PSC 332 - Modern Political Philosophy
- PSC 484 - Senior Seminar in Political Science (during the junior or senior year)
In addition, each political science major must complete SOC 333 or PY 300. Students with a major in political science must choose either a minor from another discipline or 21 hours of cognate studies involving courses from two or more disciplines, of which 12 hours must be in upper level courses with a minimum of 6 hours from each discipline. Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate a Program of Study either by meeting with the departmental chair (Morton Hall, Room 250) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216). Transfer students are advised to consult with the chair of the department before scheduling courses. Guidelines for curriculum planning in political science are available in the department office. These guidelines are designed to consider such intellectual and vocational interests as pre-law training, international studies, public service, and preparation for graduate study.

Political Science Minor
The student choosing a minor in political science must take 21 hours of course work including PSC 101, 102 and 484 (during the junior or senior year).

Second Area of Study for Elementary Education Majors
- PSC 101 - American Government
- PSC 102 - Comparative Politics and Foreign Governments
- PSC 103 - State and Local Government
- PSC 484 - Senior Seminar
- 6 additional hours of political science

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

An Illustrative Plan for Completing the B.A. Degree
With a Major in Political Science*

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Fall Semester Hours</th>
<th>Spring Semester Hours</th>
</tr>
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<td>Year 1</td>
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<td>3</td>
</tr>
<tr>
<td>EH 101</td>
<td>3</td>
<td>EH 102</td>
</tr>
<tr>
<td>HY101 OR 103</td>
<td>3</td>
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<tr>
<td>HY103</td>
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<td>PSC 103</td>
</tr>
<tr>
<td>Math</td>
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</tr>
<tr>
<td>Natural Science</td>
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<td>FL101</td>
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<td>FL102</td>
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<tr>
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<td>PSC 260</td>
</tr>
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<td>3</td>
<td>EH 206 or 241 or 230 or 251</td>
</tr>
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<td>PSC 102</td>
<td>3</td>
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</tr>
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<td>Elective</td>
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<td>Humanities &amp; Fine Arts</td>
</tr>
<tr>
<td></td>
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<td>PSC 330 or 332</td>
<td>3</td>
<td>PSC 300 or above</td>
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<td>PSC 300 or above</td>
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<td>Year 4</td>
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<td>PSC 484</td>
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<td>PSC 300 or above</td>
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<td>Upper Div. Minor Course</td>
</tr>
<tr>
<td>Upper Div. Minor Course</td>
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</tbody>
</table>

Total 128
This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a major in Political Science. A student’s schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.

**Political Science (PSC)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>American Government</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>102</td>
<td>Comparative Politics and Foreign Governments</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>103</td>
<td>State and Local Government</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>260</td>
<td>Introduction to International Relations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>280</td>
<td>Special Topics I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>302</td>
<td>The American Congress</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>304</td>
<td>American Presidency</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>309</td>
<td>Political Parties and Interest Groups</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>330</td>
<td>Classical Political Philosophy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>332</td>
<td>Modern Political Philosophy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>334</td>
<td>American Political Thought</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>340</td>
<td>Government and Politics of Industrializing &amp; Post Industrial Countries</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>341</td>
<td>Government and Politics of Modernizing Countries</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

*Note: This table represents a sample of courses in Political Science. Prerequisites and additional details may vary.*
undergoing political and economic modernization. Themes will vary but will generally include the role of democracy in development, political institutionalization, and the roles of religion and ethnicity. Prerequisite: PSC 101; 102 recommended.

416 Alabama & Southern Politics 3 hrs.
Surveys the government and politics of Alabama and provides an overview of the political culture in the American South. Prerequisite: PSC 101.

418 Urban Politics 3 hrs.
Examination of urban politics in America with attention given to urban problems, urban environment, governmental forms, power structures, and policy outputs. Prerequisite: PSC 101, 103; PSC 306 recommended.

420 Federalism and Intergovernmental Relations 3 hrs.
Examination of the theory and practice of American federalism with emphasis on the constitutional framework, intergovernmental relations and the changing roles of state and local governments.

436 Political Ideologies 3 hrs.
Critical examination of the nature of modern ideologies. Among the major ideologies studied will be important examples of conservatism, liberalism, socialism, communism, and fascism in theory and practice. Prerequisite: PSC 101.

438 Contemporary Political Thought 3 hrs.
Systematic study of recent and current thinking on issues and problems of politics, social theory and ethics. Prerequisites: 9 hours PSC, PHL, and/or HY.

451 Law, Courts, and Public Policy 3 hrs.
The role of courts and the law in American public policy process.

452 American Constitutional Law 3 hrs.
Policy-making role of the Supreme Court in the American political system through analysis of leading cases in interpreting the constitution. Prerequisite: PSC 101; 351 recommended.

454 Civil Liberties 3 hrs.
Judicial interpretations of contemporary questions involving rights of individuals and limits of freedom of action in American society. Prerequisite: PSC 101; 351 and/or HY 318 recommended.

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

468 United States National Security Policy 3 hrs.
Examination of the substance and decision making processes behind the national security policies of the United States. Includes a discussion of the historical rationale of the policy as well as the current military, economic, technological, and social challenges confronting the country. Prerequisite: PSC 101; 102, 260 recommended.

480 Advanced Topics in Political Science 3 hrs.
Selected topics in local, state, national and world politics. May be repeated for up to 6 hours credit. Prerequisite: permission of the department chair.

484 Senior Seminar in Political Science 3 hrs.
Advanced examination into the subfields of political science offered by the department. May be repeated with different faculty for up to 6 hours credit. Prerequisites: PSC 101, advanced status in political science.

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.

520 Federalism and Intergovernmental Relations 3 hrs.
Examination of the theory and practice of American federalism with emphasis on the constitutional framework, intergovernmental relations and the changing roles of state and local governments.

551 Public Policy and the Law 3 hrs.
Judicial influences on the development and application of public policy in the United States. Role of the judiciary as a political actor.

565 American Foreign Policy 3 hrs.
Analysis of major theories explaining foreign policy and various controversies surrounding policy processes and issues.
568 National Security Policy
Examination of the evolution of U.S. security policy in the post-1945 era, with a special focus upon the theory and practice of deterrence; and the problems associated with disarmament and arms control. Prerequisite: Undergraduate course in international relations recommended.

580 Special Topics in Political Science
Selected topics in local, state, national and world politics.

Psychology Department
335 Morton Hall
Telephone: (256) 824-6191
Email: psychol@uah.edu

Professors Kirkpatrick, Carpenter (Chair); Assistant Professors Edwards, Morris, Neuschatz, Seemann, Torres.

The Department of Psychology offers the B.A. and M.A. degrees in psychology. Psychology is an exciting and interesting scientific field that concerns why people think and behave the way they do. It is a tremendously varied field and a discipline with a bright and promising future. Though relatively young, psychology is an expansive discipline that incorporates topics from other disciplines such as biology, business, engineering, and education. Studying psychology requires students to solve problems, reason verbally and quantitatively, organize material, think critically, communicate clearly, and work effectively with others. At UAH, the psychology department is small and very student-centered. Students may take courses in clinical, experimental, social, developmental, cognitive, perceptual, biological, engineering, industrial, and animal psychology. In particular, students are required to gain an appreciation of the methods and tools used by psychologists to perform research. Our capstone course in supervised research allows majors to demonstrate those skills working with individual faculty members.

Mission
The focus of the Department of Psychology is threefold: teaching, scholarship, and service. Consequently, the mission of the department centers upon development of students, development of faculty and scholarly activities, and service to scholarly and professional societies as well as to appropriate communities, including those within UAH.

The Department of Psychology supports the Mission of the College of Liberal Arts in a variety of ways. We provide close interactions between teachers and learners in our seminar courses, as well as in our research courses and internship opportunities. The Department of Psychology encourages personal and professional growth in its promotion of students’ career exploration, knowledge acquisition, skill development (i.e., critical thinking, technical writing, oral communication, and statistical analyses), and valuation of diversity.

Psychology Major
The program of study for a psychology major includes 35 hours of psychology with at least 26 hours numbered 300 or above. In addition, the psychology major must be accompanied by a minor that meets the requirements designated by the selected discipline. Course work required for the major is specified below in Curriculum for Majors. Students planning to major in psychology are advised to 1) read and follow prerequisite requirements (see Prerequisites), and 2) complete PY 101, PY 102, PY 300, and PY 302 no later than the sophomore year.

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Morton Hall, Room 335) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

Psychology Minor
A minor in psychology consists of 21 hours of psychology courses of which 12 hours must be numbered 300 or above. Course work required for the minor is specified below in Curriculum for Minors.
Psychology for Students Seeking Teacher Certification

Students desiring certification should obtain preliminary academic counseling in the Department of Education. A student majoring in elementary education may choose psychology as the Second Area of Study for Elementary Education Teacher Candidates. Course work required for a second area of study for elementary education majors is specified below in Second Area of Study for Elementary Education Majors. Certification requirements can be found in the Department of Education section. Curricula which include teacher certification may require more than the minimum total of 128 hours for the degree.

Prerequisites

All psychology courses numbered 200 and above require satisfactory completion of PY 101 and most require PY 102. Prior to enrollment in PY 302, a student must complete PY 300, Psychological Statistics. 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 General Psychology 3 hrs
PY 102 Applications in Psychology 3 hrs.
PY300 Psychological Statistics 4 hrs.
PY 302* Experimental Psychology 4 hrs.
PY 498 Human Research I 3 hrs.
Two courses from Group A (See below) 6 hrs.
Two courses from Group B (See below) 6 hrs.
Elective 300-level or above 3 hrs.
Elective 3 hrs.
35 hrs.

*PY 300 is a prerequisite for PY 302.

Group A:
PY314 - Learning
PY316 - Perception
PY380 - Cognition
PY436 - Biological Psychology

Group B:
PY301 - Personality
PY315 - Developmental Psychology
PY375 - Social Psychology
PY433 – Abnormal Psychology

Curriculum for Minors

PY 101 General Psychology 3 hrs.
PY 102 Applications in Psychology 3 hrs.
One course from Group A (See above) 3 hrs.
One course from Group B (See above) 3 hrs.
PY electives (6 hours must be 300-level or above) 9 hrs.
21 hrs.

Curricula for Students Seeking Teacher Certification

Second Area of Study for Elementary Education Majors

PY101 General Psychology 3 hrs.
PY 102 Applications in Psychology 3 hrs.
PY314 Learning or Cognition 3 hrs.
or 380
PY315 Developmental Psychology 3 hrs.
PY375 Social Psychology 3 hrs.
PY301 Personality or Abnormal Psychology- 3 hrs.
or 433
18 hrs.

College of Liberal Arts 238
Social Science Composite for Secondary Education Majors

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

Dr. Daniel G. Hays Memorial Scholarship

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

Dr. Robert E. James Endowed Scholarship

A departmental scholarship awarded to one or more full-time psychology major(s) who have completed a minimum of six credit hours of introductory psychology classes at UAH, or who are currently enrolled in the second course at UAH. Award is based on academic merit, citizenship, and leadership, with regard to demonstrated financial need as a secondary consideration.

An Illustrative Plan for Completing the B.A. Degree

With a Major in Psychology*

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Fall Semester Hours</th>
<th>Spring Semester Hours</th>
</tr>
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<td></td>
<td>PY 101 3</td>
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<td>EH 101 3</td>
<td>EH 102 3</td>
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<td>Mathematics 3</td>
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<td>EH 205, 240, or 250 3</td>
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<td>PY 300 4</td>
<td>Social Science 3</td>
</tr>
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<td></td>
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<tr>
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<td>PY Group B 3</td>
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<td>PY Group B 3</td>
<td>HY102 or 104 3</td>
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<td>Elective 1</td>
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<td></td>
<td>PY Group A 3</td>
<td>Humanities 3</td>
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<td>Elective 3</td>
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<td>PY 498 3</td>
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<td>15 30</td>
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Total 128

*This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a major in Psychology. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PY 101</td>
<td>General Psychology I</td>
<td>3 hrs.</td>
<td>This course may be applied to the G.E.R. Introduction to methods and research findings in the field. Topics include historical perspectives, learning, memory, cognition, language, the biological and social basis of behavior, sensation, perception, human development, personality theories, and abnormal behavior. Students are required to participate in approved experiential activities. These activities include participating in research studies, attending lectures, reading psychological literature, and viewing videos. All activities are designed to illustrate the development, testing, and validation of psychological knowledge. Credit for PY 101 may be obtained by either Advanced Placement or the College Level Examination Program (CLEP).</td>
</tr>
<tr>
<td>PY 102</td>
<td>Applications in Psychology</td>
<td>3 hrs.</td>
<td>Introduction to applied topics in psychology, such as statistical analysis, counseling, human factors, health psychology, and industrial and organizational psychology. Career opportunities are discussed. Students are required to engage in approved experiential activities such as participating in current research studies, attending lectures, reading psychological literature, and viewing videos. All experiences are designed to illustrate the development, testing, and validation of psychological knowledge. Prerequisite: PY 101.</td>
</tr>
<tr>
<td>PY 201</td>
<td>Life-Span Development</td>
<td>3 hrs.</td>
<td>This course may be applied to the G.E.R. Examination of the psychological, social, and physical factors that affect human behavior and development from conception to death. The student is encouraged to participate in approved experiential activities, including participating in research studies, attending lectures, reading psychological literature, and viewing videos. All activities are designed to illustrate the development, testing, and validation of psychological knowledge. Prerequisite: PY 101.</td>
</tr>
<tr>
<td>PY 300</td>
<td>Psychological Statistics</td>
<td>4 hrs.</td>
<td>Introduction to psychological statistics, with an emphasis on quantitative analysis of human behavior and experimental data. Topics covered include probability, descriptive statistics, and hypothesis testing with an emphasis on correlation, t-tests, and analyses of variance. The course will provide students with a working familiarity of SPSS, and the abilities to analyze experimental data, read and comprehend published statistics, and write-up statistical results. Prerequisites: 3 hours college math. Lab fee: $30.</td>
</tr>
<tr>
<td>PY 301</td>
<td>Personality</td>
<td>3 hrs.</td>
<td>Examination of various theories of personality with possible implications for research. Prerequisites: PY 101, 102 or written permission of the instructor.</td>
</tr>
<tr>
<td>PY 302</td>
<td>Experimental Psychology</td>
<td>4 hrs.</td>
<td>Design and execution of experiments in psychology. Data analysis and manuscript preparation. Prerequisites: PY 101, 102 and PY 300. Lab Fee: $30.</td>
</tr>
<tr>
<td>PY 314</td>
<td>Learning</td>
<td>3 hrs.</td>
<td>Analysis of learning principles from simple relationships with animals to the complexities of human language and problem solving. Prerequisites: PY 101, 102, or written permission of the instructor; 3 hrs. PY 300-level or above. PY 302 strongly recommended.</td>
</tr>
<tr>
<td>PY 315</td>
<td>Developmental Psychology</td>
<td>3 hrs.</td>
<td>Cognitive, psychoanalytic, ethological, behavioral, and humanistic theories of development. Prerequisites: PY 101 and 102 or written permission of the instructor. PY 310 recommended.</td>
</tr>
<tr>
<td>PY 316</td>
<td>Perception</td>
<td>3 hrs.</td>
<td>Examines sensory systems and elements of perception. Topics include vision research, audition, chemical senses, and body sensations. Prerequisites: PY 101, 102 or written permission of the instructor, 3 hrs. PY 300-level or above. PY 302 strongly recommended.</td>
</tr>
<tr>
<td>PY 330</td>
<td>Nonverbal Communication</td>
<td>3 hrs.</td>
<td>Examines the diversity of human nonverbal behavior and its influences on everyday communication experiences. (Same as CM 330.)</td>
</tr>
<tr>
<td>PY 375</td>
<td>Social Psychology</td>
<td>3 hrs.</td>
<td>Examination of the social influences on both individual and group behavior. Topics may include attitudes, group processes, intergroup conflict, interpersonal attraction, aggression, altruism, and impression formation. Prerequisite: SOC 100 or PY 101. (Same as SOC 375.)</td>
</tr>
</tbody>
</table>
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, or written permission of the instructor; 3 hrs. PY 300-level or above. PY302 strongly recommended.

399 Professional Development for Psychology Majors 1 hr.
Development of skills related to graduate work and to occupations in psychology. Career and internship exploration, resume and graduate application writing, graduate school exploration. Exposure to work and research related topics, such as teamwork and ethics. Prerequisites: PY 101 and 102.

Courses listed below are open to students who are seniors or those enrolled in the last semester of their junior year.

402 Industrial and Organizational Psychology 3 hrs.
Application of basic principles of learning, motivation, and perception to typical industrial and organizational problems. Prerequisite: Senior/graduate standing. (Same as ISE 402.)

403 Human Factors Psychology 3 hrs.
Human performance in human-technology-environment systems. Includes consideration of human capabilities and limitations as related to controls and displays, and the role of human cognition in decision making and training effectiveness. Prerequisite: Senior/graduate standing. (Same as ISE 403.)

405 Psychopharmacology 3 hrs.
Introduction to drug classification and action with emphasis on physiological and psychological interactions. Prerequisites: 9 hours PY or BYS. (Same as BYS 405.)

406 Psychology of Women 3 hrs.
Examines theory and research in the psychological functioning of women, both in the United States and other nations. Topics include achievement and education, mental and physical health issues, biological influences on women's behavior, women and work, and victimization of women. Senior/graduate standing.

407 Cross-cultural Psychology 3 hrs.
Examines psychological similarities and differences between members of industrialized and non-industrialized cultures. Comparisons will include development, social interaction, personality, cognition, and perception, as well as psychological health and treatment, work, and acculturation. Senior/graduate standing.

420 Special Topics 3 hrs.
Pre-announced special areas in seminar discussion, laboratory work, or practicum. May be taken twice for credit.

422 Individual Research 3 hrs.
With advice of instructor, design and execution of original experiment in psychology. Prerequisites: 15 hours PY and approval of instructor. May be taken twice for credit.

426 History and Systems in Psychology 3 hrs.
Survey of psychological theory and experimentation regarding human behavior and mental processes from ancient times to the present. Prerequisites: 9 hrs. PY 300-level or above.

433 Abnormal Psychology 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. PY301 strongly recommended.

436 Biological Psychology 3 hrs.
Neural and endocrinological systems underlying behavior. Prerequisites (either a or b): (a) 15 hrs. of PY or approval of instructor; (b) BYS 119 and BYS 120 and 6 hours of PY or approval of instructor. (Same as BYS 436.)

437 Psychobiology of Stress and Illness 3 hrs.
Overview of physiological stress responses and their influence on health behavior and illness. Prerequisite: 9 hours PY or BYS.

490 Readings in Psychology 3 hrs.
Supervised in-depth readings in area of particular interest to student. Prerequisites: 12 hrs. PY 300-level or above and approval of instructor. May be taken twice for credit.
491 Special Topic in Psychology 1 hr.
Pre-announced special areas in seminar discussion, laboratory work, or practicum. Prerequisites: 9 hours PY 300-level or above. May be taken twice for credit.

492 Special Topic in Psychology 2 hrs.
Pre-announced special areas in seminar discussion, laboratory work, or practicum. Prerequisites: 9 hours PY 300-level or above. May be taken twice for credit.

498 Human Research I 3 hrs.
Capstone course for the PY major. Human behavior observation and/or experimentation. Students engage in data collection and analysis, and report their findings in a research paper and an oral presentation. Prerequisites: PY 302 with a grade of “C” or better; 9 hours PY 300-level or above and senior/graduate standing. Lab Fee: $30. (Offered Fall Semester only)

499 Human Research II 3 hrs.
Continuation of PY 498. Prerequisite: PY 499 and approval of instructor. Lab Fee: $30. (Offered Spring Semester only)

502 Industrial and Organizational Psychology 3 hrs.
Application of basic principles of learning, motivation, and perception to typical industrial and organizational problems. Prerequisite: Senior/graduate standing. (Same as ISE 502.)

503 Human Factors Psychology 3 hrs.
Human performance in human-technology-environment systems. Includes consideration of human capabilities and limitations as related to controls and displays, and the role of human cognition in decision making and training effectiveness. Prerequisite: Senior/graduate standing. (Same as ISE 503.)

505 Psychopharmacology 3 hrs.
Introduction to drug classification and action with emphasis on physiological and psychological interactions. Prerequisites: 9 hours PY or BYS. (Same as BYS 505.)

506 Psychology of Women 3 hrs.
Examines theory and research in the psychological functioning of women, both in the United States and other nations. Topics include achievement and education, mental and physical health issues, biological influences on women’s behavior, women and work, and victimization of women. Senior/graduate standing.

507 Cross-cultural Psychology 3 hrs.
Examines psychological similarities and differences between members of industrialized and non-industrialized cultures. Comparisons will include development, social interaction, personality, cognition, and perception, as well as psychological health and treatment, work, and acculturation. Senior/graduate standing.

520 Special Topics 3 hrs.
Pre-announced special areas in seminar discussion, laboratory work, or practicum. May be taken twice for credit.

524 Ergonomics and Methods Analysis 3 hrs.
Introduces basic principles of methods analysis and ergonomics. Methods analysis topics include: work measurement, work measurement tools, work sampling, job analysis, job evaluation, and 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. (Same as ISE 524.)

530 Psychometrics 3 hrs.
History and development of psychological testing with special emphasis given to both theory and process of effective evaluation. Prerequisites: undergraduate statistics, 15 hours PY or graduate standing and permission of instructor.

536 Psychobiology of Stress and Illness 3 hrs.
Overview of physiological stress responses and their influence on health behavior and illness. Prerequisite: 9 hours PY or BYS. (Same as BYS 536.)
Sociology Department
344 Morton Hall
Telephone: (256) 824-6190
Email: soc@uah.edu

Associate Professors: Berbrier, Colclough, Finley, Sitaraman (Chair); Assistant Professors: Johnston.

Sociology is the study of social forces that shape our lives. Sociology explores social relations within a wide range of institutions including family, education, religion, economy, politics, and within groups, communities and organizations. The student of sociology develops a new, broader perspective, research skills, and a critical analytic mind that can be applied in a variety of careers in business, government or education.

Mission
Our curriculum encompasses core areas in the discipline with courses in sociological theory, social inequality, social institutions, social change and sociological methodology. We are committed to providing all students with knowledge and skills that derive from a sociological perspective. Students may apply the sociological perspective in pursuing further studies in the discipline, toward work in diverse settings, and as thoughtful and involved members of their communities. Our instructional mission is enhanced by faculty with active research agendas that explore varied topics and employ both qualitative and quantitative methodologies. The faculty apply their expertise on social issues, social processes, and social research to serving needs of the University and the community at large.

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 for Elementary Education Teacher Candidates or cognate.

Sociology Major
Students who major in sociology must complete 34 hours of sociology courses including:
- SOC 100 Introduction to Sociology
- SOC 333 Statistics for the Social Sciences
- SOC 300 Research Methods
- SOC 465 Sociological Theory

A minimum of 21 hours must be taken in courses numbered 300 or above.

Students are advised to officially declare a major and to obtain a Program of Study by the beginning of the sophomore year, if not before. Students may initiate the Program of Study either by meeting with the departmental chair (Morton Hall, Room 344) or the College of Liberal Arts Academic Advisor (Morton Hall, Room 216).

Suggested courses for students planning careers in business include: SOC 439 (Complex Organizations), SOC 455 (Sociology of Work and Occupations), SOC 330 (Race and Ethnicity), SOC 315 (Cultural Change), SOC 350 (Class, Status, and Power), and SOC 430 (Mass M in America).

Suggested courses for students planning careers in social services include: SOC 106 (Marriage and Family), SOC 306 (Sociology of Gender), SOC 330 (Race and Ethnicity), SOC 350 (Class, Status, and Power), SOC 319 (Deviance and Social Control), SOC 375 (Social Psychology), SOC 435 (Social Movements), and SOC 102 (Social Problems). For those requiring a general curriculum in sociology and/or those planning to attend graduate school in the field, a combination of both micro and macro courses is advised.

Sociology Minor
A student developing a minor in sociology with a major in another discipline must complete 21 hours of sociology courses including SOC 100. A minimum of 12 hours should be in courses

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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 for Elementary Education Teacher Candidates**

Students majoring in elementary education may select sociology as their second area of study. See major requirement in the Education section. Students must complete a minimum of 18 hours in sociology, 12 of which must be above the 300-level. 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 106 Marriage and Family
3. 4 additional courses in sociology at the level of 300 or above

(The following courses are especially useful for teachers: SOC 306, SOC 310, SOC 330, SOC 350, SOC 375)

**An Illustrative Plan for Completing the B.A. Degree With a Major in Sociology**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>Academic Year Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOC 100 (Intro. to Sociology)</td>
<td>3</td>
<td>SOC course any level</td>
</tr>
<tr>
<td>EH 101</td>
<td>3</td>
<td>EH 102</td>
</tr>
<tr>
<td>Mathematics</td>
<td>3</td>
<td>Natural Science</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>5</td>
<td>Foreign Language</td>
</tr>
<tr>
<td>Humanities/Fine Arts</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17</td>
<td></td>
</tr>
<tr>
<td><strong>Year 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOC course any level</td>
<td>3</td>
<td>SOC 300 (Methods)</td>
</tr>
<tr>
<td>EH Lit</td>
<td>3</td>
<td>EH Lit</td>
</tr>
<tr>
<td>HY 101 OR 103</td>
<td>3</td>
<td>HY 102 OR 104</td>
</tr>
<tr>
<td>Minor</td>
<td>3</td>
<td>Fine Arts</td>
</tr>
<tr>
<td>Natural Science</td>
<td>4</td>
<td>Social Science</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Elective</td>
</tr>
<tr>
<td><strong>Year 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOC 333 (Statistics)</td>
<td>4</td>
<td>SOC course at 300 level or above</td>
</tr>
<tr>
<td>SOC course at 300 level or above</td>
<td>3</td>
<td>Social Science</td>
</tr>
<tr>
<td>Humanities/Fine Arts</td>
<td>3</td>
<td>Minor</td>
</tr>
<tr>
<td>Minor</td>
<td>3</td>
<td>SOC course at 300 level or above</td>
</tr>
<tr>
<td>Social Science</td>
<td>3</td>
<td>Elective</td>
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<tr>
<td></td>
<td>16</td>
<td></td>
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<tr>
<td><strong>Year 4</strong></td>
<td></td>
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</tr>
<tr>
<td>SOC course at 300 level or above</td>
<td>3</td>
<td>SOC course at 3003 level or above</td>
</tr>
<tr>
<td>SOC 465 (Theory)</td>
<td>3</td>
<td>Elective</td>
</tr>
<tr>
<td>Minor</td>
<td>6</td>
<td>Minor</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
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<tr>
<td></td>
<td>15</td>
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</tbody>
</table>

*Total 130*

*This plan is provided as one example of the many ways a student may schedule coursework to complete a B.A. degree with a major in Sociology. A student's schedule may differ in order of coursework and number of courses taken each semester. To the extent possible, schedules will be designed to fit the scheduling needs of the student.*

College of Liberal Arts 244
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.

300 Research Methods 3 hrs.
Broad and balanced background in various types of social research methods. Fundamental logic and specific techniques in conducting research. Lab Fee: $40.

306 Sociology of Gender 3 hrs.
An examination of the different perspectives used in the sociological analysis of gender and of the current research addressing gender stratification. The analysis includes the institutional consequences of gender construction in the United States and cross-culturally, as well as the effects on women and men as members of society.

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.

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 Statistics for the Social Sciences 4 hrs.
This course is an introduction to social statistics with an emphasis on quantitative analysis of survey and census data. Topics covered include descriptive statistics, random sampling, estimation and hypothesis testing with an emphasis on t-tests, chi-square, correlation and regression. This course will provide students with a working familiarity of SPSS, analysis of social science data-sets, ability to read and comprehend published statistics, and write-up statistical results. Includes laboratory. Prerequisite: 3 hours college math.

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.
350 Class, Status, and Power  
Theoretical questions and frameworks for understanding social stratification. Comparison of different types of stratification systems across time and in different societies.

375 Social Psychology  
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.)

390 Readings and Individual Research  
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.

430 Mass Media in America: Theory and Criticism  
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 430.)

435 Sociology of Social Movements  
This course explores various organized movements for social change. Questions addressed include the origins and causes of such movements, the cultural, social and political contexts that impact movements, how movements mobilize people to become active, and strategies and tactics. Other topics include organizational factors and resource mobilization, social networks, collective identity and community building, social movement framing (i.e. persuasive rhetoric and argumentation), ideology, the decline of movements, and what “success” means for a social movement.

439 Complex Organization in Industrial Society  
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 standing or permission of instructor.

440 Sociology of Religion  
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.

444 Sociology of Culture  
Explores meaning-making within the United States’ social structure. Students examine the cultural dimensions of important social processes including race, power, resistance, class, gender, family, etc. Includes theoretical and empirical analyses of both high and popular cultural forms, discursive practices, semiotics, signs and symbols, and processes of cultural production (at home, work, in art, music, theater, etc.).

455 Sociology of Work and Occupations  
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.

465 Sociological Theory  
Development of discipline of sociology in terms of major trends of sociological theory, past and present, and major theoretical problem areas. Nature of sociological theory in relation to other disciplines.

MINORS ONLY
The College of Liberal Arts oversees several programs that can be selected by students as a minor in their Program of Study. These programs are described below.

Classical Studies
Dr. Richard Gerberding, Director
410 Roberts Hall
Telephone (256) 824-6310
Email: gerberdingr@email.uah.edu
Classical studies is a program designed to impart an academic familiarity with the languages, history, and culture of ancient Mediterranean society. Its program of study includes various courses taught by several departments within the College of Liberal Arts, arranged so as to fulfill a student’s requirements for an academic minor.

Classical Studies Minor
Classical studies differs from other departments’ study of the art, history, philosophy, literature, or politics of the classical period by its requirement that the student command a reasonable facility in an ancient language. The point at which a student begins the university-level study of that language will determine the total number of hours required for the minor. If a student begins the language with a course numbered 200 or above, the minor requires the completion of at least 21 credit hours from the following courses. If the student begins with a language course numbered in the 100s, the requirement is 27 hours. For all students, at least 9 of the credit hours must be earned in courses numbered 300 or above, 12 from courses in the same classical language regardless of language placement level, and 9 from courses in subjects other than that language.

Requirements:
21 hours total (27 hours if language placement is not at 200-level or above)
12 hours in one classical language (regardless of placement level)
9 hours in classes numbered 300 or above
9 hours in classes other than the language.

Classical Studies Courses
CL 100 - (Art History 100. Survey Ancient to Medieval)
CL 101 - (FL101N101. Elementary Latin I)
CL 102 - (FL102N. Elementary Latin II)
CL 201 - (FL200N, Intermediate Latin I)
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.)
CL499 - (FL 499N, Independent study In Latin).

Global Studies
Dr. Kathleen Hawk, Director
251 Morton Hall
Telephone (256) 824-6192
Email: hawk@uah.edu

The Global Studies cognate is an interdisciplinary minor aimed at students interested in pursuing in-depth study of the world outside the United States. The cognate is designed around a core of courses that provide a strong foundation in Global Studies, while also allowing students the flexibility in their choice of electives to tailor the course of study to their individual needs and interests.

Global Studies Minor
Working with the Global Studies Advisor, students develop a thematic focus that suits their interests, and one that will ideally assist them in their careers or graduate studies.
I. General Requirements:
• Overall, the cognate must include a minimum of 27 hours.
  At least 9 hours must be in courses numbered 300 or above.
  The cognate program must be approved by the Global Studies Advisor

II. Core Courses: 9 hours, including:
• GY 105 – World Regional Geography
• GS 200 – Global Systems & Cultures
• GS 400 – Global Studies Seminar

III. Electives: 18 hours
• At least 3 hours, but no more than 9, must be taken in Category A. The remainder of
  credits must come from Category B.
• Electives must be chosen from at least three departments.

IV. Students are encouraged to select globally oriented general education
requirements (GERs)
• Examples include ARH 100, 101; EH 240-241; HY 103-104; PSC 102, 260; and
  SOC 200.

Category A:
Foreign Language
• All courses offered in French, German, Russian, and Spanish
  FL 200 (also offered in Japanese and Latin)
  FL 301
  FL 302
  FL 303
  FL 304
  FL 305
  FL 404
  FL 410
  FL 499 (also offered in Latin)

Category B:
Courses examining societies and cultures, their histories, and relationships with each other
Art History
• ARH 301
  ARH 302
  ARH 303
  ARH 304
  ARH 305
  ARH 307
  ARH 309
  ARH 310
• Communications
  CM 309
• English
  EH 240
  EH 241
  EH 242
  EH 250
  EH 251
  EH 421
  EH 522
  EH 525
• Foreign Languages & Literatures
  FL 204
• Global Studies
  GS 199
  GS 399
Global Studies Courses

199 Study Abroad 3 hrs.
Course will involve travel to selected countries for academic study purposes. Topics and countries will vary. Duration of travel will normally vary between one and three weeks and will incur additional costs to the student. The course will be taught in English and is open to all UAH students with permission of the instructor. May be repeated for credit when the content of the course differs. Primarily offered during the spring and summer terms.

200 Global Systems and Cultures 3 hrs.
A multidisciplinary introduction to global studies through a focus on cultural, economic, political, and historical dimensions of interactions among world nations and cultures.

399 Study Abroad 3 hrs.
Travel to selected countries for academic study purposes. Topics and countries will vary. The course will be taught in English and is open to all UAH students with permission of the instructor. May be repeated for credit when the content of the course differs. Primarily offered during the summer.

400 Global Studies Capstone Course 3 hrs.
Capstone course for Global Systems and Cultures cognate. Maintaining a multidisciplinary focus, this course enables students to integrate and extend their previous learning experiences in the Global Studies cognate. Students engage in an interdisciplinary research project under supervision of faculty from two or three disciplines and report their findings in their research paper and oral presentations. Offered annually. Prerequisites: Junior or Senior Status and permission from Global Studies Advisor.

Women's Studies Program

344 Morton Hall
(256) 824-6210
Dr. Nancy J. Finley, Director

The Women's Studies program brings together courses and faculty from several colleges of the university to provide an interdisciplinary experience leading to a minor in Women's Studies. As an area of scholarship, the principal focus is on the contributions, perspectives, and experiences of women in all areas of human endeavor, including the status, portrayal, or achievements of women in areas such as art, history, literature, science, business, engineering, and medicine. While the classes 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 offers 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 one required course (WS 200), five core courses, and one elective as shown in the following table. Core courses must include at least 6 hours of humanities and 6 hours of social and natural sciences listed below. 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 course (3 hrs.)
   WS 200 - Introduction to Women's Studies

2. Core Courses - 5 courses required from the following (15 hrs.)

   **Notes:**
   1. No more than 6 hours within a single subject area.
   2. No more than two of the courses applied to the minor can be from the student's major field of study. No course can be counted toward both a major and minor. WS 340 (Special Topics) or WS 499 (Independent Study) may count as core courses in various subject areas if these courses carry 3 hours credit.

   **Humanities (6 hours):**
   - CM 416 - Women Orators
   - CM 345 - Media Representation
   - EH 418 - Women Writers
   - HY 367 - Women in U.S. History
   - HY 390 - Women in European History
   - PHL 335 - Feminist Philosophy

   **Social Sciences, Health Sciences, Business, and Technology (6 hours):**
   - MGT 462 - Employment Law of Managers
   - NUR 325 - Human Sexuality
   - SOC 106 - Marriage and Family
   - SOC 306 - Gender Roles
   - PY 406 - Psychology of Women

   Approved Special Topics courses may count toward the minor. Examples include:
   - CM 340 - Special Topics: Gender and Communication
   - CM 340 - Special Topics: Race, Gender, and the Media
   - EH 540 - Special Topics: African American Writers
   - WS 340 - Special Topics (3 hours, with permission of Director)
   - WS 499 - Independent Study (3 hours, with permission of Director)

3. Elective Course - 1 additional core course or 1 from the following (3 hrs.):
   - ARH 309 - Contemporary Art/Issues
   - BYS 318 - Vertebrate Reproduction
   - CM 250 - Interpersonal Communication
   - CM/PY 330 - Psychology of Non-Verbal Communication
   - EH 331 - American Literature from the Civil War to the Present
   - EH 391 - Victorian Prose and Poetry
   - EH 493 - Victorian Novel
   - EH 500 - Literary Criticism and Theory
   - HY 365 - American Labor History
   - PHL 202 - Introduction to Ethics
   - PHL 303 - Contemporary Philosophy
   - PSC 438 - Contemporary Political Thought
   - PY 310 - Child Psychology

College of Liberal Arts
PY/SOC 375 - Social Psychology
PY/BYS 536 - Psychobiology of Stress and Illness
SOC 200 - Introduction to Anthropology
SOC 315 - Cultural Change
SOC 435 - Social Movements
WS 340 - Special Topics (1-2 credit hours)
WS 499 - Independent Study (1-2 credit hours)

New courses may be added to this list when approved for inclusion by the Women's Studies Program Advisory Committee. The Women's Studies section for each semester's schedule of classes lists the courses that may be counted toward the minor. Also see our website at http://www.uah.edu/womensstudies/curriculum.html. 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 1-3 hrs.
Pre-announced special areas addressed in seminar format, laboratory work, or practicum. May be taken twice for credit. Prerequisite: WS 200.
College of Nursing
210 Nursing Building
Telephone: (256) 824-6742
Email: nursing@uah.edu
Dean: C. Fay Raines, B.S.N., M.S.N., Ph.D., Professor
Associate Dean: Marsha Dowell, B.S.N., M.S.N., Ph.D., Associate Professor
Professor Raines; Clinical Professor Williamson; Associate Professors Dowell, Lacey, Warren; Clinical Associate Professors Browning, Herrin D; Assistant Professors Anderson, Foote, Hays, Horton, McClellan, McElroy; Clinical Assistant Professors Bonilla, Busby, Childers, Dempsey, Ferguson, George, Herrin K; Lawson, Linsky, Newman, Feveler, Primeau, Scroggins, Showalter, Thompson, Warboys.

Mission
The fundamental purpose of the College of Nursing is to prepare clinically excellent baccalaureate and master's level nurses to deliver health care services to a culturally diverse population within a variety of health care settings. Our graduates practice as professionals, able to utilize critical thinking skills for therapeutic interventions, disease prevention and health promotion. The graduate, undergraduate and continuing education programs provide opportunities for participation in collegial, interdisciplinary learning activities that promote intellectual development and life-long learning. In support of the mission of the university, the College of Nursing, through its graduates, faculty activities, and programs, contributes to the health and well-being of the community.

Overview
The College of Nursing offers the Bachelor of Science in Nursing, the Master of Science in Nursing, a Post-Master’s Family Nurse Practitioner Certificate, and a Graduate Certificate in Nursing Education. 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.

Philosophy
The College of Nursing Faculty believes that nursing is both an art and a science. We believe nursing focuses on holistic health and wellness among individuals, families, and communities in the context of cultural, environmental, and spiritual diversity. The College promotes nursing knowledge through teaching, research, and service. The diversity and complexity of changing health care systems requires critical thinking and life-long learning.

Nursing Education is within a broad theoretical and research based curriculum to address health care issues for individuals or groups with emphasis on delivery systems or health promotion and disease prevention. Implicit in this is an understanding and appreciation of human diversity in health and wellness.

The faculty serve as facilitators and models of competence in nursing practice. We are dedicated to advancing the art and science of nursing. We participate in teaching, research, and service to our students and community. We maintain the advancement of new knowledge through research.

UNDERGRADUATE PROGRAM OBJECTIVES
1. Practice nursing at the entry level based on ethical, legal, and professional standards.
2. Utilize the nursing process for promoting, maintaining and restoring health with diverse populations in a variety of settings.
3. Apply knowledge and use critical thinking as generalist in professional practice.
4. Demonstrate leadership, accountability and flexibility in collaboration with multidisciplinary health care systems.
5. Engage in life-long learning and participate in activities that enhance the discipline of nursing.

Accreditation
The Bachelor of Science in Nursing (BSN) and the Master of Science in Nursing (MSN) programs offered by the College of Nursing are accredited by the Commission on Collegiate Nursing Education (CCNE). The undergraduate program is also approved by the Alabama Board of Nursing.

Degrees and Certificates Offered
The College of Nursing offers bachelor’s and master’s degree programs, as well as a Postmaster’s Family Nurse Practitioner Certificate Program, and a Graduate Certificate in Nursing Education. 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. Students who earn the Bachelor of Science in Nursing degree are eligible to sit for the National Council Licensure Examination for Registered Nurses (NCLEX-RN).

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, the program is now offered via the web. Whenever possible, clinical experiences are arranged at flexible times and at sites convenient to students. The program for registered nurse students offers opportunities for full- and part-time study. Students who enroll in the full-time option may complete the nursing component of the program in one calendar year after completion of prerequisite general education courses.

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 6 semester hours of selected graduate coursework while completing the BSN degree. Those courses are not repeated if the student is admitted to the MSN program at UAH. Please note that enrollment in graduate courses does not ensure or imply admission to the School of Graduate Studies nor into the College of Nursing master’s program at UAH.

More detailed information about opportunities for undergraduate students and registered nurse students may be obtained from the College of Nursing Office of Student Affairs (256) 824-6742.
Master's Degree
The Master of Science in Nursing degree is awarded upon successful completion of one of four tracks at the master's level. Students have the opportunity to become family nurse practitioners, acute care nurse practitioners, adult clinical nurse specialists, clinical nurse leaders or nursing administrators in a variety of roles including case manager. The curriculum for all tracks builds on core content in theory and research. Additional courses such as health policy, case management, health care informatics, 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, at off-campus sites or by web course delivery.

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 Family Nurse Practitioner Certificate
Students already possessing a master’s degree in nursing have the opportunity to pursue a family nurse practitioner certificate. Students are admitted to the certificate program on a full-time basis to complete the requirements in one year.

More detailed information about opportunities for students seeking graduate degrees and certification may be obtained from the College of Nursing Office of Student Affairs (256) 824-6742.

Graduate Certificate in Nursing Education
The College supports the position that a master’s degree is a minimum requirement for teaching in a nursing education setting. Courses are open to current graduate students completing a graduate degree in any of the tracks offered at the College as well as to nurses with a master’s degree in nursing from UAH or other Institutions.

The purposes of the 15 clinical hour program are to:
- Prepare nurses with a master’s degree to teach in a variety of settings, i.e., associate degree-nursing programs, clinical faculty in baccalaureate programs and health care agency educational programs
- Prepare nurses with the theory and practice experiences to develop and implement educational offerings in a variety of settings for diverse populations
- Prepare nurses with a variety of teaching strategies and delivery systems for today’s new learning environment
- Prepare nurses with the necessary tools and strategies to effectively evaluate nursing performance in both clinical and classroom settings
- Prepare nurses with the skills necessary for role development as a faculty member.

Distance Learning
The mission of the College is to provide excellence in teaching, research and service while providing unique opportunities and creative, flexible programs for students, faculty and the community. Distance learning and the use of other new educational technologies are part of the future in the continuing mission.

The College of Nursing offers the RN to BSN program online via the web. This allows students at distant geographical sites to actively participate in class and clinical learning activities.

For further information and class offerings, contact the College of Nursing Office of Student Affairs (256) 824-6742.

Computer Literacy
The College of Nursing acknowledges that health care delivery systems are evolving at an accelerated rate and becoming increasingly reliant on computer technology. Computer literacy is rapidly becoming a basic communication skill. Prior to enrolling in nursing courses, it is suggested that students familiarize themselves with basic computer skills. Students should be able to use a
computer to log on to their email account to communicate with other students and faculty. They should be able to log on to the Internet to access class content. Ability to use a word processing program and perform Internet searches for health care related materials are also suggested skills.

**Facilities**
The College of Nursing utilizes the facilities and resources of the entire university, the community, and health care agencies. The college is housed in a four-story building centrally located on the UAH campus. Classrooms equipped with current educational technology as well as the Learning Resource Center assist students to learn in multiple ways.

The College of Nursing offers a wide diversity of clinical sites for student experiences. The college has contracts with over 600 health related agencies in Alabama and surrounding states. Madison County has two general hospitals with a licensed capacity of 1,013 beds, a county health department, and numerous skilled nursing homes and home health care agencies. The University of Alabama at Birmingham Medical Clinics-Huntsville Program also serve as clinical sites for students in the College of Nursing.

Huntsville Hospital System, the largest general hospital in the northern part of Alabama, is the regional medical center for north Alabama and south central Tennessee. The hospital offers comprehensive emergency treatment facilities and the only newborn intensive care unit in north Alabama. Crestwood Medical Center is a private general hospital fully equipped to handle most diagnostic and surgical procedures. Rural health clinics across Alabama are also used for student experiences. Other hospitals, clinics, and physicians’ offices are also cooperating agencies.

**Transportation**
Clinical learning experiences are varied in settings and are located within Huntsville and surrounding communities. Students are expected to travel to and from all clinical experiences. Students are responsible for providing their own transportation and carrying appropriate insurance. The College of Nursing is not liable for any traffic violations or auto mishaps during student commutes.

**Service and Scholarship**
In addition to its teaching mission of providing quality education for students, the College of Nursing provides continuing education for nurses. Educational programs may be offered at the College of Nursing or at individual health care agencies. The faculty and students of the college are committed to the provision of services for the people of Huntsville and surrounding communities. These activities are focused on the improvement of health and healthy behaviors and include such activities as health fairs and screenings.

Faculty and students also conduct and disseminate research to address issues in health care from health policy initiatives and the delivery of services to specific clinical problems. Faculty are also active in the provision of consultative services to a variety of health care agencies and educational institutions.

**Advising and Assistance**
The focus of advising in the College of Nursing is to assist students to successfully progress toward their educational objectives. The baccalaureate degree program is divided into two components: the lower division and the upper division. All pre-admission and lower division students are advised in the College of Nursing Office of Student Affairs, located on the second floor of the Nursing Building. All students, including registered nurse students, planning to apply for transfer admission from other institutions are also encouraged to meet regularly with a nursing advisor. Advisors in the Nursing Office of Student Affairs assist students to define and develop realistic educational and career plans. In addition, they monitor progress toward educational and career goals, approve all designated educational transactions such as schedules, drop/adds, withdrawals, and they maintain advising records for each student. Advisors also refer students to other campus resources when needed.
Students admitted to the upper division are assigned a faculty member who assists them throughout the remainder of the academic program. Faculty advisors assist students in completing a plan of study for their upper division work and provide guidance for future employment or educational endeavors.

**Admission Policies**

**Admission as a Freshman**

Entering UAH freshmen interested in nursing as a career must meet the general entrance requirements of the university. Each lower division student interested in nursing as a career is advised in the College of Nursing Office of Student Affairs. Students enrolled in the lower division of the college should meet with an advisor in planning a program of study. The program of study will ensure that each student registers for the correct prerequisite courses for the upper division major. Students must meet with a nursing advisor each semester prior to registration. Students must complete all lower division prerequisites prior to enrolling in the upper division of nursing. For information and assistance, call the College of Nursing Office of Student Affairs (256) 824-6742.

Admission into the upper division nursing major is competitive. A separate application for the upper division of the nursing major must be submitted by published dates, on forms provided by the College of Nursing. Each year's junior class is selected from all applicants who meet the minimum requirements. Once admitted to the upper division, each student will be assigned a faculty advisor in the College of Nursing.

**Admission as a Transfer Student**

All transfer students seeking admission to UAH should read and follow the Admissions Information section of this catalog. Specific UAH courses that satisfy admission requirements are listed under the Baccalaureate Program of Studies later in this section of the catalog. All transfer students are encouraged to complete courses equivalent to those listed in that summary. Students transferring from Alabama two-year colleges should follow the general studies curriculum approved by the Articulation and General Studies Committee (AGSC). A copy of this curriculum is available in the UAH Office of Admissions. Articulation requirements, as they relate to the nursing major, are provided below:

**Area I. Written Composition (6 semester hours).**

**Area II. Humanities and Fine Arts (12 semester hours).** Requirements include a minimum of 3 semester hours in literature, 3 semester hours in the arts, and the remaining semester hours from either the humanities or arts. Disciplines in the humanities include, but are not limited to, philosophy, religious studies, speech, foreign languages, art, music, theater, and dance. As part of the general studies curriculum, students must complete a 6 semester hour sequence in either literature or history.

**Area III. Natural Sciences and Mathematics (11 semester hours).** Requirements include a minimum of 3 semester hours in mathematics at the precalculus level or higher. Students transferring to the nursing major must complete a course in inorganic chemistry (including lab) and an additional science course with a lab in either biology, chemistry or physics.

**Area IV. History, Social, and Behavioral Sciences (12 semester hours).** Requirements include a minimum of 3 semester hours in history and at least 6 semester hours from among other disciplines in the social and behavioral sciences. Disciplines include, but are not limited to, anthropology, economics, geography, political science, psychology, and sociology. For students transferring to the nursing major, one of these courses must be in psychology. As part of the general studies curriculum, students must complete a 6 semester hour sequence in either history or literature.

**Area V. Pre-Professional, Major and Elective Courses (19-23 semester hours).** Students entering the nursing major must complete 6-8 semester hours in human anatomy and physiology (with lab)
and 3-4 semester hours in microbiology (with lab). Students entering the nursing major at UAH must also complete a minimum of 3 semester hours in statistics, 3 semester hours in human growth and development and elective hours to meet the 19 hour minimum in Area V.

The specific credit for work completed at other institutions and applied to the courses for admission to the College of Nursing is determined by the College of Nursing Office of Student Affairs. Courses taken at community or junior colleges may satisfy lower division prerequisite course requirements; courses taken at other four year institutions may meet prerequisite and upper division course requirements.

Admission to the Upper Division
The upper division of the nursing curriculum is composed of professional nursing courses. In order to be considered for admission to the upper division nursing major, students enrolled at UAH must complete a separate application form, which is available through the College of Nursing Office of Student Affairs. Transfer students must first apply to UAH through the Office of Admissions and then complete the separate application available through the College of Nursing Office of Student Affairs.

Admission of Non-Licensed (Basic) Students
1. Applicants for admission to the upper division for non-registered nurses is competitive. Each year’s junior class is selected from applicants who meet the minimum requirements:
   a) Minimum grade of “C” on all required general studies prerequisite coursework as listed under Baccalaureate Program of Studies
   b) Completion of all lower division general studies course requirements with a minimum of 59-60 hours of credit
   c) Status of good academic standing
   d) In addition to meeting other admission requirements, students seeking transfer from the upper division of another nursing education program must submit a letter of good standing indicating that the student is in good standing and eligible for continued enrollment in that program.
2. 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.

Admission of Registered Nurse Students
1. Admission to the upper division nursing major for registered nurse students is selective. Each year’s class is selected from students who meet minimum requirements:
   a) Minimum grade of “C” on all required prerequisite coursework
   b) Completion of all lower division course requirements as listed under Baccalaureate Program of Studies, with a minimum of 59-60 hours of credit
   c) Graduation from an associate degree nursing program or a diploma program in nursing
   d) Status of good academic standing
   e) In addition to meeting other admission requirements, students seeking transfer from the upper division of another nursing education program must submit a letter of good standing indicating that the student is in good standing and eligible for continued enrollment in that program.
2. An application to the upper division nursing major for registered nurse students must be completed and submitted to the College of Nursing Office of Student Affairs by March 1. Applications received after the deadline will be considered on a space available basis. Students who wish to be considered for scholarships should apply prior to February 1.
Requirements for Enrollment for Admitted Students

1. Evidence of CPR (cardiopulmonary resuscitation for adults and children) 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. Students may be required to undergo drug testing prior to enrollment in nursing courses and for cause at other points.

4. Students may also be required to have criminal background checks prior to attending selected clinical agencies. Information on testing requirements and procedures is provided upon admission and prior to each academic year.

5. All registered nurse students must individually obtain and present evidence of current professional liability insurance. The insurance must remain current until graduation.

6. Registered nurse students must submit proof of an unencumbered current license. If a student is permitted to meet course clinical requirements in a state other than Alabama, the student must be licensed in that state. Registered nurse students will not be allowed to continue in the program if any nursing license is placed on probation, suspended, or revoked. Licensure must be maintained throughout the program.

7. Recent graduates of associate degree or diploma nursing programs who are not yet licensed will be permitted to complete lower division coursework, but will not be admitted to the upper division clinical component of the program until they are licensed.

8. Essential functions define selected attributes and behaviors necessary for students to demonstrate in order to successfully complete their education and subsequently enter nursing practice. These essential functions are determined to be required for initial and continued enrollment in the College of Nursing. Students must be able to perform each of the following essential functions with or without reasonable accommodations:
   a. Critical thinking ability sufficient for clinical judgment. Examples (not all inclusive) of necessary activities include identifying cause-effect relationships in clinical and classroom situations; predicting outcomes based on plans of care for clients across the lifespan; synthesizing theory and applying it to client care situations; analyzing and synthesizing information to support or defend a position; calculating prescribed drugs; and making safe judgments.
   b. Interpersonal abilities sufficient to interact with peers and faculty. Examples (not all inclusive) include the ability to function in groups and to establish rapport/therapeutic relationships with clients.
   c. Communication abilities sufficient for clear interaction with others in English in verbal and written form. Examples (not all inclusive) include expressing ideas/thoughts in a dynamic reciprocal process of transmitting information, perceptions, thoughts, and ideas in classroom and clinical settings. Other specific situations include explaining treatment procedures, initiating health teaching, and documenting and interpreting nursing actions and client responses.
   d. Mobility/gross motor abilities sufficient to move from room to room and maneuver in small spaces. Examples (not all inclusive) include moving around in clients’ rooms, work spaces and treatment areas; administering cardiopulmonary procedures; assisting in ambulation; lifting and transferring clients (lifting a minimum of 50 pounds); and having sufficient mobility and stamina to function in clinical settings for sustained periods of time.
   e. Fine motor skills and manual dexterity sufficient to provide safe and effective care. Examples (not all inclusive) include completing examinations/evaluations by writing, typing or demonstrating and calibrating and using equipment.
   f. Auditory ability sufficient to monitor and assess health needs. Examples (not all inclusive) include hearing basic conversation; monitoring alarms, emergency signals and auscultatory sounds; and hearing cries for help.

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g. Visual abilities sufficient to monitor and assess health needs. Examples (not all inclusive) include reading documents such as patient charts and laboratory reports; reading calibrations on syringes, sphygmomanometers, and thermometers, and equipment outputs such as waves, printouts, and digital readings; and accurately observing client behaviors such as color changes and nonverbal communication.

h. Tactile abilities sufficient for physical assessment. Examples (not all inclusive) include performing palpation, percussion, temperature changes, complete physical examinations and other activities related to therapeutic interventions.

i. Behavioral/Social abilities sufficient to demonstrate emotional stability, maintenance or composure under stress, development of mature, empathetic and effective nurse-patient relationships and use of sound and unimpaired judgment in classroom and clinical activities.

These essential functions are not intended to be a complete listing of all nursing behaviors, but they are a sampling of the types of abilities needed by nursing students to meet program objectives and requirements. The College or its affiliated agencies may identify additional critical behaviors or abilities.

Health Requirements
The clinical experiences of nursing students require a health-screening program. The following steps are required as part of admission and enrollment in the upper division nursing major:

1. Each student is required to have a health examination by a physician or a certified nurse practitioner. Reports of the results of this examination must be submitted on forms provided by the College of Nursing and must be received by the College of Nursing Office of Student Affairs by published deadlines. Individual clinical agencies may require additional documentation for specific health requirements which must be met by the students.

2. Each student must be immunized for Hepatitis B. For initial enrollment, 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. Documentation of the completed series is required for continued enrollment and must be received by the College by published deadlines. Immunizations and titers are at the expense of the student.

3. Each student is required to be immunized against measles. Documentation of current immunization for measles or results of a recent titer must be received by the College of Nursing Office of Student Affairs by the published deadlines. Immunizations and titers are at the expense of the student.

4. Each student is required to be annually tested for tuberculosis. Evidence of the annual testing or results of a recent chest x-ray are required. Testing expenses are the responsibility of the student. Documentation of the test results must be received by the College of Nursing Office of Student Affairs by published deadlines.

5. Documentation of current health insurance must be received by the College of Nursing Office of Student Affairs by the published deadlines. Hospitals and health agencies provide emergency treatment to students for injury or illness occurring in the course of program requirements in their agencies. Such treatment will be at the expense of the student. Students are required to maintain health insurance throughout the program.

Financial Aid
The University Financial Aid Office, located in the University Center, provides financial aid information and assists students in meeting individual needs.

Upper Division Progression and Graduation Requirements
All students must meet UAH requirements for progression and graduation. In addition, there are the following requirements for the College of Nursing:

1. An overall C (2.0) average on all courses taken at UAH is required for graduation.

2. A grade of C or above must be earned in all required nursing courses. A student who receives a grade below C in a required nursing course may repeat the course only once. The following

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. Non-licensed students are required to take national standardized examinations in selected courses. These examinations are counted as a portion of the overall course grade for each course. A standardized examination is also given in the capstone course of the undergraduate curriculum. Students are required to make a passing score on the examination in the capstone course. A student who fails to achieve a passing score must complete a remediation program. Failure to satisfactorily complete the standardized examination in this course may delay the student’s completion and graduation from the program.

5. 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.

6. 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.

7. Registered nurse students must maintain an active and unencumbered license throughout the program. Clinical experiences in states other than Alabama require an active license in that state. 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.

8. Any requests for exceptions to progression and graduation requirements must be addressed in writing to the Associate Dean.

Responsibility to Clinical Agencies
Students are responsible for complying with policies and procedures required by clinical agencies. Failure to meet this requirement may lead to exclusion from required clinical educational experiences and prevent completion of the program.

Baccalaureate Program of Studies
Students completing the lower division (general studies) of the program at UAH should follow the program of study outlined below. Transfer students should follow the program of study approved by the Articulation and General Studies Committee and presented under Admission as a Transfer Student. Transfer students are encouraged to complete courses equivalent to those listed below:

Written Composition (6 semester hours)
   English Composition EH 101, 102

Humanities and Fine Arts (12 semester hours)
   Literature (3-6 semester hours) Students must complete a 6 semester hour sequence in either literature or history with a minimum of 3 semester hours in the other discipline.
   Philosophy (3 semester hours) PHL 101-Being, Knowledge and Value; PHL 201-Introduction to Logic; or PHL 202-Introduction to Ethics
   Elective in Humanities and Fine Arts (3-6 semester hours)

Natural Sciences and Mathematics (23 semester hours)
   Precalculus Mathematics (3 semester hours) MA 110 or MA 112
   General Biology (4 semester hours) BYS 119
   Chemistry (4 semester hours) CH 101, 105
   Microbiology (4 semester hours) BYS 214/221

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Anatomy and Physiology I and II (8 semester hours) BYS 313/314
History, Social and Behavioral Sciences (19 semester hours)
Introduction to Sociology (3 semester hours) SOC 100
General Psychology (3 semester hours) PY101
History (3-6 semester hours) Students must complete a 6 semester hour sequence in either
history or literature with a minimum of 3 semester hours in the other discipline.
Statistics (4 semester hours) PY 300 or SOC 333
Human Growth and Development (3 semester hours) PY 201
Elective History, Social and Behavioral Sciences (3-6 semester hours)

The following Upper Division courses are required for a baccalaureate degree in nursing. Please note that curricular changes may be made in the coming year. Contact the College of Nursing Office of Student Affairs for the most current information.

Nursing and Health Promotion (NUR 302)
Health Assessment (NUR 303)
Applied Pathophysiology Across the Lifespan (NUR 304)
Nursing Process for Mental Health and Illness (NUR 305)
Ethical and Legal Aspects of Health Care (NUR 306)
Scholarly Inquiry in Nursing (NUR 307)
Nursing Care of Adults with Alterations in Health I (NUR 308)
Professional Practice in Nursing I (NUR 310)
Pharmacology in Nursing (NUR 321)
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)
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)
Introduction to Computers in Nursing (NUR 339)
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 all university students. 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. A separate section of this course is offered in the fall for those students.
majoring in exercise physiology.

304  **Applied Pathophysiology Across the Lifespan**  
3 hrs. 
Application of anatomy and physiology to specific pathophysiological processes within a nursing framework. Prerequisite: Successful completion of Anatomy and Physiology sequence. Lab Fee: $30. Fall.

305  **Nursing Process for Mental Health and Illness**  
6 hrs. 
Nursing process and promotion of mental health across the lifespan including restoration of mental health. Clinical laboratory experiences provide opportunities for application of individual and group interventions in a variety of settings. Pre or co requisite: NUR 302, 303, 304, 310, 321 Lab Fee: $180. Spring.

306  **Ethical and Legal Aspects of Health Care**  
3 hrs. 
Ethical and legal dilemmas related to health care are explored, focusing on issues impacting individuals, families, and society. Traditional and contemporary ethical philosophies are discussed in terms of society’s values. Concepts of autonomy, veracity, fidelity, beneficence, justice, and advocacy are explored in relation to ethical decision making. Models for ethical decision-making will be used to analyze ethical and legal dilemmas. Basic legal concepts related to contemporary health care are presented. Open to all university students. Lab Fee: $30. Spring.

307  **Scholarly Inquiry in Nursing**  
3 hrs. 
Focuses on the various modes of inquiry used in the development of nursing science. Emphasis on the critical examination of nursing research including methodologies, utilization, and theoretical bases. Prerequisite: Successful completion of undergraduate statistics course. Open to all university students. Lab Fee: $30. Spring. Fall for registered nurse students.

308  **Nursing Care of Adults with Alterations in Health I**  
6 hrs. 

310  **Professional Practice in Nursing I**  
4 hrs. 
Provides a foundation for professional nursing practice. Professional nursing practice, professional accountability, and clinical skills of nursing practice are addressed, with special emphasis on the development of interpersonal and psychomotor skills basic to professional nursing. College laboratory and clinical experiences are included. Open to admitted upper division students only. Lab Fee: $120. Fall

321  **Pharmacology in Nursing**  
3 hrs. 
This course is designed to introduce essential pharmacologic concepts, critical thinking, and judgment skills so that the student is prepared to provide drug therapy that is safe and appropriate to patients from all populations. Pre requisite: Completion of Anatomy and Physiology sequence with a grade of C or better. Lab Fee: $30. Fall

336  **Spirituality in Nursing**  
3 hrs. 
Spirituality aspects of client, family and community care are the focus of this course. The course reviews the history of spirituality in nursing care. The nurses’ role in meeting the spiritual needs of clients throughout the lifespan is explored. Elective. Lab fee $30.

339  **Introduction to Computers in Nursing**  
3 hrs. 
Provides experience in the use of basic and versatile software programs which have wide applicability within nursing practice and within the students’ educational process. Elective, open to all university students. Lab Fee: $30.

390  **Independent Study**  
1-4 hrs. 
Individualized independent study of specific nursing problem under sponsorship of a nursing faculty member with special preparation in the field. Elective. Lab Fee: $10, $20, $30, or $40. Fall, Spring, Summer.

401  **Nursing Care of Adults with Alterations in Health II**  
6 hrs. 
Nursing process applied to clients experiencing alterations in health requiring complex and collaborative nursing management. Clinical experiences in the acute care environment. Prerequisites: NUR 302, 303, 304, 305, 308, 310. Lab Fee: $180. Fall.

402  **Population Based Health Care**  
3 hrs. 
Promotion of health, prevention of disease in at-risk aggregate populations. Examines complex problems and health care policy. Open to all university students. Lab Fee: $30. Fall.
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 401, 402, 403, 404; Pre- or co-requisites: NUR 405, 407. 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 theories, 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 339, 410. Lab Fee: $50. Fall.

412 Caring for Families, Aggregates and Populations: Theoretical Applications 7 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 339, 410; pre-or co-requisite: NUR 303, 307. Lab Fee: $180. Spring.

413 Nursing Leadership in Professional Practice 3 hrs.
Course focuses on the development and enhancement of leadership skills for the professional nurse 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.

424 Health Care and the Law 3 hrs.
Designed to integrate pertinent aspects of health care law into the study and/or practice of health care. Elective, open to all university students. (Cross listed with NUR 524) Lab Fee: $30.
425 Human Sexuality 3 hrs.
Theory and issues related to human sexuality in health and illness. Emphasis on both theory and values; clarification of human sexuality issues. Prerequisite: sophomore standing. Elective, open to all university students. (Cross listed with NUR 525) Lab Fee: $30.

432 Nursing Care of Perioperative Client 3 hrs.
The role of the nurse in providing nursing care for clients experiencing surgical intervention. The nursing process provides the framework for promoting quality perioperative nursing care for clients and their families. Elective. Prerequisite: junior standing. Lab Fee: $30.

434 Death and Dying 3 hrs.
Influence of death and dying upon attitudes and thinking gleaned from historical, cultural, philosophical, and scientific perspectives. Intimate reactions and beliefs concerning death and identifying coping resources. Elective, open to all university students. (Cross listed with NUR 534) Lab Fee: $30.

437 Nursing as a Political Force 3 hrs.
Overview of the legislative process and legislation relative to health care issues. The role of the professional nurse in the political climate is explored. Elective, open to all university students. (Cross listed with NUR 537) Lab Fee: $30.

438 Drug and Substance Abuse 3 hrs.
Issues arising from intentional or inadvertent abuse or misuse of drugs and food; legal and physical implications of such behavior. Emphasis is placed on theories of causation and treatment of methodologies. Elective, open to all university students. Lab Fee: $30.
College of Science

C207 Materials Science Building
Telephone: (256) 824-6605
Email: science@uah.edu
Web Site: http://www.uah.edu/science/

Dean:
John D. Fix, B.S., M.A., Ph.D., Professor of Physics
Associate Dean:
Daniel M. Rochowiak, B.S., Ph.D., Associate Professor of Computer Science

Mission
The College of Science at UAH is dedicated to providing high-quality undergraduate and graduate education in science and mathematics, maintaining an environment that promotes internationally recognized faculty research programs, and providing service to the university, state, and regional communities as a source of scientific and mathematical expertise.

Accreditation
The B.S. degree program in Computer Science offered in the College of Science has been fully accredited by the Computing Accreditation Commission of ABET since 1989. In addition, the chemistry department offers American Chemical Society approved curricula in chemistry and biochemistry.

Facilities/Services
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. In addition, faculty in the college are associated with the campus research centers including the Center for Applied Optics, Center for Automation and Robotics, Earth System Science Center, Global Hydrology and Climate Center, Information Technology and Systems Center, Center for Microgravity and Materials Research, Center for Space Plasma and Aeronomic Research, Laboratory for Materials and Surface Science, Laboratory for Structural Biology, the Consortium for Materials Development in Space and the National Space Science and Technology Center. The College of Science in conjunction with the Department of Mathematical Sciences oversees the Math Learning Center, located in the Salmon Library.

Degrees and Programs
The College of Science offers a broad spectrum of programs and intellectual experiences designed to meet various educational, vocational and professional goals. Students may plan programs of study leading to career opportunities in computational, mathematical, biological, and physical sciences or as background requirements for professional studies in medical fields, engineering and education. The College also offers a variety of courses which provide basic science support to other disciplines. Students receive assistance from the faculty in preparing and planning for advanced studies and in planning and carrying out research projects to enhance their course work. There are abundant opportunities for undergraduate students to engage in original scientific research, often resulting in a scientific publication or presentation at a scientific meeting. 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 awards the Bachelor of Science and the Bachelor of Arts Degrees. Majors are offered in biological sciences, chemistry, computer science, mathematical sciences, and physics. Secondary education teacher preparation programs are available in biology, chemistry, mathematics, physics and general science. A certificate program in environmental science is available to undergraduates majoring in science or mathematics and to individuals already holding degrees in a science discipline. Students may also combine a minor in atmospheric science with any of our majors.
### Degree programs

<table>
<thead>
<tr>
<th>Major</th>
<th>Degree</th>
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</thead>
<tbody>
<tr>
<td>Biological Sciences</td>
<td>B.S., B.A.</td>
</tr>
<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>
<tr>
<td>Physics</td>
<td>B.S.</td>
</tr>
</tbody>
</table>

### Science Major with Minor in Business Administration

Due to the increased need by the corporate world for employees who are not only scientists or mathematicians, but who have the background and training to move into managerial positions, students majoring in the College of Science may choose a minor in business administration. Specific examples are given for some of the majors in the departmental sections that follow.

### Graduate Degrees and Study

The College of Science offers graduate programs leading to the Master of Science degree in atmospheric science, biological sciences, chemistry, computer science, materials science, mathematics, and physics, to the Master of Science in Software Engineering, and to the Master of Arts degree in mathematics. Doctoral programs are offered in applied mathematics, atmospheric science, computer science, and physics. The Doctor of Philosophy degree in chemistry is available through a cooperative program with the University of Alabama, Tuscaloosa. Graduate certificate programs are offered in environmental science, software engineering, and information assurance. Interdisciplinary programs, offered through the Colleges of Science and Engineering, provide the opportunity to earn a Doctor of Philosophy degree in Biotechnology Science and Engineering, Optical Science and Engineering, or Materials Science. For graduate course offerings and programs, please refer to the Graduate Catalog.

### College of Science Academic Advisor

Morgan Lewis, B.S., MS  
Room 200, University Center  
256-824-6290  
email: lewism@email.uah.edu

The College of Science full-time advisor assists undergraduates in course selection and scheduling until such time that the student selects and declares their major, typically during the sophomore year. At that time the college advisor and student begin preparation of a program of study. The student is then assigned to a faculty advisor by his or her major department who will continue to assist him or her in development of a program of study and in monitoring progress to graduation. The college advisor also assists students in understanding the general education requirements, graduation requirements and assists them in locating appropriate academic assistance as needed.

### Academic Regulations and Policies

#### Junior Standing / 64 Hour Transfer Limit

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

#### Health and Physical Education Courses

Students who major in the College may count a maximum of four semester hours of health and physical education activity courses toward their requirements for graduation. HPE courses at the 200 level or greater are “professional courses” and are not counted toward the maximum number of credit hours for activity courses.
Requirements for Programs of Study Leading to the B.S. Degree

Candidates for a B.S. degree must satisfy the General Education Requirements set forth below, complete the requirements for a major in a program offered by one of the departments in the College of Science, and complete the requirements for either a minor or cognate studies (see disciplines for specific requirements). Students are required to have a C average overall, a C average in their major, and a C average in their minor or cognate studies for UAH courses. The major and minor or cognate averages will be calculated based on at least the courses listed in the Program of Study. Additional courses completed in the discipline may, but need not, be included in calculating these averages. Only courses which the student completes with a grade of D or better will count as satisfying degree requirements. A grade of C or better must be earned in some courses that are prerequisites for other courses in the discipline before continuing in the course sequence. Specific departmental requirements are listed in the course descriptions. Students are strongly encouraged to meet with the College of Science advisor to formulate a Program of Study as early as possible in their academic career.

General Education Requirements for B.S. Degree

<table>
<thead>
<tr>
<th>Area</th>
<th>Requirement</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>English Composition</td>
<td>EH 101-102 (Honors Program students may substitute EH 105)</td>
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<tr>
<td></td>
<td></td>
<td>Fine Arts (3 hrs.): ARH 100, 101, ARS 160, MU 100, 101, or CM 122</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Literature (3-6 hrs.*): EH 205-206, 205-241, 240-206, 240-241, 205-230, 240-230, or 250-251</td>
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<tr>
<td></td>
<td></td>
<td>Humanities and Fine Arts (3-6 hrs): CM 113 (required); additional hours as needed chosen from PHL 101, 201, 202; WS 200; ARS 160; ARH 100, 101; CM 122; MU 100, 101. Any 100 or 200 level FL course.</td>
</tr>
<tr>
<td>II</td>
<td>Natural Science and Mathematics</td>
<td>Mathematics (3-4 hrs.): One course in pre-calculus with algebra or higher (MA 110 or higher). All B.S. degrees require completion of a calculus course, MA 120 or 171. See disciplines for specific course requirements.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Natural Science (8 hrs.): A two-course sequence in a laboratory natural science outside the major, minor or cognate. (See disciplines for specific requirements.)</td>
</tr>
<tr>
<td>IV</td>
<td>History, Social and Behavioral Sciences (distributed as shown) (No more than 6 hours can be counted in a single discipline.)</td>
<td>History (3-6 hrs.*): HY 101-102, HY 103-104, or HY 221-222. (*Students must complete a two-course sequence in either literature or history.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social and Behavioral Sciences (6-9 hrs.): PSC 101, 102, 260; PY 101, 201; SOC 100, 106, 200; ECN 142, 143; GS 199, 200; GY 105, 110</td>
</tr>
</tbody>
</table>

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Area V
Pre-professional and elective courses

Science or engineering course outside the major and not counted in the minor or cognate requirements (3-4 hrs.): MA or CS majors must take a 4 hour laboratory science course (AST, ATS, BYS, CH, ES, PH) to meet this requirement. See individual majors for specific courses required.

Computer Science (3-4 hrs.): CS 100, 102, or higher. See majors for specific requirements.

Technical Writing (3 hrs.): EH 301

Electives (0-4 hrs.): Calculus must be taken here if not taken in Area III or in major or minor.

Major Requirements for B.S. Degree: See specific disciplines - minimum 36 hours.
Minor Requirements for B.S. Degree: See specific disciplines - minimum 21 hours.
Cognate Requirements for B.S. Degree: See specific disciplines - minimum 21 hours.
Electives: Sufficient courses to meet the minimum 128 semester hour degree requirement and the required 39 semester hours of courses numbered 300 or above.
Residency Requirement: A minimum of 25 percent of the total degree requirements and 12 of the last 18 hours must be completed at UAH. Also, unless otherwise specified by the department involved, a minimum of 12 semester hours of upper level courses (numbered 300 or above) must be completed at UAH in a student’s program, distributed as 6 hours in the major and 6 hours in the minor or cognate.

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

I. Area IV Courses

Economics - Taken as part of Area IV “History, Social and Behavioral Sciences” requirements
ECN 142 Principles of Macroeconomics
ECN 143 Principles of Microeconomics

II. Area V Courses

Calculus - Taken as part of Area V “Science or Engineering Course Outside the Major” if not taken in Area III or in the major or minor.
Microcomputer Skills - Pre-MSM students must be proficient in the use of operating systems, word processing, spreadsheets, and presentation software. Deficiency in computer skills can be remedied by taking CS 101 (this course does not satisfy the BS GER requirement), MIS 146 or a combination of the one-hour courses: MIS 102, 104, 106.
Statistics - Taken as part of Area V “Electives” requirement
MSC 287 Business Statistics I
(or MA385 Introduction to Probability)
(or ISE 390 Probability and Engineering Statistics I)
MSC 288 Business Statistics II
(or MA487 Introduction to Mathematical Statistics)
(or ISE 391 Probability and Engineering Statistics II)

III. Pre-MSM Minor (Science & Technology Business Minor)

Accounting
ACC 211 Financial Accounting 3 hrs
ACC 212 Managerial Accounting 3 hrs
Management
BLS 211 Legal Environment of Business 3 hrs
MGT 301 Managing Organizations Marketing 3 hrs
MKT 301 Principles of Marketing Operations Management 3 hrs
MSC 385 Production/Operations Management 3 hrs

TOTAL HOURS 18 hrs

College of Science 268
Requirements for Programs of Study Leading to the B.A. Degree.
See the College of Liberal Arts section of the catalog for General Education Requirements for the B.A. degree.

Jia Ju Zhan Undergraduate Research Scholars

The Jia Ju Zhan Undergraduate Research Scholars Program is designed to help carefully selected students develop their research skills during their first two years so that they can be seasoned collaborators for faculty and staff during their final two years at UAH. During their first semester Zhan Scholars take part in a special seminar on research methods, ethics, and an introduction to UAH research programs. During their second semester they begin working on research with College of Science faculty or research staff.

SC 100 Introduction to Science Research 1 hr.
An introduction to science research and research in science and mathematics at UAH for first year students who have been admitted to the Zhan Undergraduate Research Scholars Program.

Atmospheric Science Department
National Space Science and Technology Center, Room 4080
Telephone: (256) 961-7877
Email: atmos@uah.edu
Web Site: http://www.atmos.uah.edu/

Professors Christy, Knupp, Newchurch, Perkey, Welch (Chair); Research Professors Essenwanger, Vaughan; Associate Professors Han, Christopher; Assistant Professor Mecikalski.

The Atmospheric Science Department does not offer an undergraduate major. However, the atmospheric science minor, in conjunction with a physics, mathematics, computer science, or chemistry major, offers an excellent preparatory undergraduate program leading to the M.S. or Ph.D. professional degree in atmospheric science.

The minor in atmospheric science particularly serves as a complement to the physics major. Many university graduate programs in atmospheric science, including the UAH program, heavily recruit undergraduate physics majors into their programs. These students have the requisite background courses in mathematics and physics to excel in graduate atmospheric science courses of study.

Students selecting one of the several options available under the atmospheric science minor program can qualify for the “meteorologist” category when applying for GS rated jobs in various government agencies. Thus, the program offers the opportunity for its graduates to meet these well-defined criteria when seeking employment.

Requirements for a Minor in Atmospheric Science

A minor in atmospheric science includes ES 101 and 103, ATS 401, plus at least 12 hours of advanced coursework selected from: ES 303, 305, 321, 331, ATS 411, 413, 414, 415, 420, 441, 451, 454, and 461. At least 3 hours of the selected advanced coursework must be at the 400-level. Additionally, PH 111/114, 112/115, CH 121/125, MA 171, 172, 201 are required ancillary courses for the minor. PH 113/116, ST 281 and MA 244, 238 and 506 are suggested but not required.

To prepare for the “meteorologist” category when applying for GS rated jobs with the National Weather Service, a minimum of 24 semester credits in atmospheric science are required. The following advanced courses are required: ATS 413, 441, 451, 452, 454, 461. In addition, ST 281, MA 244, 238 and 506 are recommended.

The following list provides the course numbers and titles of the above requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 101</td>
<td>Planetary and Atmospheric Science I</td>
</tr>
<tr>
<td>ES 103</td>
<td>The Atmosphere and Its Properties</td>
</tr>
<tr>
<td>ES 303</td>
<td>Classification and Physical Causes of Climate</td>
</tr>
</tbody>
</table>

269 College of Science
ES 305 Hydrology
ES 321 Pollution Problems
ES 331 Global Climate Change and Infectious Disease
ATS 401 Survey of Atmospheric Science
ATS 411 Introduction to Geographical Information Systems (GIS)
ATS 413 GIS and Remote Sensing
ATS 414 Scale and Landscape in GIS
ATS 415 Advanced Topics in GIS
ATS 420 Introduction to Atmospheric Chemistry and Air Pollution
ATS 441 Atmospheric Thermodynamics and Cloud Physics
ATS 451 Atmospheric Fluid Dynamics I
ATS 452 Synoptic Meteorology
ATS 461 Atmospheric Radiation I

Atmospheric Science Track in Physics
The Physics Department offers an atmospheric science track that requires ATS 401, 441, 451, 452 and 461. See the Physics Department section for a full description.

Atmospheric Sciences (ATS)

401 Survey of Atmospheric Science 3 hrs. General survey of the field of atmospheric science. Quantitative examination of atmospheric physical properties including atmospheric composition, structure and dynamics. Detailed inspection of evolving atmospheric structures using real-time data systems. Topics include atmospheric thermodynamics, atmospheric dynamics, cloud physics, atmospheric radiation, and related topics in atmospheric remote sensing. Prerequisites: MAI 72 and PH 112, or permission of instructor. (Same as ATS 501, ES 401/501.)

411 Introduction to Geographical Information Systems 3 hrs. Introduces vector, raster and tabular concepts, emphasizing the vector approach. Topics include spatial relationships, map features, attributes, relational database, layers of data, data ingesting, digitizing from maps, projections, output, application and availability of public data sets. Prerequisite: Permission of instructor. (Same as ATS 511, CE 411/511, ES 411/511.)

413 Geographical Information Systems and Remote Sensing 3 hrs. Provides a hands-on approach to GIS and satellite remote sensing. Satellite data sets such as LANDSAT and AVHRR, coupled with GIS data sets, increase understanding of the earth system. Topics include satellite sensors, basic radiative transfer, orbits, raster formats, atmospheric correction, distortion, image corrections, rotations and mapping, spatial resolution, image interpretation, radiometric and geometric enhancement, multispectral transformations, and classifications. Prerequisite: Permission of instructor. (Same as ATS 513, ES 413/513.)

414 Scale and Landscape in GIS 3 hrs. Understanding the role of scale in analysis of remote sensing data using GIS, focusing on analysis of landscape properties. Prerequisite: ES/ATS 413. (Same as ATS 514, ES 414/514.)

415 Advanced Topics in GIS 3 hrs. Advanced special topics: visualization of GIS and remote sensing data, landscape characterization (pattern vs. process), multitemporal analysis, aggregation of data types, developing an integrated GIS environment for performing complex space-time modeling analyses, and land-atmosphere interactions. Prerequisites: ATS/ES 413. (Same as ATS 515, ES 415/515.)

420 Introduction to Atmospheric Chemistry and Air Pollution 3 hrs. This self-contained introductory course in atmospheric chemistry and air pollution is designed to provide seniors and graduate students the basics of atmospheric chemistry and air pollution concepts. Topics include air pollutants, air-pollution meteorology, atmospheric gases and aerosols, and atmospheric processes. This course will also develop the necessary fundamentals for those wishing to take the advanced (600-level) courses in the atmospheric chemistry/air pollution study area. This course is cross-listed with ES 420/520 and ATS 520. ES 520 and ATS 520 require a research project; ES/ATS 420 does not. Prerequisites: PH 112 and CH 121 or consent of instructor.

441 Atmospheric Thermodynamics and Cloud Physics 3 hrs. General aspects of thermodynamic and cloud physical processes occurring within the atmosphere; atmospheric statics and stability, saturation point analysis, aerosols, nucleation, and the College of Science
behavior/growth of cloud particles and hydrometers. Prerequisites: MA 238, PH 112. (Same as ATS 541, ES 441/541.)

451 Atmospheric Fluid Dynamics I 3 hrs.
Fluid dynamics in the atmosphere. Coriolis accelerations, scale analysis, and appropriate approximations of the complete governing equations. Numerical analysis and interpretation of weather phenomena. Prerequisites: MA 238, PH 112. (Same as ATS 551, ES 451/551.)

452 Synoptic Meteorology 3 hrs.
Analysis, interpretation, and forecasting synoptic-scale and mesoscale phenomena, including air masses, frontal systems, cyclones, anti-cyclones, tropical cyclones, and associated mesoscale phenomena. Emphasis on the use of remotely sensed data from satellites, radars, and profilers using state-of-the-art workstations. Prerequisites: ATS 441, 451. (Same as ATS 552, ES 452/552.)

454 Forecasting Mesoscale Processes 3 hrs.
Detection and forecasting of atmospheric mesoscale phenomena including the structure and evolution of clouds, precipitation (including floods), thunderstorms and severe weather. Includes basics on instruments used to detect mesoscale phenomena, most notably satellite and radar. Course material is based mainly on computerized modules and related exercises. Prerequisite: ATS 451. (Same as ATS 554, ES 454/554.)

461 Atmospheric Radiation I 3 hrs.
Fundamentals of terrestrial atmospheric radiation. Specific topics include: solar radiation at the top of the atmosphere, radiative transfer equation, gaseous absorption, scattering by molecules and particles, band models, transmittance along an inhomogeneous path, and microwave radiative transfer. Prerequisites: MA 238, PH 112. (Same as ATS 561, ES 461/561.)

Biological Sciences Department

142 Wilson Hall
Telephone: (256) 824-6260
Email: biology@uah.edu
Web Site: http://www.uah.edu/biology/

Professors Podila (Chair), Eley, Garstka, Lawton, Moriarity, Shriver; Professors Emeriti Campbell, Modlin; Associate Professors Boyd, Johnson, Leahy, Magnuson, Ng; Assistant Professors Bishop, Davis; Research Assistant Professor Cseke; Hudson Teaching Fellow Stallsmith.

Mission
The UAH Department of Biological Sciences aspires to provide one of the best programs in the Southeast U.S. contributing to meeting these challenges through undergraduate and graduate education and research. Best is understood in terms of both quality and efficiency. At the undergraduate level, we want majority of UAH undergraduates to have at least one course in biology to provide some biological science literacy for their lives as adults. For biological science majors, we want to ensure forward-looking, comprehensive curricula that meet the highest national standards. This must include instruction and laboratory experience in each of the principal areas within biological sciences, and supporting course work in mathematics, chemistry and communications and bioethics. In addition, we want to provide our undergraduate majors with support and research experience necessary to build careers beyond the undergraduate level in employment and graduate and professional schools. At the graduate level, the ultimate objective of the Department of Biological Sciences is to educate and train students the critical, problem solving and independent thinking skills that form the foundation for graduate research. Through our programs in M.S and the interdisciplinary Biotechnology Ph.D degree and at the Postdoctoral level we aspire to provide thorough training and mentoring to cultivate future scientists, who are trained in cutting edge science to serve the national needs in both education and industry.

A student may elect a program leading to either a Bachelor of Arts or a Bachelor of Science degree. In most areas of biological interest, a Bachelor of Science degree is deemed more desirable; however, a Bachelor of Arts degree may be preferred in Programs of Study relating biological sciences to the humanities, social sciences, and economics. In either case, the biological sciences department is committed to high quality undergraduate instruction, with the ultimate goal to produce accomplished graduates who can pursue advanced degrees in the health or life sciences or who can develop meaningful careers in the biological sciences.
Biological Sciences Major

The biological sciences program is flexible and broad enough to permit the student to develop courses of study to meet a wide range of interests or career goals within the life sciences. Curricula are available for students who elect to pursue biochemistry, environmental science, exercise physiology, graduate preparatory, microbiology, molecular biology, premedical technology, pre-health professional, or secondary education programs. Examples of programs of study that fulfill the University’s degree requirements and achieve diverse goals in the biological sciences are shown below. Any curriculum may be modified to fit individual aims with the approval of the biology faculty. It is strongly advised that the student electing a biological sciences major consult with a biology faculty member early in his/her academic career to formalize a plan of study (POS) to meet academic and career objectives in a timely manner. Normally, a POS should be developed before the junior year of study. It is strongly recommended that one be established before the completion of 85 semester hours of coursework.

A major in biological sciences requires a minimum of 36 semester hours of coursework in BYS and includes the following core courses: BYS 119, 120, 219, 300, and 490. Computer requirements in area V of the GER can be met with CS 100, 102, 103 or other programming course. 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.

One course in calculus is required for a B.S. in biological sciences. If the student intends to pursue a course of study requiring more advanced mathematics background, MA171 is recommended to meet this requirement. Otherwise, MA120 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, biochemistry, or molecular biology.

Anatomy options: BYS 214, 300, 317, 321, 372, 378, or 544
Physiology/biochemistry/molecular biology options: BYS 301, 318, 361, 430, 535, 436, 519, 531, 532, 543, 556 or 561.

BYS 313 and 314 taken together can be used to satisfy the distribution requirement. Additionally, CH 101, 105, and 201 or equivalent are required ancillary courses for a biological sciences minor. A course in biochemistry (BYS or CH 301) supports the minor but is not required. For a minor in the ACS biochemistry track, the following set of courses is recommended: BYS 119, 120, 219, 300, 321 and 519, 543 or 547.

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 Sample Curricula

The following are examples of various curricular constructs that can be established to meet different academic and/or career interests and objectives. Each example is to be used merely as a guideline in creating a Program of Study (POS) to meet a particular goal. Strict adherence to the suggested curriculum is not obligatory to meet degree requirements within the major as long as the individual POS has been previously approved by the faculty advisor, departmental chair, and the dean of the College.
Example I - B.S. or B.A. degree with a psychology minor (psychobiology program)

B.S. GER (for B.A. GER see Liberal Arts section) to include:
- Chemistry 101, 105, 201, 301
- Physics
  - Computer Science 100, 102, or 103
  - or another programming course
BYS Core Courses and biological sciences electives
- Psychology 101, 102, 436 one psychology elective from Group B, and 9 hours upper level PY electives (302 strongly recommended)
- Electives as needed to total a minimum of 128

Example II - B.A. or B.S. degree for secondary education.

B.S. GER (for B.A. GER see Liberal Arts section) to include: Chemistry: CH 101, 105, 201, and 301 OR CH 121, 123, 125, 126, 223, 224, 331, 332, 335, 336, 361, 362
- Physics
  - Computer Science 100, 102, 103 or another programming course
BYS core courses and biological science electives including BYS 312, 321
- Professional education courses (See Education Dept. section of the catalog)
- Electives as needed to total a minimum of 128

Example III - B.S. degree with emphasis in biochemistry; chemistry minor.

B.S. GER to include:
- Mathematics 171, 172
- Physics 111/114, 112/115
  - Computer Science 100, 102, 103 or another programming course
BYS core courses and 321, 361, 362, 363, 365, 519, 543
- Chemistry 121/125, 123/126, 223/224, 331/335, 332/336, 347 (345 desirable)
- Electives as needed to total a minimum of 128

Example IV - B.S. degree, premedical, predental, preveterinary; chemistry minor.

B.S. GER to include:
- Mathematics 171
- Physics 111/114, 112/115 or 101, 102
  - Computer Science 100, 102, 103 or another programming course
BYS core courses and 317, 361, 362, 363, 365, 532 plus elective
- Chemistry 121/125, 123/126, 223/224, 331/335, 332/336 plus elective
- Electives as needed to total 128 minimum

Semester Hours

Area III & V

Area V

Area V

Area III & V

Area III

Area V

Area V

Area V

Area III & V

Area III

Area V

Area V

Area V

Area III & V

Area III

Area V

Area V

Area V

Area III & V

Area III
Example V- B.S. degree, microbiology emphasis with chemistry minor, preparatory for: (a) the National Registry Examination for Registered Microbiologists (American Academy of Microbiology); or (b) graduate study in microbiology.

B.S. GER to include:
Mathematics 120 or 171
Physics 101,102 or 111/114, 112/115
Computer Science 100, 102, 103 or another programming course
BYS core courses and 321, 421, 430, 521, 525, 535 Chemistry 121/125, 123/126, 223/224, 331/335, 332/336 plus elective
Electives as needed to total 128 minimum

<table>
<thead>
<tr>
<th>Semester Hours</th>
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</thead>
<tbody>
<tr>
<td>51</td>
</tr>
</tbody>
</table>

Example VI-B.S. degree, environmental biology emphasis, preparatory for graduate study in ecology or environmental science; chemistry minor.

B.S. GER to include:
Mathematics 171
Physics 101,102 or 111/114, 112/115
Computer Science 102
ES 101,102
Statistics - ST 281
BYS core courses and 321, 312, 378 and two from BYS 561, 562, 563 and 564 Chemistry 121/125, 123/126, 223/224, 331/335, 332, 361, 362
Electives as needed to total 128 minimum

<table>
<thead>
<tr>
<th>Semester Hours</th>
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<td>51</td>
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</table>

Example VII-B.S. degree, composite major in biological-environmental sciences. An additional 6 hours from advanced ES courses with this program qualifies students for an environmental science certificate. Students should also see the Environmental Science section of this catalog.

B.S. GER to include
Mathematics 120 or 171
Physics 101,102 or 111/114, 112/115
Computer Science 102
ECN or PSC recommended
Statistics 281
Chemistry - CH 121/125, 123/126, 223/224, 331/335
BYS core courses and 312, 321, 364 Environmental Science 101, 102, 303 or 411, 321, 331
Electives as needed from BYS 315, 317, 322, 378, 531, 561, 562, 563, 564, ES 305, 413, 414

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<th>Semester Hours</th>
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Example VIII- B.S. degree with emphasis in exercise physiology. Selected supporting coursework in cognate studies (minor) may be used to create an emphasis in sports medicine or athletic training. Additional coursework may be required for entry into physical therapy or medical programs.

B.S. GER to include:
Mathematics 120 or 171
Physics 101,102 or 111/114, 112/115

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<tr>
<th>Semester Hours</th>
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<td>51</td>
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</table>
Computer Science 100, 102 or 103 (or another programming course)  
BYS core courses and 313, 314, 401, 402 and 505  
Chemistry 101/105  
Cognate studies (Athletic Trainer): CH 201, 301; HPE 200, 205, 210, 300, 311, and 312  
or Minor in specified discipline (e.g., CH, PY, etc.)  
Electives as needed to total 128 minimum  

Model four year plan for major in Biological Sciences and minor in Chemistry

<table>
<thead>
<tr>
<th>Semester</th>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Semester</th>
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<tr>
<td>First</td>
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<td>BYS 120</td>
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<td>EH 102</td>
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<td></td>
<td>MA120 or 171</td>
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<td>MA172 or CS 100, 102, 104</td>
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<td>Second</td>
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<tr>
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<td></td>
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<td>BYS 361</td>
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<td>HU/SS*</td>
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*Humanities or Social Sciences

Biological Sciences (BYS) Courses

**100 Introduction to Health Professions**  
1 hr.  
Career options for undergraduate students interested in health professions. Basics of health-care delivery systems and terminology of health care. Primarily for freshmen and sophomores. No BYS major or minor credit.

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College of Science
119 Principles of Biology 4 hrs.
Introduction to biological principles with a focus on cellular mechanisms. One two-hour lab per week. Lab Fee: $40.

120 Organisinal Biology 4 hrs.
Discussion of biological function with special emphasis on contrasting strategies employed by organisms in meeting similar biological needs. Prerequisite: BYS 119. One two-hour lab per week. Lab Fee: $40.

200 Dinosaur Biology 2 hrs.
Introduction to the major areas of scientific interest in dinosaur biology; origin of the dinosaurs, their size, thermal biology, behavior and functional anatomy, relationships, and extinction. Lecture, discussion, and laboratory. Field trips may be required.

201 An introduction to Molecular Understanding of Biological Systems 3 hrs.
Introduction to a molecular level understanding of the structure and regulation of genes, synthesis of proteins and the integration of molecular events into multicellular systems and organisms. Prerequisites: CH 123 or equivalent.

214 Infection and Immunity 4 hrs.
Principles of microbiology with emphasis on infectious disease of humans; epidemiological and immunological aspects. No credit for students who have credit for BYS 321 or advanced microbiology courses. Recommended for students in the College of Nursing. Prerequisites: BYS 119, CH 101 or 121. Two 2-hour labs a week. Lab Fee: $50.

219 Genetics and Evolution 4 hrs.
Hereditary basis of all living organisms, including the study of (a) genes as the discrete nature of inheritance, (b) genes in organisms and (c) genes in populations. Mendelian principles and evolutionary processes. Includes replication, transcription and translation of DNA, RNA and proteins. Prerequisites: BYS 120, MA 107 or 112 and CH 101 or 121. Two 2-hour labs per week. Lab fee: $60.

238 Local Flora 2 hrs.
Laboratory course with basic taxonomical procedures and determination of local angiosperms, primarily dicots. Basics of classification techniques and process of speciation. Field trips required. Lab Fee: $30. Spring or Summer.

300 Cell and Developmental Biology 4 hrs.
Introduces the student to topics in cell and developmental biology. Subjects include cell structure, organelles, cytoskeleton, secretory pathway, cell division, cell cycle, cell interaction and control of differentiation. Prerequisites: BYS 219, and CH 201 or 331. One lab per week. Lab Fee: $65.

301 Elementary Biochemistry 3 hrs.
Biochemistry and energetics of living cells, metabolism, structure and function of carbohydrates, lipids, proteins and nucleic acid. Enzymes, coenzymes, vitamins, blood, endocrine glands, DNA synthesis and gene expression, nutrition, drugs and biochemistry of specialized tissues. Prerequisites: BYS 120 and CH 201 or 331. (Same as CH 301.) Spring.

312 Principles of Ecology 4 hrs.
Ecological principles controlling plant and animal populations. Development of ecosystems, communities, and habitats. Prerequisites: BYS 120, CH 121. One lab a week. Lab Fee: $40. Field trip required.

313 Anatomy and Physiology I 4 hrs.
Structure and function of the human body. Physiology and anatomy of major organs, organ systems, and their interactions. Not intended for students preparing for professional schools or graduate study in physiology or development. Prerequisites: BYS 119, CH 101 and 105 (CH 201 recommended.). One lab a week. Lab Fee: $50. Fall.

314 Anatomy and Physiology II 4 hrs.
Continuation of BYS 313 stressing structural and functional relationships of major organs, organ systems, and their interdependent regulation. Not intended for students preparing for professional schools or graduate study in physiology or development. Prerequisite: BYS 313. One lab a week. Lab Fee: $50. Spring.

315 Ichthyology 4 hrs.
Classification, anatomy, physiology, and ecology of freshwater and marine fishes. Emphasis on fishes of north Alabama. Laboratory and field trips required. Prerequisite: BYS 120. Lab Fee: $40.
317 Vertebrate Zoology 5 hrs.
Morphology of vertebrate animals. Relationship of organs and systems and their phylogenetic significance. Prerequisite: BYS 120. Two three-hour labs a week. Lab Fee: $50.

318 Vertebrate Reproduction 3 hrs.
General treatment of the major concepts and controversial areas of comparative vertebrate reproduction: ecological and evolutionary aspects, development of reproductive functions and sexual behavior, seasonal breeding and other topics of current interest. Prerequisite: BYS 120 or 313 or permission of instructor.

321 General Microbiology I 4 hrs.
Basic foundation in microbiology for 1) undergraduate biology majors, 2) chemistry majors taking the ACS Biochemistry track, and 3) pre-medical, pre-dental, pre-optometry, or pre-pharmacy students majoring in other fields. Topics: structure, biochemistry, and genetics of microorganisms, control of microbial growth, and microorganisms as pathogens. Laboratory exercises focus on basic and diagnostic methods in microbiology, environmental factors controlling microbial growth and survival, and the characteristics of medically important microorganisms. Prerequisites: BYS 120, 219, CH 101 or CH 121. Lab Fee: $50.

322 General Microbiology II 4 hrs.
Emphasizes the diversity of microorganisms in form, function, and ecology, and use of microorganisms in biotechnology. Laboratory exercises focus on culture and identification of environmentally important groups of microorganisms, microbial interrelationships, and the microbiology of soil, water, milk, and food. Prerequisites: BYS 219, 321. Lab Fee: $50.

331 Global Climate Change and Infectious Diseases 3 hrs.
Global warming trends and causes, greenhouse gases, impacts of climate change, causes of past climates, El Nino events, growing resistance of pathogens and vectors to drugs and insecticides, biodiversity global analysis of emerging and re-emerging diseases and their causes. Prerequisite: Junior standing or approval of instructor.

347 Biophysical Chemistry I 3 hrs.

348 Biophysical Chemistry II 3 hrs.
Viscosity, diffusion, sedimentation, electrophoresis, determination of molecular weight by osmotic pressure. Light scattering and photochemistry. Elementary IR, UV-VIS, ESR, NMR spectroscopy. Fluorescence. Optical rotation. Prerequisite: CH 347. (Same as CH 348.)

361 General Biochemistry 3 hrs.
Molecules that comprise living systems. Nomenclature, structure, properties, and functions in metabolism of amino acids, proteins, carbohydrates, lipids, and nucleic acids. Enzymatic properties and function, major catabolic pathways, their interrelations and control mechanisms. Glycolysis, Kreb’s cycle, and oxidative phosphorylation. Prerequisites: BYS 120, CH 223, 224, 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 and 224. One 3-hour lab a week. Lab Fee: $60. (Same as CH 362.)

363 General Biochemistry II 3 hrs.
A continuation of BYS 361 to include fatty acid and amino acid oxidation, biosynthesis of biomolecules, integration of metabolism, DNA and RNA metabolism, protein biosynthesis, and genes. Prerequisite: BYS 361. (Same as CH 363.)

364 Biogeography 3 hrs.
Principles of plant and animal distribution and dispersal, using the communities of North America as prime examples. Prerequisites: BYS 120; 312 recommended.

365 General Biochemistry Laboratory II 1 hr.
Experimental course illustrating the topics in BYS 363. Prerequisite: BYS 361 and BYS 362. Parallel BYS 363. Lab Fee: $40. (Same as CH 364.)

400 Neuroscience 3 hrs.
An introductory survey of the field of neuroscience, from basic neuroanatomy & physiology to current hot topics, such as neurodegenerative disease, learning and memory, consciousness, cognitive theory and neurocomputing. Prerequisites: BYS 300

College of Science
401 Exercise Physiology
Basic human physiology as differentiated by the effects of exercise. Physiology of major systems of the body that may act as a limiting factor, or enhance the performance, of human movement. Prerequisites: BYS 313 and 314. BYS/CH 301 strongly recommended. One lab per week. Lab Fee: $50.

402 Kinesiology and Biomechanics
A study of the structural and functional relationships of the human skeletal, muscular and neural systems as they relate to movement of the human body. Prerequisites: BYS 313 and 314. PH 101 recommended. One lab per week. Lab Fee: $50.

403 Advanced Exercise Physiology
Human physiology, as differentiated by the effects of environmental variables such as altitude, thermal stress and terrain on the effects of major physiological systems of the body as well as a more in-depth analysis of resistance training, aerobic and anaerobic training. Special aids to performance, body composition, aging and integration of multiple systems such as cardiopulmonary systems, the neuromuscular systems, and how each of these variables may effect the performance of human activity. Prerequisites: BYS 313, 314, 401 and BYS/CH 301 is highly recommended. One lab per week. Lab Fee: $60.

419 Microbial Genetics

430 Immunology
Innate, humoral and cell-mediated immunity. Immune deficiencies and hypersensitivities. Autoimmunity, transplantation and tumor immunology. Prerequisites: BYS 219, 321 and BYS/CH 361 strongly recommended. One 3-hour lab a week. Lab Fee: $50.

436 Biological Psychology
Functional analysis of neural and endocrine systems underlying behavior. Prerequisites: (either a or b): (a) 15 hrs. of PY or approval of instructor; (b) BYS 120 or BYS 313, and 6 hrs. of PY or approval of instructor. (Same as PY 436.)

464 Evolution

490 Senior Seminar
Student discussions, readings, and presentations of topical biological subjects using current scientific literature, monographs and journals. Capstone course emphasizing refinement of oral and written communication skills and critical thinking. Pass/fail grading. Biological sciences major requirement, one seminar. Prerequisite: Senior standing and completion of other biology core courses.

491 Special Topics in Biological Sciences
Directed readings and/or written reports on topics of interest to individual students carried out under supervision of an instructor. Permission of instructor required before registration.

492 Undergraduate Research
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
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

505 Psychopharmacology
Introduction to drug classification and action with emphasis on physiological and psychology...
<table>
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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>519</td>
<td>Gene Structure and Function</td>
<td>3 hrs.</td>
<td>Advanced studies of replication, transcription, and translation involved in the passage of genetic information and expression, with specific emphasis on RNA processing, editing, and structure. Macromolecular topology corresponding to biological function. Prerequisites: BYS 219 and BYS/CH 361.</td>
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<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. 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>
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<tr>
<td>535</td>
<td>Microbial Physiology and Metabolism</td>
<td>4 hrs.</td>
<td>Aspects of microbial physiology such as nutrition, growth, energy, and biosynthetic mechanisms of microorganisms. Prerequisite: BYS 321. Biochemistry recommended. One 3-hour lab a week. Lab Fee: $50.</td>
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<tr>
<td>536</td>
<td>Psychology of Stress and Illness</td>
<td>3 hrs.</td>
<td>Overview of physiological stress responses and their influence on health, behavior, and illness. Prerequisite: 9 hrs. BYS or PY. (Same as PY536.)</td>
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<td>542</td>
<td>Nutritional Physiology</td>
<td>3 hrs.</td>
<td>Basic studies related to nutritional physiology. Current topics on metabolism, digestive physiology, obesity, nutrition throughout the life cycle, neural and endocrine regulation of nutrition, salt regulation, dietary trends, aging and nutrition, and exercise and nutrition. Prerequisites: BYS 532 and BYS/CH 301 or 361, or graduate standing or permission of instructor.</td>
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<tr>
<td>543</td>
<td>Molecular Biology of the Cell</td>
<td>3 hrs.</td>
<td>Cellular structure and function including mitosis, meiosis, cell cycle, and cell signaling. Discussion of biological techniques such as tissue culture, hybridoma and monoclonal antibody production, gene cloning and recombinant DNA, radiotracer methodology, and specialized microscopy. Prerequisites: BYS 120, 219, and 361 (may be taken concomitantly).</td>
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<tr>
<td>547</td>
<td>Biochemistry I</td>
<td>3 hrs.</td>
<td>Structural chemistry and function of biomolecules, mechanisms of biochemical reactions, enzyme kinetics, and energy transfer. Prerequisite: CH or BYS 363. (Same as CH 561.)</td>
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<tr>
<td>548</td>
<td>Biochemistry II</td>
<td>3 hrs.</td>
<td>Metabolism, biosynthesis of macromolecular precursors, storage, transmission, expression of genetic information, and molecular physiology. Prerequisite: CH 561 or BYS 547. (Same as CH 562.)</td>
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<tr>
<td>556</td>
<td>Advanced Molecular Techniques</td>
<td>3 hrs.</td>
<td>Laboratory techniques in molecular biology, including methods of recombinant DNA technology for identification, cloning, and characterization of genes. Prerequisites: BYS 219, 300, and 519 (may be taken concurrently) or Permission of the Instructor. One 2-hour and one 5-hour lab per week. Lab Fee: $250.</td>
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<td>562</td>
<td>Community Ecology</td>
<td>4 hrs.</td>
<td>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.</td>
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<td>564</td>
<td>Limnology</td>
<td>3 hrs.</td>
<td>Fresh-water environments and organisms exemplified by lakes, ponds, and streams in north Alabama. Prerequisites: BYS 312, 315 and/or 378 recommended.</td>
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<td>600</td>
<td>Neuroscience</td>
<td>3 hrs.</td>
<td>An advanced survey of the field of neuroscience, from basic neuroanatomy and physiology, to current topics, such as neurodegenerative disease, learning and memory, consciousness, cognitive theory and neurocomputing. Prerequisites: BYS 300.</td>
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630 Immunology  
3 hrs.  
Innate, humoral and cell-mediated immunity. Immune deficiencies and hypersensitivities. Autoimmunity, transplantation and tumor immunology. Prerequisites: BYS/CH 361 or permission of instructor.

Marine Sciences (MS)  
Courses are offered only at the Marine Environmental Sciences Consortium Sea Lab at Dauphin Island, Alabama. The following courses can be included in a biological sciences major or minor:

202 Marine Biology  
4 hrs.  
Survey of invertebrates, vertebrates, and marine plants as communities with local examples of groups. Examination of marshland, estuarine, beach, dune inlet and neritic habitats, and niches. Lectures, laboratory, and field work. Prerequisite: general biology.

304 Coastal Zone Management  
2 hrs.  
Examination of ecological features and physical management policies design for coastal communities and a review of the federal and state programs that impinge upon coastal ecological communities.

502 Marine Botany  
4 hrs.  

503 Marine Invertebrate Zoology  
4 hrs.  

505 Marine Vertebrate Zoology  
4 hrs.  

506 Marine Zoogeography  
4 hrs.  
Physical, chemical, and biological factors influencing distribution of marine organisms. Importance of continents, open oceans, and species competition on animal distribution. Zoogeographical patterns in Gulf of Mexico, western North Atlantic, and Caribbean regions. Prerequisite: 12 semester hours of biological sciences.

507 Physiology of Marine Animals  
4 hrs.  
Environmental adaptations of marine animals. Biochemical, osmotic, respiratory, and temperature responses of both invertebrates and fish. Prerequisite: 12 hours in biological sciences. Biochemistry recommended.

508 Marine Plankton  
4 hrs.  

509 Marine Ecology  
4 hrs.  
Bioenergetics, community structure, population dynamics, predation, competition, and speciation in marine ecosystems. Lecture, laboratory, and fieldwork. Students admitted without previous marine courses. For engineers and other non-biologists interested in marine environment. Individual species as they relate to ecological principles exemplifying taxonomic and ecologic backgrounds. Prerequisites: Introductory ecology. Chemistry and physics recommended; marine invertebrate zoology or marine biology helpful.

510 Marsh Ecology  
4 hrs.  
Basic understanding of ecology of salt marsh. Habitat analysis, natural history studies, and population dynamics of selected vertebrates. Specific field problem terminated by a technical paper assigned to each student. For advanced undergraduates and graduate students. Prerequisite: Introductory ecology.

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.

College of Science  
280
513 Fisheries Economics
Physical and biological environment of commercial marine organisms and its effect on
distribution and natural fluctuations in abundance. Man’s impact on population through fishing
and habitat alteration. Ecology and life history of major groups. Problems of managing fishery
resources through regulation, mariculture, and preservation of specialized habitats. Prerequisite:
General biology.

515 Coastal Ornithology
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

599 Research
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
Biology, harvesting technology, and processing of commercially valuable fish and shellfish
species of Alabama.

301 Marine Technical Methods I
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
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
Physical factors that result in climactic conditions in and near coastal region. Emphasis on
northern Gulf of Mexico.

501 Introduction to Oceanography
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
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
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
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 fieldwork. Prerequisite: physical geology.

521 Recent Marine Sedimentation
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
Principal marine fossil groups in gulf coastal plain sediments, their paleoecology, and
paleogeography. Recent and ancient marine communities and individuals in them. Prerequisite:
marine geology or advanced geology.
Chemistry Department
203-C Materials Science Building
Telephone: (256) 824-6153
Email: chem@uah.edu
Web Site: http://chemistry.uah.edu/

Professors: Baird (Chair), Gregory, Meehan, Naumann, Radonovich, Setzer; Shriver; Professor Emeritus Riley; Associate Professors George, Scholz, Weimer; Associate Research Professors Chen, Edmondson, Kaukler; Assistant Professors Paddison, Vogler, Waddell, Ward; Assistant Research Professors Ciszak, Twigg.

Mission
The mission of the Department of Chemistry is to provide high quality undergraduate and graduate education in all aspects of chemistry, with a special emphasis in materials science and biotechnology. Our goal is to educate our students in chemistry, and to provide them with life-long learning skills allowing them to adapt to an ever-changing environment. Our faculty and students strive to generate new knowledge through research and other creative activities that will benefit the residents of Huntsville, the state of Alabama, the nation, and the world.

Academic Programs
The academic program in chemistry at the University of Alabama in Huntsville has received the approval of the American Chemical Society in recognition of its strong faculty and excellent facilities for high quality undergraduate instruction. The Chemistry Department offers courses leading to the B.S. degree with a major in chemistry and supports undergraduate programs in other disciplines.

Six chemistry major curricula are offered which provide preparation for: (1) medical school, dental school, veterinary school or pharmacy school; (2) the Alabama Class B High School Teacher’s Certificate; (3) graduate study in chemistry and/or employment as an industrial chemist; (4) general education in chemistry; (5) graduate study combining chemistry and physics; (6) employment as a biochemist, clinical chemist or forensic scientist; and (7) chemical business.

Chemistry Major Requirements
The minimum total semester hours required for the B.S. degree is 128. Of these, at least 39 semester hours must be in courses numbered 300 or higher. In addition, requirements for the major in chemistry include:
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>Subject Area</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>Area I</td>
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<td>Social and behavioral science</td>
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<td>MA172 (see note [b])</td>
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<td>EH 301</td>
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</table>

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Notes:
[a] The section of the catalog dealing with the GER requirements for B.S. degree should also be consulted for more details.
[b] If the student's minor is mathematics, this requirement is waived.

2. 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.

3. Completion of sufficient electives to meet the overall minimum hour requirements for the degree.

4. 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. Note that Curriculum I specifies a minor in biological sciences, while Curriculum II specifies a minor in mathematics. Curriculum VII includes requirements in economics, mathematics and statistics.

Specialization Curricula
The Committee on Professional Training (CPT) of the American Chemical Society (ACS) specifies curricula containing prescribed course sequences that meet the American Chemical Society requirements for professional education at the B.S. level. The chemistry department offers two ACS approved curricula: one in Biochemistry (Curriculum I) and one in Pure Chemistry (Curriculum II) outlined below. The College of Science will recognize completion of either of these ACS approved curricula by awarding the student a certificate of specialization in that area.

Curriculum I Biochemistry, Premedical, Predental, Preveterinary or Prepharmacy Program.
This American Chemical Society approved program serves as preparation for medical school, dental school, veterinary school, pharmacy school, graduate study in biochemistry or employment as a clinical chemist or forensic scientist. Prospective medical students should explore their areas of interest outside of the sciences and strive for maximum scholastic achievement. Students following this curriculum in preparation for medical, dental, veterinary, or pharmacy school should consult with the Preprofessional Advisory Committee early in their college program. Premedical students should prepare to take the Medical College Aptitude Test during the spring of their junior year. (For alternative premedical curricula, see Chemistry Curriculum II and Biological Sciences Example IV.)

Courses
Biological Sciences minor- BYS 119, 120, 219, 321, 340, and 519 or 543 or 547

Semester Hours
45

Curriculum II Graduate Preparatory Program (Pure Chemistry Curriculum)
This American Chemical Society approved curriculum is designed for a student who plans to do graduate work in chemistry or a related science or desires an industrial position that requires a strong chemical background.

Courses
Chemistry—CH 121/125, 123/126, 223/224, 331/335, 332/336, 337, 341/345, 342/346, 361/362, 401/402, 421, CH 300 level or above elective
Mathematics Minor-MA 171, 172, 201, 238, 244, 415, and 385 or 460 or 465

Semester Hours
45

283
Curriculum III General Chemistry, Premedical, Predental
The reduced course requirement for the major in chemistry in this curriculum permits the student to prepare for medical or dental school and to sample courses and subjects outside of the major.

Courses
Chemistry-CH 121/125,123/126, 223/224, 331/335, 332/336, 341 or 347, 345, 361/362, 401/402, 421, plus
CH 300 level or above elective

Curriculum IV Chemistry Major with Class B High School Teacher's Certificate
This plan meets the requirements for an Alabama Class B High School Teacher's Certificate.

Courses
Chemistry-CH 121/125, 123/126, 223/224, 315, 331/335, 332/336, 361/362, 347, and 348
Biological sciences (minimum requirements) 4
MA 201 4
PH 113 and 116 4
Professional education courses (See Education Dept. section of catalog.) 33

NOTES:
1. This curriculum may require more than the minimum total of 128 hours for the B.S. degree.
2. Students pursuing this curriculum should consult with the Department of Education early in their program. Education students are required to pass an exit examination in their teaching field in order to graduate and be recommended for certification.

Curriculum V Basic Chemistry Curriculum
This curriculum is designed for students who want to combine a major in chemistry with a major in another subject.

Courses
Chemistry-CH 121/125, 123/126, 223/224, 331/335, 332/336, 341 or 347, 342 or 348, 345, 361,401, and 4217

Curriculum VI Chemical Physics Curriculum
Chemistry-physics program appropriate for pre-graduate education.

Courses
Chemistry-CH 121/125,123/126, 223/224, 331/335, 332/336, 341,342, 343,345, 346,401, and 421
Physics Minor-PH 110, 113, 116, 301, 305, 431, 451, 499
Mathematics- 201, 238, 244

Curriculum VII Chemical Business Curriculum
This curriculum is designed to prepare a student to perform business functions in the chemical or pharmaceutical industry.

Courses
Chemistry-CH 121/125, 123/126, 223/224, 331/335, 332/336, 341 or 347, 345, 361,362, 401/402, and 421
ECN 142 and ECN143 should be included in Area IV of the GER
Mathematics- MA 201 should be included in Area V of the GER.
Business Minor-ACC 211,ACC 212, BLS 211, MGT 301, MGT 301, MGT 450, and MSC 385
Statistics- MSC 287 or MA 385 or ISE 390 and MSC 288 or MA 487 or ISE 391. Of these, MA 385, ISE 390 and MA 487 can be used to satisfy Area V of the GER
Microcomputers-MIS 146 (or MIS 102, 104, and 106)

Students interested in the pharmaceuticals industry may wish to take CH 363 and CH 364 and/or one or more courses in biology. A student can satisfy the statistics requirement and add a second minor in mathematics simply by electing the sequence MA 171, 172, 201, 244, 385, and 487.
Notes applying to all curricula above:
(a) Credit may be obtained for Chemistry 121, 123, 125, and 126 by making a satisfactory score on the CLEP examination. This examination is offered at various times during the year through the Office of Testing Services. Students pursuing credit by examination should consult the Chemistry Department before taking the examination. Credit is also granted to a student who submits a score of 3 or higher on the Advanced Placement Programs of the College Entrance Examination Board.
(b) Transfer students wishing to major in chemistry must complete at least 9 semester hours of chemistry at the level of 300 or above at UAH. Courses in organic chemistry completed at the junior college level may be used to satisfy prerequisite requirements for upper level chemistry courses at UAH and total hour requirements 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, 201, and 301 or any mathematics course numbered lower than MA 171. A student requiring any of 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, 224, 331, 332, 335, 336, and 361 for premedical and predental students.
2. CH 121, 125, 123, 126, 223, 224, 331, 332, 335, 361, 362 for some biology and medical technology majors.
3. CH 121, 125, 123, 126, 331, 332, 335, 341, 342, 343 for physics and mathematics majors.
4. CH 121, 123, 125, 126, 223, 224, 331, 332, 335, 347 for biology majors taking BYS 361 and 362.

Model four-year plan for Curriculum I with Biology minor*

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<td>CH 332</td>
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285 College of Science
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Model four-year plan for Curriculum II with Math minor*

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<td><strong>Total hours: 128</strong></td>
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*Other minors are possible with the chemistry major. These are only suggested sequences of courses.
101 Introduction to Chemistry 3 hrs.
Properties of solids, liquids, gases, and solutions, atomic theory and bonding, concentration concepts, and physical and chemical properties of the more common elements and their compounds. CH 101 does not count toward the chemistry major or minor. Chemistry majors or minors taking CH 101 get elective credit only. CH 101 may be used with CH 105 and CH 113 to fulfill the laboratory science requirement of the GER. No placement examination is required for enrollment in CH 101. The student may opt to take CH 101 even if he has achieved a satisfactory score on the placement examination for enrollment in CH 121. Student must have successfully completed MA 110 or be currently taking MA 112 or higher. Parallel: CH 105.

105 Introductory Chemistry Laboratory 1 hr.
Laboratory fundamentals and basic chemical principles. A student enrolled in a B.S. degree program who plans to take CH 121 and CH 125 and has had chemistry laboratory experience may be exempt from CH 105 by permission of Chemistry Department chair. CH 105 may not be counted toward the chemistry major or minor. Chemistry majors or minors receive only elective credit. Parallel: CH 101. Lab Fee: $40.

121 General Chemistry I 3 hrs.
For science and engineering majors. Properties of gases, liquids, solids, and solutions. Nature of the chemical bond, kinetics, chemical equilibrium, electrochemistry, thermochemistry. Chemical properties of elements, their periodic groups, and their compounds. Prerequisites or parallel: CH 101 or placement test and MA 112: parallel: CH 125.

123 General Chemistry II 3 hrs.
Continuation of 121 with in-depth study of topics listed. Prerequisite: CH 121. Parallel: CH 126.

125 General Chemistry Laboratory I 1 hr.
Complements the lecture material for CH 121. Includes the determination of chemical and physical properties of materials, synthesis and characterization, and introduction to spectroscopy. Parallel: CH 121. Lab Fee: $40.

126 General 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.

201 Elementary Organic Chemistry 4 hrs.
Nomenclature, structure, functional groups, and properties of organic compounds. Recommended for nursing majors, some biology majors, and as a sequence to CH 101/105 for an 8-hour laboratory science requirement for non-science majors. Also recommended for students who would benefit from an introduction to organic chemistry before taking CH 331/332 sequence. Does not count in chemistry major or minor. Prerequisites: CH 101 and CH 105 or CH 121 and 125 Lab fee: $60.

223 Quantitative Analysis 3 hrs.
Introduction to quantitative analytical chemistry including instrumentation. Data treatment, ionic equilibria, elementary electrochemical, spectrochemical, gravimetric, and volumetric techniques. Prerequisites: CH 126; must be taken parallel to CH 224.

224 Quantitative Analysis Laboratory 1 hr.
Introduction to quantitative analytical chemistry laboratory. Experiments include pH measurements, spectrochemical, gravimetric, and volumetric titrations. Prerequisites: CH 126; must be taken parallel to CH 223. Lab Fee: $50

301 Elementary Biochemistry 3 hrs.
Biochemistry and energetics of living cells, metabolism, structure and function of carbohydrates, lipids, proteins and nucleic acid. Enzymes, coenzymes, vitamins, blood, endocrine glands, DNA synthesis and gene expression, nutrition, drugs and biochemistry of specialized tissues. Prerequisites: BYS 120 and CH 201 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 that illustrate important and exciting chemical principles. Prerequisites: CH 201 or 223 or permission of the instructor. Lab Fee: $30.
331 Organic Chemistry I
Chemistry of organic compounds. Synthetic methods, theory, and reaction mechanisms. Prerequisites: CH 123, 126; CH 223, 224 recommended.

332 Organic Chemistry II
Continuation of CH 331. Prerequisite: CH 331.

335 Organic Chemistry Laboratory I
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
Continuation of CH 335. Prerequisite: CH 335. Prerequisite or parallel: CH 332. Lab Fee: $50.

337 Organic Chemistry Laboratory III
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.

338 Introduction to Quantum Chemistry
Quantum mechanical treatment of atoms, molecules, and spectroscopy. Prerequisites: CH 341, MA 238.

341 Physical Chemistry I
Theory of classical thermodynamics and its application to the chemistry of solid, liquids, gases, and solutions. Prerequisites: CH 123, MA 201 and PH 112. Credit in CH 341 precludes credit in CH 347.

342 Physical Chemistry II
Kinetic theory of gases, theory and formulation of rate equations, mechanisms of chemical reactions, electrochemistry, and surface processes. Prerequisite: CH 341. Credit in CH 342 precludes credit in CH 348.

343 Introduction to Quantum Chemistry
Quantum mechanical treatment of atoms, molecules, and spectroscopy. Prerequisites: CH 341, MA 238.

345 Experimental Physical Chemistry I
Laboratory and computer investigations into physical chemistry. Prerequisites: CH 223, 224; Prerequisite or parallel: CH 341 or 347. Lab Fee: $50.

346 Experimental Physical Chemistry II
Laboratory investigations into thermodynamics, kinetics and spectroscopy. Prerequisite: CH 345 or CHE 295; Parallel CH 342 or 348. Lab Fee: $50.

347 Biophysical Chemistry I

348 Biophysical Chemistry II
Viscosity, diffusion, sedimentation, electrophoresis, determination of molecular weight by osmotic pressure. Light scattering and photochemistry. Elementary IR, UV-VIS, ESR, NMR spectroscopy. Fluorescence. Optical rotation. Prerequisite: CH 347. (Same as BYS 348.)

361 General Biochemistry I
Molecules that comprise living systems. Nomenclature, structure, properties, and functions in metabolism of amino acids, proteins, carbohydrates, lipids, and nucleic acids. Enzymatic properties and function; major catabolic pathways, their interrelations and control mechanisms. Glycolysis, Kreb's cycle, and oxidative phosphorylation. Prerequisites: BYS 120, CH 223, 224, 332, and 335. (Same as BYS 361.)

362 General Biochemistry Laboratory I
Practical experience in isolation, qualitative identification, and quantitative estimation of biomolecules. Prerequisite or parallel: CH 361. Prerequisites: CH 223, 224. One 3-hour lab a week. Lab Fee: $60. (Same as BYS 362.)

363 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. (Same as BYS 363.)

364 General Biochemistry Laboratory II
Experimental course illustrating the topics in CH 363. Prerequisites: CH 361 and CH 362. Parallel CH 363. Lab Fee: $50. (Same as BYS 365.)
401 Inorganic Chemistry 3 hrs.
Fundamental topics in inorganic chemistry. Atomic structure, chemical bonding, symmetry, acid-base theories, non-aqueous solvents, coordination chemistry, crystal field and ligand field theory, main group and transition metal chemistry, organometallics, catalysis, and bioinorganic chemistry. Prerequisites: CH 336

402 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.

421 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 345. Lab Fee: $60.

440 Polymer Synthesis and Characterization 3 hrs.
Synthesis of commercially relevant and novel polymers. Polymer characteristics and a discussion of the structural dependence of polymer properties. Prerequisite: CH 331. This course is also taught to graduate students as CH 540 and MTS 640. Course completion and/or grade requirements for undergraduate credit will differ from those for graduate credit. Students who have successfully completed CH 440 cannot also receive credit for CH 540 or MTS 640.

480 Selected Topics in Chemistry 1-3 hrs.
Special offerings to students in areas of interest not covered in present curriculum. Prerequisite: senior standing and approval of instructor.

491, 492, 493 Introduction to Chemical Research 1-3 hrs.
Personalized programs to round out the undergraduate curriculum of students with various goals. Prerequisite or parallel: CH 345 and senior standing. Approval of supervising faculty member and chemistry chair required. Registration utilizes last digit of course number to designate semester-hour credit. Student normally may elect only up to 6 hours. Lab Fee: $40 for CH 492, $50 for CH 493. No lab fee for CH 491.

Computer Science Department
300 Technology Hall
Telephone: (256) 824-6088
Email: info@cs.uah.edu
Web Site: http://www.cs.uah.edu/

Professors Graves, Ranganath (Chair), Richards, Slater; Professors Emeriti Davis, Johannes, Shiva; Associate Professors Delugach, Etzkorn, Li, Newman, Rochowiak; Assistant Professors Aygun, Cox, Hart, Weisskopf, Zhang; Lecturer Orme.

Mission
The overriding objective or mission of the Computer Science program is to prepare students to become contributors to the computer science profession, whether they find themselves in industrial, government, research, or university environments. The educational objectives of the Computer Science Department, which are based on the department's commitment to excellence in teaching, research, and service, and overall development of students are consistent with the mission statement of the University.

Based on the educational goals of the College of Science and the University, the Computer Science Department has established the following specific student and faculty objectives:

Student Objectives: Computer Science graduates:

1. Will be trained in theoretical concepts and mathematical fundamentals essential for establishing a strong foundation for a life long career in Computer Science.
2. Will have a good understanding of the fundamentals of the organization, operation, and use of computers.
3. Will be proficient in modern programming languages such as C, C++, and Java.
4. Will be proficient in Software Engineering methodologies and able to work on group projects.
5. Will have strong laboratory experience that provides them practical and effective computing skills.
6. Will have good analytical, communication, and problem solving skills needed for professional employment as well as graduate studies.
7. Will have a good learning experience during their degree program.

Faculty Objectives: Each computer science faculty member:

1. Should be capable of teaching a number of courses.
2. Should be well qualified to teach his/her courses.
4. Should stay current in teaching and research areas.
5. Should be involved in student advisement.

The department has excellent faculty who are dedicated to teaching, research and student advisement. The program meets national standards for excellence and since 1989 has been fully accredited by the Computing Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012.

The Computer Science Department is located in Olin B. King Technology Hall and has excellent classroom, laboratory, and student facilities. Ready access is provided to several modern, networked PC laboratories within the department. The UAH campus is fully networked with a fiber optic backbone and is a member of the NSF's VBNS2 network, giving high-speed connectivity to the Internet. Additional PC laboratories are also distributed across the campus. The department has microcomputer and network laboratories for instruction in logic design, computer architecture, and networking. Laboratory fees are associated with most computer science classes since extensive laboratory work is required. In order to accommodate student needs, lab scheduling is flexible.

Important notes regarding a computer science major
A mathematics minor is required of all computer science majors.
A minimum GPA of 2.0 must be obtained both in the computer science major and the mathematics minor courses taken at UAH
A student must meet all requirements of the College of Science and the university as well as the requirements stated in this section.
A transfer student must complete a minimum of 18 hours of CS courses at UAH in order to obtain a degree in computer science

Introductory Sequence
The introductory sequence for computer science majors and minors is CS 121, 221, 321. CS 102 or an equivalent college-level programming course is a prerequisite for CS 121. Students with a computer science AP score of 3 or higher will receive credit for CS 102.

Course Requirements for a B.S. Degree in Computer Science
The minimum number of hours required for a B.S. degree with a major in computer science is 128 distributed as shown below. AP credit may be used to replace certain required courses.

General Education Requirements (Areas I-V)
Area I: English Composition 6 hrs.
Area II: Literature, Fine Arts, Humanities. Must include CM 113 and at least one literature 12 hrs.
Area III: Natural Science and Mathematics 11-12 hrs.
One course in mathematics (MA 112 or higher)
One of the following laboratory science sequences:
PH111/114L-112/115L; CH 121/125L-123/126L;
BYS119-120

Area IV: History, Social and Behavioral Sciences
Must include at least one history; no more than 6 hours
in one discipline

Area V: Preprofessional and Elective Courses
Must include CS 102 (or equivalent), EH 301,
a 4-hour laboratory science**, and electives, including
MA 113 if required by placement

* Math courses from the minor may also be used to satisfy general education requirements, but the hours cannot be counted twice.

** Laboratory science courses must be chosen from courses that can be applied toward a major in the department where they are taught.

For further information about distribution requirements and specific courses that satisfy the categories above, see the College of Science General Education Requirements.

** Computer Science Major

CS Core
CS 105, 121, 214, 221, 308, 309, 317,
321, 413, 424, 490, 499

CS Electives
6 hours at 300-level or above, 6 hours
at 400- level or above

Mathematics Minor
MA 171, 172, 201, 244, 385, and one
of 330, 415, 442, or 485

Technical Elective
Any 300-level (or above) course from the College

Elective
of Science, or from a list available in the CS Department

General
To bring the total number of hrs. to 128

Total Hours in Program 128 hrs.

** Computer Science Minors

The department offers two minors that are described below. The request for a minor should be initiated in the student's major department.

Computer Science Minor
(Suitable for students with a major in a technical field):

CS 105, 121, 214, 221, 317, 321 and two CS electives,* one at the 300-level or higher and one at the 400-level or higher. Select from CS 309, 413, and 490 as electives, if considering an M.S. in computer science.

Computer Languages and Systems Minor
(Suitable for students with non-technical majors and minimal mathematics background):CS 102, 105, 121, 221, 321 and three CS electives,* two at the 300-level or higher and one at the 400-level or higher.

*Students must observe prerequisites when choosing elective courses.

** Model Four-Year Plan for Computer Science Majors

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td></td>
</tr>
<tr>
<td>CS 102</td>
<td>CS 121</td>
</tr>
<tr>
<td>CS 105</td>
<td>Lit/FA (Area II)</td>
</tr>
<tr>
<td>MA 171</td>
<td>MA 172</td>
</tr>
<tr>
<td>EH 101</td>
<td>EH 102</td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Computer Science (CS)

### 100 Introduction to Computers and Programming
- **3 hrs.**

### 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.

### 103 Introduction to Programming using Java
- **3 hrs.**
- Program design and implementation in the Java programming language, using hands-on programming assignments, class demonstrations and lectures. Problem analysis and some testing techniques. Basic features of program structure, data types, control structures, methods and file organization. Java's built-in class libraries, input/output features. Lab fee: $50. Cannot be counted toward CS major.

### 105 Computer Science Seminar – Ethics and Professionalism
- **1 hr.**
- Covers issues associated with the ethical use of computers in the current information age. Ethics, professionalism, software piracy, copyrighting software, ethical standards and the impact of computers on society will be covered. Familiarization with the local computing environment will also be covered.

### 121 Computer Science I
- **3 hrs.**
- Review of hardware and software components of computer systems. Review of problem solving techniques and algorithm development. Principles of software design, implementation, and testing. Introduction to object oriented design and the C++ programming language. Extensive programming assignments to provide experience in the application of design and implementation principles. Lab fee $40. Prerequisite: CS 102 or other college-level programming course, MA 112. Prerequisite or parallel: MA 113.

### 214 Introduction to Discrete Structures
- **3 hrs.**
- Review of set algebra including mappings and relations. Algebraic structures including semigroups and groups. Elements of theory of directed and undirected graphs; Boolean algebra and propositional logic and applications of these structures to various areas of computer science. Lab Fee: $40. Prerequisites: CS 121 and MA 171.
221 Computer Science II: Data Structures 3 hrs.
Continuation of CS 121 with emphasis on advanced features of the C++ programming language, including pointers, recursion, classes, inheritance, and polymorphism. Introduction to fundamental data structures including linked lists, stacks, queues, and binary search trees. Basic sorting and searching algorithms. Practical experience in the design, development, and documentation of significant object-oriented programs. Lab fee $50. Prerequisites: CS 121, MA 113. Co-requisite MA 171.

307 Object-Oriented Programming in C++ 3 hrs.
Emphasis upon object-oriented concepts and design in developing student programs in C++. Comparison with other object-oriented languages. Inheritance. Lab Fee: $40 Prerequisites: CS 207 or 221.

308 Computer Organization and Assembly Language Programming 3 hrs.
Computer hardware organization, including functions of central processing unit, instruction representation and execution. Programming experience in a representative assembly language, including floating point programming. Overview of software systems: loaders, assembler, compiler, interpreters, operating systems. Functional description of input/output and mass storage devices. Structure and operation of assemblers. Lab Fee $50. Prerequisite: CS 309.

309 Switching Theory 3 hrs.
Boolean algebra, Boolean function minimization techniques, design and analysis of combinational circuits, design and analysis of sequential circuits, asynchronous circuits, timing and loading problems, designing with integrated circuits. A lab section must be scheduled for this course. Lab Fee: $50. Prerequisite: CS 121, Co-requisite CS 214.

317 Introduction to Design and Analysis of Algorithms 3 hrs.
Introduction to complexity analysis of algorithms with emphasis on efficient methods for searching, sorting, finding spanning trees and shortest paths in graphs. Basic algorithm design techniques such as divide & conquer, dynamic programming, and backtracking. Introduction to the classification of problems; i.e. NP, intractable, and unsolvable. Lab Fee: $40. Prerequisites: MA 244, CS 214 and 221.

321 Introduction to Object-Oriented Programming in Java 3 hrs.
Writing substantial object-oriented programs in Java, including their design, documentation and testing. Advanced data structures (e.g., balanced trees, hash tables). Graphical interface programming using the Java abstract windowing toolkit. Comparison with other object-oriented languages, notably C++. Lab fee: $50. Prerequisite: CS 221 or proficiency in another object-oriented programming language.

390 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 221.

391 Introduction to Network Administration Principles for Windows 3 hrs.
Introduction to network administration principles used for installing and administrating networks based on Windows. Covers OS installation, general network topologies and protocols, along with Windows architecture for both client and server. Management of users, network file and security systems, Windows Registry, DHCP, WINS, print servers, backup systems, and disaster-recovery are covered. Special attention is given to the design and implementation of a Windows NT Domain. Lab fee: $40. Prerequisites: CS 221.

392 Introduction to Network Administration Principles for UNIX 3 hrs.
Introduction to network administration principles used for installing and administrating networks based on UNIX. Covers Linux OS installation, general network topologies and protocols, along with UNIX architecture for both client and server. Management of users, network file and security systems, kernel configuration, print servers, X Windows servers, domain name service, mail servers, as well as Web and ftp servers are covered. Special attention is given to the design and implementation of a UNIX Domain. Lab fee: $40 Prerequisite: CS 390.

396 - 398 Special Topics 3 hrs.
Course offered by an instructor in a specialized area of computer science. Prerequisite: Approval of instructor. Lab fee: $40.
403 Introduction to Formal Languages and Automata Theory  
Introduction to concepts and formalisms of formal languages and automata theory. Includes fundamental mathematical concepts, grammars and corresponding automata, and deterministic parsing of programming languages. Lab Fee: $40. Prerequisite: CS 317.

413 Introduction to Digital Computer Design  
Logic design of functional digital units, design of computer subsystems: register transfer, bus structure, timing and control. Design of processor, memory, arithmetic, and I/O units. Interrupt handling. Introduction to advanced architectures and interconnection networks. Shared memory systems, cache coherence. Memory models and memory consistency. A lab section must be scheduled for this course. Lab Fee: $50. Prerequisites: CS 308, 309.

424 Programming Languages  
Principles of modern programming language features and design. Imperative vs. declarative language styles. General purpose language features, e.g., operators, expressions, recursion, object-orientation. Special purpose language features, e.g., support for graphical interfaces, concurrency, non-determinism. Relationship of language design and implementation. Formal grammars, BNF notation. Brief history of programming languages. Taught as CS 424/524. Course completion and/or grade requirements for graduate credit will differ from those for undergraduate credit. Students may not receive credit for both CS 424 and CS 524. Lab fee $40. Prerequisites: CS 317 and proficiency in a modern programming language.

470 Introduction to Computer Networks  
Introduction to the organization and operation of computer networks. Physical, Data Link, Network, Transport, and Application-layer protocols and algorithms; LAN and WAN systems; TCP/IP; wired and wireless organizations; security approaches. Taught as CS 470/570. Course completion and/or grade requirements for graduate credit will differ from those for undergraduate credit. Students may not receive credit for both 470 and 570. Lab fee: $40. Prerequisite: Senior standing or permission of instructor.

487 Database Systems  
Introduction to the basic concepts of database management systems with a focus on relational and object-oriented systems. Database design including semantic models and normalization. Design issues including query languages, internal storage, recovery, concurrency, security, integrity, and query optimization. Lab Fee: $40. Prerequisite: Senior standing or permission of instructor.

490 Introduction to Operating Systems  
History and principles of operating systems. Emphasis on fundamental concepts of process management, memory management, I/O management, and file systems. Topics include process states, threads, CPU scheduling, concurrent processing, virtual memory, disk scheduling. Brief overview of modern operating systems including multiprocessor, distributed, and real time systems. Contemporary operating systems such as UNIX and Windows NT will be used as examples. Students will be assigned substantial programming projects and will be expected to complete at least one graded written assignment. Lab Fee: $40. Prerequisite: CS 413 or 513.

495 Independent Study  
Individual directed study under the supervision of an instructor. Prerequisites: Approval of instructor. Lab Fee: $40.

496-498 Special Topics  
Course offered by an instructor in a specialized area of computer science. Prerequisite: Approval of instructor. Lab fee: $40.

499 Senior Project: Team Software Development  
A combination of lectures on proven software engineering approaches, and team working sessions. Each student will participate in a sizable, complex software development project based on a team approach. Each team will be required to provide oral and written documentation of their work. Lab Fee: $40. Prerequisite: CS 317.

526 Program Translation and Compiler Construction  
Language representation; grammar classification; lexical analysis technique and tools; parsing technique and tools; compile-time and run-time symbol table design; code generation and optimization; error diagnostics. Compiler writing tools. Lab fee: $50. Prerequisite: CS 317. CS 424 or 403 recommended.

530 Expert Systems and Heuristic Programming  
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 and 424 or 524.

537 Introduction to Neural Networks

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.

543 Introduction to Multimedia Systems

Multimedia authoring, color models for image and video, introduction to image and video compression, digital audio, multimedia networks. Prerequisite: CS490. Lab Fee: $50.

545 Introduction to Computer Graphics

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 221 (or proficiency with the C/C++ programming language), MA244.

548 Human-Computer Interaction

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.

551 Software Modeling

A survey of techniques and methodologies for software modeling. General modeling (e.g., UML), formal models, model checking, limitations of modeling, validation of models, domain modeling, model-driven architecture. Comparison of different approaches, considering their advantages and disadvantages. Prerequisite: CS 317 or 617, or approval of instructor based upon applicable industrial software development experience. Lab fee $40.

552 Analysis and Design Patterns

An in-depth examination of analysis Patterns and Design Patterns and how they can enable better analyses and designs (primarily more reusable and extendable). Advanced C++ and Java programming and techniques, concepts, and styles and how these apply to design patterns. Lab Fee: $40. Prerequisite: CS 307 or 321.

553 Client/Server Architectures

Conceptual and practical aspects of client/server architectures, 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 J2EE. Fundamental concepts of distributed object computing. Students will apply the concepts in the development of practical distributed programs. Prerequisite: CS 307 or 321 (CS 470 recommended). Lab Fee $50.

581 Modeling and Simulation I

A general introduction to the computer science and software engineering aspects of modeling and simulation. Application of simulation analysis to the design and development of computer software and systems including modeling of computer and software components. Design, implementation, and application of discrete event simulation software. Lab Fee: $40. Prerequisites: CS214, CS221, MA244, MA385. Proficiency in programming.

582 Modeling and Simulation II

Advanced methods in the application of modeling and simulation to computer science problems. Includes probability methods for modeling computer software and systems, design of experiments for computing systems, and analysis of alternate computing configurations. Development of software for advanced simulation systems including high-performance parallel simulations and real-time distributed simulations. Lab fee: $40. Prerequisites: CS581.

585 Introduction to Computer Security

Security policies, models, and mechanisms applicable to providing security for computer-based systems, including operating systems, database management systems, and networks. Lab fee $40. Prerequisite: CS 490.

590 Programming Environments with UNIX

Advanced strategies for the design and development of systems and programs in the UNIX environment. Emphasis on automated tool and system development using UNIX tools. Parallel and supercomputer issues as treated by UNIX and C. Advanced shell concepts and programming including control flow and interrupt handling. Process and interprocess communications. Lab Fee: $40. Prerequisite: CS 390 or two years experience in UNIX.
**595 Independent Study**

Individual directed study under the supervision of an instructor. Prerequisites: Approval of instructor.

**596-598 Selected Topics in Computer Science**

Course offered by an instructor in a specialized area of computer science. Prerequisite: Approval of instructor. Lab fee: $40.

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### Environmental Science Program

Professors Lawton (Coordinator), Christy, Eley, Perkey, Podila, Welch; Research Professor Essenwanger; Associate Professors Christopher, Han, Knupp, Leahy, Newchurch. Hudson Teaching Fellow Stallsmith.

**Mission**

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 General Education Requirements (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>B.S. GER to include:</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics–MA120 or 171</td>
<td>51</td>
</tr>
<tr>
<td>Physics–PH 101, 102 or 111/114, 112/115</td>
<td>3-4</td>
</tr>
<tr>
<td>Computer Science–CS 102</td>
<td>8</td>
</tr>
<tr>
<td>Statistics - ST 281</td>
<td>4</td>
</tr>
<tr>
<td>ECN or PSC recommended</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry–CH 121, 123, 125, 126, 223, 224, 331, 332, 335</td>
<td>3-6</td>
</tr>
<tr>
<td>Biological Sciences–BYS core courses and 312, 321, 364</td>
<td>18</td>
</tr>
<tr>
<td>Environmental Science - ES 101, 102, 303 or 411, 321, 331</td>
<td>29</td>
</tr>
<tr>
<td>Electives as needed selected from BYS 315, 322, 317, 378, 531, 561, 562 563, 564, ES 305, 401, 413, 414</td>
<td>17</td>
</tr>
</tbody>
</table>

Total 128 min.

### Requirements for the Environmental Science Certificate

Basic science courses (unless exempted by advanced placement and/or testing in each case): BYS 119, 120; CH 121, 123, 125, 126; ES 101, 102; PH 111, 112; two basic courses in statistics and/or computer science.

Environmental certificate core courses:
- ES/BYS 312 Principles of Ecology
- ES 321 Pollution Problems
- ES 521 Environmental Data Analysis (or other approved course)
Advanced level specialization (9 hours required in courses in student's major or area of interest chosen from the following):

BYS 321 General Microbiology I
BYS 322 General Microbiology II
BYS 364 Biogeography
BYS 561 Physiological Ecology
BYS 562 Community Ecology
BYS 563 Population Ecology
BYS 564 Limnology

MS 509 Marine Ecology
MS 510 Marsh Ecology

CH 525 Environmental Chemistry

ISE 427 Management Systems Analysis
ISE 524 Ergonomics and Methods Analysis
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 Classification and Physical Causes of Climate
ES 305 Hydrology
ES 331 Global Climate Change and Infectious Diseases
ES 593 Directed Studies in Atmospheric and Environmental Science
ES 401 Survey of Atmospheric Science
ES 411 Introduction to Geographical Information Systems
ES 413 Geographical Information Systems and Remote Sensing
ES 414 Scale and Landscape in GIS
ES 415 Advanced Topics in GIS
ES 420 Introduction to Atmospheric Chemistry and Air Pollution
ES 441 Atmospheric Thermodynamics and Cloud Physics
ES 451 Atmospheric Fluid Dynamics I
ES 452 Synoptic Meteorology

Requirements for a Minor in Environmental Science
A student in any area of study may build a minor in environmental science with approval of the advisor in the major department and the Environmental Science Coordinator. A minimum of 21 semester hours is required for the minor.

The following are possible tracks for an environmental science minor:

Environmental Biology Track:
BYS 119, 120 to fulfill the natural science requirement
BYS 321 as an elective
ES 312, 321, 331, 561, and one additional 500 level course approved by advisor.

Atmospheric Science Track:
ES 101, 103, 303 or 321, 401, 420, 441, 451, 461

Geographic Information Systems Track
Any 3 ES courses (e.g. ES 303, 312, 331) and 411, 413, 414, 415.

Environmental Science (ES)

100 Introduction to Space Science 1 hr.
Introduction to a variety of space science subjects. Included are lectures on space physiology, computer systems, materials science, robotics in space, thermodynamics, astrophysics, and solar physics. Laboratory experiments and simulated missions. Offered in cooperation with the Alabama Space and Rocket Center and is open only to students enrolled in Space Academy II.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Planetary and Atmospheric Science I</td>
<td>4 hrs.</td>
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<tr>
<td></td>
<td>Introduction to earth's atmosphere and climate system. Structure and interaction of the components of this system. Natural and human-induced changes in these components, including the greenhouse effect, ozone depletion, air pollution, acid rain, biodiversity, and climate.</td>
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</tr>
<tr>
<td>102</td>
<td>Planetary and Atmospheric Science II</td>
<td>4 hrs.</td>
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<tr>
<td></td>
<td>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.</td>
<td></td>
<td>Fall, Spring</td>
</tr>
<tr>
<td>103</td>
<td>The Atmosphere and its Properties</td>
<td>4 hrs.</td>
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<td></td>
<td>Weather systems; severe weather; hurricanes; weather forecasting. Interpretation of current conventional surface-based, satellite, and radar weather observations. Lab Fee: $40. Prerequisite: ES 101.</td>
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<td>Fall, Spring</td>
</tr>
<tr>
<td>202</td>
<td>Physical Geology</td>
<td>3 hrs.</td>
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<td></td>
<td>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.</td>
<td></td>
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<tr>
<td>302</td>
<td>Classification and Physical Causes of Climates</td>
<td>3 hrs.</td>
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<td></td>
<td>Basic atmospheric structure and physical processes, climate history and climate change, microclimates, topoclimates. Prerequisites: ES 101, MA 112 or approval of instructor. Offered upon demand.</td>
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<tr>
<td>303</td>
<td>Hydrology</td>
<td>3 hrs.</td>
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<td></td>
<td>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.</td>
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<tr>
<td>305</td>
<td>Principles of Ecology</td>
<td>4 hrs.</td>
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<tr>
<td></td>
<td>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. Prerequisite: BYS 120. (Same as BYS 312.)</td>
<td></td>
<td>Spring</td>
</tr>
<tr>
<td>321</td>
<td>Pollution Problems</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>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.</td>
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</tr>
<tr>
<td>331</td>
<td>Global Climate Change and Infectious Diseases</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>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.)</td>
<td></td>
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</tr>
<tr>
<td>401</td>
<td>Survey of Atmospheric Science</td>
<td>3 hrs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General survey of the field of atmospheric science. Quantitative examination of atmospheric physical properties including atmospheric composition, structure and dynamics. Detailed inspection of evolving atmospheric structures using real-time data systems. Topics include atmospheric thermodynamics, atmospheric dynamics, cloud physics, atmospheric radiation, and related topics in atmospheric remote sensing. Prerequisites: MA 172 and PH 112, or permission of instructor. (Same as ATS 401/501, ES 501.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>411</td>
<td>Introduction to Geographical Information Systems</td>
<td>3 hrs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Introduces vector, raster and tabular concepts, emphasizing the vector approach. Topics include spatial relationships, map features, attributes, relational database, layers of data, data ingesting, digitizing from maps, projections, output, application and availability of public data sets. Prerequisite: Permission of instructor. (Same as ATS 411/511, CE 411/511, ES 511.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>413</td>
<td>Geographical Information Systems and Remote Sensing</td>
<td>3 hrs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provides a hands-on approach to GIS and satellite remote sensing. Satellite data sets such as LANDSAT and AVHRR, coupled with GIS data sets, increase understanding of the earth system. Topics include satellite sensors, basic radiative transfer, orbits, raster formats, atmospheric correction, distortion, image corrections, rotations and mapping, spatial resolution, image interpretation, radiometric and geometric enhancement, multispectral transformations, and classifications. Prerequisite: Permission of Instructor. (Same as ATS 413/513, ES 513.)</td>
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</tr>
</tbody>
</table>
414 Scale and Landscape in GIS 3 hrs.
Understanding the role of scale in analysis of remote sensing data using GIS, focusing on analysis of landscape properties. Prerequisite: ES/ATS 413. (Same as ATS 414/514, ES 514.)

415 Advanced Topics in GIS 3 hrs.
Advanced special topics: visualization of GIS and remote sensing data, landscape characterization (pattern vs. process), multitemporal analysis, aggregation of data types, developing an integrated GIS environment for performing complex space-time modeling analyses, and land-atmosphere interactions. Prerequisite: ATS/ES 413. (Same as ATS 415/515, ES 515.)

420 Introduction to Atmospheric Chemistry and Air Pollution 3 hrs.
This self-contained introductory course in atmospheric chemistry and air pollution is designed to provide seniors and graduate students the basics of atmospheric chemistry and air pollution concepts. Topics include air pollutants, air-pollution meteorology, atmospheric gases and aerosols, and atmospheric processes. This course will also develop the necessary fundamentals for those wishing to take the advanced (600-level) courses in the atmospheric chemistry/air pollution study area. ES 520 and ATS 520 require a research project; ES/ATS 420 do not. Prerequisite: PH 112 and CH 121 or consent of instructor. (Same as ATS 420/520, ES 520.)

441 Atmospheric Thermodynamics and Cloud Physics 3 hrs.
General aspects of thermodynamic and cloud physical processes occurring within the atmosphere; atmospheric statics and stability, saturation point analysis, aerosols, nucleation, and the behavior/growth of cloud particles and hydrometers. Prerequisites: MA 238, PH 112. (Same as ATS 441/541, ES 541.)

451 Atmospheric Fluid Dynamics I 3 hrs.
Fluid dynamics in the atmosphere. Coriolis accelerations, scale analysis, and appropriate approximations of the complete governing equations. Numerical analysis and interpretation of weather phenomena. Prerequisites: MA 238, PH 112. (Same as ATS 451/551, ES 551.)

452 Synoptic Meteorology 3 hrs.
Analysis, interpretation, and forecasting synoptic-scale and mesoscale phenomena, including air masses, frontal systems, cyclones, anti-cyclones, tropical cyclones, and associated mesoscale phenomena. Emphasis on the use of remotely sensed data from satellites, radars, and profilers using state-of-the-art workstations. Prerequisites: ATS 441, 451. (Same as ATS 452/552, ES 552.)

454 Forecasting Mesoscale Processes 3 hrs.
Detection and forecasting of atmospheric mesoscale phenomena including the structure and evolution of clouds, precipitation (including floods), thunderstorms and severe weather. Includes basics on instruments used to detect mesoscale phenomena, most notably satellite and radar. Course material is based mainly on computerized modules and related exercises. Prerequisite: ATS 451. (Same as ATS 454/554, ES 554.)

461 Atmospheric Radiation I 3 hrs.
Fundamentals of terrestrial atmospheric radiation. Specific topics include: solar radiation at the top of the atmosphere, radiative transfer equation, gaseous absorption, scattering by molecules and particles, band models, transmittance along an inhomogeneous path, and microwave radiative transfer. Prerequisites: MA 238, PH 112. (Same as ATS 461/561, ES 561.)

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
204 Madison Hall
Telephone: (256) 824-6470
Email: math@uah.edu
Web Site: http://www.math.uah.edu/

Professors Ames, Friedman, Gibson, Li, Morales, Siegrist (Chair), Slater; Associate Professors Dow (Research), Howell, Huang, Kunin, Ravindran, Zhang; Associate Research Professor Dow; Associate Professor Emeritus Forte; Assistant Professors Ai; Lecturers Bowman, Lenahan, Marples, Presson.
Mission
The Department of Mathematical Sciences is dedicated to education, research, and service in mathematics.

Our educational mission is to provide excellent instruction and resources for the mathematics education of our students through our courses and degree programs. As the language of science, mathematics is of fundamental importance to the general education of UAH students, particularly students planning careers in science and engineering. Through our bachelor's, master's and doctoral degree programs, our goal is to help produce the new generations of well-educated mathematicians that are critical for the progress of mankind.

Our mission in research and scholarship is to discover and disseminate new mathematics and to apply mathematics to problems in engineering and in the physical, biological, and social sciences.

Our service mission is to promote and communicate the importance of mathematics in society and to help maintain standards of excellence in mathematics through refereeing and reviewing. Our service mission is to work with other departments and units in UAH to achieve the goals of the College of Science and the university as a whole.

We recognize that the components of our mission are not separate but are intimately interrelated. Excellence in teaching, research, and service can only be achieved together.

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 the GER should make their choice from the sequence MA 107, MA 110, MA 112, MA 113, MA 120, MA 244, ST 281, MA 333, and MA 385, beginning with the course indicated by their placement.

Students who plan to continue in mathematics and need 3 to 9 hours to satisfy the GER should make their choice from the sequence MA 112, MA 113, MA 171, MA 172, MA 201, and MA 244, beginning with the course indicated by their placement.

For a student majoring in an area of science or engineering the sequence of math courses would typically be one of the following, depending on placement:
MA 112, MA 113, MA 171, ...
MA 115, MA 171, ...
MA 171, ...

For a student majoring in administrative science, the sequence of math courses would typically be one of the following, depending on placement and goals:
MA 107, MA 120
MA 112, 120
MA 112, MA 113, MA 171

A student majoring in an area in liberal arts could take MA 110, MA 112, MA 113, MA 115, or MA 171 to meet the General Education Requirement, depending on placement.

A student majoring in Nursing could take either MA 110 or MA 112, depending on placement and goals.
Placement
No student may enroll in his or her first MA course at UAH before a placement determination has been made. Students are placed in an appropriate course based on their high school mathematics background, their ACT (or SAT) score in mathematics, their previous college credit (if any), or a placement test.

Please contact the Department of Mathematical Sciences, or visit the department’s web site at http://www.math.uah.edu, for more information about placement.

Mathematics Major
All majors in mathematics must include MA 171, MA 172, MA 201, MA 244, MA 330 and MA 385 (basic core). Only MA courses numbered 171 or above may be included in a mathematics major, and an overall average of C is required for all UAH MA or ST courses that are included in a mathematics major. Information on other MA course requirements is given in Curricula I, II, and III below. Students who think that substitutions in those curricula can produce a program better suited to their needs should consult their faculty advisor about the feasibility of such substitutions. All MA electives must be approved by the student’s faculty advisor prior to registering for the courses. Majors in mathematics must also include CS 121, PH 111, PH 112, PH 114, and PH 115.

Mathematics Minor
Students majoring in other academic areas who wish to minor in mathematics may select, in consultation with and approval of the mathematical sciences faculty, at least 21 semester hours of appropriate courses in mathematics, including 6 semester hours in courses numbered 300 or above. Only MA courses numbered 171 or above may be included in a mathematics minor, and an overall average of C is required for all UAH MA or ST that are included in a mathematics minor. A typical mathematics minor consists of MA 171, MA 172, MA 201, MA 244, and two approved MA courses numbered above 300. All minors must include MA171 and MA 172.

Double Major or Second Major
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. Curriculum III below is specifically designed for such students.

Curriculum I
This curriculum leads to a B.A. or B.S. degree with a major in mathematics, and is appropriate for students planning careers in industry or graduate study in mathematics.

<table>
<thead>
<tr>
<th>Area</th>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>MA Basic core plus&lt;br&gt;MA 238, MA 442, MA 465, MA 452&lt;br&gt;MA electives (three courses at the 300 level or above, including at least one 500 level course.)</td>
<td>42</td>
</tr>
<tr>
<td>Computer Science</td>
<td>(GER Area V) CS 102, CS 121</td>
<td>6</td>
</tr>
<tr>
<td>(GER Area III)</td>
<td>Physics PH 111, PH 112, PH 114, PH 115</td>
<td>8</td>
</tr>
<tr>
<td>Minor</td>
<td></td>
<td>21-24</td>
</tr>
<tr>
<td>Other GER and Electives</td>
<td></td>
<td>At least 51</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>At least 128</td>
</tr>
</tbody>
</table>

Notes:
The MA electives must be pre-approved by the student’s mathematics advisor.
The GER for the B.A. degree are listed in the College of Liberal Arts section. The GER for the B.S. degree are listed in the College of Science section.
Curriculum II
This curriculum leads to a B.A. or B.S. degree with a major in mathematics, and meets the requirements for an Alabama Class B Middle/Junior High School Teacher's Certificate or an Alabama Class B High School Teacher's Certificate.

**Area**
**Mathematics**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA Basic core plus</td>
<td>39</td>
</tr>
<tr>
<td>MA 333, MA 442, MA 452</td>
<td></td>
</tr>
<tr>
<td>MA/ST 487</td>
<td></td>
</tr>
<tr>
<td>MA elective (3 hrs at the 500 level; 6 hrs. total)</td>
<td></td>
</tr>
</tbody>
</table>

**Computer Science (GER Area V)**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 102, CS 121</td>
<td>6</td>
</tr>
</tbody>
</table>

**Physics (GER Area III)**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 111, PH 112, PH 114, PH 115</td>
<td>8</td>
</tr>
</tbody>
</table>

**Education Courses**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 111, PH 112, PH 114, PH 115</td>
<td>33</td>
</tr>
</tbody>
</table>

**Other GER and Electives**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA or ST electives (three courses at the 300 level or above, including at least one 500 level course)</td>
<td>At least 42</td>
</tr>
<tr>
<td>CS 102, CS 121</td>
<td>6</td>
</tr>
<tr>
<td>PH 111, PH 112, PH 114, PH 115</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA or ST electives (three courses at the 300 level or above, including at least one 500 level course)</td>
<td>At least 42</td>
</tr>
<tr>
<td>CS 102, CS 121</td>
<td>6</td>
</tr>
<tr>
<td>PH 111, PH 112, PH 114, PH 115</td>
<td>8</td>
</tr>
</tbody>
</table>

**Total:** At least 128

**Notes:**
The MA elective must be pre-approved by the student's mathematics advisor.

See the Education Department section of the catalog for information on education courses and general education requirements.

Students pursuing this curriculum should consult with the Education Department early in their programs.

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

Students who choose this curriculum may not be adequately prepared for graduate study in mathematics. This curriculum may require more than the minimum 128 semester hours.

Curriculum III
This curriculum is restricted to students who are pursuing a double major in mathematics and another discipline in the College of Science, or a major in mathematics and a second major in a discipline in the College of Engineering. This curriculum prepares students for careers in industry.

**Area**
**Mathematics**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA Basic core plus, MA 238</td>
<td>39</td>
</tr>
<tr>
<td>One approved analysis course, such as MA 415, MA 452, MA 460, or MA 503</td>
<td></td>
</tr>
<tr>
<td>One approved algebra course, such as MA 442, MA 508, or MA 540</td>
<td></td>
</tr>
<tr>
<td>MA or ST electives (three courses at the 300 level or above, including at least one 500 level course)</td>
<td></td>
</tr>
</tbody>
</table>

**Computer Science (GER Area V)**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 102, CS 121</td>
<td>6</td>
</tr>
</tbody>
</table>

**Physics (GER Area III)**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 111, PH 112, PH 114, PH 115</td>
<td>36-45</td>
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</tbody>
</table>

**Second Major**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 111, PH 112, PH 114, PH 115</td>
<td>8</td>
</tr>
</tbody>
</table>

**Other GER and Electives**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA or ST electives (three courses at the 300 level or above, including at least one 500 level course)</td>
<td>At least 42</td>
</tr>
<tr>
<td>CS 102, CS 121</td>
<td>6</td>
</tr>
<tr>
<td>PH 111, PH 112, PH 114, PH 115</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA or ST electives (three courses at the 300 level or above, including at least one 500 level course)</td>
<td>At least 42</td>
</tr>
<tr>
<td>CS 102, CS 121</td>
<td>6</td>
</tr>
<tr>
<td>PH 111, PH 112, PH 114, PH 115</td>
<td>8</td>
</tr>
</tbody>
</table>

**Total:** At least 128

**Notes:**
The MA electives must be pre-approved by the student's mathematics advisor.

If a student elects to take neither MA 452 nor MA 442, then an additional 500 level course is required.

If the student’s other major is not in the College of Science, then normally the General Education Requirements of the College of Science must be satisfied, as well as the GER of the other college. Under appropriate circumstances, some substitutions in the College of Science GER may be allowed upon petition by the student. For more information, contact the Department of Mathematical Sciences.

This curriculum will usually require more than the minimum 128 semester hours.
# Model Four Year Plan for a B.S. Degree in Mathematics

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 171</td>
<td>4</td>
<td></td>
<td>MA 172</td>
<td>4</td>
</tr>
<tr>
<td>EH 101</td>
<td>3</td>
<td></td>
<td>EH 102</td>
<td>3</td>
</tr>
<tr>
<td>CS 102</td>
<td>3</td>
<td></td>
<td>PH 111</td>
<td>3</td>
</tr>
<tr>
<td>GER</td>
<td>3</td>
<td></td>
<td>PH 114</td>
<td>1</td>
</tr>
<tr>
<td>GER</td>
<td>3</td>
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<td>HY 101</td>
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</tr>
<tr>
<td></td>
<td>16</td>
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<table>
<thead>
<tr>
<th>Second Year</th>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 201</td>
<td>4</td>
<td></td>
<td>MA 238</td>
<td>3</td>
</tr>
<tr>
<td>MA 244</td>
<td>3</td>
<td></td>
<td>MA 330</td>
<td>3</td>
</tr>
<tr>
<td>PH 112</td>
<td>3</td>
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<td>CH 121</td>
<td>3</td>
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<tr>
<td>PH 115</td>
<td>1</td>
<td></td>
<td>CH 125</td>
<td>1</td>
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<tr>
<td>EH 205</td>
<td>3</td>
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<td>Minor</td>
<td>3</td>
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<tr>
<td>CS 121</td>
<td>4</td>
<td></td>
<td>Minor</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td></td>
<td></td>
<td>16</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 442</td>
<td>3</td>
<td></td>
<td>MA 452</td>
<td>3</td>
</tr>
<tr>
<td>MA 465</td>
<td>3</td>
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<td>MA 3xx or 4xx</td>
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<td>GER</td>
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<tr>
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<td>Elective or GER</td>
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<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Fourth Year</th>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 4xx</td>
<td>3</td>
<td></td>
<td>MA 5xx</td>
<td>3</td>
</tr>
<tr>
<td>MA 4xx</td>
<td>3</td>
<td></td>
<td>Minor</td>
<td>6</td>
</tr>
<tr>
<td>Minor</td>
<td>3</td>
<td></td>
<td>Electives or GER</td>
<td>8</td>
</tr>
<tr>
<td>Elective or GER</td>
<td>6</td>
<td></td>
<td></td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td></td>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

Total hours: 128

**Mathematics (MA)**

**Notes:**
1. No student may receive more than 6 hours credit for MA courses numbered below 120.
2. AGSC refers to the Alabama General Studies Curriculum (see [http://stars.troyst.edu/](http://stars.troyst.edu/) for more information).
3. 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.
4. No student may enroll in his or her first MA course at UAH before placement determination has been made.

004 **Basic Algebra**

For students with a deficiency in high school credit in algebra or who need an algebra review. **No credit**

033 **High School Geometry**

For students with a deficiency in high school credit in geometry. Prerequisite: Basic algebra. **No credit**

107 **Algebra with Applications**

Algebra review, functions and graphs, linear models, exponential and logarithmic functions, mathematics of finance, sets and probability. Prerequisites: placement. No credit given to students who have received credit for another MA course. **3 hrs.**

110 **Finite Mathematics**

Algebra review, elementary functions, matrices, logic, sets, counting, and an introduction to probability and statistics. Prerequisites: placement. MA 110 is an AGSC core course. **3 hrs.**

112 **Precalculus Algebra**

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. Prerequisites: Placement. No credit given to students who have completed an MA course numbered above MA 112. MA 112 is an AGSC core course. **3 hrs.**
113 Precalculus Trigonometry
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. Prerequisites: MA 112 with a grade of C or better, or placement. No credit given to students who have completed an MA course numbered above MA 113. MA 113 is an AGSC core course.

115 Precalculus Algebra and Trigonometry
The algebra of functions, including polynomial, rational, exponential, and logarithmic functions; systems of equations and inequalities; trigonometric and inverse trigonometric functions; trigonometric identities and equations; a brief introduction to DeMoivre's Theorem, vectors, polar coordinates, and the binomial theorem. Prerequisites: placement. This course is intended for students who plan to take at least MA 171 (Calculus A), but who do not need the full two-semester sequence in precalculus (MA 112, 113). MA 115 is an AGSC core course.

120 Calculus with Applications
Limits, continuity, differentiation, applications of the derivative, integration, the fundamental theorem of calculus, applications of the integral. Prerequisites: MA 107 or MA 110 or MA 112 with a grade of C or better, or placement. No credit given to students who have already received credit for a calculus course. MA 120 is an AGSC core course.

171 Calculus A
Limits, derivatives, applications of the derivative, definite and indefinite integrals, exponential and logarithmic functions, and inverse functions. Prerequisites: MA 113 or MA 115 with a grade of C or better, or placement. Lab fee: $10. MA 171 is an AGSC core course (AGSC number 125).

172 Calculus B
Techniques of integration, applications of the integral, polar coordinates, sequences, series, and conic sections. Prerequisite: MA 171 with a grade of C or better. Lab fee: $10. MA 172 is an AGSC core course (AGSC number 126).

201 Calculus C
Vectors, vector-valued functions, partial derivatives, multiple integrals, vector fields, line and surface integrals. Prerequisites: MA172 with a grade of C or better. Lab fee: $10. MA 201 is an ACSC core course (AGSC number 227).

230 Mathematics for Elementary School Teachers
The course emphasizes the use of logical thinking in mathematics and the development of students' understandings of algorithm design. Directed at providing the elementary education student the mathematical background necessary for an understanding of the mathematical principles that are introduced to children in the elementary grades. Emphasis on sets, logic, an understanding of the number system (integers, fractions, decimals, percents), and number theory. Prerequisites: One MA course at the 100 level or above with a C or better, or placement. Open only to students majoring in elementary education.

238 Applied Differential Equations
This course provides an elementary introduction to the techniques and necessary theory for solving the basic differential equations usually encountered by beginning science and engineering students. General topics include analytical and graphical methods for solving and analyzing first-order differential equations; Euler's numerical method; the basic theory of higher-order, linear differential equations, with major emphasis on equations with constant coefficients; variation of parameters; the Laplace transform as a tool for solving differential equations. MA 238 is an AGSC core course.

Prerequisites: MA 172 and MA 201 (corequisite).

244 Introduction to Linear Algebra
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. Prerequisites: MA 172 or MA 120. Lab fee: $10. MA 244 is an AGSC core course (AGSC number 237).

299 Mathematics Project
Individualized special projects in mathematics and its applications for inquisitive and well-prepared sophomore-level undergraduate students. No credit allowed toward a major or minor in mathematics. S/U grading. Prerequisites: approval of department chair and instructor.

College of Science
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. Prerequisites: MA 244 or approval of instructor.

385 Introduction to Probability 3 hrs.
This course is a calculus-based introduction to probability with special emphasis on the interplay between probability and statistics. Topics include descriptive statistics; probability spaces; discrete distributions (including the binomial, geometric, hypergeometric, and Poisson); continuous distributions (including the uniform, exponential, and normal); joint distributions; mean, variance, and general expected value; independence and correlation; the law of large numbers; and the central limit theorem. Prerequisites: MA 120 or MA 172, and one MA course at the 200-level or above. No credit given to students who have successfully completed MA 585.

399 Mathematics Project 1 hr.
Individualized special projects in mathematics and its applications for inquisitive and well-prepared junior-level undergraduate students. No credit allowed toward a major or minor in mathematics. S/U grading. Prerequisites: approval of department chair and instructor.

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 201, MA 244, CS 121, and one MA course at the 300-level. Lab fee: $40.

420 Intermediate Differential Equations 3 hrs.
This is a second course in differential equations. Course topics include series solutions for second order differential equations and the method of Frobenious; eigenvalue and eigenvector methods for solving systems of linear first order equations; the qualitative theory of nonlinear equations; boundary value problems and the Sturm-Liouville theory. Prerequisites: MA 201, MA 244, and MA 238. This course is taught as MA 420/520. Course completion and/or grade requirements for the MA 520 course will differ from those for the MA 420 course.

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. Prerequisites: MA 330 and MA 442, or approval of instructor. This course is taught as MA 452/502. Course completion and/or grade requirements for the MA 502 course will differ from those for the MA 452 course.

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. Prerequisites: MA 244 and MA 238. This course is taught as MA 460/561. Course completion and/or grade requirements for the MA 561 course will differ from those for the MA 460 course.

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 and MA 238.
487 Introduction to Mathematical Statistics 3 hrs.
This is an introductory, calculus-based course in mathematical statistics. Topics include a review of basic probability, including probability spaces, independence, distributions and expected value; the fundamental theorems of probability, including the law of large numbers and the central limit theorem; estimation, including point estimation and interval estimates for means, variances, and proportions; hypothesis testing, including tests for means, variance, and goodness of fit; an introduction to correlation and regression; theory of inference, including sufficiency and power.
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 inquisitive and well-prepared senior level undergraduate students. No credit allowed toward a major or minor in mathematics. S/U grading. Prerequisites: approval of department chair and instructor.

502 Introduction to Real Analysis 3 hrs.
See MA 452. This course is taught as MA 452/502. Course completion and/or grade requirements for the MA 502 course will differ from those for the MA 452 course.

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.
Prerequisites: MA 201 and one MA course at the 300 level or above, or approval of instructor.

506 Methods of Partial Differential Equations 3 hrs.
Survey of theory and methods for solving elementary partial differential equations. 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 244 and MA 238. No credit given to students who have successfully completed MA 526.

508 Applied Linear Algebra 3 hrs.
Fundamental concepts of linear algebra are developed with emphasis on real and complex vector spaces, linear transformations, and matrices. 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. Prerequisites: MA 244, MA 238. No credit given to students who have successfully completed MA 544.

515 Introduction to Numerical Analysis 3 hrs.
Rigorous analysis and derivation of numerical methods for the approximate solution of nonlinear equations; interpolation and integration of functions, and approximating solutions of ordinary differential equations. Prerequisites: MA 201, MA 244, and MA 238, CS 121, plus one 500-level (or higher) MA course, or graduate standing in the Department of Mathematical Sciences. Lab Fee: $40.

520 Intermediate Differential Equations 3 hrs.
See MA 420. This course is taught as MA 420/520. Course completion and/or grade requirements for the MA 520 course will differ from those for the MA 420 course.

524 Dynamical Systems I 3 hrs.
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, Lyapunov functions, center manifolds, Hopf bifurcation. Prerequisites: MA 244, MA 238, and MA 452.

526 Partial Differential Equations I 3 hrs.
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 3 hrs.
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** 3 hrs.
Counting, pigeonhole principle, permutations and combinations, generating functions, principle of inclusion and exclusion, Polya's theory of counting. Prerequisites: MA 442 or approval of instructor.

**542 Algebra** 3 hrs.
Topics from group theory and ring theory: subgroups, normal subgroups, quotient groups, homomorphisms, isomorphism theorems, ideals, principal ideal domains, Euclidean domains, fields, extension fields, elements of Galois theory. Prerequisites: MA 442 or approval of instructor.

**544 Linear Algebra** 3 hrs.
Vector spaces over a field, bases, linear transformations, matrices, determinants, eigenvalues, similarity, Jordan canonical forms, dual spaces, orthogonal and unitary transformations. Prerequisites: MA 244 and MA 442.

**561 Introduction to Fourier Analysis** 3 hrs.
See MA 460. This course is taught as MA 460/561. Course completion and/or grade requirements for the MA 561 course will differ from those for the MA 460 course.

**562 Intermediate Fourier Analysis** 3 hrs.
(Formerly MA 560). 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, MA 238, 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, MA 238, MA 385, one MA course at 400-level or above, and CS 121 or equivalent.

**585 Probability** 3 hrs.
Course topics include probability spaces, random variables, conditional probability, independence, modes of convergence, and an introduction to sigma-algebras and measurability; distributions, including discrete, continuous, joint and marginal distributions, transformations of random variable, distribution and quantile functions, and convergence in distribution; expected value, including properties of general expected value, mean, variance, covariance, generating functions, and conditional expected value; special models and distributions, including Bernoulli trials and the binomial and negative binomial distributions, the Poisson model and the Poisson and gamma distributions, the normal distribution, finite sampling models and the hypergeometric distribution; the law of large numbers and the central limit theorem. 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** 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 113 or MA 115 or placement. Student cannot receive credit for more than one of ST 281 or MSC 287. Lab Fee: $40.

**487 Introduction to Mathematical Statistics** 3 hrs.
See MA 487. This course is taught as MA 487/ST 487.
Physics Department
201-C Optics Building
Telephone: (256) 824-2483
Email: physics@uah.edu
Web Site: http://www.uah.edu/physics/

Diimmock, Fix, F. Franz, J. Franz, Gregory, Lieu, J. Miller, Takahashi; Professors Emeriti Barr, Chan, Comfort, Duthie, Smalley; Associate Professors Pakhomov; Assistant Professor: R. Miller, Oluseyi; Research Professor Paciesas; Associate Research Professor Preece, Zhang; Assistant Research Professors Bonamente, Lompa, Sanghadasa; Lecturers Elsamadicy, Strong.

Mission
The mission of the Department of Physics encompasses the three areas of teaching, research, and service. Our undergraduate program prepares students for employment as industrial physics or for further graduate work in physics or related fields, including astrophysics, optics, biophysics, engineering, or medicine. We further play a vital role in the education of other science and engineering students, and promote the understanding and appreciation of science through our general study courses. Externally funded research is the foundation of our graduate program that prepares students for the many challenges and opportunities for new discoveries both in private industry, government labs or at other universities. Finally we promote the advancement of science through publications, public outreach, and activities within our profession.

A degree in physics is for students who want a broad-based physical science education. Physics students receive training in problem solving skills that are universal and indispensable, making the students highly adaptive and able to learn new technologies as they are developed. The undergraduate program in physics provides the foundation necessary for either continued study in graduate school or for a terminal degree leading to professional employment. The physics program allows students the freedom to design their upper-level curriculum to place increased emphasis on their personal interests and to match their future plans and ambitions. Physics students work closely with a physics faculty advisor in establishing their program of study. Areas of specialization include: optics, astrophysics, engineering physics, atmospheric science, secondary school teaching, and more. Under their programs of study, students may choose specific sets of related courses and earn certificates of specialization awarded by the College of Science within areas of physics. Research is an integral part of the Physics degree. During their senior year, all physics students take a “capstone” course, PH 499, and receive real-world research experience by working individually with faculty members on research projects, either on campus or with a local company or government lab.

Physics Major
All majors in physics must take the following courses: PH 110, 111-116, 301, 305, 351, and 499. The introductory 100-level courses provide the basic physics foundations and are necessary prerequisites to the remaining upper level courses, both core and elective. Physics majors also choose 18 hours of 300- and 400-level courses, both lecture and laboratory, from science areas such as physics, optics, astrophysics, and atmospheric science, to complete their major requirements. The selected courses must be listed on a Program of Study and approved by the physics advisor, the Department of Physics, and the College of Science. Students are encouraged to file a Program of Study at the earliest opportunity.

An engineering physics option, requiring either PH 337 or PH 306 and 30 hours of cognate engineering courses in lieu of the 18 hours of science courses, is also available. This cognate is approved jointly by the physics advisor and the College of Engineering.

All physics majors are required to minor in mathematics. The mathematics minor and other curriculum requirements and details are specified below. No grade lower than a D may be counted toward the requirements for graduation listed in the student’s Program of Study. In addition, the university has minimum GPA requirements in major subjects, minor/cognate subjects, and overall; see the Academic Information section of this catalog for details of these important requirements.
A typical curriculum for students interested in graduate study in physics is described below as the curriculum for the Applied and Theoretical Physics Curriculum. A four-year plan for students electing this option is shown below.

**Minors in Physics**
Students majoring in other academic areas who wish to minor in an area within physics may select, in consultation with and approval of their physics faculty advisor and the College of Science, at least 21 hours of appropriate courses within the physics area. The department in which the student is majoring should initiate a request for the minor. The Physics Department supports three minors: General Physics, Optics, and Astronomy/Astrophysics. For each of these minors, students are required to take PH 110 and 499. An overall average of C or better is required for the courses constituting the minor.

**General Physics Minor:** For a physics minor, a student must complete at least 21 hours of appropriate courses in physics, including PH 110-116, 499, and 3 semester hours in physics courses numbered 300 or above.

**Optics Minor:** A minimum of 21 semester hours of course work is required for a minor in optics. The courses should include: OPT 341, 342, 411, 412, 441, 442, OPE 456, and PH 110, 499.

**Astronomy/Astrophysics Minor:** A minor in astronomy/astrophysics consists of AST 106, 107, 371, PH 110, 111, 114, and 499.

**Specialization Curricula**
By not specifying the 15 hours of upper-division physics course, we give the student the freedom to develop a course of study in physics that matches the student's interests. In consultation with their physics faculty advisor, students have the option of taking special sequences of courses, which lead to a certificate awarded by the College of Science acknowledging the student's specialization within physics. In most cases, the specialization courses are part of the 15 hours of upper-division physics courses or part of the optional technical electives under the GER; therefore, there are no additional credit hours beyond the Physics BS requirements. A grade of C or better is required for each of the courses in these curricula in order to qualify for the specialization curricula recognition.

I. **Applied and Theoretical Physics Specialization Curriculum**
Physics has long been recognized as the true fundamental science and the program leading to the awarding of the Applied and Theoretical Physics certificate of specialization guarantees that the student is exposed to all aspects of both fields. This program of study is specifically designed for the undergraduate student who has already decided to pursue a graduate degree in physics. The student receives the B.S. degree in Physics and is recognized with a certificate of specialization in Applied and Theoretical Physics by the College of Science. Additional courses in Computer Science are strongly suggested.

The course requirements for all physics majors include 18 hours of electives from 300- and 400-level courses. For the curriculum in Applied and Theoretical Physics, these electives are replaced with 23 hours of requirements that better prepare the student for graduate study. These requirements are PH 310, 311, 306 or 337, 421, 431, 432, 451, and 452. Students interested in pursuing graduate study in Astrophysics may replace PH 306/337 with AST 371. Students interested in graduate study in Optics may replace PH 306/337 with OPT 341.

Model Four Year Plan in Preparation for Graduate School with a certificate of specialization in Applied and Theoretical Physics (128 hours).
Optics Specialization Curriculum

Optics is a multidisciplinary field that requires a broad spectrum of knowledge. Beginning with the core physics courses, students completing the Optics specialization curriculum receive a strong exposure to geometrical optics, physical optics, optical instruments, and interference & diffraction, along with upper-division laboratory experience with hands-on training using state-of-the-art equipment and modern optical techniques. In addition, the Physics Department offers Optics electives that cover contemporary topics such as polarimetry, optoelectronics, lasers, optical sources and detectors, and radiometry. The Optics curriculum produces professionals who are able to move immediately into government or private industry, and are also well prepared for graduate work in optics, physics, or related fields.

To receive the B.S. in Physics and be recognized with an Optics certificate of specialization by the College of Science, students take OPT 341, 342, 411, 412, 441, 442, and OPT/PH 3xx/4xx, a total of 19 hours, which satisfies the 18 hours of electives required for the Physics major. Students are encouraged to take other Optics or Physics courses for their GER elective requirements, particularly if graduate work is anticipated. Suggested selections include: OPT 444, 445, 446, 447; PH 431, 432, 451, 452.

Model Four Year Plan for B.S. in physics with a certificate of specialization in Optics (128 hours).

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To receive the B.S. in Physics and be recognized with an Optics certificate of specialization by the College of Science, students take OPT 341, 342, 411, 412, 441, 442, and OPT/PH 3xx/4xx, a total of 19 hours, which satisfies the 18 hours of electives required for the Physics major. Students are encouraged to take other Optics or Physics courses for their GER elective requirements, particularly if graduate work is anticipated. Suggested selections include: OPT 444, 445, 446, 447; PH 431, 432, 451, 452.

Model Four Year Plan for B.S. in physics with a certificate of specialization in Optics (128 hours).
MA 171 4 MA 172 4
PH 110 3 PH 111 3
PH 114 1
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Second year
EH 205 3 EH 206 3
HY 101 3 HY 102 3
GER 3 MA 238 or 244 3
MA 201 4 PH 305 3
PH 112 3 PH 113 3
PH 115 1 PH 116 1
17

Third year
GER or PH 431 3 GER or PH 432 3
CS 1xx 3 EH 301 3
MA 238 or 244 3 MA 3xx or Electives 3
PH 351 3 PH 301 3
OPT 341 3 PH 3xx/4xx or Electives 3
PH 3xx/4xx or Electives 3 OPT 342 3
18

Fourth year
GER or PH 431 3 GER or PH 432 3
CM 113 3 PH 499 3
MA 3xx/4xx or Electives 3 MA 4xx or Electives 3
OPT 411 2 OPT 412 2
OPT 441 3 OPT 442 3
Electives 2
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Total 128 min.

III. Astrophysics/Astronomy Specialization Curricula
The fields of astrophysics and astronomy have seen great advances over the centuries, especially in the last few decades. The introductory physics courses included in the physics core and the courses included in the mathematics minor prepare students to study the theories of our universe. Students secure their strong exposure to physics by choosing from several upper-level physics electives, then select from a range of contemporary electives such as introductory astronomy and astrophysics, stellar and galactic structure, and high-energy astrophysics.

Graduates who complete this curriculum find work in all aspects of astrophysics from low-level atmospheric magneto-physics, to solar physics and the Sun-Earth magnetic field system and, finally, to the mysteries of dark matter and cosmology. With laboratory experience and exposure to electronics, students may also find work supporting astronomical guidance and control systems, both on terrestrial and space-borne platforms.

Besides the physics core courses, the following courses must be included for the astrophysics/astronomy certificate of specialization awarded by the College of Science: AST 106, 107, 371, and 471. In addition, 12 hours of upper-level physics or astrophysics courses are needed to meet major requirements. Suggested selections include: PH 306, 310, 311, 337, 431/432, 451/452, 474 and AST 472 and 473.

Students intending to continue on to a graduate school with an Astrophysics Specialty might consider a 5-year advanced program of study. This program incorporates all requirements for the Theoretical Physics Specialty, all requirements for the astrophysical specialty, and allows the student to take up to 9 hours of upper-level PH/AST courses at the graduate level for transfer to a graduate program. Certificates for both Theoretical and Astrophysics Specialties would also be awarded.
Model Four Year Plan for B.S. in physics with a certificate of specialization in Astrophysics/Astronomy (128 hours).

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Model Five Year Plan for B.S. in physics with a certificate of specialization in Astrophysics/Astronomy and Theoretical/Applied Physics (144-149 hours).

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>EH 101 3</td>
<td>EH 102 3</td>
</tr>
<tr>
<td></td>
<td>CH 121 3</td>
<td>CH 123 3</td>
</tr>
<tr>
<td></td>
<td>CH 125 1</td>
<td>CH 126 1</td>
</tr>
<tr>
<td></td>
<td>MA 171 4</td>
<td>MA 172 4</td>
</tr>
<tr>
<td></td>
<td>PH 110 3</td>
<td>PH 111 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PH 114 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Second</td>
<td>EH 205 3</td>
<td>EH 206 3</td>
</tr>
<tr>
<td></td>
<td>AST 106 4</td>
<td>HY 101 3</td>
</tr>
<tr>
<td></td>
<td>MA 201 4</td>
<td>MA 238 or 244 3</td>
</tr>
<tr>
<td></td>
<td>AST 371 3</td>
<td>PH 305 3</td>
</tr>
<tr>
<td></td>
<td>PH 112 3</td>
<td>PH 113 3</td>
</tr>
<tr>
<td></td>
<td>PH 115 1</td>
<td>PH 116 1</td>
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<td></td>
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<tr>
<td></td>
<td>18</td>
<td>16</td>
</tr>
</tbody>
</table>

College of Science

312
### Atmospheric/Environmental Science Specialization Curriculum

A plethora of atmospheric and environmental issues relating to man’s interaction with the natural environment are currently being studied worldwide and locally. UAH students, both undergraduate and graduate, research many aspects of these issues right here at UAH through the Atmospheric Science department, the Earth System Science Center and the Global Hydrology and Climate Center located in the National Space Science and Technology Center. Students with strong exposure to environmental change and atmospheric/geologic processes will find work in many disciplines including meteorology, groundwater protection, ecosystem regulation, remote sensing and much more.

The introductory physics courses included in the physics core and the courses included in the mathematics minor prepare students for in-depth study of the atmosphere and our environment. Students may choose from a large selection of courses throughout the range of atmospheric and environmental subjects or may choose to concentrate on specific aspects such as meteorology, remote sensing, or global change.

Besides the physics core courses, the following courses are required for the atmospheric/environmental science certificate of specialization awarded by the College of Science: ES 101, ATS 401, 441, 451, and 461. In addition, 6 hours of upper-level physics, atmospheric science or environmental science courses are needed to meet major requirements.

**Model Four Year Plan for B.S. in physics with a certificate of specialization in Environmental and Atmospheric Science (128 hours).**

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Courses</th>
<th>Spring Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First year</strong></td>
<td><strong>Second year</strong></td>
<td><strong>Third year</strong></td>
</tr>
<tr>
<td>Fall</td>
<td>Spring</td>
<td>Fall</td>
</tr>
<tr>
<td>EH 101</td>
<td>EH 102</td>
<td>CH 121</td>
</tr>
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<td>CH 125</td>
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<td>PH 114</td>
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Total 144-149 hrs.
Second year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EH 205</td>
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<tr>
<td>HY 101</td>
<td>3</td>
</tr>
<tr>
<td>ES 101</td>
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<td>MA 201</td>
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<td>PH 112</td>
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</tr>
<tr>
<td>PH 115</td>
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<tr>
<td></td>
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Third year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PH 3xx/4xx</td>
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</tr>
<tr>
<td>or GER</td>
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<tr>
<td>CS 1xx</td>
<td>3</td>
</tr>
<tr>
<td>MA 238 or 244</td>
<td>3</td>
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<td>ATS 401</td>
<td>3</td>
</tr>
<tr>
<td>PH 351</td>
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</tr>
<tr>
<td>Electives</td>
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</tbody>
</table>

Fourth year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER</td>
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<tr>
<td>CM 113</td>
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</tr>
<tr>
<td>MA 3xx/4xx</td>
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<tr>
<td>or Electives</td>
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<tr>
<td>ATS 441</td>
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</tr>
<tr>
<td>ATS 451</td>
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<tr>
<td>Electives</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>17</td>
</tr>
</tbody>
</table>

V. Engineering Physics Specialization Curriculum

Engineering Physics has long been recognized as a valuable academic program and it is well respected throughout the scientific and engineering communities. Combining the fundamentals from both fields guarantees that a graduate is well prepared for the challenges of the real world. The B.S. degree is granted in physics with the awarding of the certificate of specialization in Engineering Physics by the College of Science.

Course requirements for the Engineering Physics specialization curriculum include the required core courses for the B.S. in Physics, at least one 3xx/4xx physics course, and a minimum of 15 hours of upper level (300 - 400) courses in any engineering field. It is not required that all 15 hours be taken in a single engineering discipline. Prerequisite courses may be required for many of the upper-level engineering courses. The 15 hours of upper-level engineering courses and the one upper-level physics course replaces the 18 hours of Science Electives in the standard physics program of study so that the total number of hours in the degree program is essentially unchanged.

VI. Secondary Education

The Physics Department participates with the Education Department in the support and training of secondary school teachers that wish to earn a Physics B.S. degree and certification from the Alabama State Department of Education. Details of this teacher preparation program are listed under the Education Department in the College of Liberal Arts. The required physics courses are PH 110-116, AST 106, AST 107, PH 337, PH 305, PH 351, PH 499.
Physics Curriculum Details
For a B.S. degree with a major in physics

GER (See specific requirements for College of Science)  
Area I  51-57
Area II (CM 113 is required)  6
Area III (CH 121, 123, 125, 126 required)  12
Area IV  11-12
Area V (EH 301; CS 102, 103 or engineering equivalent, are required)  12
Physics Major—PH 110, 111-116, 301, 305, 351, 499  10-15
plus additional 18 hours at 300-level or above  45
Mathematics Minor—MA 171, 172, 201, 244, 238, one additional  24
MA course at the 300-level or above and one at 400-level or above
Electives As needed  
Total 128 min.

Astronomy/Astrophysics (AST)

100 Survey of Astronomy  
One semester survey for non-majors; topics from visible phenomena in the sky to the latest astronomical discoveries; properties of planets, origin of the solar system, life cycle of stars, galaxies and quasars, origin of the universe, life in the universe.  
3 hrs.

106 Exploring the Cosmos I  
Introduction to astronomy with emphasis on quantitative aspects of physical phenomena occurring in the universe. Motions of celestial bodies, development of astronomy, gravity and motion, light and telescopes, properties of gases and radiation, Earth and Moon, eclipses, survey of the solar system. Laboratory included. AST 106 and 107 satisfy GER laboratory science requirements. Prerequisite: high school algebra and trigonometry. Lab Fee: $40 Fall.  
4 hrs.

107 Exploring the Cosmos II  
Continuation of AST 106. The Sun, stars and stellar evolution, white dwarfs, neutron stars, and black holes, binary stars, the Milky Way galaxy, galaxies, quasars and other active galaxies, cosmology, life in the universe. Laboratory included. Prerequisite: AST 106. Lab Fee: $40. Spring.  
4 hrs.

371 Introduction to Astrophysics  
3 hrs.

471 Astrophysics  
3 hrs.

472 Advanced Astrophysics & Cosmology  
Hubble expansion, Friedmann equation, sources of energy density, age of the universe. Cosmic microwave background. Radiations in early universe, radiation and matter eras, primordial nucleosynthesis. Dark matter issues; gravitational lensing, baryonic dark matter; neutrinos and WIMPS. Development of structure in the early universe; horizon & flatness problems; inflation; Jean's mass, evolution of structure. Prerequisite: AST 471, PH453, 474, suggested PH421. Spring odd.  
3 hrs.
473 High Energy Astrophysics 3 hrs.

Optics (OPT)

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 ynu ray tracing. Prerequisites or parallel: PH 113, 305 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. Prerequisites: OPT 341, PH 305. Spring.

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. Prerequisites: PH 116, OPT 341. Suggested Co-requisite: OPT 441. Lab Fee: $50. Fall.

412 Physical Optics Laboratory 2 hrs.
Introduction to physical optics phenomena, Young's double slit experiment, Lloyd's mirror, Fresnel birefringence, 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. Prerequisites: PH 116, OPT 342. Suggested Co-requisite: OPT 442 or EE 382. Lab Fee: $50. (Same as OPE 455.) 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: OPT 342. (Same as OPE 441 and EE 461.) Fall even.

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: OPT 441 OR PH 431. (Same as OPE 442 and EE 462.) Spring odd.

444 Optoelectronics 3 hrs.
Review of polarized light and the Jones and Mueller calculi. Propagation of light in birefringent material, modulation of light using electro-optic effect, Kerr effect, acousto-optic effect, and Faraday effect. Elements of photo-detection and detectors, signal processing, and signal-to-noise ratios. 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, even.

445 Introduction to Lasers 3 hrs.
Introduction to the concepts and principles of lasers. Stimulated emission, light amplification, optical pumping, optical resonator theory, cavity modes, gas lasers, solid state lasers, laser applications, Gaussian beams, coherence, and holography. Prerequisites: PH 432, PH 451. Fall, odd.

446 Radiometry, Detectors, and Sources 3 hrs.
Theory and practice of radiometry and photometry. Blackbody radiation and Lambertian sources. The propagation of radiant energy in free space and through optical systems. Detector classes, responsivity, bandwidth, and noise. Power spectral density, properties of sources, photon noise. Prerequisite: OPT 342. (Same as PH 546, OSE 546.) Spring, even.

447 Polarized Light/Polarimetry 3 hrs.
Linear, circular, and elliptical polarization of light. Mueller and Jones calculi, Stokes vectors,

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. 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. PH 100 satisfies GER laboratory science requirements when a two-course sequence is not required. 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.

110 Frontiers in Science 3 hrs.
Introduction to the frontiers and problems facing modern physical science today. Working physicists from local companies, national labs, and the University present the role and impact physics plays in their jobs. This course exposes the student to such diverse topics as modern cosmology, relativity, quantum theory, industrial physics, biophysics, complex modeling, medical physics, etc. The importance of seeing the diversity of physics applications and the possible future employment opportunities serves as a motivator for mastering the problem solving and conceptual skills that lie ahead in the student’s undergraduate studies. Prerequisite or parallel: MA171. Fall.

111 General Physics with Calculus I 3 hrs.
For science and engineering students. Phenomenological and quantitative in nature with emphasis on understanding basic ideas of physics and ability to apply these ideas to specific problems. Vectors, Newtonian mechanics, energy, simple harmonic motion, statics, fluids. Co-requisite: PH 114. Prerequisite: MA171. All terms.

112 General Physics with Calculus II 3 hrs.
Continuation of PH 111. Heat and thermodynamics, basic electricity, electric and magnetic fields. Co-requisite: PH 115. 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. Co-requisite PH 116. 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. Co-requisite PH 111. 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. Co-requisite PH 112. 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. Co-requisite PH 113. Lab Fee: $40. All terms.

301 Intermediate Mechanics 3 hrs.
Mathematical Methods in Physics 3 hrs.
Application of analytical techniques to solve problems in physics. Complex exponentiation, Fourier series, matrix methods, differential equations and vector calculus applied to problems in mechanics, electricity and magnetism, optics, and thermodynamics. Prerequisite: PH 112. Spring.

Applied Physics 3 hrs.
Application of physical principles to solutions of realistic problems using Mathematica. Error propagation, iterative techniques, approximations, data analysis/signal processing, numerical solutions to differential equations, and basic statistical manipulations applied to systems with many degrees of freedom, non-linear systems, rotational mechanics, advanced electric field solutions, heat transfer, scattering, and diffraction. Prerequisites: PH 305 or with MA 238/244 in parallel, CS 102 or equivalent. Fall even

Intermediate Laboratory I 2 hrs.
Experimental study of laws of mechanics, acoustics, fluids. Introduction to study of statistical methods. Lab Fee: $40. Fall.

Intermediate Laboratory II 2 hrs.
Electronics instrumentation and circuits, electric fields, optics. Lab Fee: $40. Spring.

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; PH 305 suggested. Lab Fee: $40. Fall odd.

Introduction to Modern Physics 3 hrs.
Special relativity — length contraction, time dilation, simultaneity, relativistic dynamics. Kinetic theory. Quantum physics—wave packets, the uncertainty principle, Schrödinger’s equation and solutions for simple systems, application to atomic, nuclear, and solid-state physics. Prerequisite: PH 305 or with MA 238/244 in parallel. Fall.

Laboratory (Senior) 2 hrs.
Advanced experimental techniques in various sub-fields of physics. Prerequisite: PH 310 or 311. Lab Fee: $40. Fall, Spring.

Senior Thesis 3 hrs.
Semi-original work performed under direction of faculty member. All terms.

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. Prerequisite: PH 351. Prerequisite or parallel: PH 301; PH 306 suggested. Spring even years.

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 305, MA 201. Prerequisite or parallel: MA 238. Fall even years.

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 odd years.

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; Schrödinger’s equation; simple systems in one, two and three dimensions; the hydrogen atom. Prerequisites: PH 305, 351, MA 238, 244. Suggested PH 306 in parallel. (Same as PH 551, CH 553, and MTS 651.) Fall.

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.

Introduction to Particle Physics 3 hrs.
Survey of elementary particle physics with emphasis on the Standard Model of quarks, leptons, and gauge bosons. Lorentz transformations, four-vectors and relativistic kinematics, angular momentum & spin. Lifetimes, cross-sections, and Feynman rules. Quantum electro- & chromodynamics, Dirac equation, renormalization. Physics beyond the Standard Model. Pre- or
Corequisite: PH 451. Fall even years.

474 Introduction to General Relativity 3 hrs.

499 Physics Practicum 3 hrs.
"Capstone" course designed to provide real-world research experience for graduating seniors. Students work individually with faculty members on projects. Required for all physics majors and physics area minors. Prerequisite or parallel: All required courses on the POS must be taken prior to, or concurrently with, this course. All terms.
The M. Louis Salmon Library is housed in a 105,000 square foot facility which includes a state-of-the-art high-tech wing with an Information Arcade, five computer labs including: a math tutorial lab, a liberal arts lab, a nursing lab, and two Library/distance learning labs. Over 250 workstations are supported in the facility. A Media/Distance Learning support center is also housed in the Library.

The Library supports the academic and research programs of the University. It has a collection of over 325,000 print volumes, a selective collection of over 500,000 United States government publications, and over 600,000 materials in microform and manuscript collections. In addition to books and microform materials, the Library offers a broad selection of books, journals, newspapers and other serials in electronic form. Approximately 15,000 electronic periodicals, over 40,000 electronic books and over 250 databases can be accessed both on and off campus via the Library website at http://www.uah.edu/library. In addition, the University Archives/Special Collections offer a number of unique collections including the papers of former Congressman Robert Jones, the personal Library of Willy Ley, the architectural research collection of Harvie P. Jones, and several space related collections involving such projects as the Saturn V rocket, Skylab and Apollo-Soyuz.

For students in science and engineering and technology, research at UAH is supported by the Redstone Scientific Information Center (RSIC) located five miles from campus. RSIC was developed to support the wide-ranging research interests of NASA and the United States Army Missile Command and it is one of the finest technical libraries in the Southeast. UAH subscribes to numerous full-text and bibliographical databases each of which supports specific colleges including: Liberal Arts, Nursing, Administrative Science, Engineering, and Science.

The Library is privileged to provide access to many major online resources including the entire Elsevier online collection of over 1845 journal titles through Science Direct, the IEEE collection through IEEEExplore and the JSTOR (Journal Storage) collection. (All materials from the Library are available without charge to UAH faculty members and graduate students by request through the Salmon Library.) Reciprocal borrowing agreements are also in force with over 100 academic libraries and particularly with the Network of Alabama Academic Libraries (NAAL). The Library has a contract with the University of Illinois for access to its 10 million books and 100,000 serial titles. The Library is a member of several consortia that provide access to research materials not owned by libraries in north Alabama. Its membership in the Online Computer Library Center (OCLC) and the Network of Alabama Academic Libraries (NAAL) facilitates rapid document delivery/interlibrary loan service to faculty and students without charge.

Reference services are provided not only electronically through the Library’s virtual reference option but also by subject specialist librarians who staff the reference desk. The librarians are able to assist students in finding information in person, by e-mail, or phone. Group Library instruction sessions are provided to teach students how to locate, manage, and evaluate the information they need for class projects and papers. Other Library services include group study rooms, computers for writing papers, a scanner workstation, a digital audio/video room, special computer accommodations for users with disabilities and support for distance education. A new, user-friendly printing system is available in the Library InfoArcade and labs.

Planned for mid-2005 is wireless access for the library building, acquisition of a federated search tool and an open URL link resolver service.

For additional information about the Library, inquire at the Circulation Desk, (256)824-6530, the Reference Desk, (256)824-6529 or Interlibrary Loan, (256)824-6124. Library home page: http://www.uah.edu/library.
Division of Continuing Education

Wilson Hall, Room 110
Telephone: (256) 824-6013
Email: clantonk@cepo.conted.uah.edu
Web site: www.coned.uah.edu
Director: Karen Mack Clanton, B.S.B.A., M.S.M.

The Division of Continuing Education is committed to meeting the diverse needs of organizations, agencies, and individuals through non-credit and credit programs that are timely, relevant, and in accordance with the strategic directions of the University. The Division provides access to quality education and training for individuals; partners with businesses and government for workforce development; enhances public awareness of the instructional and research strengths of the University; promotes lifelong learning fostering continued growth, human fulfillment, and positive social change; and supports economic development throughout North Alabama. This objective is carried out through the following programming departments: Professional Development, Educator Programs, Academy for Lifetime Learning, and Health and Physical Education.

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 state of the art computer labs for cutting edge engineering and computer training, and a distance learning production/classroom that allows production of high quality programs for presentation in a hybrid CD ROM/Web based format. Health and physical education activities are located in the University Fitness Center, an on-campus facility that contains an indoor pool, gymnasium, weight room, indoor track, and aerobic area. Courses are also held in Spragins Hall, which maintains racquetball and tennis courts. Other continuing education activities are held at various locations throughout the community.

PROFESSIONAL DEVELOPMENT
Certificate Programs and Short Courses
The Department of Professional Development develops and presents professional training and educational activities in the areas of business and management, engineering technology, computer technology, foreign languages, and interior design. Programs are designed to allow a student the choice of attending individual courses of interest, or to complete a more structured certificate program leading to a Certificate of Professional Achievement. Courses are offered day, evening, and through eTraining Solutions, our hybrid CD ROM/Web based distance learning format, to help accommodate the busiest of schedules. Students are offered an atmosphere conducive for meeting their professional training needs, with state-of-the-art computer labs and classrooms, and instructors who are known and respected industry practitioners and researchers in their respective fields.

Certificate programs and professional review series include:

- Aerospace Propulsion Systems
- C++ Programming
- Federal Contract Management Essentials
- Federal Contract Management Specialization
- Interior Design
- ISO 9001-2000
- Java Developer
- Linux
- Modeling and Simulation
- Net Application
- Oracle Database
- Oracle Developer
- Procurement Management
Customized Training
Customized contract training is provided for organizational clients in business, industry, and government. New programs can be developed, or existing programs tailored, to meet specific needs and offered at the client’s site or at the Professional Development Department facilities on the UAH campus. Training programs can also be developed in several convenient distance learning formats. Customized programs provide a cost-effective and convenient method of employee training, structured in a format that creates a team environment, and assists in implementation of learning in the workplace.

Listener's License
The Division of Continuing Education coordinates the Listener's License program, which allows participants to attend regular credit classes, without regard to university admittance status. Listeners are not required to take tests or satisfy attendance requirements and no academic or CEU credit is awarded. Participants pay an established course fee, any associated laboratory fees, purchase a campus parking decal, and receive library privileges for the term. Only select courses are available through the Listener's License program, and courses taken through the Listener's License program may not be petitioned for credit by examination. Students under disciplinary or academic suspension from any college or university are ineligible to register as Listeners. To determine which courses are available for Listener's License, call the Professional Development Office at 824-6372.

For Information:
Professional Development
(256) 824-6372
Jo Ann N. Jones, Director
Lisa Strickland, Senior Assoc. Director
Wilson Hall, Room 210
Huntsville AL 35899-0650
jonesj@cepo.conted.uah.edu
strickland@cepo.conted.uah.edu
Web Site: www.coned.uah.edu
FAX (256) 824-6934

EDUCATOR PROGRAMS
The Department of Educator Programs designs, develops, and conducts quality credit and non-credit professional development programs to meet the in-service needs of K-12 administrators, teachers, and staff. Partnerships are developed with local schools, government agencies, and the private sector to design unique programs to meet institutional needs and achieve educational objectives. Specific programs may be conducted in local, national, and international settings. Current programs include a hands-on graduate level course, Exploring Space: The Classroom Connection, offered in conjunction with the U.S. Space and Rocket Center.

For Information:
Educator Programs
(256) 824-6835
Dr. John R. Pottenger, Director
Dottie Jordan, Program Coordinator
Wilson Hall, Room 110
THE ACADEMY FOR LIFETIME LEARNING, INC.
The Academy for Lifetime Learning, Inc. (The Academy) provides lifelong learning courses and enrichment activities designed to fulfill the educational needs of the mature, usually retired, residents of the Tennessee Valley. The Division's goal is to engage mature adults in lifelong learning and to maximize the outreach and resources of the university to the community and its constituents. The Academy is a member-governed, member-led, non-profit, volunteer organization. The Academy sponsors non-credit courses, forums, seminars, and other events to promote understanding and appreciation of subjects selected by its members. These activities are designed to satisfy members' interests in a cooperative and socially congenial manner.

The Academy curriculum includes a wide range of courses: Art, Computer, Creative Writing, Economics, Estate Planning, Foreign Languages, Foreign Policies, Government, Great Books, History, Investments, Law, Leisure, Literature, Medical Issues, Music, Nature Studies, Poetry, Politics, Psychology, Science, Space Exploration, and much more. Courses are offered during fall, winter, and spring, with most meeting one day a week for eight weeks for approximately 1.5 hours each class. Each course is taught by qualified volunteer instructors, and course activities require no tests or grades.

For Information:
The Academy for Lifetime Learning
(256) 824-6959
Mary Pat Bohrman, Outreach Coordinator
Wilson Hall, Room 110
Huntsville AL 35899-0650
bohrmanmp@cepo.conted.uah.edu
Web Site: www.ALLUAH.com

HEALTH & PHYSICAL EDUCATION
The Department of Health and Physical Education (HPE) supports the mission of the university by providing quality teaching and service through a variety of health, wellness, fitness, and recreational courses and by developing partnerships with organizations that are responsive to the needs of our students and the greater community. The unique and diverse courses are based upon timely, relevant, and basic and applied research that will promote an establishment of healthy activities for a lifetime. Emphasis is placed upon enhancing and maximizing health, physical performance, lifetime fitness, and disease prevention for students, faculty, and staff, and increasing public awareness of the social implications of current health issues. The HPE Department works to update and improve academic offerings to keep pace with the continually growing fields of physical education, health, exercise science, recreation, leisure, and sports.

Facilities
The Department of Health and Physical Education is housed primarily in two buildings: Spragins Hall and the University Fitness Center. Renovated in 2003, Spragins Hall has been host to the UAH athletic teams since 1977. It features a 2,250-seat gymnasium, three racquetball courts, weight room, exercise floor, and training facility. Located adjacent to Spragins Hall is a six court tennis facility.

The state-of-the-art University Fitness Center opened in 2001. It is equipped with several group exercise rooms and a 6,000 sq. ft. weight room containing over 70 pieces of exercise machines and free weight equipment. The Cardiovascular Center offers a choice of over 40 pieces of equipment including treadmills, elliptical machines, steppers, and bikes. The swimming pool is 25 yards in length and has six lanes for lap swimming. Three collegiate-size basketball courts and a suspended 4-lane indoor track are also located under the Fitness Center's roof. Other facilities include volleyball, sand volleyball, table tennis, and badminton.
Activity Courses
The HPE department offers a wide variety of knowledge and experience in physical fitness, recreation, sports, and healthy activities through its 100-level courses. These courses are continually updated to utilize the latest equipment and practices within the field. Students will have opportunities to improve fitness, learn skills, and participate in a variety of activities while gaining the knowledge to implement healthful practices.

Professional Courses
The HPE department offers professional courses (200-level and above) in nutrition, health, athletic training, exercise science, and related fields. These courses provide both skills and academic training preparing the student for further studies or careers in Health and Physical Education. Many of these courses complement degree programs with an athletic training or exercise physiology emphasis.

HPE Registration
Students register for HPE credit courses through Charger Central. Dates, times, procedures and eligibility requirements for registration are published in the UAH Schedule of Classes, which is available in Charger Central, the Academic Advising offices, and on the UAH website. Please consult your department of major for specific guidelines on elective courses. NOTE: Part-time students (registered for less than 12 credit hours) taking HPE classes that meet in the University Fitness Center (UFC) will be required to purchase membership to the UFC. Membership rates are based on the total number of credit hours for which you are enrolled. Fees apply for the duration of the course.

For Information:
Health and Physical Education Program
(256) 824-6007
David L. Kyle, M.A., Associate Director
108 Spragins Hall
Huntsville, AL 35899-0650
kyled@uah.edu
Web site: www.coned.uah.edu/health.cfm

Health and Physical Education (HPE)

Activity Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Lab Fee</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Aerobics I</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>101</td>
<td>Aerobics II</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>102</td>
<td>Step Aerobics I</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>103</td>
<td>Step Aerobics II</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>104</td>
<td>Kardio Kickbox</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>107</td>
<td>Bootcamp Fitness</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>109</td>
<td>Speed &amp; Plyometric Training</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>110</td>
<td>Jogging for Fitness</td>
<td>$10</td>
<td>1 hr.</td>
</tr>
<tr>
<td>111</td>
<td>Butts &amp; Guts Workout</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>112</td>
<td>Fitball Conditioning</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>113</td>
<td>Body Sculpting</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>117</td>
<td>Weight Training I</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>117</td>
<td>Weight Training I for Women Only</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>118</td>
<td>Weight Training II</td>
<td>$20</td>
<td>2 hrs.</td>
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<tr>
<td>118</td>
<td>Weight Training II for Women Only</td>
<td>$20</td>
<td>2 hrs.</td>
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<tr>
<td>119</td>
<td>Weight Training III</td>
<td>$20</td>
<td>2 hrs.</td>
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<tr>
<td>119</td>
<td>Weight Training III for Women Only</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>120</td>
<td>Beginning Swimming</td>
<td>$20</td>
<td>1 hr.</td>
</tr>
<tr>
<td>121</td>
<td>Intermediate Swimming</td>
<td>$20</td>
<td>1 hr.</td>
</tr>
<tr>
<td>122</td>
<td>Advanced Swimming</td>
<td>$20</td>
<td>1 hr.</td>
</tr>
<tr>
<td>123</td>
<td>Deep Water Workout I</td>
<td>$20</td>
<td>2 hrs.</td>
</tr>
</tbody>
</table>
130 Beginning Karate. Lab Fee: $20.
132 Advanced Karate. Lab Fee: $20.
134 Beginning T’ai Chi. Lab Fee: $10.
136 Yoga. Lab Fee: $10.
137 Judo/Jujitsu. Lab Fee: $10.
140 Beginning Ballroom Dance. Lab Fee: $10.
142 Swing Dance. Lab Fee: $10.
143 Latin Dance. Lab Fee: $10.
150 Beginning Racquetball. Lab Fee: $20.
152 Advanced Racquetball. Lab Fee: $20.
153 Beginning Tennis. Lab Fee: $10.
154 Intermediate Tennis. Lab Fee: $10.
155 Advanced Tennis. Lab Fee: $10.
156 Golf I. Lab Fee: $80.
157 Golf II. Lab Fee: $80.
167 Rock Climbing. Lab Fee: $120.
168 Fencing. Lab Fee: $35.
169 Basketball. Lab Fee: $10.
170 Volleyball. Lab Fee: $10.
174 Billiards. Lab Fee: $30.
175 Beginning Bowling. Lab Fee: $30.
199 Special Topics in Health & Physical Education. Lab Fee: Variable.

Professional Courses

200 Contemporary Nutrition 2 hrs.
This course is intended for anyone with a personal interest in learning the basic principles of nutrition as they relate to the growth, development, and maintenance of the human body. Lab fee: $20.

205 First Aid & CPR. 1 hr.
Students will focus on recognizing emergency situations. First Aid and CPR also provides skills and knowledge necessary in caring for injuries or sudden illnesses. Lab Fee: $20.

210 Beginning Athletic Training 3 hrs.
Presents the knowledge and techniques necessary to prevent and/or care for common athletic injuries. For coaches, athletes, and those working in recreation, physical education, or athletics. Lab Fee: $20.

220 Basic Scuba 2 hrs.
Basic skills, theories, techniques, and fundamentals of scuba diving are introduced, practiced, and refined including open water diving. Scuba certification is available upon successful completion of course. Student must provide mask, fins, and snorkel. Cost of open water dives not included in lab fee. Lab Fee: $110.

221 Advanced Scuba 1 hr.
Presents skills and knowledge for deep diving (80+ feet). Limited visibility diving, and advanced navigation techniques. Earn YMCA advanced open water certification. Students must provide mask, fins, and snorkel. Cost of open water dives not included in lab fee. Prerequisites: Open water certification, minimum of 6 logged dives. Lab Fee: $20.

230 Private Pilot Ground School 3 hrs.
Prepares student for FAA Private Pilot written examination. Provides student with necessary knowledge to progress into primary pilot flight training. A kit for approximately $150 must be purchased.

231 Instrument Airplane (IFR) Rating 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. A kit for approximately $150 must be purchased.

300 Nutrition for Fitness and Sport 3 hrs.
Explore the theoretical and applied nutritional sciences as they relate to fitness and sport. Develop
skills applicable to solving nutritional problems in exercising populations. Prerequisite: HPE 200.

**311 Advanced Athletic Training**

Provides students with an advanced study in the profession of sports medicine. Topics include care and prevention of injury, legal concerns, administration of sports medicine, and physiology of injury and exercise. Lab Fee: $20.

**312 Athletic Training Practicum**

Planned supervised 80-hour work experience with a physical education, athletic, or leisure service program. Written reports, a major project, and final oral report are required. Lab Fee: $20.

**351 Exercise Testing and Prescription**

Provides students with techniques that evaluate aerobic capacity, muscular strength and endurance, flexibility, and body composition. The development of exercise prescriptions based on evaluation results will be emphasized. Lab Fee: $50.

**450 Exercise Physiology Internship**

Designed to provide practical experience and understanding of wellness/fitness programs including implementation and supervision of group and individual exercise programs, health education projects and administrative duties. Lab Fee: $20.

### CE REGISTRATION SERVICES

The Continuing Education (CE) Business Office, located in Wilson Hall, Room 124, provides registration services for all non-credit and selects credit courses offered by the Division. Call (256) 824-6010 or 1-800-448-4031 to obtain a current course catalog, or visit our Web Site at http://www.coned.uah.edu. There is no application process for non-credit courses, and enrollments are taken throughout the year.

#### Non-Credit Courses

One CEU is awarded for each ten contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction. UAH awards Continuing Education Units (CEUs) and a certificate of completion to each person who successfully completes a CEU designated non-credit course. Transcripts are available upon written request from the Continuing Education Business Office, for a $4 fee per transcript.

#### HPE Credit Courses

Students register for HPE credit courses through Charger Central. Dates, times, procedures and eligibility requirements for registration are published in the UAH Schedule of Classes, which is available in Charger Central, the Academic Advising offices, and on the UAH website. Please consult your department of major for specific guidelines on elective courses.

### For Information:

Continuing Education Business Office
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Wilson Hall, Room 124
Huntsville, AL 35899-0650
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ANDERSON, MICHAEL D., B.S., M.S., Ph.D. (Iowa State University), Assistant Professor of Civil and Environmental Engineering, 1998.* Research Interests: Transportation and traffic engineering, intelligent transportation systems, urban planning, and applications of geographic information systems to transportation. Email: mkeea@cee.uah.edu

AYGUN, RAMAZAN, S., B.S (Bilkent University, Turkey), M.S. (Middle East Technical University, Turkey), Ph.D. (State University of New York, Buffalo). Assistant Professor of Computer Science. 2003.* Research Interests: Multimedia databases, multimedia synchronization, modeling and verification of multimedia systems. Email: raygun@cs.uah.edu

BAIRD, JAMES K., B.S. (Yale University), M.A., Ph.D. (Harvard University). Chair and Professor of Chemistry, and Director, Joint Materials Science Doctoral Program. 1982.* Research Interests: Diffusion in solids, crystal growth, critical phenomena, shock waves and plasmas. Email: bairdj@uah.edu

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BELL, DIANA, B.A. (Marshall University), M.A. (Northwestern State University), D.A. (Illinois State University). Associate Professor of English and Director of the Writing Center, 1996.* Research Interests: Writing pedagogy, writing and technology, writing center administration, and educational reform. Email: belldc@uah.edu

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BERKOWITZ, DAVID, B.S. (Rutgers University, Camden), M.B.A. (University of Texas, Austin), Ph.D. (University of Alabama). Director of CMOST and Associate Professor of Marketing, 1997.* Research Interests: New product diffusion and adoption, new product
development, international marketing and international product management. Email: berkowd@uah.edu

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BOUCHER, PHILIP P., B.A. (University of Hartford), M.A., Ph.D. (University of Connecticut). Distinguished Professor of History, 1974.* Research Interests: Colonial Americas, especially French. Email: boucherp@uah.edu

BOWEYER, DONALD, B.A. (West Virginia Wesleyan College), M.A. (California State University, Northridge), D.A. (University of Northern Colorado), Associate Professor of Music, 1998. Research Interests: Music technology, composition, jazz. Email: bowyerd@uah.edu

BOYD, LYNN, B.A. (Wake Forest University), Ph.D. (University of Utah), Associate Professor of Biological Sciences, 1998.* Research Interests: Cell polarity in early development of caenorhabditis elegans, the role of the par-2 gene in cell polarization, proteins that interact with actin. Email: boydl@uah.edu

BOYKIN, TIMOTHY B., B.S.E.E. (Rice University), M.S.E.E., Ph.D. (Stanford University). Associate Professor of Electrical and Computer Engineering, 1992.* Research Interests: Theory and modeling of compound and quantum semiconductor devices; physics of nanoelectronic devices; solid-state devices. Email: boykin@ece.uah.edu

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BUKSA, IRENA, M.A. (University of Warsaw, Poland), D.A. (Syracuse University). Associate Professor of Slavic Languages, 1990. Research Interests: Russian/Slavic linguistics and 20th Century Russian literature. Email: buksai@uah.edu

BURNETT, JOHN E., B.S. (University of New Mexico), M.A. (Claremont Graduate University), Ph.D. (University of Alabama, Tuscaloosa). Associate Professor of Finance, 1992.* Research
Interest: Investments. Email: burnettj@uah.edu

BUSBY, STEVEN T., B.S.N. (Troy State University), M.S.N. (University of South Alabama). Clinical Assistant Professor of Nursing, 2003.* Email: busbys@uah.edu

CARPENTER, SANDRA L., B.A. (California State University), Ph.D. (University of California). Chair and Professor of Psychology, 1989.* Research Interests: Social, personality, and cognitive psychology, categorization of information about ourselves, information about other people, causes of anger and consequences of categorizations. Email: carpen@email.uah.edu

CASSIBRY, JASON T., B.S. (University of Missouri, Rolla), M.S. (University of Illinois), Ph.D. (University of Alabama in Huntsville). Assistant Research Professor of Mechanical and Aerospace Engineering, 2005.* Email: cassibj@uah.edu

CATES, JOHN, B.A. (University of Alabama in Huntsville), J.D. (Cumberland School of Law). Clinical Assistant Professor of Business Legal Studies, 2004. Email: catesj@uah.edu.

CERRO, RAMON L., B.S. (Universidad Del Litoral, Argentina), M.S., Ph.D. (University of California, Davis). Chair and Professor, Chemical and Materials Engineering, 1997.* Research Interests: Theoretical and experimental fluid mechanics, heat and mass transfer, physicochemical hydrodynamics, coating flows, drops and bubble dynamics. Email: rle@eb.uah.edu

CHEN, CHIEN P., B.S. (National Taiwan University), M.S., Ph.D. (Michigan State University). Professor of Chemical Engineering, 1986.* Research Interests: Multiphase flows, combustion, computational fluid dynamics, turbulent transport, micro-electronic packaging. Email: cchen@che.uah.edu

CHEN, LI QING, B.S. (University of Science and Technology, China), M.S. (Fujian Institute of Research, Chinese Academy of Sciences), Ph.D. (University of Pittsburgh). Associate Research Professor of Chemistry, 1998.* Research Interests: X-ray crystallography, structural biology, structural genomics, structure-based drug discovery and development. Email: chenlq@uah.edu

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CHRISTOPHER, SUNDAR A., B.E. (Madras University), M.S. (South Dakota School of Mines and Technology), M.A. (The University of Alabama in Huntsville), Ph.D. (Colorado State University). Associate Professor of Atmospheric Science, 1997.* Research Interests: Satellite remote sensing, earth radiation budget. Email: sundar@nsstc.uah.edu

CHRISTY, JOHN R., B.A. (California State University), M.Div. (Golden Gate Baptist Theological Seminary), M.S., Ph.D. (University of Illinois). Professor of Atmospheric Science, 1991.* Research Interests: Climate, satellite observations, State Climatologist. Email: christy@nsstc.uah.edu

CHUNG, T.J., Engineering Diploma (Seoul National University), M.S., Ph.D. (Oklahoma State University). Distinguished Professor of Mechanical Engineering, 1970.* Research Interests: Computational fluid dynamics, continuum mechanics, numerical modeling of combustion and propulsion, fluid dynamics, heat transfer, and transport phenomena. Email: tchung@mae.uah.edu


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COE, DAVID, B.S. (Duke University), M.S., Ph.D. (Georgia Institute of Technology). Assistant Professor of Electrical and Computer Engineering, 2002.* Research Interests: Microelectromechanical systems (MEMS) design and fabrication, Integrated Microsystems combining MEMS and VLSI, development of new microfabrication processes. Email: coe@ece.uah.edu

COLCLOUGH, GLENN, B.A., M.A. (Kent State University), Ph.D. (University of Georgia). Associate Professor of Sociology, 1984.* Research Interests: Organization of work and social stratification. Email: colclog@uah.edu

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COLEMAN, HUGH W., B.S. (Mississippi State University), M.S., Ph.D. (Stanford University). Professor of Mechanical Engineering, 1991.* Research Interests: Propulsion, uncertainty analysis, experimentation. Email: coleman@mae.uah.edu

COMPOSITION, PAUL J., B.S. (West Virginia University), M.S. (Troy State University), Ph.D. (West Virginia University). Associate Professor of Industrial and Systems Engineering and Engineering Management, 1996.* Research Interests: Product and system development, decision analysis, engineering economics, manufacturing systems. Email: pjc@ise.uah.edu

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CORSETTI, CHARLES, B.E. (Manhattan College, New York), M.S., Ph.D. (Air Force Institute of Technology, Ohio), Lecturer in Electrical and Computer Engineering, 1999. Research Interests: Design and analysis of real-time digital and analog systems, and development of software programs and documentation, engineering applications of MATLAB, SIMULINK, MATHCAD and electronics workbench. Email: corsetti@ece.uah.edu

COST, THOMAS L., B.S.A.E. (University of Alabama, Tuscaloosa), M.S.A.E. (University of Illinois), Ph.D. (University of Alabama, Tuscaloosa), P.E. Professor of Mechanical Engineering, 1985.* Research Interests: Finite element hyperelastic materials, microstructural changes, energy functions, strain invariants, parabolic membranes, mass additive methods for model testing. Email: tcost@mae.uah.edu

CROUSE, MICHAEL G., B.F.A. (Atlanta College of Art), M.F.A. (University of Michigan). Professor of Art, 1980. Research Interests: Multiple color lithographic, screen prints, and collagraph prints that explore our ideas, concepts, and myths about the vernacular landscape (rural, urban, and suburban) in both historical and contemporary contexts. Landscapes that have been shaped and altered by our automobile culture and employ several of the political and social tenets and pictorial conventions found in nineteenth-century American landscape painting. Email: crousem@uah.edu

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DROST, JOHN, Lecturer in the Library, 2001. Research Interests: Library automation systems, UNIX, Sirsi and BRS software applications, awk and sed scripting and the Sirsi API Interface. Email: drostj@uah.edu
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EAKER, LISA M., B.S., M.S. (Florida State University), Ph.D. (Virginia Tech). Assistant Professor of Education, 2003.* Research Interest: Modernist notions of atomistic individualism both constrain and afford the possibilities for meaningful social action. Why are social problems often treated as individual maladies? Email:eakerl@uah.edu
EARLY, JULIE E., B.A., M.A. (Michigan State University), A.M.L.S. (University of Michigan), Ph.D. (University of Chicago). Associate Professor of English, 1990.* Research Interests: Victorian and Edwardian literature and culture, the novel. Email:earlyj@uah.edu
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ENG, SANDRA, B.S., M.S. (Winona State University), Ph.D. (University of Iowa). Coordinator of Science Education and Associate Professor of Education, 1998.* Research Interests: Creating and examining science learning opportunities in the classroom, science education reform, student assessment in the science classroom, using original work to create laboratory experiences. Email: enger@uah.edu
ENGLISH, JENNIFER, B.S., M.S., Ph.D. (Georgia Institute of Technology). Assistant Professor of Electrical and Computer Engineering, 2000.* Research Interests: The design and fabrication development of MEMs devices using silicon and ceramic-based materials, the integration of CMOS and MEMs fabrication, MEMs packaging, implementing control schemes for MEMs and wireless operation of MEMs devices. Email: english@eb.uah.edu
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Interests: Software engineering (software reuse and object-oriented software metrics, software quality metrics), distributed systems (CORBA), artificial intelligence (knowledge-based systems, program understanding, natural language processing), computer networks (primarily protocols).

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FINLEY, NANCY, J., B.A., M.A., Ph.D. (University of Oklahoma). Interim Director of Women's Studies and Associate Professor of Sociology, 1982. Research Interests: Sociology of gender, marriage and family, feminist theory and social movements. Email: finleyn@uah.edu

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FORK, RICHARD L., B.S. (Principia College), Ph.D. (Massachusetts Institute of Technology), Professor in Electrical and Computer Engineering, 1994.* Research Interests: Scaling of modelocked lasers to high peak power and high average power, space solar power, modelocked laser based sensing. Email: fork@ece.uah.edu

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GHOLSTON, SAMPSON, B.S. (Austin Peay State University), M.S. (University of Alabama), Ph.D. (University of Alabama, Huntsville), Associate Professor of Industrial and Systems Engineering and Engineering Management, 1997.* Research Interests: Quality engineering, supplier development applied statistics, engineering management. Email: gholston@ise.uah.edu


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