1989

1989-1990 Undergraduate Catalog

University of Alabama in Huntsville

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Undergraduate Catalog 1989-1990
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The University of Alabama in Huntsville also reserves the right to modify its institutional policies from time to time. Students enrolling in the University are subject to current policies and rules as contained herein and as subsequently stated or modified by official institutional action.
### Class Periods

<table>
<thead>
<tr>
<th>Period</th>
<th>Monday, Wednesday, Friday</th>
<th>Time</th>
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<tr>
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<tr>
<td>C</td>
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</tr>
<tr>
<td>D</td>
<td>12:15 p.m.-1:30 p.m.</td>
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<td>F</td>
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<tr>
<td>T</td>
<td>8:10 p.m.-10:10 p.m.</td>
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</tr>
</tbody>
</table>

### The UAH Term System

UAH has four identical terms, each spanning ten weeks plus an exam week. Credit for course work is granted in standard semester-hour units.

### General Information Center

The General Information Center located in Room 124 of the University Center is available to all students, prospective students, and the public to obtain information about The University of Alabama in Huntsville.
ACADEMIC CALENDAR 1989-90

Fall Term 1989-90

Labor Day Holiday ........................................... September 1, 4, 5, 1989
Registration .................................................. September 14, 15
First Saturday Class ......................................... September 16
Classes Start .................................................. September 18
Thanksgiving Holidays ....................................... November 23, 24
Last Class ..................................................... November 28
Study Day ...................................................... November 29
Exams .......................................................... November 30
Exams, Sunday .................................................. December 1, 4, 5
Commencement, Sunday ....................................... December 10
Christmas Holidays ........................................... December 22, 25, 26
Christmas Holiday continued ............................... December 27, 28, 29

Winter Term 1989-90

New Year's Day Holiday ....................................... January 1, 1990
Registration .................................................... January 3
Classes Start .................................................. January 4
Last Class ...................................................... March 14
Study Day ....................................................... March 15
Exams ........................................................... March 16, 17, 19, 20

Spring Term 1989-90

Registration .................................................... March 23, 1990
First Saturday Class ......................................... March 24
Classes Start .................................................. March 26
Memorial Day Holiday ........................................ May 28
Last Class Day .................................................. June 1
Exams ........................................................... June 2, 4, 5, 6
Commencement, Sunday ..................................... June 10

Summer Term 1989-90

8 Week Term

Registration .................................................... June 15, 1990
Classes Start .................................................. June 18
Independence Day ............................................. July 4
Last Class Day .................................................. August 13
Study Day ....................................................... August 14
Exams ........................................................... August 15, 16, 17

10 week Term

Registration .................................................... June 15, 1990
Classes Start .................................................. June 18
Independence Day Holiday .................................. July 4
Last Class Day .................................................. August 27
Study Day ....................................................... August 28
Exams ........................................................... August 29, 30, 31
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The University of Alabama in Huntsville is a campus of The University of Alabama System. It is a teaching and research institution dedicated to excellence in the promotion of the intellectual, technological, and economic enhancement of the state, region, and nation. The University offers a wide range of academic and professional majors at the bachelor's and master's levels and a specialized selection of doctoral level programs.

The University is committed to developing a faculty of the highest quality, and to providing an environment which facilitates its continued intellectual and professional growth. The University Faculty is, in turn, committed to stimulating the intellectual development of its students.

The institution recognizes its responsibility to prepare its students to take leadership roles, think creatively and critically, and communicate clearly; to respect knowledge and the pursuit of truth; and to engage in the challenge and pleasure of a lifetime of learning. Because of its location in a technologically oriented major population center, UAH offers educational opportunities for traditional students and those individuals who are beyond the traditional college age.

UAH recognizes its responsibilities to the Huntsville community and the surrounding region, one of the nation's key centers for governmental and industrial advanced technological research. In meeting those responsibilities the institution provides unusual opportunities for new and creative programs, especially in science, engineering, primary care medicine, and related areas. One of the distinguishing characteristics of UAH is its sustained core of basic and interdisciplinary research, augmented by its research centers which focus on areas of national high priority. Both the research activities and classroom experiences at UAH are supported by contemporary computer technology.

Through the excellence of its academic programs, faculty research and student support activities, UAH provides unique opportunities for the personal and professional development of each student. UAH, through its graduates and its programs, aspires to contribute to the economic advancement, cultural enrichment, and quality of life.
General Information

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 in physics and engineering were initiated in 1971. In 1973 UAH received its first residents in family practice and its first medical students taking electives toward their M.D. degree from the University of Alabama School of Medicine. UAH’s first full-time medical students began their core clinical experience at the Huntsville component of the University of Alabama School of Medicine in the fall of 1974.

This brief chronology indicates that the programs at UAH are still in the developing stages, a characteristic of viable programs in any university. UAH was brought into being to meet the specific needs of a scientific and technological enterprises and the cultural and intellectual needs of a rapidly expanding region. Since UAH is new, it is relatively unfettered by tradition and patterns of established practice. It is our 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
UAH is accredited by the Southern Association of Colleges and Schools.

Degree Programs
The degree programs at UAH are administered by the Colleges of Administrative Science, Engineering, Liberal Arts, Nursing, Science, and the School of Graduate Studies. Medical students taking clinical clerkships and electives at the UAH School of Primary Medical Care are admitted and receive their M.D. degrees through the School of Medicine in Birmingham.
Continuing Education

The Division of Continuing Education offers noncredit activities in a variety of subjects for individual enrichment and professional advancement. The division offers professional development and certificate programs primarily for adults who are not interested in pursuing a traditional degree but who desire an organized sequence of study in a specialized area at university level.

Library

The UAH Library is being developed to give maximum support to the academic and research programs. Its more than 279,221 volumes of monographs and journals reflect great care in selection; more than 664,941 items such as microfiche, federal documents, maps, technical reports, and sound recordings provide supplementary sources for special purposes. Acquisition of library resources has high priority. Courses in bibliography are offered by the professional library staff.

The availability of the Redstone Scientific Information Center, with holdings in science and technology that make it possibly the finest technical library in the Southeast, adds substantial strength to UAH programs, particularly at the graduate level.

Faculty

The faculty has been assembled from leading universities throughout the United States and abroad. Its quality is evidenced in its writing, research, and reputation in the academic world.
Facilities

The 337-acre UAH campus is in northwest Huntsville adjacent to Research Park. The 17 university buildings, all of which have been constructed since 1960, contain modern equipment and exemplify modern functional design. The 10-acre medical campus is in the downtown medical district and provides two modern buildings for medical education and patient health care.

Morton Hall, which is the oldest building on campus, houses classrooms and offices for the College of Liberal Arts and the College of Administrative Science. Computer laboratories for both Colleges are also housed in Morton Hall.

The Science Building contains classrooms and laboratories for programs in biological, environmental, and physical sciences and offices for the dean and some of the faculty in the College of Science. The building has modern laboratory equipment including a penthouse containing a live animal room and greenhouse. Interactive computer terminal facilities are also located here.

The former Auto Check building houses the Kenneth E. Johnson Research Center and the Alabama Solar Energy Center.

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

The Research Institute houses Research Administration and laboratory space and equipment to support experimental research. Additionally, it houses the university computer facility, the computer science department and the office of the state climatologist.

The Engineering Building was constructed in two phases. Phase One houses the Office of the Dean, and offices, classrooms and laboratories for the Departments of Electrical and Computer Engineering and Mechanical Engineering. Phase Two houses the offices for the Department of Industrial and Systems Engineering as well as additional classrooms and laboratories.

The recently remodeled and enlarged contemporary University Center houses the Division of Student Affairs, the Office of Admissions and Records, the Academic Advisement and Information Center, Career Planning and Placement Office, Cooperative Education Office, University Bursar's Office, Student Government Association, the Office of Testing Services, and Exponent. It has facilities for dining, assemblies, meetings, dramatic presentations and recreational activities as well as housing the University Bookstore.

The Frances C. Roberts Hall, a two-unit complex, houses many of the faculty of music, art, foreign languages and history. In addition to instructional programs in the humanities, it contains large lecture rooms for varied university programs.

The College of Nursing Building is a contemporary triangular structure. Its four levels contain administration and faculty offices, classrooms, service areas, and a large and well equipped Learning Resources Center.
The Alumni House, formerly the Continuing Education Center, houses the offices of alumni affairs, development, and governmental relations of the Office of University Advancement.

The Marion Beirne Spragins Hall has classrooms and offices for Health and Physical Education and Athletic Department faculty and staff, a gymnasium with a seating capacity of 2800, a swimming pool, handball courts, and other physical education and recreational facilities.

The Central Receiving and Shipping Building houses the shipping and receiving office and storage facility, the Central Mail Room, and Reproduction and Duplication Department.

The Physical Plant Building contains offices, shops, and storage areas for the Physical Plant Department, which include administrative offices, custodial services, campus police, campus safety, maintenance, grounds services, and the motor pool.

The Tom Bevill Center is one of the newest buildings on campus and has 100 hotel rooms, a restaurant, offices for the U.S. Army Corps of Engineers Training Division and the University’s Division of Continuing Education, meeting rooms, and computer labs. It also has sophisticated audio-visual systems, computer networking, links to Huntsville’s new 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 Clinical Science Center in the downtown medical district contains the School of Primary Medical Care administrative offices and academic support services, including the Health Sciences Library and the Office of Audio-visual and Production Services. The building is the headquarters for the school’s medical student, continuing medical education, and emergency medical technician-paramedic training programs. It contains classrooms, faculty offices, and research laboratories.

Adjacent to the Clinical Science Center is the UAH Medical Clinics building, which houses patient care services in family practice (the UAH Family Practice Center), internal medicine, obstetrics and gynecology, pediatrics, and psychiatry, as well as patient education services, clinical-support services, faculty offices, and the administration of the UAH-Huntsville Hospital Family Practice Residency Program.

Library

The UAH Library, a three-story, two-building unit, is made up of the first two phases of a library complex that will form the center of a cluster of academic buildings projected for the campus.

The Library supports the academic and research programs of the University. It has a collection of 300,000 volumes along with collections of U.S. Government Documents, sound recordings, materials in microform and microfiche, and manuscript collections designed to support the efforts of students and faculty. In addition, the library currently receives almost 3,000 periodicals. For students in the social sciences and humanities, microfiche collections such as the Evans Imprint series and the Library of American Civilization and slide collections on Afro-American art are of particular value. For students in the sciences, work at UAH is supported by the Redstone Scientific Information Center which is located five miles from campus. This library was developed to support the wide-ranging research interests of NASA and the United States Army Missile Command, and its collections of 300,000 volumes and 3,300 journal subscriptions along with more than 1.3 million research reports make it one
of the finest scientific libraries in the southeast. It is available without charge to faculty members and graduate students of the University. Reciprocal borrowing agreements are also in force with Alabama A&M University and the University of North Alabama to allow UAH students free access to those libraries.

The library is also a member of several consortia that are designed to bring research materials not otherwise available to campus. Its membership in OCLC, the Network of Alabama Academic Libraries, and Alabama Library Exchange all are designed to facilitate rapid Interlibrary Loan Service to students without charge.

Library services, including study rooms, orientations for classes, and online bibliographic database searching, are designed to assist in the research effort. The library catalog is available online from any terminal attached to the University computer or through dial access.

A library handbook detailing individual services of the library is available without charge at the library's reference desk.

University Housing

The university provides both on-campus and off-campus housing for a limited number of students. The university owns 88 two and three-bedroom apartment units conveniently located to the campus. On-campus residence facilities are available for full-time single students, handicapped students, and married students without children. The new on-campus residence halls consist of one-bedroom apartments for married and handicapped students and three-bedroom multiple occupancy apartments for single students.

The University Noojin House

Built in 1950 as the private residence of F. Kenneth Noojin, the house became available to the community through acquisition by the University of Alabama Huntsville Foundation, which in turn gave the facility to the University. The house is available for receptions, conferences, luncheons, parties, and workshops. The faculty, staff, students and community are encouraged to utilize the gracious facility.
The University of Alabama in Huntsville welcomes inquiries and applications from interested persons who wish to further their education. The student body is composed of individuals of all ages—traditional full-time college students and other adults who are combining their educational pursuits with work, family, and various activities. Prospective students should apply well in advance of the date of proposed entrance.

Application forms, detailed application instructions, and information brochures are available at the Office of Admissions in the University Center. A copy of the UAH catalog is mailed to each new student upon admission to the University; additional copies are available for purchase in the UAH bookstore.

Information for prospective students is available through the Office of Admissions. Campus tours on an individual or group basis are available (phone 895-6070). Faculty members and academic advisors (phone: 895-6290) are eager to confer with interested individuals to discuss their enrollment plans and opportunities at UAH.

Admission Policies

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

- students who are seeking degrees (Degree Bound) and
- those who have no immediate degree plans (Nondegree Students)
- and have never attended any college (freshmen)
- those who are transferring from one or more previous colleges (transfers)
- students who are currently in their senior year of high school and
- students who are fully qualified (Regular) and
- students who are presently in high school and are academically talented and who wish to enroll concurrently in courses at UAH (Early Start Program)
- students who have already earned a baccalaureate degree and are seeking another baccalaureate degree (Second Bachelor’s Degree) or
- those who are taking courses on a nondegree or preparatory basis for graduate school (Nondegree postgraduate, i.e., NPG)
Eligibility for Admission as a Regular Student

Admission as a regular student is based upon high school and previous college performance, if applicable as well as scores on specified tests. See table below.

### Required Application Materials

<table>
<thead>
<tr>
<th>Classification</th>
<th>Application Forms</th>
<th>$20 fee* Forms</th>
<th>High School Transcripts</th>
<th>ACT Scores</th>
<th>GED Scores</th>
<th>College Transcripts</th>
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<td>GED Recipient</td>
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<tr>
<td>ESP</td>
<td>Contact Office of Admissions</td>
<td>Phone: 895-6070</td>
<td></td>
<td></td>
<td></td>
<td>2 copies from each institution attended</td>
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<tr>
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</table>

Internationals See pages 17 to 18

*Nonrefundable

### High School Graduates

High school graduates may be admitted as regular freshmen on the basis of acceptable high school records and scores achieved on the American College Testing (ACT) program examinations (SAT accepted as substitute for ACT). The two factors of grades and scores are considered together. Higher results in one area are able to offset lower performance in the others. For example, an applicant who earns an ACT score of 21 must have at least a 2.25 average in high school academic units in order to qualify for admission. See the chart below for further definition.

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

<table>
<thead>
<tr>
<th>If ACT score is</th>
<th>If SAT score is</th>
<th>THEN For Regular Admission Minimum High School Grade Point Average in Academic Units Must Be</th>
</tr>
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<tbody>
<tr>
<td>14 or below</td>
<td>750 or below</td>
<td>3.25</td>
</tr>
<tr>
<td>15</td>
<td>800</td>
<td>3.00</td>
</tr>
<tr>
<td>16 - 17</td>
<td>850</td>
<td>2.75</td>
</tr>
<tr>
<td>18 - 19</td>
<td>900</td>
<td>2.50</td>
</tr>
<tr>
<td>20 - 21</td>
<td>950</td>
<td>2.25</td>
</tr>
<tr>
<td>22</td>
<td>1000</td>
<td>2.00</td>
</tr>
<tr>
<td>23 and above</td>
<td>1050 and above</td>
<td>1.15</td>
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</table>

NOTE: THE COLLEGE OF ENGINEERING Requires A MINIMUM ACT SCORE OF 19 OR AN SAT SCORE OF 900 FOR ADMISSION TO THE COLLEGE OF ENGINEERING.
Applicants should present a minimum of 20 Carnegie high school units. These should include:

- 4 years of English
- 3 years of Social Studies
- 1 year of Algebra
- 1 year of Geometry
- 1 year of Biology (recommended)
- 1 year of Chemistry/Physics (required by the Schools of Engineering and Science; recommended by all other Schools)
- 1 year of Algebra II/Trigonometry (recommended by all Schools; the School of Engineering specifies 1 year of each)

Sufficient academic electives to meet the required 20 units

(The State of Alabama requires 3.0 units of Physical Education and 0.5 units of health)

Current high school students will find it to their advantage to follow the advanced diploma curriculum. Students who plan to major in programs in the College of Administrative Science should refer to the College's section in the catalog for more information on high school preparation.

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

High school graduates who have never attended college and who have been out of high school five or more years do not need to submit ACT test scores.

General Education Development (GED) Recipients

Persons who have not graduated from high school may be admitted on the basis of a satisfactory score on the GED test. A score of 50 is required for regular admission status. 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 (895-6725).

Early Start Program

UAH welcomes inquiries from academically talented high school students who wish to enroll in courses for college credit during the summer term between their junior and senior years of high school or concurrent with their senior year in high school. For detailed information, such students should see their high school counselors or personnel in the Office of Admissions.

Transfer Students

Students who have previous academic records at a college or university level may be admitted to UAH as transfer students. The high school transcript of a transfer student will be reviewed for completion of required units, and deficiencies, if any, will be noted on the admission certificate. Admission to the College of Engineering is an independent action from admission to the University. A student who is currently on suspension from another college or university is not eligible for enrollment until his suspension period has terminated.

Transfer students seeking admission to the College of Administrative Science are admitted with a pre-business classification (code 07) and remain in this classification until they are admitted to the Upper Division of the College. Transfer students who intend to pursue the BSBA degree should read carefully the College's section on, "Admission as a Transfer Student" and "Admission to the Upper Division".
Students Transferring from Other Institutions

A prospective transfer student who has attempted fewer than 18 semester hours of work at an accredited college or university and who has at least a 1.0 average on a 4.0 scale will be considered for admission on the basis of high school grades and ACT scores.

Applicants with previous records showing 18 semester hours or more of work attempted at accredited colleges or universities must have a minimum overall C (2.0) average on all work attempted in order to qualify for regular admission.

Evaluation of Transfer Credit

Transfer admissions decisions will be based on a full evaluation of transcripts from all colleges and universities attended. Transfer credit evaluations will be completed before or during the first term of enrollment.

Credit hours and quality points associated with courses in which the subject matter is not acceptable at UAH will be disregarded when determining admissibility and status at UAH and will thus be excluded from calculations of hours attempted and overall grade point average.

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

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

Catalog for Transfer Students

A student transferring from an Alabama junior college may choose to fulfill the degree requirements of the UAH catalog which was in effect at the time of the student’s initial enrollment at the Alabama junior college, provided that the date does not exceed the seven year limit. See time limits section of the catalog. This policy enables students enrolled at Alabama junior colleges to effectively plan degree programs 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 colleges are encouraged to consult with their advisors when planning their programs of study.

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

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

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

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

The University of Alabama in Huntsville follows the practices specified in *Transfer Credit Practices of Selected Educational Institutions*, published by the American Association of Collegiate Registrars and Admissions Officers, in evaluating college level courses from other recognized colleges and universities for the purpose of transfer of credit to UAH.
If the previous record was earned at an institution not holding regional accreditation, a decision on acceptance of credits will be made on an individual basis. If credits are accepted, they will be classified as provisional. Full credit for a provisional credit will be based upon performance during the first 30 semester hours attempted at UAH. In order to receive full credit for provisional credit, a student must earn a C or better in each course attempted during the first 30 hours. Each student with credits in this category should see the registrar concerning his status at the end of the term in which he has completed his first 30 semester hours at UAH.

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

Credit for Business Administration courses taken in schools with American Assembly of Collegiate Schools of Business (AACSB) accredited programs is transferable to UAH. Credit in courses taken in programs without AACSB accreditation may be accepted with approval of the Dean of the College of Administrative Science. Transfer credit will be granted for administrative science courses only with a ‘‘C’’ or better. This policy applies to students entering or re-entering UAH after September 1, 1983. All inquiries concerning applicability of transfer credit should be made to the Office of Academic Assistance, College of Administrative Science, Room 222, Morton Hall, (205) 895-6024.

Nondegree Postgraduate (NPG) Students

An applicant already holding a bachelor’s or other higher degree will be considered for admission as a nondegree postgraduate.

A student admitted in this category and who has met the proper course prerequisites may take any course at the 500 level or below. In some instances, a student may, with the approval of the department chairman, take courses numbered 600 or above. Credits earned in these courses while a student is classified as a nondegree postgraduate, however, will not carry graduate credit.

A person whose application to the Graduate School has not been approved on the basis of grade-point average, test score or both may apply for admission as a nondegree postgraduate. Upon completion of 12 hours or more of advanced-level courses with an average grade of B or better, a student may reapply for admission to the Graduate School. Evaluation of the application will include the demonstrated performance in the advanced-level courses. In this case, an applicant may be admitted provisionally if acceptance is recommended by the appropriate academic department.

Admission of International Students

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

Admission Requirements

An undergraduate applicant must submit:
1. Completed application form.

In addition, the student must request that:
3. Two official copies in English of secondary school and college or university transcripts be forwarded to the University of Alabama in Huntsville directly from the institution(s) attended. Do not send personal copies.

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

5. Scores from the Test of English as a Foreign Language (TOEFL) be sent directly to UAH from Educational Testing Service. A minimum score of 500 is required.

6. A certified financial statement be submitted as evidence of sufficient finances to cover his university and personal expenses while attending UAH. In addition, a deposit of $1,500 is required before an applicant will be considered for admission. To make this deposit, have a bank cashier's check drawn in U.S. dollars for $1,500 made payable to the University of Alabama in Huntsville. Mail this check to the Office of Admissions, the University of Alabama in Huntsville, Huntsville, AL 35899. If an applicant is unable to attend UAH after making the deposit or if admission is denied, the deposit will be returned. The deposit must be maintained at $1,500 until the student completes his studies at UAH. The amount held on deposit by the University will accrue interest.

7. Evidence be presented of university-approved health insurance coverage. Proof of continued coverage must be presented by the student each term he is enrolled.

Individuals in the U.S. on a student visa who are transferring from another college or university in the U.S. must show evidence of release from the previous program by the international student adviser at their previous school. Transfer students must have completed the equivalent of one academic term at those institutions before admission to UAH.

A graduate applicant must submit:
1. Completed application form.

In addition, the student must request that:
3. Two official copies in English of secondary school and college or university transcripts be forwarded to the University of Alabama in Huntsville directly from the institution(s) attended. Do not send personal copies.

4. Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT) scores be sent directly to UAH from Educational Testing Service. (See Graduate Admission.)

5. Scores from the Test of English as a Foreign Language (TOEFL) be sent directly to UAH from Educational Testing Service.

6. A certified financial statement be submitted as evidence of sufficient finances to cover university and personal expenses while attending UAH. In addition, a deposit of $1,500 is required before an applicant will be considered for admission. To make this deposit, have a bank cashier's check drawn in U.S. dollars for $1,500 made payable to the University of Alabama in Huntsville. Mail this check to the Office of Admissions, the University of Alabama in Huntsville, Huntsville, AL 35899. If an applicant is unable to attend UAH after making the deposit or if admission is denied, the deposit will be returned. The deposit must be maintained at $1,500 until the student completes his studies at UAH. The amount held on deposit by the University will accrue interest.

7. Evidence be presented of university-approved health insurance coverage. Proof of continued coverage must be presented by student each term he is enrolled.
Nondegree 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 895-6070.

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

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

A student enrolled as a nondegree student must satisfy course prerequisites for each course taken.

Conditional Admission for High School Graduates

An individual who has applied under the Regular Admission Plan and who does not meet the criteria for regular admission may be admitted to UAH as a conditional admit. The conditional admit will be required to carry a light course load until he/she has completed a total of 15 semester hours of work. If the student has achieved an overall C average at the completion of 15 or more hours of work, he will be admitted as a regular degree-seeking student. Credits earned as a conditional admit are recorded on the student’s permanent record and will count if applicable in a regular undergraduate degree program when the individual has qualified for admission as a regular student.

A student enrolled in this category is subject to the same periodic review of his 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 term, and the student must petition the Admissions Committee for approval to re-enroll.

Probational Admission for Transfer Students

An individual who has applied and who does not qualify as a regular transfer student may be admitted on probation. A transfer student enrolled in this category is subject to the same periodic review of his 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 term, and the student must petition the Admissions Committee for approval to re-enroll.

Re-Entry

A student who has not attended UAH for one or more terms 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.

Admission to the Graduate School

See School of Graduate Studies Catalog for detailed information.
Admission to Student and Resident Medical Programs

For information concerning admission to the University of Alabama School of Medicine and to the UAH-Huntsville Hospital Family Practice Residency Program, see section on the School of Primary Medical Care.

Alabama Residence

A determination of residency status is made at the time the student is admitted to UAH. In order for a change in residency status to be effective for any given term, such change must be accomplished no later than the first day of classes for that term. For further information, consult the Office of Admissions.

The University of Alabama System Board of Trustees has defined residence. A resident, for tuition purposes, is an individual who has resided (been physically present) in Alabama for 12 consecutive months prior to enrollment/reenrollment AND who intends to reside indefinitely in the State of Alabama.
### Financial Information

#### UNDERGRADUATE TUITION

<table>
<thead>
<tr>
<th>REGISTRATION FEES</th>
<th>TUITION IN-STATE</th>
<th>TUITION NON-RESIDENT</th>
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<tbody>
<tr>
<td></td>
<td>$65.00</td>
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<tr>
<td>ADD PER HOUR</td>
<td>65.00</td>
<td>130.00</td>
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</tbody>
</table>

The above total does not include lab fees, late-registration or change-of-course fees.

An estimated average cost of books per term for full-time students is $85.00.

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.

#### Billing and Payment Procedure

Students participating in early registration will receive in the mail (see mailing date in calendar in timetable of classes) a schedule of courses, and tuition bill.

Tuition charges should be paid in full by the close of business on the due date indicated on the statement. Students whose payments have not been received by the deadline may have their registration cancelled, and such students will be required to complete a new set of registration materials during open registration hours.

Tuition will be payable at the time of registration for all who register during periods of open registration.

Charges resulting from dropping, adding, or other charges will be due at the time the change is made.

Many students have all or part of their tuition and other costs paid by various sponsoring agencies (including tuition assistance for faculty, staff and their dependents). It is the student’s responsibility to see that the Bursar’s Office receives the approved tuition assistance authorization from his sponsor. In many cases the sponsor does not pay the entire statement.
These students should contact the Bursar’s Office to determine the unpaid amount and make full payment before the due date to avoid cancellation of their registration.

Fees for courses being audited are the same as those being taken for credit. Full-time students may include full-term, regular credit courses offered through the Division of Continuing Education under the maximum fee structure of UAH.

Standard fees and fee conditions, however, do not apply for short-term, off-campus, or noncredit offerings. For additional information see Division of Continuing Education in this catalog.

**Other Charges**

<table>
<thead>
<tr>
<th>Application (non-refundable)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>International student deposit</td>
<td>$1,500.00</td>
</tr>
<tr>
<td>Change of schedule (non-refundable)</td>
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</tr>
<tr>
<td>Drop/add/change to audit/reinstatement</td>
<td>$20.00</td>
</tr>
<tr>
<td>Late registration (non-refundable)</td>
<td>$20.00</td>
</tr>
<tr>
<td>Credit by examination or validation, per semester hour</td>
<td>$10.00</td>
</tr>
</tbody>
</table>

**Laboratory/Special Fees**

| Level 1 | $5.00 |
| Level 2 | $10.00 |
| Level 3 | $20.00 |
| Level 4 | $30.00 |
| Level 5 | $40.00 |
| Level 6 | $50.00 |
| Level 7 | $60.00 |
| Level 8 | $70.00 |
| Level 9 | $80.00 |
| Level 10 | $90.00 |
| Level 11 | $100.00 |
| Level 12 | $110.00 |
| Level 13 | $120.00 |
| Replacement of I.D. card | $10.00 |

**Vehicle registration**

Regulations concerning traffic and parking are available at the Campus Safety Office | $15.00 |

**College of Nursing**

| Liability Insurance (per year) | Approx. $60.00 |
| Uniforms | Approx. $200.00 |
| College of Nursing Pin (graduation) | $35 - $100 |
| Annual health examinations | Variable |
Withdrawals and Refunds

After classes have begun, students may withdraw from one or more classes until the end of the sixth week of classes. A student desiring to withdraw from school must complete a withdrawal request form at the Office of Student Records, Room 116, University Center. Date of withdrawal is the date the written request is received at the Office of Student Records. Date of withdrawal will determine the amount refunded. Only course fees, lab fees, building fees and Union fees are refundable.

Date of Withdrawal from College

<table>
<thead>
<tr>
<th>Fees Owed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Withdrawal after registration is completed but before classes begin</td>
</tr>
<tr>
<td>plus withdrawal fee $20.00</td>
</tr>
<tr>
<td>After first two weeks of class</td>
</tr>
</tbody>
</table>

Dates of withdrawal from courses which are scheduled on other than a full-term basis will be prorated.

Refund checks will be issued as quickly as they can be processed after the second week of classes.

Students suspended for disciplinary reasons shall have no right to refund of any portion of any fees paid or due to be paid.

Financial Aid

See Student Affairs.

University Housing

For current rate information contact the Housing Office at:

Housing Office
The University of Alabama in Huntsville
Huntsville, Alabama 35899
(205) 895-6108

In addition to rental charges, each occupant is charged for gas and/or electricity. Residents desiring a telephone assume responsibility for proper installation of telephone and payment of all bills.
Student Affairs

The Division of Student Affairs provides services to individual students which facilitate the student's attainment of academic, cultural, social and personal goals. It also coordinates and supports group activities and campus events that enhance the quality of student life at the University. The Division of Student Affairs also supports Student Government Association activities and programs, as well as 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 financial aids, the university center, housing, athletics, club sports, student life, auxiliary services, career planning and placement, intramurals, student development programs and leadership training.

Tutoring Services

Tutoring services are available through the student development programs office, and UAH satellite unit of the North Alabama Educational Opportunity Center, the Veterans Educational Assistance Program and the Special Services Office. All students at UAH are eligible for the EOC Tutorial Program, and the student developmental programs. Both are provided at no cost. Students who are eligible for the Veterans Educational Assistance Program may be reimbursed for tutoring arranged through the EOC Office. Students desiring to tutor or be tutored may make application with the EOC counselor-coordinator at the EOC Office, Room 118, University Center, or telephone 895-6290, or Student Development Programs Office, Room 113, University Center, or telephone 895-6203. Special Services also provides tutoring for students who qualify.

Office of Financial Aid

Student Aid

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

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

Students should make financial plans well in advance of entering the University. They are advised to write the Office of Financial Aid requesting a copy of the financial aid booklet at the time of application to the University. Applications for student aid should be filed at the Office of Financial Aid before the priority deadline, April 1, for the following school year. No award implies automatic renewal; a new application must be submitted by this deadline each year.

American College Testing Need Assessment

UAH participates in the American College Testing (ACT) Need Assessment Program. The amount of financial aid granted a student is based upon financial need, which ACT assists colleges and universities in determining. Students are required to submit a Family
Financial Statement (FFS) to ACT designating UAH (Code 0053) as a recipient of the needs analysis report. The FFS should be mailed to ACT no later than March 1. The FFS may be obtained from a secondary school or the Office of Financial Aid at UAH.

Types of Financial Aid

Scholarships

Most scholarships at UAH are awarded for the academic year (nine months) but are seldom available for the summer term. Nearly all scholarships are awarded on a merit-need basis. Most available scholarships vary from $100 to $2,500. Scholarship applications are available at the Office of Financial Aid. The deadline for receipt of applications is February 1.

The following scholarships are awarded annually:

The *Kelly Zettle Memorial Scholarship* was established in memory of Jacqueline Kelly Zettle from donations to the University. It is awarded each year to a student or students pursuing a music major. To be eligible, one must be a full-time student having a grade-point average of at least 2.0.

The *Gerhard B. Heller Memorial Scholarship* was established in memory of the late Gerhard B. Heller from donations to the University from family and friends. It is awarded annually for one year beginning with the fall term to a full-time junior or senior majoring in physics or chemistry.

The *Samuel Palmer Memorial Scholarship* is a scholarship trust fund established in 1967 by the Board of Trustees of the University of Alabama. Interest from this fund is used for two scholarships awarded annually to UAH students. The recipients are selected on the basis of scholastic standing and leadership and must be full-time undergraduate students.

The *JoAnn Sloan Memorial Scholarship* was established in memory of JoAnn Elizabeth Sloan from donations to the University from family and friends. The award is given annually to full-time students majoring in nursing. The recipient must be in good standing with demonstrated need for financial assistance.

The *American Institute of Industrial Engineers, Inc., Scholarship*-The North Alabama chapter of AIIE provides two tuition scholarships each year for one term. A recipient is selected for fall term and another for spring term. To be eligible, the student must be a full-time undergraduate student who intends to specialize in industrial and systems engineering.

The *Gregory David Johnston Scholarship* was established in honor of Gregory David Johnston and awarded annually by the UAH Foundation to a senior student at Huntsville High School. This scholarship is awarded to a student who demonstrates outstanding leadership ability.

The *Felix L. Newman Scholarship* was established by a gift from Felix L. Newman, a long-time resident of Huntsville and devoted friend of the University. It is awarded each year to a student at the junior level or above pursuing a degree in the humanities.

The *University Women’s Club Scholarship* is a tuition scholarship awarded annually by the University Women’s Club to a full-time student at UAH with sophomore standing having a minimum of 3.0 grade-point average. The recipient must be an academically deserving student who has demonstrated leadership or a potential for leadership.

The *University Undergraduate Tuition Scholarship* is awarded by individual academic departments to students demonstrating outstanding scholarship. Each scholarship covers the basic tuition, excluding special fees and laboratory fees, for three consecutive terms. To be eligible, the recipient must be a full-time undergraduate student who has completed at least 59 credit hours but no more than 91 credit hours by the end of the term in which he/she is considered a candidate, have an overall grade-point average of 3.0, be pursuing a major in the area for which the scholarship is granted, have on file an approved AOC form and be in good financial standing with the university.
The University Alumni Scholarship-The Alumni Association provides two full scholarships each year to full-time undergraduate students. The recipients are selected on the basis of need, leadership ability, and academic achievement.

The August S. Ries Scholarship is an annual scholarship awarded each year by the Huntsville chapter of the Alabama Society of Professional Engineers to a full-time freshman engineering student who has a minimum 3.0 grade-point average.

The University of Alabama Huntsville Foundation Scholarship is awarded annually to high school seniors from Madison County who plan to attend UAH. Criteria for eligibility consists of scholastic ability, leadership, and financial need. Selection of winners is made by the high schools.

The Omicron Delta Epsilon Scholarship is awarded annually to a student majoring in economics. The recipient must have and maintain an overall average of 3.0 and have completed 12 hours in economics.

The George W. Ditto Scholarship, an endowed scholarship, was established in memory of George W. Ditto, a man who devoted his life to the teaching profession. Two full-tuition, one year, non-renewable scholarships are offered annually to two science or engineering majors.

The Mildred D. Simmons Memorial Scholarship was established by a gift from William K. Simmons, Jr., of Huntsville and by other devoted friends and relatives. Mrs. Simmons was a graduate of Crawford W. Long School of Nursing and practiced in Huntsville for many years. The scholarship is awarded each year to a student in the College of Nursing.

The UAH Leadership Scholarship-The Division of Student Affairs awards several leadership scholarships yearly. These are one-year, nonrenewable scholarships.

The UAH Academic Scholarship Program-Several full-tuition scholarships are awarded to students of sophomore through graduate status who demonstrate exceptional scholastic ability. The scholarships are renewable based on the cumulative grade-point average.

UAH Honor Scholarship Program-Full-tuition scholarships are awarded to National Merit Semifinalists and National Achievement Semifinalist who graduate from high schools in the UAH service area. The scholarships are renewable based on cumulative grade-point average.

Leroy Simms Scholarship Fund-An endowed fund established to recognize the many contributions of Mr. Leroy Simms to The University of Alabama in Huntsville. The full-tuition scholarship is awarded annually to the National Merit Semifinalists or National Achievement Semifinalists with the highest composite ACT score.

R. Wayne Sanders Memorial Scholarship-An endowed fund established by Mr. and Mrs. M.W. Sanders in memory of their son, R. Wayne Sanders. The full-tuition scholarship is awarded annually to a junior or senior pursuing a degree in the liberal arts. The recipient must exhibit outstanding leadership traits.

Thomas and Minnie Rast Scholarship Fund-An endowed fund established to recognize the many contributions and dedicated service of Mr. and Mrs. Thomas E. Rast to The University of Alabama in Huntsville. Full-tuition scholarships are awarded to junior and senior level students pursuing an undergraduate degree at UAH.

Nicholson Files Scholarship-Full-tuition scholarships awarded annually to Cullman County seniors who have outstanding academic and extracurricular high school records.

Scottsboro Rotary Club Scholarship-Full-tuition scholarships awarded annually to two Scottsboro High School seniors who have outstanding academic and extracurricular high school records.

Arab Rotary Club Scholarship-Full-tuition scholarships awarded annually to Arab High School seniors who have outstanding academic and extracurricular high school records.

James D. Hayes Scholarship-An endowed fund established to recognize the many contributions and dedicated service of Mr. James D. Hayes to the University of Alabama in Huntsville. The full-tuition scholarship is awarded to a junior or senior engineering major.
William Penn Nichols Memorial Endowed Scholarship—An endowed fund established by Mrs. Josephine Nichols Holliman to honor the memory of her father, William Penn Nichols. One full-tuition scholarship is awarded annually to a deserving student with preference given to descendants of the late William Penn Nichols.

Decatur Scholarship—Full-tuition scholarships awarded annually to Decatur, Alabama seniors who have outstanding academic and extracurricular high school records.

Housing Honor Scholarship—Several scholarships are awarded annually to exceptional students throughout Alabama to cover the cost of University Housing.

Frances C. Roberts Endowed Scholarship—An endowed fund established by the History Department of The University of Alabama in Huntsville to honor Dr. Frances Cabaniss Roberts for her many contributions and dedicated service. A full-tuition scholarship is awarded annually with preference given to a junior or senior history major.

William R. Gillies Society of Manufacturing Engineers Scholarship—A one year scholarship established by the North Alabama Society of Manufacturing Engineers. The scholarship is awarded annually to a mechanical engineering or industrial and systems engineering major who has earned sixty credit hours or more.

Outstanding High School Senior Scholarship—Full-tuition scholarships awarded to outstanding high school seniors who graduate from high schools in the UAH service area. The scholarships are renewable on a competitive basis.

Outstanding Junior College Scholarship—Full-tuition scholarships awarded to graduating junior college students in the State.

Research Park Scholarship—A four-year full scholarship fund established for an entering freshman who plans to major in engineering. This renewable scholarship is restricted to sons and daughters of employees working in Research Park.

Dreifus Jewelers Scholarship—A scholarship fund established by Dreifus Jewelers for a full-time undergraduate enrolled in the College of Liberal Arts.

W.L. and Lucille Howard Memorial Scholarship—An endowed fund established by the University of Alabama Huntsville Foundation in memory of Mr. and Mrs. Howard. This fund offers several full scholarships yearly to junior or senior level students enrolled in the College of Administrative Science.

Isidore and Mamie Wind and Children Scholarship Fund—An endowed fund established by a trust in memory of the Wind family. Several full scholarships are awarded yearly to full-time UAH students.

Aratex Services, Incorporated—A full-tuition scholarship fund established by Aratex Incorporated for a full-time UAH junior enrolled in the College of Administrative Science, majoring in management.

Irene Wright Endowed Scholarship—An endowed fund established in memory of Mrs. Irene Wright by private donations and assets of the University of Alabama Huntsville Foundation. One full-tuition scholarship is available yearly to an entering freshman enrolling in the College of Liberal Arts.

Bromberg Scholarship—An endowment established by Bromberg and Company for the awarding of yearly scholarship assistance to a student majoring in Fine Arts.

Elizabeth M. Fisher Memorial Scholarship—An endowed scholarship fund established by the Fisher Family as a memorial endowment for Mrs. Elizabeth M. Fisher. A tuition scholarship is awarded yearly to a graduate student in the College of Nursing.

Boeing Scholarship—A scholarship fund established by the Boeing corporation for junior and senior level students enrolled in the College of Engineering.

The Carl T. Jones Engineering Scholarship—An endowed fund, was established from donations to UAH and the University of Alabama Huntsville Foundation in memory of Carl T. Jones, prominent Huntsville businessman and civic leader. An award is made annually to a student majoring in civil engineering.
The Wernher von Braun Space Sciences Scholarship-An endowed scholarship, created by the National Space Club Huntsville Committee and friends in honor of Dr. von Braun. This scholarship is awarded to a senior in a space related field.

The Spencer Scholarship-An endowed fund, was established to recognize the untiring service of the Spencers to the University of Alabama in Huntsville. It is awarded annually to a UAH junior or senior.

The Bell Endowed Scholarship was created by a bequest to honor the memories of Robert Kirk Bell and Carolyn Pride Bell. This endowed scholarship is awarded to an undergraduate student majoring in liberal arts.

The Charles E. Shaver, Sr. Presidential Scholarship-An endowed fund, was established by the University of Alabama Huntsville Foundation to honor Mr. Shaver, former long-term chairman of the Foundation. The scholarship recognizes entering freshman of exceptional ability and is renewable for four years.

The Pruitt Memorial Scholarship-An endowed fund, was established in memory of Ms. Christine Martin Pruitt, a UAH graduate. One scholarship is awarded annually to an undergraduate in the College of Nursing.

The Instrument Society of America Scholarship was created by the local chapter of the Instrument Society of America. This endowed fund provides two scholarships annually, one to a student in the College of Engineering and one to a student in the College of Administrative Science.

The NEC Electronics Scholarship is an endowed fund established by NEC Electronics, Inc. to recognize and support an outstanding student initially in the field of electrical engineering who exhibits qualities of scholarship, personal integrity, and excellence in all endeavors.

The M. Louis Salmon Scholarship-An endowed fund, was created by the Watts family in honor of Mr. Salmon, third chairman of the UAH Foundation, for his outstanding service to higher education and his leadership in civic affairs.

The Humana Hospital-Huntsville Scholarship is an endowed fund established by Mr. and Mrs. William T. Dale. The scholarship is awarded annually to a student who participates in the UAH Wind Ensemble.

The 3M Scholarships are funded by 3M Company on behalf of their facilities in Alabama. Three awards are made each year to students in the College of Engineering.

The Yvonne M. Kheir Memorial Scholarship-An endowed fund, was created by members of the Kheir family in honor of their mother. This award is presented to a student in electrical engineering.

The Gary Lindsay Memorial Scholarship is an endowed fund created by friends and coworkers at Teledyne Brown Engineering to honor Mr. Lindsay. This award is presented annually to a student in engineering.

The Margaret Bond Economics Scholarship is an endowed fund established in honor of Dr. Bond, former chairperson of the Department of Economics and Finance. The recipient, a junior or senior majoring in economics, is selected by the faculty of the College of Administrative Science.

Public Relations Council of Alabama Scholarship
This Huntsville Chapter of the Public Relations Council of Alabama provides a scholarship to an undergraduate student attending the University of Alabama in Huntsville and seeking a degree in an accredited public relations related area of study. Junior standing with at least a 3.0 GPA is required.
State Nursing Scholarships

An act was passed by the Alabama legislature in 1957 to provide scholarships for basic nursing education. These scholarships are each $600 to be 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 his repaying the amount of the scholarship received to the UAH Scholarship Fund.

Loans

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

The Perkins Loan Program is available to all students enrolled at least half-time and who have financial need indicated by the Family Financial Statement. An undergraduate may be eligible to borrow a maximum of $9,000 over several years. Graduate or professional students may be eligible to borrow a maximum of $18,000, including their undergraduate loans. The program contains a provision that part of the loan plus interest may be canceled if the borrower performs military service in hostile areas. Forgiveness is also provided for teachers of handicapped or disadvantaged students and for those teaching in other special programs designated by the U.S. Office of Education.

The Stafford Loan Program provides federal backing for loans made through private lending agencies such as banks, savings and loans, and credit unions.

A maximum of $2,625 per academic year may be applied for in most states if the educational costs warrant borrowing this much money. Total loans outstanding may not exceed $17,250 for undergraduates. The aggregate maximum may be extended to $54,750 for students who borrow for graduate study.

Loans and Scholarships for Medical Students

Information about financial assistance for medical students is available from the Office of Medical Student Affairs, Clinical Science Center.

Emergency Loans

Emergency Student Loan Fund—Any full-time student of UAH officially enrolled and physically present on campus is eligible to apply for an emergency loan. These loans are made for emergencies only. The maximum amount of the loan is $200, but normally loans will be made for $100 or less for a maximum of ninety days or until the end of the term, whichever comes first. Applications are available from the Office of Financial Aids.

Grants

A Supplemental Educational Opportunity Grant—provides aid to undergraduate students who would not, except for the grant, 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 his/her 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 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 by means of the Pell application; (2) be enrolled in an eligible program at an eligible college, university, vocational, or technical school; (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 Pell application is submitted to a processing agency which calculates the student’s aid index. The institution then uses this SAI report to calculate the Pell Grant award based on full or part-time enrollment and the cost to attend the institution. All eligible students are awarded grants.

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

Federal Financial Aid Repayment

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

Work-Study Program

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

Graduate Fellowships and Assistantships

Persons interested in graduate fellowships or assistantships or both should direct their inquiries to the appropriate academic departments.

Tuition Assistance

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

Graduate Record Examination Fee Waiver Program

UAH is a corporate institute for the Graduate Record Examination (GRE) Fee Waiver Program. These waivers are limited to senior students receiving financial assistance through the University whose parents’ financial contribution is estimated to be zero for the applicant’s senior year in college.

Information and fee waiver certificates may be obtained in the Office of Financial Aid.
Cooperative Education (Co-op) Program

An academic program known as Cooperative Education (Co-op) can provide qualified students paid work experience which is directly related to their major. For details, see the Cooperative Education Program description under Academic Information.

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.

Medical Services

UAH students who need a family physician may become patients of the UAH Family Practice Center by going to the UAH Medical Clinics in the Huntsville Medical District to complete the intake forms. All UAH students registering as patients are required to have valid UAH identification cards.

UAH Medical Clinics office hours are 8 a.m. to 5 p.m. Monday through Friday. Appointments may be made by phoning 536-5511.

All patient care services provided by UAH School of Primary Medical Care are on a fee-for-service basis.

Career Planning and Placement

The Career Planning and Placement Office provides developmental and educative services which assist students in identifying their individual capabilities, interests, skills, and acquired knowledge, and to relate these characteristics to meaningful vocational options. This office communicates career, occupational, and employment information to the University as a whole, and interprets options available to students within graduate school, business, government, education, and non-profit organizations. The culmination of these activities is placement counseling and referral to employers or graduate schools.

The Career Planning and Placement Office offers the following services to students and alumni: part-time employment referral within the community of Huntsville and surrounding areas for currently enrolled students; full-time placement referral and on-campus interviews for graduating seniors, students currently enrolled in a graduate degree program, and alumni; career planning assistance with professional staff; workshops to develop student skills in resume writing, interviewing, and job search planning; use of the SIGI PLUS computer-assisted guidance system to assess interests, abilities, and values and relate these characteristics to 426 occupations; access to a computerized guidance information system with occupational and college information through Montgomery; a Career Resource Center of occupational information, company literature, salary information, and graduate school information; lists of job openings throughout the United States; a Job/Career Fair each Fall and Spring; and, Career Information Days for various Schools at UAH.

A credential file which includes a resume, an authorization form, and a candidate registration form is established for each senior, graduate student (currently enrolled in a degree program), or UAH alumni who registers with this office. Information in the candidate's file is available to employers upon request. Each registered person receives a monthly newsletter, Career Directions, which provides current employment trends, job hunting hints, and the monthly on-campus recruitment schedule.
Students may register for any of the services at the Career Planning and Placement Office, 212 University Center. Appointments may be made with Placement staff members by calling 895-6612 between 8:15 a.m. and 5:00 p.m., Monday through Friday.

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 term enrolled. This form must be turned in to the veterans affairs clerk in the Office of Student Records, Room 116, 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.

University Housing

The University of Alabama in Huntsville offers a variety of housing facilities to meet the needs of its diverse student population. The UAH apartment-type housing combines the convenience of living at home with accessibility to the entire campus. The apartments are located within walking distance of academic buildings, the library, the gymnasium with its swimming pool, racquetball courts and tennis courts, and the University Center. The apartments are also convenient to supermarkets, drugstores, movie theaters, restaurants and department stores.

Each apartment has its own entrance and is air-conditioned, carpeted and equipped with a stove and refrigerator. All residents have full use of coin operated laundry rooms which are conveniently located within the housing complex. A recreation room and a study lounge are provided for residents’ social and educational needs.

University Housing is administered by a Director of Housing in the University’s Division of Student Affairs. The Director is aided by Student Resident Assistants who are available to assist residents with any problems or emergencies which may arise when the housing office is closed. It is the desire of the entire housing staff to assist students in their adjustment to college life and to be of service to all housing residents.

Access to University Housing is a privilege. The University reserves the discretionary right to evaluate each applicant for the purpose of determining eligibility and suitability for residence in University Housing. Any person, married or single, who has been admitted as a student to UAH is eligible for admission to University Housing. A prospective student

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need not be accepted for admission prior to applying for assignment in campus housing. A married couple is eligible if either the husband or wife is or will be a UAH student. If admission to the University is denied, the housing deposit may be refunded.

A full-time student has priority for assignment over a part-time student. Priority for assignment is also based on date of application. The earlier a student submits an application with deposit, the better the chance for the requested assignment. Students may request roommates, or the Housing Office will attempt, by screening the applications, to assign roommates who have similar interests and characteristics.

Since University Housing space is limited, students interested in living in campus housing should apply at least two academic terms before enrolling at UAH. An application deposit submitted with the completed application form will reserve a place on the waiting list for campus housing. Rental charges are on an academic term basis with rent due when tuition is due. Housing policies and regulations are included in the Housing Rental Agreement that the residents are required to sign. Housing application forms and additional information may be obtained from the Housing Office, University of Alabama in Huntsville, Huntsville, Alabama 35899 (205) 895-6108. Individual and group tours of the apartments may be arranged by appointment through the Housing Office.

Preschool Learning Center

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

General Information
The new University Center is a welcome addition to the UAH campus. Long awaited, it is a part of the co-curricular educational program of the University and has become a focal point of the campus. Designed for the entire campus community, it offers facilities and programs to meet the intellectual, social, recreational, and cultural needs of students, faculty, staff, alumni, and the entire Huntsville community.

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

The offices of the Vice-President for Student Affairs, the Student Government Association, the Exponent, Admissions and Records, Financial Aid, Academic Advisement, the Educational Opportunity Center, Co-op, Career Planning and Placement, Testing Services, Student Activities, Student Development Services and the Bursar are also located in the University Center.

Information Desk
In addition to having general campus information, the information desk sells a variety of tobacco, candy, and newspapers. The university community may pick up or purchase tickets for campus events, get assistance in scheduling events in the Center, or receive directions to campus or community points. Typing elements are available to those with a current student I.D. Academic, admissions, and financial aid information is available from the information desk in the student services corridor of the building.

Lounge
Two well lit, spacious lounges, designed as a place to relax and meet friends, are equipped with comfortable furniture and have a large number of plants and windows.

Game Room
Located in the lower level of the Center, the game room has pool tables and ping pong tables as well as a wide variety of pinball machines and video games. A large number of board games are also available. Three TV lounges, with cable TV, are located in the game room.

Meeting Rooms
The Center has 10 meeting rooms designed with multipurpose functions. The rooms can accommodate meetings of 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 UAH Bookstore is a full-service college bookstore operating for the needs and convenience of the UAH Community. The University Bookstore provides the Campus' required and supplemental textbooks, a large selection of technical and reference books and various study aids including Cliff's notes and Schaum's outline series. The bookstore also buys back used texts from students during the store hours year round. In addition to these services, the bookstore will special order any book in print.
In the University Bookstore, students can find UAH Campus sportswear, UAH insignia gifts, cards, imprinted notebooks, a wide variety of school supplies, calculators, and a choice of Artcarved or Josten's class rings.

Special purchase programs for students, faculty and staff are available for IBM Apple computers.

Student 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 organizes a variety of activities for students and their families such as the weekly Children's Hour, Family Night Out and Dinner Theatre programs. The Student Activities office also maintains a complete listing of clubs and organizations.

University Food service
A completely modern and spacious serving and dining area greet customers to the University Cafeteria. A complete line of short order items, ice cream shop, deli, and hot food are available to patrons. A more formal dining area, located behind the cafeteria, is available for luncheon buffets and catered dinners in the evenings. The Food Service will cater to all areas of the Center as well as other parts of the campus.
Activities

Student Government Association

The Student Government Association promotes the welfare of students in all areas of university life. Its primary purpose is to help improve the educational environment. This includes promoting academic innovation and working closely with faculty and administration toward making desirable changes in institutional policies.

The SGA is responsible for developing and sponsoring programs which will enrich the student's cultural, intellectual, and social life. Each student enrolled at UAH is automatically a member of SGA. An executive branch and an eighteen member legislature are responsible for carrying out the official business of the organization.

The Association sponsors over ninety clubs and organizations across campus in addition to sponsoring many student services such as health insurance, special rates for community cultural events, and a student directory. The SGA, provides students with a grievance officer.

Association for Campus Entertainment

The Association for Campus Entertainment (ACE), funded by an extension of the SGA, plans and executes student activity programs for UAH students through its six activity boards. The purpose of ACE is to provide entertainment as well as enhance a student's cultural, intellectual and social life.

They also provide the students with a telephone information service known as "The Source". The number is 895-6666.

The six activity boards contained in ACE are as follows:

Drama Board

University Playhouse is a student group administered by the Drama Board. The group's goal is to produce theatre for and by UAH students. Membership is open to any currently-enrolled student interested in theatre. Each year a broad selection of plays is presented and since 1983 University Playhouse has entered its fall play in the American College Theatre Festival. Recent productions have included The Diary of Anne Frank, Baby, and Antigone.

Film Series

The Film Series, free to UAH students, shows art, foreign, contemporary, and classic movies weekly. The intent behind the series is to entertain as well as provide students with a wide cultural background in films and to give students an opportunity to investigate the social and economic importance of film as an art form.
Symposium and Lecture Series
The Symposium and Lecture Series serves as an extension of the classroom through bringing a variety of speakers to the campus. Faculty, staff and students have opportunities to discuss contemporary matters with authoritative personalities at these programs. All students are encouraged to attend the programs and actively participate in the series.

Cabaret Series
UAH Cabaret produces "club type" entertainment for the University community as well as for the city of Huntsville. Show content, in the past, has ranged from mime to bluegrass, from comedy to jazz, from blues to rock-and-roll. All students, faculty, and staff are invited to enjoy the shows.

Special Events Series
The Special Events committee is responsible for planning annual events such as Homecoming, Springfest, and Octoberfest.

Publicity Series
It is the function of the Publicity Director to inform potential audiences of all programs that the other ACE Activity Boards are bringing to campus. Radio, television, and printed materials are all utilized in the effort to publicize ACE programs.

Student Organizations
Accounting Club
The purpose of the Accounting Club is to promote interest in the accounting profession and provide students an opportunity to become better acquainted with each other, the accounting faculty, and accounting practitioners. Activities include meetings which feature guest speakers, facility tours, and social activities. Membership is open to all students in accounting and related disciplines.

American Institute of Chemical Engineers (AIChE)
The objective of AIChE is to contribute to the development of chemical engineering at UAH through activities involving the faculty and student members while promoting the professional development of its members by programs relating the student organization to local, regional and national AIChE activities. Membership is open to all undergraduate chemical engineers.

American Production and Inventory Control Society Student Chapter (APICS)
The APICS Student Chapter is a technical/professional organization open to all UAH students regardless of major. Monthly meetings feature guest speaker, films, plant tours, and faculty presentations. The main purpose of the organization is to educate students in the opportunities available in careers in modern production planning and control. Scholarships and paper contests are available through the parent Tennessee Valley Chapter of APICS.

American Society of Civil Engineers (ASCE)
The purpose of the ASCE Student Club is to promote the profession of civil engineering among students through organized programs and projects. Professional and community oriented activities provide an opportunity for students to learn the meaning of professionalism. Scheduled meetings include businesses, speakers, field trips, and social activities.
American Society of Mechanical Engineering (ASME)
The purpose of ASME is to aid mechanical engineering students in their personal and professional development. Membership is open to all engineering students. Activities include speakers, business meetings, projects, field trips, and social activities.

American Society of Personnel Administration (ASPA)
ASPA is a world wide professional association of personnel and industrial relations practitioners, university faculty members and students. The programs and activities are designed to provide a professional enrichment for the student’s academic experience.

Art Club Focal
The purpose of Art Club Focal is to (a) foster a wider student interest and participation in the arts, (b) encourage community interest and involvement in the art activities at UAH, and (c) promote a broader scope of education through extra-curricular activities such as field trips, workshops, lectures, and films.

Association for Computing Machinery (ACM)
The Student Chapter of the ACM is a technical organization for all students interested in Computer Science. The purposes of the club are to assist the student in his or her professional development as a computer scientist, to promote good fellowship among students and faculty in Computer Science, and to provide for contact between students and representatives of both industry and graduate research institutions.

Regularly scheduled meetings feature speakers drawn from both the UAH faculty and local industry. Students who work in local industry will also be encouraged to present short papers on their work.

Association of Nursing Students
The purpose of this Association is to provide a means to aid nursing students in realizing professional goals and to provide interaction and fellowship among clinical and proclinical nursing students. Any student enrolled in nursing at the university is eligible for membership. Through this organization, students participate in local projects, social activities, and programs as well as those of the state and national nursing student’s associations.

Ballroom Dance Club
The purpose of the club is to foster a wide student interest and participation in ballroom dance, to offer students of HPE ballroom dance classes an appropriate time and place to practice and develop skills acquired in those classes, and to assist students in further developing dance skills and leadership skills.

Baptist Student Union
The Baptist Student Union exists for the purpose of providing an outlet for Christian expression, discussion, and study. Membership in the BSU is open to any University student. Its student center is adjacent to campus on Sparkman Drive.

Biology Club
The objective of the Biology Club is to promote interest and research in biological sciences. Any person enrolled as a full-time or part-time student and interested in biology is eligible for membership. The meetings are called by the president. Activities are aimed at giving the members a first-hand look at science in its natural environment and include field trips, lectures, and films. The club also offers aid on research projects.
Black Student Association
The goals of the Black Student Association include promoting unity and black cultural awareness among students, encouraging students to participate in all campus activities, promoting race relations among students at UAH and fostering the needs and interests of minority students.

Business Council
The Business Council is comprised of the Presidents and Vice Presidents of all the business clubs with the Dean and the Assistant Dean of the College of Administrative Science acting as advisors. The Business Council conducts a job fair for prospective graduates each year. Social events and programs of interest to students in all business fields are provided.

Campus Ministry Association (CMA)
CMA is a collection of faith groups which provides responsive ministry in and with the UAH community. The Association’s primary focus is the enrichment of the University experience among students, faculty, and staff. For more information call 837-2483.

Chemistry Club
The Chemistry Club promotes an awareness of the science of Chemistry among students at UAH. Members learn about current research in Chemistry, and also about career opportunities in chemistry and those professions which depend upon chemistry. Activities include speakers, field trips and social events. Membership is open to all graduate and undergraduate students interested in chemistry. For more information call the Chemistry Office, 895-6153.

Chinese Student and Scholars Association from Mainland China.
The purpose is to promote the mutual understanding among people with different cultures.

Christian Students Organization
This organization was founded to promote spiritual growth and development among college students.

Circle K
Circle K is caring. It is composed of students who wish to become actively involved in community concerns via service projects and activities. Through this collegiate service club, Circle K members express this care by assisting the elderly, the underprivileged, and the UAH campus. Becoming a part of a Circle K Club is an opportunity to commit yourself to enriching the lives of many individuals and, at the same time, enhancing your own life because you’re chosen to care. Sponsored by the Huntsville Metropolitan Kiwanis Club. Weekly meetings.

Collegiate Management Club
The Collegiate Management Club is directly affiliated with The National Management Association. The purposes of the chapter include developing a professional spirit and understanding of management as a professional; promoting principles and ethics in all business practices and providing the opportunity for academic development of managerial and leadership skills.

Collegiate Republicans Club
The College Republicans foster and encourage the activities of the Republican Party, assist in the election of Republican candidates to local, state and national office and formulate and administer programs aimed at involving college students in the Republican party.
Collegium Musicum

The purpose of this society is to recognize students' interests and participation in the field of music and to encourage and support excellence in the musical activities of both the university and the Huntsville communities. Membership is open to all students majoring or minoring in music.

Data Processing Management Association (DPMA)

The DPMA Student Chapter program is designed for students planning careers in information processing or related fields. Student Chapters provide students with opportunities to exchange information with members of the information processing community and to explore various career opportunities. To be eligible for membership, students must be pursuing a major in either MIS or Computer Science. Its primary objective is to foster a better understanding of the vital relationship of information processing management and society.

Fellowship of Christian Athletes

The purpose of this organization is "to present to athletes and coaches, and all whom they influence, the challenge and adventure of receiving Jesus Christ as Savior and Lord, serving Him in their relationships and in the fellowship of the church."

Fellowship of Christian Students

The purpose of the Fellowship of Christian Students is to provide an opportunity for fellowship and bible study among all religious UAH students particularly those associated with the Churches of Christ.

Financial Management Club

Membership in the Financial Management Club is open to any student interested in a career in Finance, including Real Estate, Insurance, Banking, Investments, and Financial Management. The club is devoted to the professional development of its members and to fostering improved relationship among students, faculty, and professionals in the several areas of finance.

French Club—"Le cercle francais"

The purpose of Le Cercle Francais is to promote understanding and appreciation of the culture of France and from francophone countries throughout the world (Belgium, Canada, Switzerland, Black Africa, Haiti). The Club also tries to further French studies among UAH students. The club meets once a month in a social milieu for specific programs and discussions.

Forensic Club

The Forensic Club offers highly motivated students the opportunity to study and participate in intercollegiate CEDA-style debate, as well as various on-campus debating activities. Membership is open to all students, and interested persons should contact Dr. Rita Whillock, Dept. of Communication Arts, 232 Morton Hall (895-6645) early in the academic year.

General Union of Palestine Students

The purpose of the General Union of Palestine Students is to promote the investigation, publication and understanding of the violations of the Palestinians' human rights. The organization also provides the students of UAH the opportunity to lend support to the victims of such violations.

German Club

The German Club wants to promote interest in the usage and study of the German language, in the cultures and literatures of the German-speaking countries, Germany, Austria, Switz-
erland, and in international exchange and understanding. The membership is open to all faculty, staff, and students of the various disciplines. The club meets once a month for specific programs, related to the above stated goals and for more informal activities at additional times.

**History Forum Club**

The History Forum sponsors a series of lectures in the winter semester each year. The Forum invites distinguished speakers from across the United States and abroad to speak on historical topics of current interest. The Forum is a student-faculty group organized with student officers supported by history department faculty members. It is open to all members of the University community.

**Institute of Electrical and Electronic Engineers (IEEE)**

The Student Chapter of IEEE is a technical/professional organization for students in Electrical Engineering. Monthly meetings feature guest speakers, films, projects, or facility tours acquainting members with various aspects of electrical engineering. Membership is open to all undergraduate and graduate students in Electrical Engineering who are at least half-time students.

**American Institute of Industrial Engineers**

The object of this chapter is to promote the profession of industrial and systems engineering through the organized effort of this group in study, research and discussion. Monthly meetings featuring guest speakers, films, or plant tours are presented to acquaint the student body with the ideas, purposes, and objectives of industrial engineering. Membership is open to all full-time undergraduate and graduate students in industrial and systems engineering.

**Indian Student Organization**

To promote friendship and understanding among students from India which is a land of various cultures.

**Japanese Club**

The purpose of the Japanese Club is to create an environment in which UAH students of the Japanese language, culture and heritage meet together and with the UAH community and the general public to share information about Japanese and American cultural patterns, to practice the Japanese language and to promote friendship and understanding among its members.

**Karate Club**

The objectives of the Karate Club are to promote the sport of Karate, to create opportunities for students to compete, and to increase campus awareness of self-defense. Seminars and training workshops are presented for the benefit of the club members. Membership is open to all students who are or who have been exposed to the martial arts.

**Korean Students Association**

The purpose of this organization is to promote mutual friendship and solidarity among Korean students at UAH and to give other students a better understanding of Korean culture and history.

**Lancers**

Outstanding students are selected each year for their leadership, achievements and public relations skills to serve as the official student representatives of the University. The men and
women who serve as Lancers introduce UAH to many exciting visitors and play an important role in assisting with events on and off campus. Faculty, staff and other student organizations can call on the Lancers for help with activities that benefit UAH. For more information about joining the Lancers or requesting their assistance, contact the Office for University Advancement.

Marketing Club (UAH Collegiate Chapter of the American Marketing Association)
The Marketing Club is open to all students having an interest in marketing and/or a desire for a career in marketing after graduation. Membership provides full affiliation with the national American Marketing Association and a subscription to the Marketing News, a twice monthly marketing trade publication. Meeting and other club activities are directed primarily toward career development for marketing club members; guest speakers for club meetings are selected for their potential contribution to job seeking and career development.

Mathematics Club
The purpose of the Mathematics Club (also called the Mathematics Group) is to increase the influence of the University in mathematics and its applications, to promote good fellowship, and to offer services to students and faculty in the field of mathematics. The group is open to all students, and meetings are held monthly during the academic year.

Medical Careers Club
The Medical Careers Association is for students who intend pursuing a career in the health field, which includes premedical and predental students as well as those in nursing and allied health sciences. The purpose of the association is to help its members fulfill the entrance requirements of the various professional schools across the nation and to acquaint them with opportunities in the health fields. Interviews with and lectures by admission officers of professional schools, programs about the latest advances and opportunities in the health fields, and guidance in the selection of courses of study are some of the services provided by the association.

Medical Student Association
The Medical Student Association was created to provide a forum for the members of the School of Primary Medical Care. This organization seeks to develop opportunities for personal growth and to foster an atmosphere of mutual respect between students and community.

Model United Nations Club (Political Science)
The purpose of the UAH Model United Nations Club is to assist all UAH students in all disciplines in achieving greater understanding of international affairs and organizations, to learn skills in public speaking and debate, to study the functions of the United Nations, to provide members of the club and the University Community with information and programs of interest, and to help students to participate in the Annual Deep South Model United Nations sponsored by Auburn University and to participate in other Model United Nations meetings where appropriate.

Music Educators National Conference
This organization seeks to acquaint its members with the music profession and to work to increase interest, knowledge, and productivity in all areas of music education.

Muslim Student Association
The purpose of this organization is to promote unity and joint action among the Muslims, to conduct social, cultural, religious and other activities in the best traditions of Islam, to
arrange and hold congregational prayers and Islamic religious festivals at appropriate times, to promote friendly relations among Muslims and non-Muslims, to endeavor to make Islamic teachings known to interested non-Muslims, and to provide needed general guidance and/or assistance to Muslims coming to the community.

National Association of Accountants (NAA)

The National Association of Accountants is a professional organization whose purpose is to promote excellence in management accounting. Monthly meetings of the North Alabama Chapter feature guest speakers on various accounting/business topics. UAH accounting students are eligible for student memberships for a special reduced fee. Through interaction with NAA members, students learn about career opportunities in management accounting.

National Association of Business Economists Student Chapter

Students enrolled in business economics or related fields are eligible for student membership in the National Association of Business Economists, the largest association of economists connected with private business. One of the purposes of the national association is to illuminate the contribution which trained economists can make in the business firm. The purpose of the UAH chapter is to provide a forum for social and professional exchange between students, faculty and the national association.

National Contract Management Association (NCMA) Student Group

Students majoring in procurement management or related fields are eligible for student membership in the National Contract Management Association and the Huntsville chapter. It is an association of contracting professionals. With more than 21,000 members it is one of the largest professional associations. The NCMA administers two professional certification programs. The Huntsville chapter has monthly meetings, seminars and workshops. Members receive monthly issues of *Contract Management*. NCMA’s purpose is to keep its busy professional members educated and abreast of contracting and procurement developments.

National Society of Black Engineers

The objectives of the National Society of Black Engineers are to stimulate and develop student interest in engineering; to promote participation at all levels of responsibility in the field of engineering by the black and ethnic minority communities; and to advance the black professional engineer within the individual engineering disciplines.

Phi Beta Lambda

Phi Beta Lambda is national organization for college students preparing for careers in the fields of business, office and business teacher education. Members receive *Tomorrow's Business Leader*, the official magazine of FBLA-PBL. It contains career tips and the latest FBLA-PBL news from across the nation. PBL provides a variety of activities for its members, from professional workshops to picnics and field trips. PBL also takes a stand in the community by helping charity and health organization.

Political Science Club

The purpose of the Political Science Club is to promote interest in politics and policies at the domestic and international levels, and to provide an opportunity for faculty and student interaction. The club holds regular business meeting and discussions. Past activities have included lectures, symposiums involving the Huntsville community, and various social events.
Public Relations Council
The Public Relations Council of Alabama Student Chapter is open to all students who have a sophomore level standing. The objectives of the club include increasing communication between the schools on campus and publicizing these schools. There is a minimum of four meetings per year which are randomly called by the president. The club interacts with the Huntsville PRCA Chapter regularly.

Resident’s Advisory Council
The purpose of the Resident’s Advisory Council is to encourage the intellectual, social, cultural and recreational growth of students residing in University Housing.

Slovo-Slavic Club
The Slovo-Slavic Club is for students who wish to further their understanding of Slavic cultures. Although the emphasis is on Russia, the whole spectrum of Slavic nations is studied. At club gatherings, the members use various media to investigate different facets of their interests.

The Society of Physics Students
The Society of Physics Students promotes contact between fellow students and faculty and provides a medium for interaction with the local physics community and other universities. Students in SPS pay minimal national dues and receive Physics Today. Any interested student may join.

The Society of Women Engineers
The Society of Women Engineers is a professional, non-profit educational service organization set up to inform women of the opportunities available to them in industry. The Society encourages all math, science, and engineering students to meet monthly and share in the many experiences that other women in technology have had. It provides students with a chance to socialize, a chance to mingle and interact with company representatives and, thus, it provides a headstart towards becoming a true professional.

World Issues Society
It is the purpose of the World Issues Society to promote an interest in the study of sociology, research of social problems, and such other social and intellectual activities as will lead to improvement in the human condition.

Student Alabama Education Association
The UAH chapter of the student AEA is for students who plan to be educators. One of the association’s purposes is to involve students in the issues and processes of education before they begin their careers. Any undergraduate education student may join.

Students for the Exploration and Development of Space
The Students for the Exploration and Development of Space educates the students and the general public about the benefits of space exploration and development. The organization also provides a forum for the discussion and exchange of ideas related to the exploration and development for space.

Students over the Traditional Age
The Students Over the Traditional Age club’s purpose is to promote the exchange of knowledge and experiences among students twenty-five or older.
Greeks

Interfraternity Council (IFC)

IFC serves as the governing body of the five fraternities at UAH in order to develop cooperation and coordination of activities among the member fraternities. The five national social fraternities on campus are Alpha Tau Omega, Delta Chi, Kappa Alpha Psi, Pi Kappa Alpha and Sigma Chi. For more information contact the Interfraternity Council Advisor at 895-6445.

Panhellenic Council (Panhel)

The Panhellenic Council is the organization which coordinates sorority activities at UAH. The five Social sororities available to young women at UAH are Alpha Kappa Alpha, Chi Omega, Delta Sigma Theta, Delta Zeta, and Kappa Delta. For more information contact the Panhellenic Advisor at 895-6445.

Academic Honors Societies

Administrative Science Honorary

The Administrative Science Honorary is for students majoring in one of the disciplines of the College of Administrative Science. Its purpose is to recognize, promote, encourage, and maintain academic excellence and to provide an opportunity for personal growth through participation with the academic community and professional involvement beyond the classroom. Standards for membership are completion of 60 semester hours (the last 30 at UAH), a cumulative grade point of 3.5 or above, and recommendation by a member of the Administrative Science faculty.

Alpha Epsilon Delta (Pre-Health)

The UAH chapter of Alpha Epsilon Delta, the national pre-health professional honor society, was established on campus in the fall of 1978 and was chartered in the spring of 1979. Membership in Alpha Epsilon Delta 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. It thus became the fifth chapter of this society in this state. Membership in Alpha Kappa Delta 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 in the chapter must have completed at least 10 credit hours in sociology, must have at least a general scholastic average of B on all sociology courses, and must be in the upper 35 percent of the class. Election to Alpha Kappa Delta shall be without regard to race, creed, sex, or, national origin. A $12 fee pays for a lifetime membership.

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 intelligent being and 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, second, or third quarter of enrollment.
Alpha Psi Omega (Theatre)
The Xi Theta cast of Alpha Psi Omega was established at UAH in 1983 and chartered in 1984. Alpha Psi Omega is the national theatre honorary whose purposes are to recognize those students who have achieved a high standard in dramatic arts and to provide a wider fellowship for those interested in the theatre. Membership is earned through work in University-sponsored theatre activities and is open to students of any major.

Beta Beta Beta (Biology)
The Mu Omega chapter of the national honor society for biology was installed in May 1978. The purpose of the society is to provide recognition for students of the biological sciences who achieve scholastic distinction. The society promotes an interest in and furthers the objectives of science. Active members are undergraduate majors who have completed three courses in biology with a B average.

Eta Kappa Nu (Electrical Engineering)
The Theta Eta (UAH) Chapter of Eta Kappa Nu was chartered on April 29, 1978. The objectives of Eta Kappa Nu are to honor those students of 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.

National Management Association
The student chapter of the National Management Association is an honorary organization offering membership to any student in the College of Administrative Science. Membership requirements are minimum of a 2.7 grade point average and an interest in the field of Management as a primary function or as an auxiliary function to some other area of Administrative Science.

Omicron Delta Epsilon (Economics)
The objectives of Omicron Delta Epsilon, international honor society in economics, are recognition of scholastic attainment in economics, the honoring of outstanding achievement in economics, the establishment of closer ties between students and faculty in economics within and among colleges and universities, and the publication of the official journal, the American Economist. Omicron Delta Epsilon is a member of the Association of College Honor Societies. The UAH chapter was approved in February 1973.

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 intercollegiate 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
The Order of Omega organization is to recognize those students who have attained a high standard of leadership in inter-Greek activities, to bring together members of the faculty, alumni and student member of the institutions, fraternities and sororities.
Phi Alpha Theta (History)
UAH has a chapter of Phi Alpha Theta, international history, honorary society. Membership is open 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 other courses.

Phi Delta Kappa
A number of faculty and staff members are actively involved in the Huntsville chapter of Phi Delta Kappa, national leadership fraternity in the field of education.

Phi Kappa Phi
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 whatever field it will stimulate others to espouse excellence. Moreover, the society feels that it serves the interests of the student capable of excellence by insisting that to acquire a chapter of Phi Kappa Phi, an institution provide the atmosphere conducive to academic excellence.

Phi Sigma Iota (Foreign Language)
Phi Sigma Iota is the national Foreign Language Honor Society. It 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. Thus it helps to maximize the understanding of ourselves and our cultural heritage by understanding others. Numerary membership is open by nomination to any UAH student who is at least a junior; has 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 should take at least two 300 level courses in foreign languages. Associate membership is open to anyone who believes in the purpose of the honor society and wishes to help it obtain its goals.

Pi Kappa Delta
The purpose of this honor fraternity is to foster wide student interest and participation in collegiate forensics, to promote the development of self-esteem, leadership and communication skills and to honor students exhibiting these qualities.

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. The purposes of Pi Tau Sigma are to foster the high ideals of the engineering profession, to stimulate interest in coordinate 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. Eligibility extends to 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. The purposes of Psi Chi 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. The requirements for admission are a 3.0 overall grade-point average and a 3.0 in psychology, and 12 hours of psychology for a minor or 15 hours for a major.

**Sigma Pi Sigma (Physics)**

The Sigma Pi Sigma honorary society operates within the Society of Physics Students. Membership is based on general scholarship. An overall GPA of 2.75 and a GPA of 3.2 in at least 5 courses in physics are required for membership in Sigma Pi Sigma.

**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 the students and the alumni of the chapter, as well as the entire University and civic community. Membership is open by chapter 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. The purposes of Sigma Theta Tau include the recognition of superior achievement and leadership qualities, the fostering of high professional standards and creative work, and the strengthening of the individual’s commitment to the ideals and purposes of the nursing profession. Invitation to membership may be extended to junior and senior nursing students who have completed at least one-half of the required nursing component with a grade point average of 3.0. Graduate students in nursing who have completed one-fourth of the required graduate curriculum may be eligible for membership with a grade point average of 3.3.

**Tau Beta Pi (National Engineering Honor Society)**

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. Scholastic requirements include: class standing of the top eighth of the junior class or the top fifth of the senior class and demonstration of exemplary character.

**UAH Music Ensembles**

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

**Choral Organizations UAH Choir**

The choir performs choral literature of the great masters of music history as well as folk music of various countries. Attendance at all rehearsals and performances is required. Audition with conductor is required.

**Huntsville Village Singers**

The Village Singers is a small, elite group of mixed voices which performs madrigals and choral chamber music as well as choreographed tunes and medleys from Broadway and Hollywood. This group was selected for USO overseas tours in 1972 and 1974. Audition with conductor is required. Attendance at rehearsals and performances is also required.
Instrumental Organizations

Huntsville Symphony Orchestra

The Huntsville Symphony Orchestra, a semiprofessional blend of University and community talent, prepares six formal concerts each year. Four international artists perform with each annual concert series. The orchestra rehearses Monday and Friday from 7:30 to 10:00 p.m. Audition with conductor is required. Attendance at rehearsals and performances is also required.

UAH Jazz Ensemble

A workshop experience providing students with instruction in jazz arranging and composition and in improvised jazz is stressed. Attendance at rehearsals and performances is required. Audition with instructor is also required.

UAH Wind Ensemble

A select group of experienced bandsmen who perform the best available music literature for wind ensemble and concert band. The ensemble rehearses Wednesday from 7:00 to 9:30 p.m. Attendance at all rehearsals and concerts is required. An audition with the conductor is also required.

UAH Pep Band

The Pep Band is a musical organization of students that promotes spirit and enthusiasm at a variety of athletic events. Members and scholarship recipients are chosen by audition and may elect to enroll in the group for class credit.

Intercollegiate Athletics

The UAH Athletic Department continues with a concentrated effort toward building a more productive and more progressive overall program. Evidence of the effort is apparent in all visible areas almost immediately. Beyond that, there is a new attitude about the direction of UAH sports. Like the department itself, the program continues to grow.

UAH currently sponsors intercollegiate athletic programs in men’s and women’s basketball, crew, tennis, soccer, hockey, and women’s volleyball. Participation in these programs is open to any qualified student. Intercollegiate teams are affiliated with the National Collegiate Athletic Association (NCAA) and the Southeastern Athletic Conference.

Basketball (Men)

The UAH men’s basketball team is entering its sixteenth season this year. During this time, the sport has advanced from NAIA to NCAA Division II, creating a higher level of competition with each move. The Charger team of the late-80’s has a new look. This look includes a new coaching staff, outstanding recruits and new opponents. The newly conceived Mayor’s Classic will become a yearly event as the Chargers meet Alabama A&M for the city title each year.

Basketball (Women)

In 1977, UAH introduced women’s basketball to its list of collegiate sports. Like the men’s program, the women’s team has advanced to NCAA Division II competition. The women’s team has finished as high as runner-up in the NAIA national championship tournament. The Lady Chargers produced nationally recognized NCAA II athletes, such as second string All-American Annette Fletcher. The Lady Chargers are gaining in number and strength each season. They will also compete at the annual Mayor’s Classic held at the Von Braun Civic Center.
Soccer (Men’s)
The Charger soccer team distinguished itself nationally when it competed in the NAIA. The team qualified for the NAIA national tournament nine times, advanced to the final eight a total of six times and finished as high as second (1978). The team now competes on the NCAA Division II level, and plays a schedule that includes other nationally-ranked teams.

Hockey (Men’s)
The UAH Hockey program began as a Charger club team in 1978. This club team won three consecutive Central States Collegiate Hockey League titles, and the 1980 national title. The team advanced to NCAA Division II, where they continued their winning tradition. In 1987, the team advanced into NCAA Division I competition and Huntsville was named the Hockey Capital of the South. As a Division I team, the Chargers compete against hockey powers such as Notre Dame, Maine, and Alaska-Fairbanks.

Volleyball (Women’s)
The UAH volleyball team began in 1986. Although still a young program, the team’s strength is developing. The Lady Chargers compete against teams throughout the South, including the University of North Carolina-Asheville and Florida Atlantic University.

Tennis (Men’s and Women’s)
The Tennis program was re-established in 1986 after 3 years of inactivity. The second beginning was as an NCAA Division II team. The team is supported by the Huntsville Tennis Center, which hosts some UAH home games.

Crew (Men’s and Women’s)
The crew program went varsity in 1985 after being a club sport for almost twenty years. After three years on the varsity level, the two man heavy weight won national recognition when it won the first national championship ever for UAH in the Dad Vail Regatta.

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 team sports include basketball, flag football, softball, and volleyball. The individual sports which are offered are bicycling, horseshoes, golf, bowling, racquetball, swimming, table tennis, tennis, and weightlifting.

Spirit Organizations
Cheerleaders
The UAH Cheering Squad has 10 members. The primary purpose of the cheerleaders is to promote spirit, enthusiasm, and support for intercollegiate athletics on the campus. Squad membership is determined by a panel of judges during clinic and tryout sessions conducted each spring and fall. All cheerleaders must be students who are currently enrolled as freshmen, sophomores, juniors, or seniors and must maintain a minimum of a 2.0 (C) grade-point average.
Mascot
The UAH Charger Mascot promotes spirit, enthusiasm and support for intercollegiate athletics and the University. This person must be a student who is currently enrolled as a freshman, sophomore, junior or senior and must maintain a minimum of a 2.0 (C) grade point average.

Pep Band
The UAH Pep Band is a musical organization of students that promotes spirit and enthusiasm at a variety of athletic events. Members and scholarship recipients are chosen by audition and may elect to enroll in the group for class credit.

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: 895-6090. 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.

*Axis* is an art and literary magazine. *Axis* is the printed campus forum for art and literature which is sponsored by the Publications Board. All UAH students are eligible to submit their work for publication in *Axis*. Anyone wishing to submit art or literature for consideration for the next issue, can bring or mail their work to the *Exponent* office, Room 104, University Center.

Commencement
The signal event of the student’s academic program is commencement. Twice each year, at the end of the spring and fall terms, the University community conducts a special convocation of scholars, family, and friends to celebrate the completion of degree requirements by our graduates. These academic ceremonies in full regalia also symbolize the institution’s distinctive mission to engage in teaching, research, and public service.
Academic Advisement and Information Center

Academic advising is available to students in the Academic Advisement and Information Center, in advising offices in the Colleges of Nursing, Engineering, and Administrative Science and in the department or program in which a major has been declared. Special advising is provided in the professional areas of law and medicine; and career counseling is available through the Office of Career Planning and Placement. Freshmen and undeclared majors are advised in the Academic Advisement Center or, in the case of engineering and nursing freshmen, in the advising offices of the Colleges of Engineering and Nursing. When students declare a major (program of study), they are assigned a faculty advisor in their major department or program. All students are encouraged to maintain contact with their advisors and to take advantage of the opportunities for academic advising which the University provides.

Located in Room 118 University Center, the Academic Advisement and Information Center is staffed by a team of experienced faculty. They assist prospective and enrolled students in course and program planning, disseminate accurate information about academic programs and procedures, make referrals to appropriate offices and services, and advise and register students during registrations and orientations. Appointments may be made by calling 895-6290.

All freshmen students except those enrolled in the Colleges of Engineering and Nursing are required to visit the Advisement Center at least once each term to review their academic progress and to plan their schedule of courses for the next term. These schedules must be signed by an advisor in the AAIC in order to be processed by the Office of Admissions and Records. Undergraduates enrolled as special students must also have schedules validated each term in the Academic Advisement Center as long as they remain in the special-student category. Sophomore students outside of the three professional colleges (Administrative Science, Engineering and Nursing) who have not declared a major will be advised in the Advisement Center and will continue to have their registration cards signed by advisers in the AAIC.

Prospective transfer students who wish to gain information concerning the general requirements of various undergraduate degree programs may seek the services of the Academic Advisement Center. These students are further referred to department chairmen who can aid them in program planning in their major fields of interest. Transfer students will be advised and registered by the appropriate faculty advisor. Once enrolled at the University, transfer students beyond the freshmen level who are not enrolled in the Colleges of Engineering, Nursing, and Administrative Science, are advised by the Academic Advisement Center for the first term.
Academic rules and regulations stated in this catalog are subject to review for extenuating circumstances. Students are encouraged to use the services of the Academic Advisement and Information Center for the appropriate procedure of appeal. Academic appeals originate with the student and will be processed through the student’s major department, the dean of the school, and the Office of Academic Affairs, in that order.

Students beyond the freshman level who have not filed a Program of Study and are enrolled in the College of Administrative Science must have schedule cards approved each semester by a faculty adviser in that school. For an appointment, call 895-6024.

**General Information Center**

The General Information Center is located in 124 University Center. The staff maintains current information on academic programs, procedures, and activities of interest to the public and the University community. Interested persons should call 895-6295. Information on admissions, application forms, brochures, testing, and other materials relating to the University are available at the center.

**Policies**

**Nondiscrimination**

The University of Alabama in Huntsville is committed to equal employment and educational opportunity. Its policy is one of nondiscrimination with regard to any person on the basis of race, color, national origin, religion, sex, or age, and with regard to any otherwise qualified handicapped individual solely on the basis of handicap. This equal opportunity policy extends to the recruitment and admission of students, the recruitment and employment of faculty and staff, and the operation of all programs and activities. Additionally, the University is an affirmative action employer of protected minorities and women.

The foregoing commitment is designated to meet the nondiscrimination affirmative action requirements of applicable federal law, including the following statutes (with implementing regulations) and executive orders, as amended: Title VI and Title VII, Civil Rights Act of 1964; Executive Order 11246; the Age Discrimination in Employment Act of 1967 and the Age Discrimination Act of 1975; Title IX, Education Amendments of 1972; the Equal Pay Act of 1963; the Rehabilitation Act of 1972; and the Vietnam Era Veteran Readjustment Assistance Act of 1974.

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

- Dr. Elmer Anderson
  Faculty EEO Officer
  123 Madison Hall
  The University of Alabama in Huntsville
  Huntsville, AL 35899 (205-895-6337)

- Ms. Gerry Moore
  Staff EEO Coordinator
  135 Madison Hall
  The University of Alabama in Huntsville
  Huntsville, AL 35899 (205-895-6545)
Handicapped Students

The University of Alabama in Huntsville is committed to meeting the bona fide educational needs of enrolled students with physical or mental impairments, in accordance with the standards of the Rehabilitation Act of 1973. The University will operate its programs and construct its facilities in such a manner as to ensure accessibility for such handicapped students. When the need is made known to the University, appropriate academic adjustments will be made and auxiliary educational aids will be secured as necessary to prevent discrimination against handicapped students. The specific accommodation to be provided and the method by which it will be supplied will be determined on case-by-case basis.

The Vice President for Student Affairs has been designated by the University as the official responsible for coordination the institution’s implementation of this policy and its compliance with the Rehabilitation Act. Assistance to handicapped students is made available primarily through the Office of Student Development Services.

A student with a complaint relating to the activities of the University under this policy should contact the Counselor for Handicapped Students in the Office of Student Development Services.

Marital, Parental, or Temporary Disability Status

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

Confidentiality of Records

The Family Educational Rights and Privacy Act of 1974 is a federal law which protects the confidentiality of student educational records. To implement this law UAH has formulated and adopted a written institutional policy governing the handling of these records. Copies of this policy document are available to students at the Office of Admissions and Records, and it should be referred to for a more comprehensive treatment of this subject than is given in the summary statement here.

Under this law and university policy, a student has a right of access to his educational records and may inspect and review the information contained in them. The term educational record generally refers to any record maintained by the institution directly pertaining to an individual as a student, other than that made by institutional, supervisory, or administrative personnel remaining in the sole possession of the maker; by campus security; or by a physician, psychiatrist, or any other such professional medical personnel. This right of access does not extend to financial information submitted by the student’s parents or to confidential letters and recommendations collected under established policies of confidentiality and placed in his files before January 1, 1975. Furthermore, the student may at his discretion waive the right to any confidential letters of recommendation.

If a student believes his records contain inaccurate, misleading, or otherwise inappropriate data, he may bring the matter to the attention of the records official concerned. If by informal discussion with this official the student does not obtain the corrective action desired, he is entitled to a hearing at which he may challenge the item he finds objectionable. The decision of the hearing official or panel shall be final. If the decision is adverse to the student, he may insert in his educational record an explanatory statement relating to the contested item.
A student's privacy interest in his records is further protected by the rule against unauthorized disclosure. The University may not without the student’s consent release his educational records or any personally identifiable information contained in them to other individuals or agencies. Disclosure to the following parties, however, is specifically excepted by the Privacy Act from this rule: (a) administrative and academic personnel within the institution who have a legitimate educational interest; (b) officials of institutions in which the student seeks to enroll; (c) persons or organizations to whom the student is applying for financial aid; (d) accrediting agencies; (e) organizations conducting studies relating to tests, student aid programs, instruction; (f) certain federal and state government officials; (g) any person where the disclosure is required for compliance with a judicial order to proper subpoena; (h) appropriate persons where a health or safety emergency affecting the student exists; and (i) parents of a dependent student. As to some of these parties, additional conditions must be met in order for the disclosure to be allowable in the absence of a written consent from the student. Personally identifiable information will be transmitted by the University to a third party only on the condition that the recipient not permit any other party to have access to it without the student’s consent.

The University may release directory information to others without the necessity of obtaining permission from the student. Directory information is limited to the student’s name, address (local and permanent), telephone number, date and place of birth, major field of study, participation in officially recognized activities and sports, weight and height statistics if he is an athletic team member, date of attendance, degrees and awards received, and the previous educational institution most recently attended. If the student does not wish this information to be released, he may so indicate on the form provided at the time of registration, and the university will withhold it during that particular term. This request for nondisclosure of directory information must be renewed each term.

The following officials have been designated as records officials for student records within their respective area:

- Assistant Vice President for Enrollment Management (Admissions and Records)
- Director, Academic Advisement and Information Center
- Director, Cooperative Education
- Assistant Dean, College of Administrative Science
- Assistant to Dean, Engineering, Lower Division
- Appropriate Engineering Department Chairman, Upper Division and Graduate
- Director, Nursing, Undergraduate Program
- Director, Nursing, Graduate Program
- Director, Nursing, RN Education
- Director, Continuing Education
- Vice-President, Student Affairs
- Director, Medical Student Affairs
- Director, Financial Aid

A student should make a request concerning his educational records to the appropriate official listed above.

Any student who believes that his rights under the Privacy Act have been violated by the University may notify and request assistance from the Vice President for Academic Affairs and may file a complaint with the Family Educational Rights and Privacy Act Office, Department of Health, Education, and Welfare, Washington, D.C. 20201.
Student Responsibility

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

1. To consult their advisors on all matters pertaining to their academic careers, including changes in their programs.

2. To observe all regulations of their college and select courses according to the requirements of that college.

3. To attend all meetings of each class in which they are enrolled. Instructors will announce at the beginning of the term if they consider attendance in computing final grades.

4. To fulfill all requirements for graduation.

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

6. To answer promptly all written notices from advisors, faculty, deans and other University officers.

7. To file an “Application for Degree” in the Office of Student Records two terms before the expected date of graduation.

8. To enroll in only those courses for which the stated prerequisite(s) (if there are any) have been satisfactorily completed. Failure to comply with this procedure may result in administrative withdrawal.

9. To maintain the integrity of the classroom by practicing academic honesty. Students should refer to the Student handbook for details regarding academic dishonesty.

Student Conduct

A student enrolling in the University assumes an obligation to conduct himself in a manner compatible with the University’s role as an educational institution. The administration reserves the right to establish rules for expulsion and penalties for failure to meet standards of scholarship, character, and health.

All members of the UAH community are subject to the provisions of federal and state statutes and local city ordinances with regard to alcoholic beverages, drugs and narcotics, weapons, gambling, fireworks, and the use of state property. Such laws are fully in force on the University campus and may be enforced by public authorities, as well as campus police. Each person associated with the University is responsible for being aware of and abiding by these laws.

The University has incorporated as its own regulations all existing federal, state, and local laws defining and proscribing criminal behavior. In addition, the following policy applies to the UAH campus community:

1. University policy forbids the possession or consumption of alcoholic beverages by a student anywhere on University property, except in the student’s residence in University housing. In addition, any possession or consumption of alcoholic beverages by a student under 21 years of age, the legal age for drinking established by state law, or any other violation of state or local law with respect to drinking is contrary to established University policy. Activity of this kind may subject a student to both criminal prosecution and campus disciplinary action.

A student organization should be aware that it may be held responsible for actions of individuals, including non-members, connected with their consumption of alcoholic beverages made available by the organization at its functions. Careful consideration of this potential liability under the law and under University policy should therefore enter into plans to offer such beverages at an activity.

2. Narcotics and other controlled substances will not be permitted anywhere on University property except upon prescription by a practitioner (as that term is defined in the Alabama
Uniform Control Substances Act) or except by a practitioner or his authorized agent under his supervision, incident to research, teaching, chemical analysis, or professional practice.

3. Firearms or other weapons (including explosives) are not to be brought onto or kept on UAH property by anyone, whether holding a firearm’s license or not, except police officers and other law enforcement officials in the exercise of their lawful duties.

Students who violate any of the foregoing laws, regulations, or policies are subject to University disciplinary action as provided in the UAH Student Judicial Code and/or arrest and prosecution by civil authorities as appropriate. Similarly, faculty or staff personnel who violate these laws, regulations, or policies are subject to adverse employment action, including dismissal, and/or arrest and prosecution as appropriate. Suspected violations of the Student Judicial Code should be reported to the Office of the Vice President for Student Affairs.

Officers in the Office of Campus Security are by statute charged with all the duties and vested with all the power, such as that of arrest, of police officers. Violations of federal, state, or local laws should be promptly reported to the security office and full cooperation given in the discharge of its responsibilities.

**Special Programs**

**Honors Program**

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. Over the periods of their participation, students in the Honors Program pursue structured enrichment activities, Honors coursework that parallels regular offering, special interdisciplinary seminars, and enhanced opportunities for independent study and research. Participating students also will find reward in the direct contact the Honors Program affords with other talented and highly motivated students and with faculty. Students who are admitted to the Honors Program in 1989-1990 and who wish to participate fully in the Program will earn by graduation a minimum of 30 hours in Honors coursework. For freshman entering the Honors Program in 1989-1990, courses of study should include:

**Freshman/Sophomore**

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General education courses offered for Honors credit</td>
<td>12</td>
</tr>
<tr>
<td>Honors Forum</td>
<td>6</td>
</tr>
</tbody>
</table>

**Junior/Senior**

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interdisciplinary Seminars</td>
<td>6</td>
</tr>
<tr>
<td>Independent Study/Honors Project</td>
<td>6</td>
</tr>
</tbody>
</table>

**Total**                                           **30**

1 Other general education courses offered for Honors credit will appear in schedules of courses for each term. Student should plan to pursue Honors work in several disciplines.

2 Depending upon a student’s major/college these two courses serve as electives or can be taken in lieu of specific degree requirements.

There will be variation in the coursework taken by Honors students; however, all students should plan to take 6 hours of Honors Forum, and many Honors students, depending upon their point of entry into the program, will take Honors English Seminar (EH 105H), Honors Calculus I (MA 153H), Honors Seminar 399, and an Honors Senior Project. Careful advisement is provided so that students can work out efficient and challenging courses of study.

The Honors Program serves excellent students without regard to the majors or colleges in which the students enroll. Entering freshmen are invited to participate based on an evaluation of ACT or SAT scores and high school performance. Other students are admitted based on outstanding college performances. Students with cumulative college grade point
averages of 3.5 or higher after earning 9 hours of credit at UAH are urged to discuss with the director how they may best participate in the Honors Program. Students may participate in the Honors Program in several ways. Because the University plans to phase in Honors coursework over several years, the Program in 1989-1990 will be most attractive to freshman and sophomores. Students are expected to maintain excellent academic standards in order to remain in the Honors Program.

It is expected that Honors students will be awarded financial aid under one of UAH’s several programs to assist the academically talented. Students should discuss financial aid for Honors students with the director of the Honors Program or the director of Financial Aid.

For more information concerning the Honors Program, please write the Director of the Honors Program, The University of Alabama in Huntsville, Huntsville, Alabama 35899; or telephone 205-895-6450.

Cooperative Education (Co-op) Program

The UAH Cooperative Education (Co-op) Program provides the opportunity for the academic work of qualified students to be enriched with productive periods of practical experience in business, industry, and government. In addition to gaining practical experience in a field directly related to their major, Co-op students earn sufficient money to pay a substantial portion of their University expenses. At graduation, the majority of UAH Co-op students are offered full-time permanent employment with their Co-op employer.

Most students participating in the UAH Co-op Program alternate terms of full-time study with terms of full-time career-related work with leading employers in the Huntsville area.

Students majoring in all undergraduate disciplines are potential candidates for Co-op positions if they meet the program’s academic requirements. Any currently enrolled UAH student may apply to the program if the student has a minimum of 16 hours college credit, at least eight hours earned or in process at UAH, and if the student has an overall quality point average (QPA) of at least 2.5 on the 4.0 scale.

A Graduate Co-op Program is also offered at UAH for those students pursuing a graduate degree. The Graduate Program is explained in the UAH Graduate School Catalog.

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

For more information, contact the UAH Co-op Office. The mailing address is: Cooperative Education Office, The University of Alabama in Huntsville, Huntsville, AL 35899. The telephone number is (205) 895-6741.

Special Services Program

A Special Services Program consisting of tutoring, testing, developmental skills, classes, counseling and advising has been developed to assist students who are intellectually able to do college work but who have poor academic preparation for college services are also provided for students who are handicapped. All students who are admitted on probationary status or who are having problems with any of their basic introductory or remedial-level courses should make an appointment with the Director of the Special Services Program as soon as possible following registration. There is much greater probability of success if students apply for help from the program before the third week of the term, and students may be refused admission to the program after this time. The Special Services Program is closely coordinated with other University programs such as the Educational Opportunity Center, Academic Advisement and Information Center, Admissions, and Financial Aid. The purpose of the Special Services Program is to help students improve their chance of completing their college education.
Testing Service

The tests used for admissions, credit by examination, and placement which are administered through this office include: the American College Testing (ACT), the Miller Analogies Test (MAT), the Graduate Record Examination (GRE), the Medical College Admissions Test (MCAT), the College Level Examination Program (CLEP), the General Education Development (GED) Testing Program, the English Language Proficiency Test (ELPT), the Calculus Readiness Test (CRT), the UAH chemistry placement test, and the National League for Nursing (NIN) profile examinations. Applications and information pertaining to the following testing programs are also available: the Graduate Management Admissions Test (GMAT), the National Teachers Examination (NTE), the Law School Admission Test (LSAT), the Test of English as a Foreign Language (TOEFL), and the Alabama Initial Teacher Certification Test.

Testing Services is located in Room 203, University Center, phone, 895-6725.

Placement Tests

Placement standards are used after students are admitted to UAH to help determine the most appropriate level of entry into coursework in mathematics, English, foreign language, and chemistry. Students may be placed in noncredit, level one, level two, or level three courses. It is to the student's benefit to abide by the assigned placement.

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.

A student’s ACT scores and high school grades determine his placement in English. In mathematics a placement test is also required.

A student desiring to register for Chemistry 121 must (1) be placed in CH 121 from results of the Chemistry Placement exam, or (2) have taken CH 101 or its equivalent.

A student who has had formal training in French, German, or Spanish 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 has had formal training will begin on level 101.

A student is required to pursue placement procedures only with regard to the aforementioned academic area and conditions. If a student has not received placement recommendations before enrollment, he should contact the Office of Admissions.

The Chemistry Placement Test and residual ACT Placement tests are scheduled once each term. The Mathematics Placement Tests are scheduled regularly. Students wishing to take these tests should register in the Office of Testing Services (895-6725) at least three days before the tests are to be given. Students will be notified at the time of the exams when they can expect to receive the results of the tests. The charge for the residual ACT is $13. The chemistry placement examination and Mathematics Placement Tests are free.

Credit by Examination

At UAH a student may obtain up to one-fourth of his degree (32 semester hours) by examination. There are three alternatives by which a student may gain credit through examination at UAH: 1) the Advanced Placement (AP) Program, 2) the College Level Examination Program (CLEP), and 3) departmental examinations. Credit by examination is not allowed: 1) to receive credit when a student has successfully completed a course at a higher level than the one being challenged, 2) to raise a passing grade, 3) to remove failures received in a course during the period of current enrollment, or 4) to satisfy the residence requirements for graduation.
1) Advanced Placement Program
Several UAH departments will award credit to students who have earned a score of 3 or higher on Advanced Placement (AP) Program examinations of the College Entrance Examination Board. The areas in which credit is presently awarded are biological sciences, chemistry, mathematics, and English composition and literature, computer science. Credit, if awarded, will be recorded without grades or quality points and will not, therefore, be included in calculation of the grade-point average.

2) College Level Examination Program (CLEP)
The College Level Examination Program (CLEP) 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, and intensive reading, may substantially reduce the cost in both time and money spent on a college degree by taking one or more of these tests. The policy for CLEP credit varies with each institution. The policies listed herein are those of UAH. These tests are given monthly but must be registered for three weeks or longer before the testing date. For a complete listing of dates and deadlines, contact the Office of Testing Services in Room 203 University Center.

CLEP General Examinations
The General Examinations are objective tests that measure achievement in five basic areas of the liberal arts: English composition, humanities, mathematics, natural sciences, and social sciences and history. Credit by General Examination can be given only if examinations were taken before entering college or during first term in college, providing the student has not been enrolled in a comparable course for more than three weeks. The student may be awarded 6 hours elective credit per examination. To achieve credit for any of the general tests, the student must score a minimum of 549. No credit is awarded for scores below 549. Credit is recorded without grades or quality points and is counted as elective credit only.

CLEP Subject Examinations
Credit awarded for CLEP subject examinations will be recorded on the student’s record without grades or quality points and will not, therefore, be included in calculation of the quality-point average. The CLEP subject tests and minimum score for credit which will be accepted as substitutes for UAH courses are listed below:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Minimum Score</th>
<th>For</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Government (with essay)</td>
<td>54</td>
<td>PSC 101</td>
</tr>
<tr>
<td>American History I (with essay)</td>
<td>53</td>
<td>HY 221</td>
</tr>
<tr>
<td>American History II (with essay)</td>
<td>53</td>
<td>HY 222</td>
</tr>
<tr>
<td>*Analysis and Interpretation of Literature (with essay) and College Composition (composite score)</td>
<td>60</td>
<td>EH 101, 102</td>
</tr>
<tr>
<td>General Chemistry (take placement exam first)</td>
<td>48</td>
<td>CH 121, 123, 125, 126</td>
</tr>
<tr>
<td>Introductory Accounting</td>
<td>57</td>
<td>ACC 211, 212</td>
</tr>
<tr>
<td>Introductory Business Law</td>
<td>57</td>
<td>BLS 221</td>
</tr>
</tbody>
</table>
Introductory Macroeconomics .......................... ECN 142
Introductory Microeconomics .......................... ECN 143
Introductory Sociology .................................. SOC 100
Western Civilization I (with essay) ....................... HY 101
Western Civilization II (with essay) ...................... HY 102

*The English Department requires a composite score of 60 on the two examinations, Analysis and Interpretation of Literature (with essay) and the College Compositions, in order to receive 6 hours credit for English 101, 102. Note that no credit is allowed unless both examinations are taken.

If a student does not pass the test(s) no record is placed on his transcript. General examination or subject examinations may be retaken six months after initial testing.

Credit by subject examination is not allowed unless the appropriate academic department has accepted the CLEP test for use by the University.

3) Credit by Department Examination
Departmental Examinations 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 class or on a tutorial basis, or through private study. Satisfactory completion of the examination will normally allow the student to be eligible for credit in the appropriate course.

The amount of credit allowable through departmental examinations is determined by the appropriate academic dean and the department chair concerned. (See the catalog section on Billing and Payment Procedure for the fee structure for Credit by Examination)

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

- Biological Sciences ................................. Contact Department Chair
- Computer Science .................................. All 100 and 200 level courses
- Mathematics ...................................... MA 003
- Music ............................................. Mu 101, 102, 103, 104, 110, 301, 302, 303, 304, 305, 306, 311, 312
- Nursing ............................................ Contact Nursing Advisement Office
- Philosophy ....................................... PHL 201, 320

For further information concerning CLEP, the AP program or Department Examinations contact the Office of Testing Services, Room 203, University Center, telephone 895-6725.

Course Information
The courses to be offered each term will be announced in the UAH timetable of classes well in advance of the term. There is no assurance that a particular course will be scheduled in any given term or year. Instructor assignments listed in the term schedule are subject to change without notice.

Courses are described under the sections of the various schools.

Course Numbering System

<table>
<thead>
<tr>
<th>Range</th>
<th>Year Student Normally Takes Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>001-099</td>
<td>Refresher (noncredit)</td>
</tr>
<tr>
<td>100-199</td>
<td>Freshman</td>
</tr>
</tbody>
</table>
200-299 Sophomore
300-399 Junior (upper level)
400-499 Senior (upper level)
-599 Advanced undergraduate credit or graduate credit, according to the Colleges of Engineering and Administrative Science–graduate credit only. Colleges of Liberal Arts, Nursing, and Science may be either undergraduate or graduate credit. Check course listing for specification.
-799 Graduate (NPG and advanced undergraduate students only by special permission.)

Course Prefix Legend

Accounting ................................ ACC  
Art History ................................ ARH  
Arts, Hum. & Soc. Sci. ..................... AHS  
Art Studio ................................ ARS  
Astronomy ................................ AST  
Atmospheric Science ....................... ES  
Bibliography ................................ BIB  
Biological Sciences ......................... BYS  
Business Legal Studies ..................... BLS  
Chemical Engineering ..................... CHE  
Chemistry .................................. CH  
Civil Engineering .......................... CE  
Communications ........................... CM  
Computer Engineering ..................... CPE  
Computer Science ......................... CS  
Economics .................................. ECN  
Education .................................. ED  
Electrical Engineering ..................... EE  
English ..................................... EH  
Environmental Science .................... ES  
Finance ..................................... FIN  
French ....................................... FH  
German ..................................... GN  
History ..................................... HY  
Ind. & Sysems Engr ........................ ISE  
Japanese ................................... JE  
Journalism ................................ CM  
Latin ....................................... LN  
Linguistics ................................ LI  
Management ................................ MGT  
Marketing ................................... MKT  
Marine Science ............................. MS  
Mathematics ................................ MA  
Mechanical Engineering ................... ME  
Medicine .................................... MED  
Management Information Systems ......... MIS  
Management Science ....................... MSC  
Modern Languages ........................ ML  
Music ....................................... MU  
Music Education ............................ MUE  
Natural Science ............................ NS  
Nursing ..................................... NUR  
Optical Engineering ....................... OPE  
Optical Science ............................. OPT  
Philosophy .................................. PHL  
Physical Education ......................... HPE  
Physics ...................................... PH  
Political Science ........................... PSC  
Procurement Management ................... PRM  
Psychology .................................. PY  
Public Administration ...................... PA  
*ROTC ..................................... MIL  
Russian ..................................... RN  
Sociology .................................... SOC  
Spanish ..................................... SH  
Speech ....................................... CM  
Statistics:  
Liberal Arts ................................ AHS  
Administrative Science .................... MSC  
Mathematical Sciences .................... ST  

*Courses at Alabama A&M University are available to UAH students by means of the Visiting Student Program. Information on procedures to be followed for registration in the courses is available in the Office of Admissions and Records.
Student Classification

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

<table>
<thead>
<tr>
<th>Semester Hours Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman ................ 0-29</td>
</tr>
<tr>
<td>Sophomore ................ 30-59</td>
</tr>
<tr>
<td>Junior .................... 60-91</td>
</tr>
<tr>
<td>Senior .................... 92 up</td>
</tr>
</tbody>
</table>

Student Course Loads

A full-time undergraduate student is one who is enrolled in courses totaling at least 8 semester hours a term. The maximum number of semester hours in which a student will be permitted to enroll in one term is 13, including simultaneous correspondence courses. Under exceptional circumstances, permission may be granted by the dean of the school in which the student is enrolled to take additional hours. (Equivalents will be used for noncredit and audit courses.) A student enrolling for a minimum load each term should not expect to graduate in four years unless he enrolls four terms each year.

Students are responsible for independent study. Careful budgeting of time is necessary if the desired academic goals are to be reached. Accordingly, full-time students are advised to limit their employment. Experience has shown that approximately twenty hours a week constitutes an average work load that will allow needed time for adequate study.

Students who for financial reasons need to be employed to a great extent should reduce their course load. To allow sufficient time for the amount and quality of work necessary to meet academic goals, fully-employed undergraduate students normally find that they should take no more than two courses.

A part-time undergraduate student is one who is enrolled in courses totaling one to 7 semester hours.

A full-time graduate student is one who is enrolled in courses totaling 6 to 10 graduate-level semester hours a term.

Orientation

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

Registration

Dates of early and, regular registration are listed in the UAH calendar. Any continuing or returning student eligible to register may take part in early registration. All past financial obligations to the University must be cleared before a student may register for courses.

All students in the College of Engineering and the College of Nursing are required to have an advisor's approval of registration requests. All students above the level of freshman who do not have an approved program of study on file in the College of Administrative Science are required to have advisor's approval of registration. All freshman and first term transfers in the Colleges of Liberal Arts, Administrative Science, and Science, and special students are required to process registration requests through the Academic Advisement and Information Center.

A student who schedules courses during any registration period (early or regular) will have made a financial commitment to the University. If courses are dropped or changed, the student must submit these changes in writing to the Office of Student Records. Adjustments in fees, if any, will be made by the Bursar's Office.
Schedule Adjustments

After a student has completed registration, all changes in his schedule must be made on a change-of-course form and recorded in the Office of Student Records. (See section on Registration for approval required.)

Credit to Audit

A student is permitted to change a course from credit to audit only during the first two weeks of classes.

Removal of Course from Schedule

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

Other Kinds of Changes

The following kinds of changes may be accomplished only during the designated hours of regular registration and the schedule adjustment period.

1. Change from one course to another.
2. Change from one section to another section of the same course.
3. Addition of course to schedule.
4. Change from audit to credit. Only students who are otherwise eligible to take the work for credit will be permitted to make this kind of change.

Withdrawal Policy

To withdraw from one or more classes, a student must initiate a formal request for withdrawal through the Office of Student Records. Class non-attendance does not constitute withdrawal nor does notification to the instructor. Unless the withdrawal procedure is followed, a student continues to be enrolled in class and a failing grade may be assigned.

Regardless of the reasons for withdrawing, students must carry out withdrawal procedures as follows:

1. Obtain a Request for Withdrawal Form from the Office of Student Records, 116 University Center.
2. If withdrawing during the first two weeks of the term, submit the completed withdrawal form to the Office of Student Records. A grade of W will be recorded.
3. If withdrawing during the third through sixth week of the term, the withdrawal form must be signed by the student's academic advisor. (Depending on the student’s class rank and program of study, the appropriate advisor is located in the Academic Advisement Center, the advising offices of the Colleges of Administrative Science, Engineering, or Nursing, or within the major department.) A grade of W or WF will be assigned by each instructor based on the student’s performance up to the date of withdrawal. A grade of WF is calculated in the grade point average in the same manner as an F.
4. Beginning with the seventh week of the term, a student may withdraw ONLY in exceptional circumstances and with the approval of the dean of the college in which the student is enrolled. If the dean signs the withdrawal form, a grade of W or WF will be assigned by the instructor based on the student’s performance to the date of withdrawal.
5. THE EFFECTIVE DATE OF WITHDRAWAL is the date the Request for Withdrawal Form with appropriate signatures is received in the Office of Student Records, which will then notify instructors that the student has withdrawn.
6. Students in the Cooperative Education (Co-op) program must secure the approval of the Director of Cooperative Education prior to withdrawal.

Repeating a Course

An undergraduate student may not repeat a course in which the grade of C, P or better is received with the exception of courses designated that may be repeated for credit. Concurrent registration for multiple sections of a course is disallowed. Each time a course is taken, the hours attempted and the quality points earned will be counted in calculating the student’s grade point average. The credit for any course repeated may be counted only once towards graduation except for courses otherwise designated.

Class Attendance

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

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

Examinations

During each term, one or more announced examinations of class period length may be held.

At the end of each term, 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 he 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 by the end of the ninth week of classes. It is the student’s responsibility to notify his 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, WF, S, U, P,

A Superior achievement. Credit given; four quality points given per semester hour.
B Above average achievement. Credit given; three quality points given per semester hour.
C Average achievement. Credit given; two quality points given per semester hour.
D Passing work. Credit given; 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 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 term 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.

X Excused absence from examination.

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

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

WF Withdraw failing.
Recorded by the Office of Student Records when a student withdraws from a course
with failing work. (See Withdrawal.)

S Satisfactory work. Applicable to noncredit courses and to some specified credit
courses.

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

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

Change of Grade
A student is permitted a maximum of one term from the date a grade is assigned to request
a change of course grade. Grades submitted to the Office of Student Records can be changed
only by submission by the instructor of a Change of Grade form containing a written
explanation of the error. The Change of Grade form must be approved by the dean of the
College concerned and received in the Office of Student Records no later than two terms
from the date the original grade was assigned.

Student Grade Report
At the completion of each term, a report of final grades is mailed to the address furnished
by the student.
A statement of a student's satisfactory or unsatisfactory academic performance will be
provided, upon request, to the individual or agency sponsoring the student's tuition if the
individual or agency submits a statement certifying grade release unless written notification
to the contrary is submitted by the student to the Office of Student Records before the final
examination period.

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

Academic Achievement
Honor Scholar
An undergraduate student in good standing earning 8 or more semester hours in a term
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 8 semester hours a term and establishes a GPA of 3.50-
4.00 at the end of the term in which a cumulative total of at least 8 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 8 or more semester hours in a term with a GPA of 3.00-3.49 is recognized by having his name placed on the list of scholars.

A student who takes less than 8 semester hours a term and establishes a GPA of 3.00-3.49 at the end of the term in which a cumulative total of at least 8 semester hours are completed, will have his name placed on the list of scholars. For this purpose, a part-time student's work will be considered in blocks that do not overlap.

Graduation with Honors
A student graduating at the bachelor's level with a GPA of 3.20 up to 3.50 will be graduated cum laude; a student with a GPA of 3.50 up to 3.80 will be graduated magna cum laude; a student with a GPA of 3.80 or higher will be graduated summa cum laude.

In determining eligibility for honors, a student's overall GPA as well as his GPA on work taken at UAH will be computed and both computations must fall within the specified range.

Honor designations will appear on transcripts, commencement programs and diplomas.

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 Probation and Suspension
In order to remain in good academic standing, an undergraduate student must maintain an average of 2.0 (C) on all work attempted at UAH, within the University of Alabama System, as well as on all college work attempted.

At any point that a student's cumulative grade point average, either overall or at UAH, falls below 2.0 (C), the student will be placed on scholastic probation. (See exception applied to freshmen below.)

If a student's grade point average on one term (minimum load 8 hours, accumulated for part-time students) is below 1.0 (D) with the cumulative GPA greater than 2.0, a warning message will be printed on the student's grade report, and a list of such students provided to the school deans.

A beginning freshman will be reviewed for the first time at the end of the term in which he has attempted a total of 8 semester hours of work (accumulated for part-time). At this point, if the student has at least a 1.0 but less than 2.0, he is placed on academic warning and referred for appropriate advising. If such a student has a GPA of less than 1.0, he is placed on scholastic probation.

Once a student is placed on scholastic probation, such a student is reviewed in intervals of a minimum of 8 semester hours of work attempted (accumulated for part-time students). At such review points, three actions are possible:
1. If cumulative GPA is 2.0 on all work and on UAH work, student is removed from probation.
2. If cumulative GPA is less than 2.0 on all work, but block of work being reviewed is 2.0 or higher, student is continued on probation.
3. If cumulative GPA is less than 2.0 on all work or on UAH work and GPA on block of work being reviewed is less than 2.0, student is suspended.

A regularly admitted student suspended for the first time is automatically eligible to re-enter the second term following such suspension. A student admitted in any special category
and suspended for the first time must petition the Admissions Committee for permission to re-enter after an absence of at least one term.

A student suspended the second time within the University of Alabama System is disqualified for readmission. After a period of one year, such student may petition for re-admission.

Individual schools may have additional requirements specific to their programs. Refer to school sections.

**Indeterminate Academic Status Policy**

For the purpose of determining academic status of those students on academic probation, a grade of I or X will be treated as a grade of F. Credit hours attempted will be charged to the student and zero quality points will be earned for the I and/or X. The action of Academic Suspension will be exercised when the results of calculation of grade point average (with the I or X treated as a F) indicates such action to be appropriate (See Academic Probation and Suspension section of the undergraduate catalog). When the I or X is remedied and the grade change reported to the Office of Records, grade point average and subsequent standing will again be determined.

**Conditional/Probational to Regular Status**

Students admitted on condition or probation will be evaluated for regular student status after earning 15 or more 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 special student is not required to initiate this change. Each student’s record is reviewed via computer after each term.

**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 Appeal 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 school, and the Office of Academic Affairs, in that order. Students classified as “special” will be routed through the most appropriate academic dean, but should begin by contacting the Academic Advisement and Information Center, 895-6290.

Students should contact their major advisor for assistance.

**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.

**Declaring a Major (Program of Study)**

Students should declare a major by the end of the freshman year. When the student declares a major, the student will be assigned an adviser by the relevant dean/department chairman. At that time the complete advising folder will be transferred from the Academic Advisement and Information Center (AAIC) to the relevant dean or department chairman’s office for
permanent retention. Sophomores who have not declared a major will continue to have their registration cards signed in the AAIC. If students with 45 semester hours are still not prepared to declare their majors, they will declare an intention to continue to seek advice from the AAIC.

Within the same degree a student may elect to complete requirements for more than one major.

**Pass-Fail Option**

To be eligible to take courses on a P-F basis, a student must: (1) have junior or senior standing; (2) not be on probation; (3) have an approved major or program plan appropriately filed. A student is limited to 12 semester hours of credit on a P-F basis. P-F system applies only to courses chosen as electives. Some departments limit P-F option to electives outside the department or school.

A grade of P may be changed to a regular grade only if the student changes his 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, it must remain.

Under the P-F system, a grade of P will not be counted in a student’s GPA; a grade of F will be counted in a student’s GPA.

A student wishing to exercise a P-F option must make application at the Office of Student Records before the end of the late registration period.

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

**Visiting Student Program**

**Undergraduate**

A cooperative arrangement exists with Alabama A&M University, Athens State College, Calhoun Community College, Oakwood College and the University of Alabama in Huntsville. A similar arrangement exists with the University of Alabama in Tuscaloosa and in Birmingham. 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.
2. The course desired must be unavailable at the student’s home institution.
3. Visiting students are limited to one undergraduate course a term 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.
5. The student’s request must be approved by his adviser and other appropriate personnel.
6. Permission of the host institution is dependent upon availability of space for the visitor after its own students are accommodated.

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

**Graduate**

A cooperative arrangement exists with Alabama A&M University. Any student interested in participating in this program should consult the School of Graduate Studies Catalog.
Reserve Officers Training Corps (ROTC)

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

Application for Graduation

Candidates for graduation must file their application at least six months 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.

Students completing degree requirements in any term other than spring and fall terms will be given certified letters of completion and will receive diplomas at the next graduation ceremony.

Second Bachelor’s Degree

A student who holds a bachelor’s (or higher) degree from another institution and who wishes to earn a second bachelor’s degree at UAH, must request a detailed evaluation of his previous record before he may officially declare a major.

The program for the second bachelor’s degree must meet all requirements imposed on transfer students, e.g., hours in residence, (see Total Degree Requirements section), upper level hours, appropriate major and minor or cognate studies).

After a student has earned one bachelor’s degree at UAH, he may qualify for a second bachelor’s degree by completing (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. The second degree must include a new major. The student must meet all other applicable requirements for the degree. Excess credits earned while pursuing the first degree are not applicable to the second degree.

Time Limits

A student may complete requirements for graduation as specified in the UAH catalog for the year he enters UAH provided he does so within a period of seven years from his original date of entry. If a student does not complete requirements for graduation within the seven year period, the student must change to the then current catalog and meet the requirements as specified. Subsequent seven year periods will again demand a change in catalog. At any time within the seven years that requirements for graduation are changed, a student may elect to be graduated under the new requirements or the catalog chosen. However this does not extend the seven year limit beyond the original date of entry. In other words, catalog requirements pertinent to an individual student are based upon original date of entry and proceed in seven year increments. At any time within the seven years that requirements for graduation are changed, a student may elect to be graduated under the new requirements.
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 only upon the written request of the student involved.

Official transcripts are not issued to the individual student; however, he may request an unofficial transcript which does not bear the University seal.

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

Correspondence Study and Other Nonresident 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 write to the College of Continuing Studies, Independent Study Division, University of Alabama, P.O. Box 2967, University, Alabama 35486.

Undergraduate Colleges, Majors and Degrees

Detailed information concerning the various degree programs, including course descriptions, is organized according to colleges. See the table of contents for the listing of colleges.

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
Economics Marketing
Finance Procurement Management
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 History
Communication Arts Music
Education Music Education
English Political Science
Foreign Language/International Psychology
Trade Russian Area studies
French Sociology
German
Other areas with course offerings are Japanese, Latin, linguistics, philosophy, Russian, Spanish and physical education.

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

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

College of Science

Areas of study in which majors are currently offered are:

- Biological Sciences
- Chemistry
- Computer Science
- Mathematics
- Mathematics Education
- Optical Science
- Physics

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

Degrees Offered

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

Bachelor of Arts—Art, art education, biological sciences, communication arts, economics, education, English, foreign language/international trade, French, German, history, mathematics, mathematics education, music, music education, political science, psychology, Russian area studies, sociology

Bachelor of Science—Biological sciences, chemistry, computer science, education, mathematics, mathematics education, optical science, physics.

Bachelor of Science in Business Administration—Accounting, economics, finance, management, management information systems, marketing, procurement management.

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

Bachelor of Science in Nursing—Unified professional curriculum.

Total Degree Requirements

1. Minimum requirements for the Bachelor of Arts, Bachelor of Science, Bachelor of Science in Business Administration, and Bachelor of Science in Nursing degrees are 128 semester hours; for the Bachelor of Science in Electrical and Industrial and Systems Engineering degree, 129 semester hours; for the Bachelor of Science in Chemical Engineering, 134 semester hours; for the Bachelor of Science in Civil and Mechanical Engineering degree, 133 semester hours; and for the Bachelor of Arts in Music, 134 semester hours. A minimum of 25 percent of the total requirements and 12 of the last 18 hours must be completed at UAH. Also, unless otherwise specified by the department involved, a minimum of 12 semester hours of upper-level numbered 300 or above must be completed at UAH in a student’s program (6 hours in his major and 6 hours in his minor or cognate studies). A minimum of 30 percent of the total degree requirements must be taken in courses numbered 300 or above.

2. The maximum amount of correspondence or credit by examination allowed towards a bachelor's degree is 25 percent of the degree requirements.

3. An overall average of C is required for all courses taken: (a) at all institutions; (b) at UAH; (c) in all courses in the major discipline taken at UAH, and also in all courses taken in the major discipline, including UAH courses and transfer courses; and (d) in all courses in the minor discipline taken at UAH, and in all courses taken in the minor discipline including UAH courses and transfer courses; or in all courses listed in the cognate studies option taken at UAH, and in all courses listed in the cognate studies option, including UAH courses and transfer courses.
4. Additional degree requirements for each degree are described in the appropriate sections of this catalog.

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

**I. General Education Requirements**

**Humanities and Fine Arts**

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition (EH 101 and EH 102)</td>
<td>6</td>
</tr>
<tr>
<td>(Students admitted to Honors Program may substitute EH 105 for English Composition requirement)</td>
<td></td>
</tr>
<tr>
<td>Origin and Development of the Contemporary World (HY 101 and HY 102)</td>
<td>6</td>
</tr>
<tr>
<td>Foreign Languages (two courses at the 200 level or placement at that level)</td>
<td>6</td>
</tr>
<tr>
<td>Survey of Literature (EH 205 and EH 206; or EH 205 and EH 241; or EH 205 and EH 230; or EH 206 and EH 240; or EH 230 and EH 240, or 250 and 251)</td>
<td>6</td>
</tr>
<tr>
<td>Fine Arts. Art History (ARH 100 or ARH 101) or Art Studio (ARS 110) or Music (MU 100 or MU 110) or (CM 122).</td>
<td>3</td>
</tr>
<tr>
<td>Lower division humanities course. PHL 101 or any humanities course at the 200 level chosen from English, Philosophy (Excluding PHL 201), or History (Course must be outside major and minor except for those students who complete all requirements for teacher certification).</td>
<td>3</td>
</tr>
<tr>
<td>Upper division Humanities or Fine Arts Elective. Chosen from English (excluding EH 300, EH 301, and EH 302), History, Philosophy, Art, Music, Foreign Languages (Literature courses only), or Communication Arts (CM 309 or CM 322). (Course must be outside major and minor except for students completing all requirements for teacher certification) (Students admitted to Honors Program may substitute H 399 for this requirement).</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Humanities and Fine Arts</strong></td>
<td><strong>33</strong></td>
</tr>
</tbody>
</table>

**Science, Mathematics, and Social Sciences**

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics. One course at Level II or above.</td>
<td>3</td>
</tr>
<tr>
<td>Laboratory Science. Two courses in a single discipline and one course in a second laboratory science discipline (BYS, AST, CH, PH, or ES).</td>
<td></td>
</tr>
<tr>
<td>Social Sciences. (PSC 101, PSC 135, SOC 100, SOC 200, PY 103, EC 142, and EC 143) Any four of these courses and it does not need to be outside major or minor. (Students who complete all requirements for teacher certification may substitute ED 230 and ED 263 for two of these courses).</td>
<td>12</td>
</tr>
<tr>
<td>Upper division Social Science Elective. Chosen from Political Science, Sociology, Psychology, Economics, Students admitted to Honors Program may substitute a second H 399 for this requirement.</td>
<td></td>
</tr>
<tr>
<td>Upper division Social Science electives must be outside major and minor. LOWER DIVISION SS does not have to be outside major and minor. UPPER DIVISION Must be outside major and minor - Depts effected include PSC, SOC, PY</td>
<td>3</td>
</tr>
</tbody>
</table>
Additional Requirements. One additional course chosen from MA 151 or higher, PHL 201, ST 281, AHS 300, CS 100, or CS 108. (Students who complete all requirements for teacher certification may substitute ED 510 or ED 360). .......................... 3 Hours

Total Science, Mathematics and Social Sciences .......................... 33 Hours

Major Requirements

A minimum of 30 semester hours in a program of study in a single department with at least 21 of these hours at the 300 level Minimum or above. .................................................... 30-36 Hours

Minor Requirements

A minimum of 18 semester hours in a single discipline with a minimum of 12 hours *at the 300 level or above or a minimum of 21 semester hours in an approved cognate area of closely related courses approved by the major department with 12 of these hours at the 300 level or above. (See individual department programs for specific requirements of each minor or consult with an advisor in major department for the development of a Minimum approved cognate area) .............................. 18-21 Hours

Free Electives

The student may select any elective courses outside of the major and minor as needed to complete the University requirement of a minimum of 128 hours for graduation. The requirements of some programs may exceed 128 hours.

Minimum semester hours for completion of program minimum .... 128 Hours

*An exception is in Mathematics. Consult The Mathematical Sciences Department for details.

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

I. General Education Requirements

English Composition (EH 101 and EH 102) (Students admitted to the Honors Program may substitute EH 105 for the English Composition requirement) .......................... 6

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

Foreign Language and Communication Skills

a) Two terms of foreign language at the 200 level, or .................. 6

b) Three terms of communication skills (CS 108 or 113; CM 113; EH 301) .................................................... 9

Survey of Literature (any one of the two term sequences below) .... 6
EH 205 and EH 206; EH 205 and EH 241; EH 205 and EH 230; EH 206 and EH 240; EH 230 and EH 240 .................................................... 9

Fine Arts (6 hrs from two of the following options) .................. 6
ARH 100 or ARH 101; ARS 110; MU 100 or MU 110; PHL 101 or PHL 202 or PHL 311

Social and Behavioral Sciences (6 hrs in one discipline) .......... 6

Economics, Political Science, Psychology, Sociology

Mathematics. One course at Level III or above ...................... 3

Laboratory Science and Technical Studies

a) Two courses in a single lab. science (outside major/minor), and. .................................................... 8

Laboratory Sciences are: Astronomy, Biological Sciences, Chemistry, Environmental Science, Physics

74
b) Coursework (to include at least one laboratory) in any department or program (outside of major/minor) in the Colleges of Science and Engineering: 7-8

TOTAL: 54-58

Major Requirements (see specific discipline)

Minor Requirements (see specific discipline)
- Free Electives (sufficient courses to complete the total hour requirement for graduation)
- Minimum semester hours for completion of program: 128 hours

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.

Program of Study
The Program of Study Form is a document prepared cooperatively by a student and a responsible faculty adviser, with the prior assistance of the Office of Student Records in preparing the evaluation of transfer credits and reviewing general education requirements. Academic departments or colleges must assume responsibility for ensuring that each of their students has an opportunity to develop a Program of Study form before the end of the student's sophomore year. Once the Program of Study form has been accurately completed, checked in the dean's office, and signed by the appropriate individuals, it becomes a contract between the student and the university with responsibilities bearing on both parties.

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.

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

Premedical and Predental Programs

Most students entering medical or dental schools do so after earning an undergraduate degree. After consulting the specific requirements of the desired medical or dental school, applicants interested in careers in medicine or dentistry will find that UAH offers programs that will prepare them for admission to the professional school.

Competition for admission to medical and dental schools is intense and students should realize that completion of the admission requirements does not insure acceptance. Since admission to the schools is not assumed, students are advised to complete undergraduate degree requirements.

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

1. Two academic years of English
2. One and one-half academic years of general biology or zoology plus electives
3. One academic year of general inorganic chemistry (including qualitative analysis and laboratory work)
4. One academic year of organic chemistry with laboratory work
5. One academic year of physics with laboratory
6. College algebra and calculus

In addition many medical schools require that students take one year of physical chemistry. Students are encouraged to take as broad a curriculum as possible. To reduce duplication in later work, genetics, cellular and developmental biology, and cellular physiology are recommended as electives in life sciences. A student is advised to choose his program according to his individual interest and ability so that he may fulfill his maximum academic potential.

The UAH School of Primary Medical Care offers for selected UAH undergraduates several courses that are designed to assist pre-health professional students to increase their awareness of the health professions, problems, and issues. These courses are described in this catalog’s School of Primary Medical Care section, which also includes descriptions of the school’s medical student and resident programs.
Typical of the requirements for admission to dental schools are these which follow for the School of Dentistry of the University of Alabama in Birmingham:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Biological sciences</td>
<td>8</td>
</tr>
<tr>
<td>2. Inorganic chemistry (including qualitative analysis)</td>
<td>8</td>
</tr>
<tr>
<td>3. Organic chemistry</td>
<td>8</td>
</tr>
<tr>
<td>4. Quantitative analysis</td>
<td>4</td>
</tr>
<tr>
<td>5. Physics (including laboratory)</td>
<td>8</td>
</tr>
<tr>
<td>6. College algebra and trigonometry</td>
<td>6</td>
</tr>
<tr>
<td>7. 30 semester hours of non-science courses to include 6</td>
<td></td>
</tr>
<tr>
<td>(preferably 12) semester hours in English. It is</td>
<td></td>
</tr>
<tr>
<td>recommended that students complete 12 semester hours in</td>
<td></td>
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<tr>
<td>a foreign language and include as many courses in history,</td>
<td></td>
</tr>
<tr>
<td>political science, economics, philosophy, psychology, and</td>
<td></td>
</tr>
<tr>
<td>sociology as possible</td>
<td>30</td>
</tr>
<tr>
<td>8. The completion of a minimum of 90 semester hours of collegiate work.</td>
<td></td>
</tr>
<tr>
<td>Students should elect courses in mathematics through calculus and should</td>
<td></td>
</tr>
<tr>
<td>not elect biological sciences courses that constitute a part of the dental</td>
<td></td>
</tr>
<tr>
<td>school curriculum. Students interested in preprofessional health programs</td>
<td></td>
</tr>
<tr>
<td>(predentistry, premedicine, preoptometry, pre-veterinarian medicine)</td>
<td></td>
</tr>
<tr>
<td>are encouraged to contact the preprofessional adviser by calling the</td>
<td></td>
</tr>
<tr>
<td>Office of the Dean, College of Science, phone 895-6605.</td>
<td></td>
</tr>
</tbody>
</table>

Medical Technology

A bachelor's degree program with emphasis in premedical technology is available through the Biological Sciences Department (Curriculum VIII). This curriculum is designed to satisfy prerequisite requirements for acceptance into a clinical training program in medical technology.

Certificate Programs

Education—Teaching Certificates

A student may complete professional requirements for a Class B Elementary, Middle or High School Professional Teaching Certificate in any of the approved major areas of concentration, and a Class B Elementary-Secondary Professional Certificate in Art or Music. Class A Professional Certificates are available in biological sciences, chemistry, English, history, mathematics, and physics. Students interested in a degree in education involving programs in other major areas may complete much of the course work at UAH. When preparing such programs, a student should consult the requirements of the particular school to which he may transfer.

Certificate Programs

Environmental Science Certificate Program

A student may elect to follow a program of environmental science courses leading to a Certificate in Environmental Science. A fully prepared student can earn the certificate while competing the requirements for the bachelor's degree in mathematics, science, or engineering without any additional hours. See requirements listed in the Atmospheric and Environmental Science Program section of this catalog. In completing the program, the student also satisfies the requirements for an undergraduate minor in environmental science.
Accounting Certificate Program.
Many individuals have expressed a desire to pursue a career in accounting after having earned a bachelor’s degree in another discipline. In order to take the Uniform Certified Public Accountant Examination in Alabama, a person must have a bachelor’s degree (not necessarily in accounting) and as many credit hours in accounting as the student would have if he/she had majored in accounting. In order to meet this need, UAH offers a Certificate in Accounting Program. Admission to the program is limited to students having a bachelor’s degree in a field other than accounting. See Certificate in Accounting section within the College of Administrative Science.

Production Planning and Control Certificate Program
After earning a degree in another discipline, many individuals express a desire to pursue a career in production and inventory control (P&IC). The Certificate Program in Production Planning and Control is designed to prepare individuals for knowledgeable entry into this field. See Certificate in P&IC section, College of Administrative Science.
College of Administrative Science

Dean C. David Billings, B.S., Ph.D., Professor of Finance
Assistant Dean R. Eugene Bryson, B.B.A., M.B.A., Ph.D., C.P.A., Associate Professor of Accounting.
Rudolph S. Lindbeck, B.S., M.A., Ph.D., Professor of Accounting; Chair, Graduate Program Advisory Committee.
Kenneth J. Burger, B.S., M.B.A., Ph.D., Assistant Professor of Marketing, Chair, Undergraduate Program Advisory Committee.
Grover L. Porter, B.S., M.S., Ph.D., C.P.A., Chair, Department of Accounting and Business Legal Studies; Professor of Accounting.
Niles C. Schoening, B.A., M.C.P., Ph.D., Chair, Department of Economics and Finance; Associate Professor of Economics.
J. Daniel Sherman, B.S., M.A., Ph.D., Chair, Department of Management and Marketing, Associate Professor of Management.
Robert F. Zant, A.A., B.A., M.A., Ph.D., Chair, Department of Management Information Systems and Management Science; Professor of Management Information Systems.

Department of Accounting and Business Legal Studies
Professors Lindbeck and Porter; Associate Professor Bryson; Assistant Professors Batchelder, Spearing, Wall and Woodward; El Fekey, Adjunct instructor, Swann; Lecturer, Justinger.

Department of Economics and Finance
Professors Billings, Bond; Associate Professor Paul, Schoening and Wilhite; Assistant Professors Forbes, Sarver and Tan.

Department of Management and Marketing
Professor McCollum; Associate Professors Jackson, Olsen, Sherman; Assistant Professors Burger; Instructors Adams, Padmanabhan and Spann.

Department of Management Information Systems and Management Science
Professor Zant; Research Professor Schroer; Associate Professor Stafford; Assistant Professors, Ford, Sundaraiyer, Tseng; Adjunct Assistant Professor Ballenger, Kamhieh, Teoh and Workman; Instructors Jarman and Richards.
Mission
The College of Administrative Science is a professional school with the mission to dis­seminate and develop knowledge which contributes to the education of competent, creative, and socially responsible managers for careers in private and public sectors with specific emphasis on the management of technology. This mission is influenced by today's rapidly changing environment, which is increasingly oriented toward the application of advanced technology in organizations. This mission is also influenced by the location of the College in the third largest economic and cultural center in the State of Alabama, in a leading advanced technology center and a major space center in the nation. The faculty is committed to programs and activities that will help increase the contribution that this urban center makes to the economic and professional development of the state and nation.

In fulfilling its mission the College seeks to accomplish three major objectives in instruc­tion, research and service. These objectives are:

1. To provide quality programs of undergraduate and graduate instruction in educating persons for the practice of administration at all levels of responsibility in diverse organizations;
2. To produce research which furthers the accumulated knowledge and/or contributes to the practice of the respective disciplines represented in the College.
3. To render public service to business, industry and government in the region and to conduct productive applied research which serves the technology industry and public sector organizations in the region. In addition, faculty involvement in professional societies is emphasized.

The programs to achieve these objectives recognize the needs of specific constituencies, including minority groups; women; part-time, working and adult students. There is also a special obligation to provide applied research and public service to broad groups through bureaus, centers, and institutes. The College is committed to serve society beyond the campus through professional development programs and to apply knowledge and expertise to the solution of problems of people, urban areas, rural areas, public bodies, and state and federal agencies whenever there are needs in which the College can be helpful.

Accreditation and Membership
The College is accredited by the Southern Association of Colleges and Schools.

The College of Administrative Science is a member of the American Assembly of Col­legiate Schools of Business (AACSB) which is a not-for-profit corporation of educational institutions, corporations, and other organizations devoted to the promotion and improvement of higher education in business administration and management.

The College is an associate member of the Association for University Business and Economic Research (AUBER) which is the professional association of business and economic research organizations in universities in America and six other countries.

The College is a member of the National Association of Management and Technical Assistance Centers which is a non-profit association of management and technical assistance centers devoted to marshalling the resources of institutions of higher education to accelerate the economic development process.

Center for High Technology Management and Economic Research
The Center serves the business community, state and local governments, individuals, and the University through management and technical assistance, dissemination of economic and socioeconomic information, and support for faculty in seeking funding for research projects. Special emphasis is on business in technological fields. The Center publishes the results of its research as monographs so that significant developments in business and economics can achieve wide exposure. For more information on the Center, see the Graduate Catalog.
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 in cooperation with the Division of Continuing Education’s Office of Management Studies 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, call the Office of the Dean (205-895-6735).

Degrees Offered

Bachelors. The College of Administrative Science offers two undergraduate degrees, the Bachelor of Science in Business Administration (BSBA) and the Bachelor of Arts (BA) in economics. The BSBA encompasses majors in accounting, economics, finance, management, management information systems, marketing, and procurement management (purchasing and contract management).

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 School’s general and major degree requirements in effect at the time they embark on the program leading to the second degree.

Masters. The College’s Graduate Program offers a Master of Science in Management for qualified students desiring advanced work in management. This program encompasses specializations in accounting, management, management information systems, and project management.

For more information on the Master of Science in Management Program, refer to the UAH Graduate Catalog.

Highly qualified students enrolled in the BSBA undergraduate program of the College of Administrative Science may be able to complete the requirements for a master’s degree by completing one additional year of course work beyond the bachelor’s level. BSBA seniors who are interested in obtaining an MSM degree should contact the College’s Coordinator of Graduate Advisement in Room 222 Morton Hall.

Doctor. The Ph.D. in Business Administration is offered in cooperation with the University of Alabama in Tuscaloosa. For additional information on the Ph.D. program, see the UAH Graduate Catalog and the College of Administrative Science section of the Catalog.

Business Administration Minor

Students from colleges other than Administrative Science may minor in business administration. The minor consists of at least 21 hours, but may be expanded to 30 hours of courses available in the College of Administrative Science. A baccalaureate program with more than 30 hours or 25 percent in course content or credit hours in subjects commonly available in the College of Administrative Science will be reviewed to determine if it meets the BSBA degree requirements.

Students who choose Business Administration as a minor should take ECN 142 and ECN 143 or ECN 239 to meet their social science degree requirements since these hours are counted within the 30 hour or 25 percent rule. Additional minor courses consist of ACC 211 (Lab ACC 221), ACC 212 (Lab ACC 222), FIN 301, MGT 301, MKT 301, and 9 to 12 hours of College of Administrative Science courses including 6 hours at the 300 or 400 level.
Pre-MBA. Students who choose business administration as a pre-MBA minor should select the following courses for the 9 to 12 hours of College of Administrative Science electives:

- BLS 211, MIS 301, MGT 450 or MKT 415, and MSC 385.

International Trade. A field major in Foreign Languages and International Trade (FLIT) is offered in cooperation with the College of Liberal Arts’ Department of Foreign Languages for students interested in specializing in a foreign area of the world or in international business, economics or affairs. The major prepares students for careers in international organizations within the U.S. government and in business firms. A broad variety of career opportunities exist in the multinational and multilingual business world. For additional information see the Foreign Languages Department’s section in the catalog.

Pre-Law. The work of successful lawyers has come to be more and more 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 coming to 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.

Students who choose business administration as a pre-law minor should select the following courses for the 9 to 12 hours of College of Administrative Science electives:

- BLS 211, Legal Environment of Business
- BLS 310, Labor Law
- BLS 411, Business Law (Uniform Commercial Code)

Economics Minor

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

Economics as a Second Area of Study

Students majoring in Elementary Edcations may choose economics as their second area of study. The area of study requires 18 hours of economics courses and the prior approval of the Chairperson of the Department of Economics and Finance.

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
- Procurement Management PRM
High School Preparation
An applicant should present a minimum of 16 high school units including specific units as follows (1 unit = 1 year of course work):

4 English
1 Social Studies
1 Algebra
1 Geometry
9 Electives (8 academic electives. It is recommended that at least one unit should be in Algebra II; one unit in biology; one unit in Chemistry or Physics; three units in social studies including U.S. government and Economics.)

16 Total units

Advanced Standing. An applicant will find it advantageous to complete the following recommendations in the choice of high school electives so that advanced standing may be attained and the applicant begin the college program at an appropriate level:

4 English
4 Social Studies (including U.S. Government and Economics)
3 Mathematics (including Algebra I & II, and Geometry)
2 Science (Biology and Chemistry or Physics)
9 Electives (It is suggested that at least one unit should be in cultural studies such as art, music, drama, humanities, etc.; two units in foreign language; one unit of speech; one-half unit in personal management and one unit in computer literacy using Basic.)

22 Total Units

Admission as a Freshman
Entering UAH freshmen interested in business administration must meet the general entrance requirements of the University. Students who intend to pursue the BSBA degree should read carefully the section "Admission."

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
MA 105 College Algebra 3 hours
MA 143 Finite Mathematics 3 hours

These courses carry the academic credit indicated and will appear on transcripts of students who successfully complete the courses. Since the courses are prerequisite to courses required for the BSBA, credit earned in one or more of the courses may be applied toward the minimum elective requirements for the BSBA.

Pre-Business Classification
All undergraduate students entering the College of Administrative Science are admitted with a pre-business classification (code 07). Regular students (defined on page 17) remain in this classification until they are admitted to the Upper Division of the College of Administrative Science (code 17). Any request for deviation from these requirements must be petitioned through the College's Office of Academic Assistance.
Students admitted into the pre-business classification may not attempt any business course number above 299.

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

**Special Students**

Individuals admitted to the University as Conditional/Probational must have their status changed to regular (defined on page 17) through the UAH Admissions Office and complete all Upper Division admission requirements before applying for admission to the Upper Divisions of the College and choosing a major. Special students may not attempt upper level business courses.

**Admission as a Transfer Student**

Students planning to transfer into the College of Administrative Science from another two- or four-year institution to obtain the BSBA are advised to follow the transfer program outlined below:

- **Mathematics**
  - Survey of calculus (3 hours)
- **Communication**
  - Composition (6 hours)
  - Speech (3 hours)
- **Social Sciences**
  - Principles of Economics (6 hours)
  - Government, Psychology, Sociology (6 hours)
- **Humanities**
  - World History (6 hours)
  - Literature (3 hours)
  - Fine Arts (3 hours)
  - Elective (3 hours)
- **Laboratory Science** (8 hours)
- **Business**
  - Introduction to Computers and Information Systems (3 hours)
  - Business Statistics (3 hours)
  - Social, Legal and Ethical Environment of Business (3 hours)
  - Accounting (6 hours)

The specific credit for work done at other institutions which will apply toward the BSBA or BA degree is determined by the College’s Coordinator of Undergraduate Advisement. Allowance of transfer credit by the Office of Admissions and Records does not necessarily mean that such credit will be applied toward a BSBA or BA degree. All inquiries concerning the applicability of credit should be made to the College’s Coordinator of Undergraduate Advisement (205-895-6024).

Credit for business administration courses taken in schools with American Assembly of Collegiate Schools of Business (AACSB) accredited programs is transferable to UAH. Credit in courses taken in programs without AACSB accreditation may be accepted with approval of the College’s Coordinator of Undergraduate Advisement. This policy has been in effect since December 14, 1982.

Course work taken at a junior college after a student has earned more than 64 semester hours of credit may not be accepted for transfer. Courses taken at the lower division at another institution which are upper division courses at UAH will be accepted for transfer only after successful validation.
See the College’s Coordinator of Undergraduate Advisement for the policy about specific transfer courses.
This policy has been in effect since December 14, 1982.

Admission to the Upper Division
Admission to the Upper Division of the College of Administrative Science is available to students who have:

1. Completed English Composition (EH 101-102), Communications (CM 113), one term of Calculus (MA 151) and library research (BIB 230).
2. Earned a minimum grade of "C" in both English Composition courses (EH 101-102).
3. Completed all Lower Division Business Administration Core Curriculum with a minimum average of C (2.0) for the seven courses: ECN 142, ECN 143, MIS 201, MSC 287, BLS 211, ACC 211 with ACC 221, and ACC 212 with ACC 222.
4. Completed 60 semester hours.
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-level business courses without completing the prerequisites, being admitted to the upper division will be administratively withdrawn from those classes.

Probation and Dismissal
Students are placed on probation at the end of any semester in which they do not have a cumulative grade point average of 2.0. 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.

Residency Requirement
At least 12 of the last 18 semester hours of a student’s program and a minimum of 32 semester hours of the total degree program must be completed at UAH. For BSBA students, the hours taken in residency must include at least 50 percent of the BSBA program (core curriculum and major option) including a minimum of 12 hours in the major option and 3 hours in MGT 499, Business Policy. Students who are required to take additional courses within the College of Administrative Science in order to meet the residency requirement may be required to complete more than 128 semester hours in order to graduate.

Student Advisement and Enrollment
Faculty advising of students is an integral part of the student’s academic progress and career development. Advising for BSBA and BA degree candidates is handled at various stages of a student’s college career through the University’s Academic Advisement and Information Center (AAIC), the College’s Office of Academic Assistance, and faculty members in the student’s intended major.

First year students and newly enrolled transfer students are required to plan their course selection with an adviser in the AAIC. After completing the first year of studies (30 semester hours) students seeking a BSBA are advised by the College of Administrative Science’s Coordinator of Undergraduate Advisement in the College’s Office of Academic Assistance (Morton Hall, Room 222; telephone 895-6024.) Transfer students are advised in the Office of Academic Assistance upon completion of one full term at UAH. The College’s Office of Academic Assistance is a student’s contact point for information concerning possible majors, declaring a major, transfer credit and degree requirements.
The College's Coordinator of Graduate Advisement, in conjunction with members of the College's graduate faculty, is responsible for advising all management graduate students.

With certain exceptions, all College of Administrative Science undergraduate and graduate students must have their registration cards signed by the appropriate advisement personnel. Excepted from the signature requirement are undergraduate juniors and seniors who have met both of the following requirements:

1. A formal declaration of major, signed by the student and the faculty advisor, on file in the UAH Records Office.
2. The student must have satisfactorily completed all of the following courses:
   - English Composition EH 101-102
   - Basic Speech Communication CM 113
   - Mathematics MA 151 or MA 153
   - Library Research BIB 230
   - Principles of Economics ECN 142-143
   - Principles of Accounting ACN 211-212
   - Accounting Lab ACC 221-222
   - Management Information Systems MIS 201
   - Statistical Analysis MSC 287
   - Legal Environment of Business BLS 211

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

The focus of advising in the College of Administrative Science is to help students progress toward their educational objectives. The school's advising system offers:

1. Transcript evaluation for transfer students and continuous monitoring of degree progress for all students.
2. Suggestions of specific courses to be selected in a given semester.
3. Program planning designed to outline an entire course of study.
4. Referral to appropriate university resources for students seeking career guidance, personal counseling or other types of assistance.

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.

Types of Advising Assistance Available.

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 College's Office of Academic Assistance, 222 Morton Hall, working with various departments within the school.

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 term. Students should refer to the UAH Schedule of Courses and the Catalog in consultation with the faculty advisor or staff of the College's Office of Academic Assistance to determine a specific course of study. Selection of specific sections and of times for courses is the student's responsibility. The tentative schedule must be approved by an advisor.

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 Office
of Academic Assistance and includes suggested model programs for each of the major fields of study offered by the College.

Counseling. Students seeking career guidance, personal counseling or other types of assistance will be directed to the appropriate University office by the staff of the College’s Office of Academic Assistance.

Where to Find Advising Assistance.

College’s Office of Academic Assistance (222 Morton Hall). The College’s Office of Academic Assistance is staffed to provide assistance and understanding of degree program requirements, planning an entire academic course of study, designing a course schedule for a particular semester and for providing referrals to other University offices for assistance as appropriate.

College’s Office of the Dean (220 Morton Hall). Students should come to the office of the dean for special advising assistance that cannot be resolved at locations described in this section and to file appeals and waiver requests relative to college and University regulations. The dean’s office will also refer students to the appropriate office should the student be unsure as to where to find assistance.

The University’s Academic Advisement and Information Center (AAIC, 118 University Center). The AAIC is available to assist first year students and newly enrolled transfer students with their course selection.

University’s Student Records Office (116 University Center). The student records office maintains a complete and up to date file for each student admitted to the University.

Cooperative Education.

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, compliment 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. Individual academic projects are formulated in consultation with the student’s faculty advisor. Co-op placements must be approved by the student’s faculty sponsor. Participation in the co-op program requires enrollment in designated courses having prerequisites. More information is available from the business coordinator in the Co-operative Education Office.

Catalog Requirements and Changes

The College of Administrative Science reserves the right to modify curricula and specific courses of instruction, 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 on the bulletin board adjacent to the College’s Office of Academic Assistance (Morton Hall 222). The notices placed thereon officially update the University catalogs and are binding on students pursuing programs offered by the College as if published in the catalogs.

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.

Changes in course requirements are occasionally needed in order to improve the quality of the academic programs. Such changes are not retroactive on work already taken by admitted students but will apply on work yet to be taken, except that the total remaining hours required
for graduation cannot be increased and the student is not required to take an added course not available prior to graduation or for which a specified prerequisite course(s) will not have been 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. 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.

Any deviations from curricular and other College requirements must be approved in writing in advance of the deviation (for example, substitution of courses). Such changes must normally be recommended by the student’s assigned advisor and approved by the Assistant Dean.

**Bachelor of Science in Business Administration**

**Degree Requirement**

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

The undergraduate curriculum is divided into the lower and upper division. To prepare students for the challenges of the future, the College’s programs provide a solid foundation in the diverse academic disciplines which relate to the needs of business, industry, and government. At the undergraduate level students concentrate the first two years of study on general course work in the humanities and fine arts, the behavioral and social sciences, the natural 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-business administration core curriculum prepares the student for admission to upper division course work in the College of Administrative Science.

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

Each student must meet the following degree requirements established by the University and the faculty of the College of Administrative Science to be awarded a BSBA:

1. Complete the lower division general education requirement;
2. Complete the lower division 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 with a minimum grade of "C"; and

11. Comply with University and College of Administrative Science residency requirements.

Three levels of requirements must be completed in order to receive the Bachelor of Science in Business Administration degree: (1) University general education and graduation requirements, (2) College of Administrative Science core requirements, and (3) College major requirements. Students should complete these three levels of requirements in the order listed, with some overlap and duplication of courses among the three levels. The recommended sequence of courses is presented in the following sections.

**Lower Division Requirements: 63 Semester Hours**

Work in the first two years of study is planned in such a way as to give the student basic information in the general areas of the humanities and fine arts, communication, the social and behavioral sciences, the natural and physical sciences, and mathematics. This liberal arts and science foundation is referred to as the General Education Requirements (GER). In addition to the GER, students must complete 21 semester hours of work in the pre-business administration lower division core curriculum. Lower division requirements are as follows:

1. **Lower Division General Education Requirements**

   1. Communications
      a. English Composition I & II (EH 101-102) ........................................6
      b. Basic Speech Communication (CM 113) ........................................3
      c. Bibliography of Business and Economics (BIB 230) .........................1
   2. Mathematics*
      Survey of Elementary Calculus (MA 151**) ....................................3
   3. Social Sciences
      Two of the following three courses:
      American Government (PSC 101), Introduction to .........................6
      Sociology (SOC 100), General Psychology (PY 103)
   4. Humanities
      a. Origins and Development of the Contemporary .........................6
         World I & II (HY 101, 102)                                       
      b. Survey of Literature (EH 205, 206, 230, 240, or 241) .............5
      c. Fine Arts (ARH 100 or 101, ARS 110, or MU 101 ...................3
         or 110)
      d. Lower Division Humanities Electives (for example ..................3
         PHL 202—Introduction to Ethics)
   5. Natural and Physical Sciences
      a. Laboratory Science (for example principles of ..................8***
         biology, chemistry or physics)

   TOTAL 42

*Each BSBA student will be given a mathematics placement level when the student enters UAH. The placement levels and their appropriate courses are:

- Remedial MA 004 (Algebra) or MA 033 (Geometry)
- Level I MA 119 or MA 105

89
Level II MA 121 or MA 143
Level III MA 153 or MA 151

**The mathematics department recommends that students planning a curriculum not requiring training past a minimum proficiency level should choose the following track:

MA 105 — College Algebra
MA 143 — Finite Mathematics
MA 151 — Survey of Elementary Calculus

Students planning to (a) emphasize quantitative methods, or (b) minor in an area requiring at least two quarters of calculus, or (c) attend graduate school should choose the following track:

MA 119 — Precalculus I
MA 121 — Precalculus II
MA 153 — Calculus I
MA 154 — Calculus II

***Students who have completed 10 quarter hours (or 6.6 semester hours) of laboratory science will be considered to have met this requirement. Students who have completed fewer hours of laboratory science may petition the Dean of the College of Science for an assessment of equivalency.

II. Lower Division Business Administration Core Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of Macroeconomics (ECN 142)</td>
<td>3</td>
</tr>
<tr>
<td>Principles of Microeconomics (ECN 143)</td>
<td>3</td>
</tr>
<tr>
<td>Introduction to Computers and Information Systems (MIS 201)</td>
<td>3</td>
</tr>
<tr>
<td>Statistical Analysis (MSC 287)</td>
<td>3</td>
</tr>
<tr>
<td>Social, Legal and Ethical Environment of Business (BLS 211)</td>
<td>3</td>
</tr>
<tr>
<td>Principles of Accounting I (ACC 211 with Lab ACC 221)</td>
<td>3</td>
</tr>
<tr>
<td>Principles of Accounting II (ACC 212 with Lab ACC 222)</td>
<td>3</td>
</tr>
</tbody>
</table>

Total 21

Total Lower Division Requirements .................................. 63

Suggested Schedule of Lower Division Courses for Full-time Students Seeking a BSBA Degree

<table>
<thead>
<tr>
<th>Year</th>
<th>First Term</th>
<th>Second Term</th>
<th>Third Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshmen Year</td>
<td>English Comp. 1 3</td>
<td>English Comp. 2 3</td>
<td>Public Speaking 3</td>
</tr>
<tr>
<td></td>
<td>Business Calculus 3</td>
<td>Economics 1 3</td>
<td>Economics 2 3</td>
</tr>
<tr>
<td></td>
<td>World History 1 3</td>
<td>World History 2 3</td>
<td>Literature 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social Science 1* 3</td>
<td>Social Science 2* 3</td>
</tr>
<tr>
<td>Sophomore Year</td>
<td>Computers in Business 3</td>
<td>Business Statistics 3</td>
<td>Legal Env. Business 3</td>
</tr>
<tr>
<td></td>
<td>Fine Arts* 3</td>
<td>Accounting 1 3</td>
<td>Accounting 2 3</td>
</tr>
<tr>
<td></td>
<td>Science 4</td>
<td>Science* 4</td>
<td>Humanities* 3</td>
</tr>
<tr>
<td></td>
<td>Business Library 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Students must complete two of the following three courses:
  American Government (PSC 101), Introduction to Sociology (SOC 100), General Psychology (PY 103).
Students must complete one of the following courses:
- Art History 1 (ARH 100), Art History 2 (ARH 101), Art for the Non-Artist (ARS 110),
- Music Fundamentals (MU 100), Music Appreciation (MU 110).

Students must complete two laboratory science courses such as principles of biology, chemistry or physics.

Students must complete a lower division humanities elective such as Introduction to Ethics (PHL 202), or Introduction to Philosophy (PHL 101).

**Upper Division Requirements: 65 Semester Hours**

Work in the last two years of study is planned in such a way as to build on the foundation provided by the lower division general education requirements and the lower division business administration core. The final two years completes the student’s common body of knowledge in business administration and provides the student with advanced work in a subject area (major).

Please read the College’s section, “Admission to the Upper-Division”, to determine the requirements to enroll in upper division courses (numbered 300 through 499).

### II. Upper Division General Education Requirements

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategies of Business Writing (EH 300)</td>
<td>3</td>
</tr>
<tr>
<td>(Is a corequisite or prerequisite for all ADSC courses with a number greater than 301 and prerequisite for 400 level courses.)</td>
<td></td>
</tr>
<tr>
<td>Electives outside the College of Administrative Science</td>
<td>7</td>
</tr>
<tr>
<td>(These electives may be taken in the lower division)</td>
<td></td>
</tr>
</tbody>
</table>

*Total 10*

### II. Upper Division Business Administration Core Curriculum

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial Accounting (ACC 301)*</td>
<td>3</td>
</tr>
<tr>
<td>Principles of Financial Management (FIN 301)</td>
<td>3</td>
</tr>
<tr>
<td>Principles of Management (MGT 301)</td>
<td>3</td>
</tr>
<tr>
<td>Information Systems in Organizations (MIS 301)</td>
<td>3</td>
</tr>
<tr>
<td>Principles of Marketing (MKT 301)</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Methods in Business (MSC 325)</td>
<td>3</td>
</tr>
<tr>
<td>Production/Operations Management (MSC 385)</td>
<td>3</td>
</tr>
<tr>
<td>International Business Requirement</td>
<td>3</td>
</tr>
<tr>
<td>(ACC 450, ECN 446, FIN 454, MKT 415 or MGT 450)</td>
<td></td>
</tr>
<tr>
<td>Business Policy (MGT 499)</td>
<td>3</td>
</tr>
</tbody>
</table>

*Accounting majors take ACC 314*

*Total 27*

### III. Major (each major is described below)              21

### IV. Free electives (May be selected from any school within the University) 7

*Total Upper Division 65*

*Total Lower Division 63*

*Total minimum hours for a BSBA Degree 128**

**No more than six hours of HPE activity and music ensemble courses may count toward graduation.
Majors in the BSBA Degree

Accounting

The major in accounting offers an instructional program emphasizing the concepts, principles, and procedures related to measuring, recording, classifying, summarizing, and interpreting financial information. It is intended to prepare students for: (1) public accounting, (2) management accounting, (3) governmental accounting, and (4) executive careers. The program also provides an excellent foundation for graduate study in accounting, management, and law.

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

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>ACC 310</td>
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<td>ACC 311</td>
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<td>ACC 312</td>
<td>Intermediate Accounting III</td>
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<tr>
<td>ACC 313</td>
<td>Income Tax Accounting I</td>
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</tr>
<tr>
<td>ACC 407</td>
<td>Accounting Information Systems</td>
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</tr>
<tr>
<td>ACC 431</td>
<td>Principles of Auditing</td>
<td>3</td>
</tr>
<tr>
<td>ACC 470</td>
<td>Seminar in Contemporary Accounting Issues</td>
<td>3</td>
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</tbody>
</table>

Students preparing for professional certification examinations, such as the Certified Public Accountant (CPA), the Certified Management Accountant (CMA), or the Certified Internal Auditor (CIA), will need course work in accounting beyond the minimum requirements for the BSBA degree. Students interested in additional information concerning preparation for one or more of the preceding examinations should contact the Chair of the Department of Accounting and Business Legal Studies (895-6159).

Suggested Schedule of Upper Division Courses for Full-time Accounting Students

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<th>Year</th>
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### Suggested Schedule of Upper Division Courses for Part-time Accounting Students

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</table>

*Seven semester hours of electives must be taken outside the College of Administrative Science, the other seven may be taken from any school within the University.

### Economics

The BSBA curriculum emphasizes the applied aspects of economic analysis and describes the principles and methods for organizing a business firm and combining resources to produce goods and services, taking account of costs, profits, and the organization of markets. The economics major is appropriate for careers in both public agencies and private firms where economic data analysis and forecasting are performed. The program also prepares for students who wish to pursue advanced degrees in business, economics, and law. Students wishing to major in economics should see the Chairman of the Department of Economics and Finance.

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

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
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</thead>
<tbody>
<tr>
<td>ECN 340</td>
<td>Macroeconomic Analysis</td>
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</tr>
<tr>
<td>ECN 345</td>
<td>Microeconomic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>FIN 352</td>
<td>Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>ECN 375</td>
<td>Labor Markets, Wages and Employment</td>
<td>3</td>
</tr>
<tr>
<td>ECN 440</td>
<td>Industrial Structure and Regulation</td>
<td>3</td>
</tr>
<tr>
<td>ECN 448</td>
<td>Development of Economic Theory</td>
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<tr>
<td>ECN 470</td>
<td>Seminar in Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

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Suggested Schedule for Economics Students

Students should contact the Chairman of the Department of Economics and Finance to receive a schedule for upper division economics courses.

Finance

The major in finance acquaints students with the modern analytic principles of finance and the structure and performance of financial markets and institutions. To be successful, a finance major should possess superior analytic skills and be proficient in economic analysis, algebra, elementary calculus, and statistics. The major in finance is preparatory to careers in security analysis, portfolio management, commercial, investment, mortgage banking, and corporate financial management.

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

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
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</thead>
<tbody>
<tr>
<td>FIN 352</td>
<td>Money &amp; Banking</td>
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<tr>
<td>FIN 361</td>
<td>Equity Markets</td>
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</tr>
<tr>
<td>FIN 375</td>
<td>Financial Institutions</td>
<td>3</td>
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<tr>
<td>FIN 378</td>
<td>Intermediate Finance</td>
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<tr>
<td>FIN 395</td>
<td>Advanced Topics in Corporate Finance</td>
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</tr>
<tr>
<td>FIN 431</td>
<td>Managerial Finance</td>
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<td>FIN 470</td>
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21

Suggested Schedule of Upper Division Courses for Full-time Finance Students

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Hours</th>
<th>Winter</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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</table>

Suggested Schedule of Upper Division Courses for Part-time Finance Students

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Hours</th>
<th>Winter</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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<tbody>
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<tr>
<td></td>
<td>BLS 211</td>
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<td>MGT 301</td>
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</tbody>
</table>

94
Management

A major in management enables the student to develop a better understanding of the social, political, and industrial society in which we live. 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 several available 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 general business 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 marketing) is not as appropriate an educational background as is extensive upper division coursework in three or four functional areas.

The second is the Management track. This track focuses on personnel administration, organizational behavior, and labor relations.

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

**General Business Track:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 378 Intermediate Finance</td>
<td>3</td>
</tr>
<tr>
<td>MGT 363 Personnel: Human Resource Management</td>
<td>3</td>
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<tr>
<td>MKT 332 Consumer Behavior</td>
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<td>MSC 386 Advanced Production and Operations Management</td>
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<tr>
<td>MKT 342 Promotional Strategy</td>
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<tr>
<td>MIS 400 Decision Support Systems</td>
<td>3</td>
</tr>
<tr>
<td>MGT 405 Small Business Management</td>
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</table>

*Seven semester hours of electives must be taken outside the College of Administrative Science, the other seven may be taken from any school within the University.*
Human Resource Management Track:

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT 361 Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>MGT 362 Management and Labor Relations</td>
<td>3</td>
</tr>
<tr>
<td>MGT 363 Personnel: Human Resources Management</td>
<td>3</td>
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<tr>
<td>BLS 310 Labor Law</td>
<td>3</td>
</tr>
<tr>
<td>Nine hours of management electives*</td>
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</tbody>
</table>

*S*Students who take MGT 450 to satisfy the international business requirement cannot use this as a management elective course. Additional management electives may be taken as college electives.

### Suggested Schedule of Upper Division Courses for Full-time Management Students

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Hours</th>
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Management Information Systems

The major in management information systems is designed for students who want to become designers of information systems that utilize computers in a business or administrative environment. Management information systems subject matter includes computer hardware, computer software, systems analysis and design methodologies, behavioral issues and the business or administrative context within which computer systems are applied. The Management Information Systems curriculum differs from the Computer Science curriculum in a number of ways:

a. The management information systems curriculum covers information system concepts and processes within the contexts of organization functions, management activity and technical information systems knowledge, whereas computer science tends to be taught within an environment of mathematics, algorithms, and engineering technology.

b. The management information systems graduate is expected to work within the environment of an organization and to interact with both organizational functions and computer technology. The computer science graduate has less interaction with organizational functions and more interaction with hardware and software technology.

c. In technical expertise, the management information systems curriculum places a substantial emphasis on analysis and design methodologies appropriate to the business and administrative environment. The computer science graduate typically has less exposure to management information requirements analysis and organizational considerations but obtains greater expertise in algorithm development, and computer hardware.

Requirements for a major in Management Information Systems within the BSBA degree are as follows:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
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</thead>
<tbody>
<tr>
<td>MIS 210</td>
<td>Introduction to Computer Programming in Business</td>
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<tr>
<td>MIS 340</td>
<td>Data Bases for Management</td>
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<tr>
<td>MIS 412</td>
<td>Information System Design</td>
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<tr>
<td>MIS 475</td>
<td>Information Resource Management</td>
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<tr>
<td>MIS 499</td>
<td>Special Development Project</td>
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<tr>
<td>MIS 310</td>
<td>Advanced Computer Programming Business</td>
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<tr>
<td>MIS 350</td>
<td>Advanced Data Bases for Management</td>
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<tr>
<td>Plus three hours from the following:</td>
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<tr>
<td>MIS 400</td>
<td>Decision Support Systems</td>
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<tr>
<td>MIS 480</td>
<td>Seminar in Management Information Systems</td>
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Total Hours Within Major ABOVE CORE REQUIREMENTS 21
### Suggested Schedule of Courses for Full-time MIS Students

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<th>Year</th>
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<th>Winter</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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</table>

*Seven semester hours of electives must be taken outside the College of Administrative Science, the other seven may be taken from any college within the University. (+ Majors may wish to take MIS 495)

### Suggested Schedule of Courses for Part-time MIS Students

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<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Hours</th>
<th>Winter</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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<tr>
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<td>MIS 499</td>
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<td>MIS Elective</td>
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<td>Int'l Business</td>
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</tr>
</tbody>
</table>

*Seven semester hours of electives must be taken outside the College of Administrative Science, the other seven may be taken from any college within the University. (+ Majors may wish to take MIS 495)
Marketing

The marketing program studies the principles, practices and concepts involved in business activities which transfer products and services from the producer to the consumer. It includes the study of consumers and their behavior in the market, the channels of distribution, promotional consideration, and other related topics. In particular, this program focuses on the marketing research activities such as analysis of data on product and sales, the conducting of surveys and interviews, test marketing of new products, and preparation of recommendations to clients or internal management. A degree in marketing prepares the student for careers with manufacturers, distributors, retailers, government, and other business operations.

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

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 332 Consumer Behavior</td>
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</tr>
<tr>
<td>MKT 343 Marketing Research Design</td>
<td>3</td>
</tr>
<tr>
<td>MKT 344 Marketing Research Applications</td>
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</tr>
<tr>
<td>MKT 470 Seminar in Marketing</td>
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<tr>
<td>MKT 480 Marketing Management</td>
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</tr>
<tr>
<td>Six hours of marketing electives*</td>
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</table>

*Students who take MKT 415 to satisfy the international business requirement cannot use this as a marketing elective course. Additional marketing courses can be taken as College electives.

Suggested Schedule of Upper Division Courses for Full-time Marketing Students

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Hours</th>
<th>Winter Hours</th>
<th>Spring Hours</th>
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<tbody>
<tr>
<td>3</td>
<td>MKT 301 3</td>
<td>MKT 332 3</td>
<td>MKT 343 3</td>
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<td>MGT 301 3</td>
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<td>FIN 301 3</td>
<td>MSC 325 3</td>
<td>MSC 385 3</td>
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<td></td>
<td>MIS 301 3</td>
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<tr>
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<td>MKT 470 3</td>
<td>MKT 344 3</td>
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<td>Int'l. Business 3</td>
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</tbody>
</table>

Suggested Schedule of Courses for Part-time Marketing Students

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Hours</th>
<th>Winter Hours</th>
<th>Spring Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Humanities 3</td>
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<td></td>
<td>6</td>
<td>7</td>
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</tr>
</tbody>
</table>
*Seven semester hours of electives must be taken outside the College of Administrative Science, the other seven may be taken from any college within the University.

**Procurement Management (Purchasing)**

The major in procurement management, contract management and purchasing describes the methods, techniques, and processes by which contracts are obtained, monitored, and completed. It has as its primary objective the preparation of qualified students for careers in procurement management in federal, state and local government agencies as well as the private sector. In order to achieve these objectives, the program stresses a broad foundation in the essential elements of business administration, and a specialization in procurement management.

The program is designed to provide the basic skills and knowledge requirements for procurement positions (GS 1102) for positions at the GS 5-9 level of the following procurement specializations:

- Contract Negotiator/Specialist
- Cost/Price Analyst
- Contract Administrator
- Contract Terminations
- As well as Contracting Officer, levels 1, 2, & 3.

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

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>PRM 301</td>
<td>Introduction to Procurement</td>
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<tr>
<td>PRM 302</td>
<td>Contract Administration</td>
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<tr>
<td>PRM 303</td>
<td>Cost and Price Analysis</td>
<td>3</td>
</tr>
<tr>
<td>PRM 404</td>
<td>Negotiation Techniques</td>
<td>3</td>
</tr>
<tr>
<td>PRM 405</td>
<td>Government Contract Law</td>
<td>3</td>
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<td></td>
<td>Six hours of College of Administrative Science electives approved by advisor:</td>
<td>6</td>
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</tbody>
</table>

21
The faculty recommends that procurement College of Administrative Sciences electives be chosen from the following courses:

- MKT 322 Logistics Management
- ACC 314 Cost Accounting
- ACC 407 Accounting Information Systems
- MGT 361 Organizational Behavior
- MSC 386 Advanced Production/Operations Management
- MSC 401 Production Planning and Control
- MSC 402 Materials Management
- MKT 343 Marketing Research Design

The faculty recommends that any available free electives be chosen from the following courses:

- CM 310 Persuasion
- CM 350 Organizational Communication
- PSC 350 Public Administration
- ISE 321 Engineering Economy
- ISE 378 Materials and Manufacturing Processes

This major helps students prepare for the Office of Personnel Management (OPM) competitive examination for positions in the field of government contracting, particularly Contract Specialist, GS-5/7. Students preparing for professional certification examinations, Certified Associate Contracts Manager (CACM) and Certified Professional Contracts Manager (CPCM) will need to complete one or two years of relevant work experience, respectively, and educational requirements beyond the minimum requirements for the BSBA degree. Students interested in additional information concerning preparing for one or more of these examinations should contact the chair of the Department of Management and Marketing (895-6680).

**Suggested Schedule of Upper Division Courses for Full-time Procurement Management Students**

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Hours</th>
<th>Winter</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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<tr>
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<td>MGT 301</td>
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### Suggested Schedule of Upper Division Courses for Part-time Procurement Management Students

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<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

*Seven semester hours of electives must be taken outside the College of Administrative Science, the other seven may be taken from any college within the University.

### Possible Minors for the BSBA Degree

BSBA degree candidates may supplement their degree program by choosing a minor. Students electing a minor may use the 14 hours of electives and courses completed in the general education requirements as part of the required 21 hours. However, students who choose a minor may be required to complete more than 128 hours. Courses counted in a minor may not be applied to core or major course requirements for a BSBA degree. Check with the College’s Office of Academic Assistance (Room 222, Morton Hall) for information on minors.

### Certificate In Accounting

Many individuals express a desire to pursue a career in accounting after having earned a bachelor’s degree in another discipline. In order to sit for the Uniform Certified Public Accountant (CPA) Examination in Alabama and many other states, the Certified Management Accountant (CMA) examination, or the Certified Internal Auditor (CIA) examination, a person must have a bachelor’s degree (not necessarily in accounting) and as many credit hours in accounting as the student would have if he/she had majored in accounting. In order to meet this need, UAH offers a Certificate in Accounting program.

Admission to the Certificate in Accounting program is limited to students having a bachelor’s degree in a discipline other than accounting. In addition, a student is required to complete the Pre-Business Administration Core Curriculum and specific course prerequisites before enrolling in the program courses set out below:
Course Number and Title                                Semester Hours
ACC 310 Intermediate Accounting I                       3
ACC 311 Intermediate Accounting II                      3
ACC 312 Intermediate Accounting III                     3
ACC 313 Income Tax Accounting I                         3
ACC 314 Cost Accounting                                 3
ACC 407 Accounting Information Systems                  3
ACC 431 Principles of Auditing                          3
ACC 470 Seminar in Contemporary Accounting Issues       3

The student must counsel with the Coordinator of Undergraduate Advisement, secure the approval of the Chair of the Department of Accounting and Business Legal Studies, and be admitted to UAH as a regular student before enrolling in the Certificate in Accounting program. A student may transfer credit to apply toward the Pre-Business Administration Core Curriculum, prerequisite requirements, and a maximum of six (6) semester hours in accounting toward the program itself. An overall average of C is required in all courses taken in the Certificate in Accounting program.

Bachelor of Arts in Economics Degree Requirements
The College of Administrative Science offers the BA in economics degree. This curriculum emphasizes the liberal arts aspects of economic study providing the student with a greater appreciation and understanding of the economic, cultural, and political environment of our society. This avenue of study is especially useful to students interested in pursuing graduate study in economics or other related academic fields. The BA degree in economics is also an excellent preparation for students planning careers in business, law, the foreign service or other related professions.

For more information see the section of the catalog concerning requirements for the BA degree.

1. General Education Requirements
   Humanities and Fine Arts
   English Composition (EH 101 and EH 102) ............... 6
   Origin and Development of the Contemporary World (HY 101 and HY 102) ........... 6
   Foreign Languages (two courses at the 200 level or placement at that level) ............ 6
   Survey of Literature (EH 205 and EH 206; or EH 205 and EH 241; or EH 205 and EH 230; or EH 206 and EH 240; or EH 230 and EH 240) .................. 6
   Fine Arts. Art History (ARH 100 or ARH 101) or Art Studio (ARS 110) or Music (MU 100 or MU 110) or Communication (CM 122) .................. 3
   Lower division humanities course. PHL 101 or any humanities course at the 200 level chosen from English, Philosophy (Excluding PHL 201), or History (course must be outside major and minor except for those students who complete all requirements for teacher certification) .................. 3
   Upper division Humanities or Fine Arts Elective. Chosen from English (excluding EH 300, EH 301, and EH 302), History, Philosophy, Art, Music, Foreign Languages (Literature courses only), or Communication Arts (CM 309 or CM 322). (Course must be outside minor except for students completing all requirements for teacher certification) .................. 3

103
Total Humanities and Fine Arts .......................................................... 33
Science, Mathematics, and Social Sciences Mathematics. One course at Level II or above ................................................................. 3
Laboratory Science. Two courses in a single discipline and one course in a second laboratory science discipline (BYS, AST, CH, PH, or ES) .... 12
Social Sciences. (PSC 101, PSC 135, SOC 100, SOC 200, PY 103). Any four of these courses. (Students who complete all requirements for teacher certification may substitute ED 230 and ED 263 for two of these courses) ................................................................. 12
Upper division Social Science Elective.  
Chosen from Political Science, Sociology, Psychology, ......................................................... 3
Additional Requirements. One additional course chosen from MA 151 or higher, PHL 201, ST 280, AHS 300, CS 100, or CS 108. (Students who complete all requirements for teacher certification may substitute ED 510 or ED 360) .............................................................................. 3
Total Science, Mathematics and Social Sciences .................................................. 33

II. Major Requirements for the BA Degree in Economics

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECN 142</td>
<td>Principles of Macroeconomics</td>
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</tr>
<tr>
<td>ECN 143</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECN 310</td>
<td>Introduction to the Use of Mathematics in Economics and Business</td>
<td>3</td>
</tr>
<tr>
<td>ECN 340</td>
<td>Macroeconomic Analysis</td>
<td>3</td>
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<tr>
<td>ECN 345</td>
<td>Microeconomic Analysis</td>
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<td>ECN 352</td>
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<td>ECN 375</td>
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<td>ECN 448</td>
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<tr>
<td>ECN 470</td>
<td>Seminar in Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

III. Minor Requirements

A minimum of 18 semester hours in a single discipline with a minimum of 12 hours at the 300 level or above or a minimum of 21 hours in an approved cognate area of closely related courses approved by Department of Economics and Finance with 12 of these hours at the 300 level or above .................................................. 18-21

IV. Free Electives

The student may select any elective course outside of the major and minor as needed to complete the university requirement of a minimum of 128 hours for graduation. The requirements of some programs may exceed 128 hours.

Minimum semester hours for completion of program ........................................... 128

For more information please contact the Chairman of the Department of Economics and Finance.

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. Students from other classes may be admitted for lower division credit. Graduate students may take these courses and receive lower division credit, but not graduate credit.
Upper Division. Courses numbered 300 to 499 are available only to juniors, seniors and graduate students. All students, both those admitted as majors in the College of Administrative Science and those admitted as majors in other Colleges in the University, must meet College of Administrative Science general prerequisite requirements in order to be admitted to upper division College of Administrative Science courses in addition to the specific course prerequisites cited in the course descriptions.

General prerequisites for all upper division College of Administrative Science courses are the completion of English 101 and 102, upper division standing (completion of at least 60 semester hours) and admission to UAH as a regular student. See NOTE at end of this section.

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

Graduate Division. Only students admitted to the graduate school may enroll for courses numbered 500 to 599. Baccalaureate candidates may register for a dual course number in the 400 to 499 series. Graduate students register for the course in the 500 to 599 series. Additional work will be required of the graduate student registered in the 500 level course: to bring the course up to graduate level.

Courses numbered 600 to 699 are designed for graduate students only. Students may not be admitted to these courses unless they have been admitted to the graduate school.

Offerings. The following abbreviations indicate the terms of the calendar the course normally will be offered: Su—Summer Term, F—Fall Term, W—Winter Term, and Sp—Spring Term. Where courses are offered on alternate years only, the words “even” or “odd” will indicate which years the course will be offered. Course offerings by term are subject to change dependent upon availability of faculty resources and to accommodate the needs of students.

NOTE: Any faculty member teaching an upper-division course in the College of Administrative Science may assume that all students have completed the specific courses listed under “Lower Division Requirements” above; and for courses with a number greater than 301, will have completed EH 300.

Accounting (ACC)

Lower Division Courses

211 Principles of Accounting I 3 hrs.
Introduction to the accounting process, based upon the theory of double-entry bookkeeping. Particular emphasis upon the creation, content, and analysis of basic financial statements. Prerequisite: sophomore standing. Parallel: ACC 221. Su, F, W, Sp.

212 Principles of Accounting II 3 hrs.

213 Individual Income Tax Return Preparation 3 hrs.
A study of basic income tax law and procedures needed to prepare individual federal and state income tax returns. Prerequisite: Students enrolled at UAH not majoring in Accounting.

221 Accounting Lab 1 0 hrs.
222  Accounting Lab II  0 hrs.

249  Fundamentals of Accounting  3 hrs.
A one-quarter course in accounting for students in fields other than administrative science who aspire to managerial positions which require an understanding of accounting. The course provides such students with an introduction to accounting terminology, to construction of accounting reports, and to the pervasive use of accounting information in business. This course may not be used as credit toward a BSBA degree. Prerequisites: sophomore standing and MSC 287. Parallel: ACC 221. Lab fee: Level 4.

Upper Division Courses (see prerequisites for Upper Division)

301  Managerial Accounting  3 hrs.

310  Intermediate Accounting I  3 hrs.

311  Intermediate Accounting II  3 hrs.
Continued in-depth theoretical and practical treatment of selected accounting topics covering assets, liabilities, and stockholders' equity. Emphasis is placed upon the unique accounting characteristics of corporations. Prerequisite: ACC 310. Lab fee: Level 3. F, W, Sp.

312  Intermediate Accounting III  3 hrs.

313  Income Tax Accounting I  3 hrs.
Determination of taxable income, business and nonbusiness deductions, and selected aspects of tax accounting for individuals and sole proprietorships. Prerequisite: ACC 212. Lab fee: Level 3. Su, W.

314  Cost Accounting  3 hrs.
Review of basic cost accounting concepts. Detailed study of advanced topics relating to job order and process costing systems, standard costing, and cost-volume-profit analysis, with special attention given to behavioral implications and ethical considerations of cost accounting, as well as international business. Prerequisite: ACC 212. Lab fee: level 3. F, Sp.
407 Accounting Information Systems 3 hrs.
Design, operation, and analysis of accounting information systems with respect to
data input, processing, storage, recall, security, internal control, and the audit trial.
Emphasis is on computer oriented systems. Prerequisites: ACC 212, MIS 301.

413 Income Tax Accounting II 3 hrs.
Tax accounting for partnerships, corporations, S corporations, estates, and trusts.
Tax administration and research are emphasized. Prerequisite: ACC 313. Lab fee:
Level 3.

415 Advanced Financial Accounting 3 hrs.
Analysis of issues and alternatives in advanced problem areas including
partnerships, business combinations, and not-for-profit organizations. Prerequisite:
ACC 312. Lab fee: Level 3.

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 312, MSC 287, and senior
standing. Lab fee: Level 3. Su, W.

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

450 Seminar in International Accounting 3 hrs.
Seminar on current topics in international accounting. Prerequisite: ACC 312.
(Same as ACC 550)

470 Seminar in Contemporary Accounting Issues 3 hrs.
Seminar on current topics in professional accounting. Prerequisite: ACC 431 and
senior standing. Sp.

490 Independent Study 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.

Graduate Courses (for details, see Graduate Catalog)

507 Accounting Information Systems 3 hrs.
513 Income Tax Accounting II 3 hrs.
515 Advanced Financial Accounting 3 hrs.
532 Advanced Auditing 3 hrs.
550 Seminar in International Accounting 3 hrs.
570 Seminar in Contemporary Accounting Issues 3 hrs.
601 Foundations in Accounting for Management 3 hrs.
602 Managerial Accounting 3 hrs.
607 Advanced Accounting Information Systems 3 hrs.
614 Advanced Managerial Accounting 3 hrs.
642 Advanced Internal and Operational Auditing 3 hrs.

Business Legal Studies (BLS)
Lower Division Courses
211 Legal Environment of Business 3 hrs.
A study of the legal environment of business including ethical, social, and political influences on both profit and non-profit organizations. Su, F, W, Sp.

Upper Division Courses (see prerequisites for Upper Division)
310 Labor Law 3 hrs.
Analysis of background, content, and significance of labor relations law. Prerequisites: BLS 211, MGT 301. Sp.
411 Business Law for Accountants 3 hrs.
An 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. Prerequisites: BLS 211 and senior standing. Graduate Courses (for details, see Graduate Catalog)
511 Business Law for Accountants 3 hrs.
The Social, Legal and Ethical Environment of Organizations 3 hrs.

Economics (ECN)
Lower Division Courses
142 Principles of Macroeconomics 3 hrs.
Economic analysis and its application in investigating the economic functional relation between business, consumers, and government. National income analysis, determination of employment and price levels, and introduction to market demand and supply analysis. Students who pass this course will not be eligible to take ECN 239 for additional credit. Prerequisite: MA 104 or 105 or recommended equivalent. Su, F, W, Sp.
143 Principles of Microeconomics 3 hrs.
Continuation of ECN 142. Advanced value theory and its application to analysis of market performance under conditions ranging from competitive to monopolistic, including consideration of distribution along functional lines, and economic growth. Students who pass this course will not be eligible to take ECN 239 for additional credit. Prerequisite: ECN 142. Su, F, W, Sp.
239 Principles of Economics for Engineering and Science Students 3 hrs.
Basic concepts of microeconomics and macroeconomics for students with some 
degree of analytical capabilities. Major topics of study will include supply and 
demand, costs, industrial structure, resource pricing, national income accounting, 
determination of levels of GNP and other macroeconomic variables, and fiscal and 
monetary policy. Prerequisite: MA 153. Note: Students who complete this course 
cannot receive more than 3 hrs. degree credit from among this course, ECN 142 
and ECN 143.

Upper Division Courses (see prerequisites for Upper Division)

310 Introduction to the Use of Mathematics in Economics and Business 3 hrs.
Review of algebra and introduction to matrix algebra and calculus with application 
to economic and business problems. Prerequisite: ECN 143, MA 105 or its 
equivalent. F.

340 Macroeconomic Analysis 3 hrs.
Comprehensive study of the national economic system. Inteependent market 
processes in determining income, consumption, saving, investment, interest, 
employment, and the price level. Economic growth as influenced by institutional 
structure, technological change, business management, and government monetary 
and fiscal policy. Application of economic accounting structure and method. 
Prerequisite: ECN 143, and permission of the department chair.

345 Microeconomic Analysis 3 hrs.
Economic principles underlying value and distribution with additional training in 
application of these principles to problems of analysis. Prerequisite: ECN 143, and 
permission of the department chairperson.

375 Labor Markets, Wages and Employment 3 hrs.
Economic analysis of labor markets at the micro and macroeconomics level. Topics 
include the determination of labor force participation, hours of work, education, 
job search, labor turnover, productivity, and unemployment. Prerequisite: 
Permission of the Department Chair.

440 Industrial Structure and Regulation 3 hrs.
Microeconomic analysis of the competitive structure in which the firm operates 
and its effect on economic efficiency. The various forms of government regulation 
plied to industries are introduced and implications for firm’s behavior are 
analyzed. Prerequisite: Permission of the Department Chair.

448 Development of Economic Theory 3 hrs.
Historical development of economic thought from ancient times to the nineteenth 
ecentury and from early modern times to present. Prerequisite: Permission of the 
Department Chair.

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.
Finance (FIN)

Lower Division Courses

260 Personal Finance 3 hrs.
Problems and techniques of family financial planning. Benefits and warnings relative to consumer credit, insurance, home ownership, and personal investing in light of current economic and legal constraints. F.

Upper Division Courses (see prerequisites for Upper Division)

301 Principles of Finance 3 hrs.

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. F.

361 Equity Markets 3 hrs.
A study of the structure and performance of equity markets. Market design, regulation, performance, and institutional framework. Prerequisite: FIN 301. F.

375 Financial Institutions 3 hrs.
Role and activities of financial intermediaries as they affect flow of funds and capital formation. Money markets and capital markets in which these institutions operate. Prerequisite: FIN 301 and FIN 352. W.

378 Intermediate Finance 3 hrs.
Study of financial theory as it relates to corporate policy, including the theory of efficient markets, capital structure theory, long-term financing and dividend policies. Prerequisite: FIN 301. W.

395 Advanced Topics in Corporate Finance 3 hrs.
This course covers the role of options, warrants, convertibles, leasing, mergers, acquisitions, and pension plans in a corporate environment. Prerequisite: FIN 378.

431 Managerial Finance 3 hrs.
Financial principles applied to financial management problems such as cash management; payables and receivables management; cost of short-term credit; and forecasting and financial planning. Prerequisite: FIN 301. Lab Fee: Level I. F.

454 International 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 352 and senior standing or approval of Department Chair. F, Sp.

470 Seminar in Finance 3 hrs.
Extensive readings and reports reflecting current developments and trends in financial theory and its applications to the decision-making process. Development
of a logical approach to financial problems using accepted techniques of financial

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  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.

Graduate Courses (for details, see Graduate Catalog)
601  Introduction to Managerial Finance  3 hrs.
650  Special Studies  3 hrs.
670  Advanced Managerial Finance  3 hrs.

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
explored. Su.

101  Introduction to Entrepreneurship  3 hrs.
Introduction to the management of a small business and the entrepreneurial career.
The course will focus on elementary concepts of planning, financing, developing,
and managing a new business. Lab fee: Level 5. W.

Upper Division Courses (see prerequisites for Upper Division)
301  Principles of Management  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. Lab fee: Level 2. Su,

361  Organizational Behavior  3 hrs.
Behavioral-science and social-systems approach to behavior of people at work in
organizations. Behavioral decision-making, organizational theory, communication
process, work motivation, groups, leadership, organizational climate,
organizational development and other aspects of human behavior in organizations.
Prerequisite: MGT 301. Lab fee: Level 2. F, Sp.

362  Management and Labor Relations  3 hrs.
Psychological and institutional factors as well as economic analysis of major aspects
of such problems as employment, wages, hours, unionism, labor-management
relations, and social security. Prerequisite: MGT 301. Lab fee: Level 2. W.
Theories and practices related to personnel functions such as recruitment, selection, orientation and placement, training, evaluation, promotion, and compensation. Recent research in human resource management; valuable to students majoring in other areas related to these functions. Prerequisite: MGT 301. Lab fee: Level 2. F, Sp.

Small Business Management 3 hrs.
Application of principles and practices of modern management start-up operation and control of small business firms. Role of small businesses in the economy. Opportunities and operational problems of small firms. Prerequisite: MGT 301 and senior standing. Lab fee: Level 2.

The course explores the complex relationships existing between business, government, and society. Furthermore, it seeks through both the primary and auxiliary texts, to examine the ethical considerations inherent in these relationships. Prerequisite: MGT 301, MKT 301, and senior standing. Lab fee: Level 2.

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

International Management 3 hrs.
Management of the multinational business enterprise in interaction with its political, economic, social, cultural, and legal environments. Prerequisite: MGT 301 and senior standing. Lab fee: Level 2. F, Sp.

Employee Training and Development 3 hrs.
Introduction to the development of employee training and development programs, assessment of training needs, program evaluation, and organizational development. Prerequisites: MGT 361, MGT 362.

Wage and Salary Administration 3 hrs.
An introduction to compensation practices, legal constraints, wage and salary determination, and benefits programs. Prerequisites: MGT 301, MGT 362, MGT 363.

Seminar in Management 3 hrs.
Selected topics in management. Prerequisite: senior standing. Lab fee: Level 2.

Special Projects 3 hrs.
Independent study in an area of interest to the student in the field of management. Prerequisites: senior standing and approval of Department Chair.

Internship in Management 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, approval of the Department Chair, and subject to college’s guidelines on internships.
499 Business Policy 3 hrs.
Integration of principles and methods acquired in the core curriculum of business strategy, policy, and management action. The course involves the study of administrative processes under conditions of uncertainty including integrating analysis and policy determination. The course includes analysis of comprehensive business cases and the opportunity to acquire skills in diagnosing and solving complex business problems in local firms through one of the college's centers. This course should be taken with 6 or fewer semester hours. Prerequisite: senior standing, completion of all other core courses, EH 300, and 50% of major courses. Lab fee: Level 3. Su, F, W, Sp.

Graduate Courses (for details, see Graduate Catalog.)

505 Small Business Management 3 hrs.
540 Small Business Counseling 3 hrs.
550 International Management 3 hrs.
570 Seminar in Management 3 hrs.
574 Information System Planning 3 hrs.
595 Internship in Management 3 hrs.
605 Advanced Entrepreneurship 3 hrs.
622 Human Behavior Organization 3 hrs.
623 Organizational Theory 3 hrs.
624 Organizational Problems 3 hrs.
625 Labor Relations and the External Environment 3 hrs.
629 Leadership and Motivation 3 hrs.
631 Personnel Administration in Organizations 3 hrs.
634 Seminar in Administrative Science 3 hrs.
635 Administrative Science Internship 1-3 hrs.
640 Principles of Project Management 3 hrs.
650 Selected Research Topics 3 hrs.
698 Strategic Management 3 hrs.
699 Master's Thesis 3 hrs.

Management Information Systems (MIS)

Lower Division Courses

101 Microcomputer Applications 3 hrs.
Provides students with a working knowledge of microcomputers. The course covers background orientation material. Its main focus is the business software applications of microcomputers. Applications orientation are computer programs that perform
user tasks, such as word processing, accounting packages, electronic spreadsheets, data based management, networking, and basic programming. Does not carry credit for Computer Science majors. (Same as CS 101). Lab fee: Level 3.

201 **Computer Applications in Business** 3 hrs.
Evaluation of digital computers. Overall structure of computer problem solving and method of constructing computer solution. Overview of hardware/software systems. Data and information processing in organizations and other computer uses in management. Programming in BASIC and the use of business software packages such as word processing, precision support systems, spreadsheets and database concepts on Personal Computers. Applications and examples will generally be from administrative areas. Prerequisites: MA 121 or MA 143 or Level III placement. Lab fee: Level 5. Su, F, W, Sp.

210 **Introduction to Computer Programming in Business** 3 hrs.
Fundamentals of structured design and programming using a procedural language such as COBOL. Table handling and hierarchical data structure. Prerequisites: MIS 201 or CS 113. Lab fee: Level 6. F, Sp.

**Upper Division Courses (see prerequisites for Upper Division)**

301 **Information Systems in Organizations** 3 hrs.
Understanding the role of information systems in organizations and how they relate to organizational objectives and organizational structure. Introduces information system applications. Prerequisites: MIS 201, MSC 287, ACC 211, and ACC 212. Lab fee: Level 4. Su, F, W, Sp.

310 **Advanced Computer Programming in Business** 3 hrs.
Advanced business language such as COBOL features, control language and file handling (sequential, random and indexed sequential), Program structure documentation, and maintenance. Course project in development and documentation of significant business application. Prerequisite: MIS 210. Lab fee: Level 6. Su, W.

340 **Data Bases for Management** 3 hrs.
The 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 210, MIS 301. Lab fee: Level 6. W, Su.

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 is in development and documentation of significant business applications. Prerequisite: MIS 340. Lab fee: Level 6. F, Sp.

400 **Decision Support Systems and Expert Systems** 3 hrs.
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 340, MGT 301, MKT 301, FIN 301, and MSC 385. Lab fee: Level 6. W, Su.

407 **Accounting Information Systems** 3 hrs.
Design, operation, analysis of accounting information systems with respect to data input, processing, storage, recall, security, internal control, and the audit trail.
Emphasis will be placed on computerized systems. Prerequisites: MIS 301, ACC 212. (Same as ACC 407). Lab fee: Level 4. Su, F, Sp.

412 **Information Systems Design and Implementation** 3 hrs.
Advanced coverage of the strategies and techniques of structured systems development. Emphasizes information analysis and the logical specifications of the system. Students prepare exercises and case studies to develop proficiency in information analysis techniques. Integrates computer technology, systems analysis, systems design, and organizational behavior in designing large scale application or decision support systems. Prerequisites: MIS 301. Lab fee: Level 6. F, Sp.

475 **Information Resource Management** 3 hrs.
Overview of the management of the information systems resources of the firm. Prerequisite: MIS 412. Lab fee: Level 4. W, Su.

480 **Seminar in Management Information Systems** 3 hrs.
Selected topics in Management Information Systems. Topics will reflect the contemporary issues and current technological advancements which impact the development, implementation and management of effective information systems in organizations. Prerequisites: senior standing and approval of Department Chair. Lab fee: Level 5.

490 **Special Projects** 3 hrs.
Independent study in an area of interest to the student in the field of Management Information Systems. Prerequisite: senior standing and approval of Department Chair. Lab fee: Level 5.

495 **Internship in Information Systems** 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. F, W, Sp, Su.

499 **Systems Development Project** 3 hrs.
A capstone course emphasizing the development of a computer application via the life cycle methodology. Term projects will produce current system specifications, devise new logical system design, develop a physical design for a new design and implement the design to the extent possible. F, Sp.

**Graduate Courses (for details, see Graduate Catalog)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hrs.</th>
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<tbody>
<tr>
<td>507</td>
<td>Accounting Information Systems</td>
<td>3</td>
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<tr>
<td>575</td>
<td>Information Resource Management</td>
<td>3</td>
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<tr>
<td>617</td>
<td>Modeling and Decision Systems</td>
<td>3</td>
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<td>634</td>
<td>Seminar in Management Information Systems</td>
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<td>640</td>
<td>Seminar in Database Management</td>
<td>3</td>
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<td>645</td>
<td>Application of AI and Decision Making</td>
<td>3</td>
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<tr>
<td>660</td>
<td>Seminar in Telecommunications &amp; Distributed Processing</td>
<td>3</td>
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<tr>
<td>672</td>
<td>Seminar in Systems Design Process</td>
<td>3</td>
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<tr>
<td>699</td>
<td>Masters Thesis</td>
<td>3</td>
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</table>
Management Science (MSC)

Lower Division Courses

287 Introduction to Business Statistics 3 hrs.
Introduction to the concepts of probability and business statistics. Topics include collection, classification, and presentation of data, measures of central tendency, and dispersion of data; probability distributions; confidence limits and hypothesis testing. Prerequisite: MA 143, or MA 151 or equivalents. Lab fee: Level 5. Su, F, W, Sp.

Upper Division Courses (see prerequisites for Upper Division)

325 Quantitative Methods in Business 3 hrs.
Statistical and quantitative modeling and problem solving methods used in business. Topics include correlation, Chi-square, analysis of variance, regression, linear programming, decision theory, simulation, and queueing analysis. Prerequisite: MA 151, MIS 201, MSC 287. Lab fee: Level 5. W.

385 Production/Operations Management 3 hrs.
Survey of the concepts, processes, and institutions involved with the production function of the firm. Topics include forecasting, production planning, and control, materials management, and quality control. Applications of management science tools to production problems. Prerequisites: MA 151, MIS 201, MSC 287, MSC 325. Lab fee: Level 5. Su, F, W, Sp.

386 Advanced Production/Operations Management 3 hrs.
Further examination of the concepts, processes, and institutions involved with the production function of the firm. Topics include linear programming, transportation and assignment problems, line balancing, learning curves, queueing theory, facility location, facilities design and layout, job design, productivity, and work measurement. Prerequisite: MSC 385. Lab fee: Level 3. F.

395 Sampling in the Business Environment 3 hrs.
Review of elementary concepts, design of questionnaires, methods of data collection, sampling designs, ratio estimation, specialized sampling and survey problems, and analysis of sample data. Prerequisite: MSC 385. Lab fee: Level 3.

401 Production Planning and Control 3 hrs.
In depth study of modern production planning and control, including forecasting, master production scheduling and capacity planning. Prerequisites: MIS 201, MSC 325, MSC 386. Lab fee: Level 3.

402 Materials Management 3 hrs.
In depth study of modern materials management techniques including inventory management and control, and production activity control. Prerequisites: MIS 201, MSC 325, MSC 386. Lab fee: Level 3.

430 Introduction to Econometrics for Economics and Business Applications 3 hrs.
Review inferential statistics, statistical relationship of economic and business models (single-equation versus simultaneous-equation models), multiple regression techniques and their application to estimation of economic and business models. Prerequisite: MSC 385, MSC 325 or approval of instructor. Lab fee: Level 3.
Seminar in Production Management 3 hrs.
Seminar on current topics related to production management, such as materials requirements planning, flexible manufacturing systems, Japanese management systems, robotics. Prerequisites: MIS 301, MSC 325, MSC 386. Lab fee: Level 3.

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.

Internship in Management Science 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. F, W, Sp, Su.

Graduate Courses (for details, see Graduate Catalog)
570 Seminar in Production Management 3 hrs.
641 Project Management Planning and Control 3 hrs.
642 Management Science for Project Management 3 hrs.
643 Systems Modeling and Simulation 3 hrs.
645 Applications of Artificial Intelligence 3 hrs.
648 Management of Computer Integrated Manufacturing 3 hrs.
650 Selected Research Topics 3 hrs.
651 Quantitative Methods II 3 hrs.
699 Master's Thesis 3 hrs.

Marketing (MKT)
Upper Division Courses (see prerequisites for Upper Division)
301 Principles of Marketing 3 hrs.

315 Sales Management and Professional Selling 3 hrs.
Integration of techniques and concepts of professional selling with problems of sales management. Objectives and policies for sales managers concerning managing sales force and methods of marketing analysis in terms of sales forecasts and budgeting. Problems faced by sales management in competition, pricing, and promotion. Prerequisite: MKT 301. Lab fee: Level 2.

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. Lab fee: Level 2.
<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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<tbody>
<tr>
<td>322</td>
<td>Introduction to Logistics Management</td>
<td>3 hrs.</td>
<td>Survey of logistics systems design, administration, and control. Topics also include transportation, materials handling and information systems. Prerequisites: MKT 301 and MSC 385.</td>
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<td>332</td>
<td>Consumer Behavior</td>
<td>3 hrs.</td>
<td>Interdisciplinary approach to analyze and interpret consumer buying habits and motives and the resultant purchases of goods and services. Purchaser’s psychological, economic, and sociocultural actions and reactions as they relate to better understanding of consumption. Prerequisite: MKT 301. Lab fee: Level 2. W.</td>
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<tr>
<td>342</td>
<td>Promotional Strategy</td>
<td>3 hrs.</td>
<td>Promotional techniques available to marketing management. Consumer behavior and communication process means 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. Lab fee: Level 2.</td>
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<tr>
<td>343</td>
<td>Marketing Research Design</td>
<td>3 hrs.</td>
<td>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 and MSC 287. Lab fee: Level 3. F. Sp.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>344</td>
<td>Marketing Research Applications</td>
<td>3 hrs.</td>
<td>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, MSC 325, and MKT 343. Lab fee: Level 3. W, Su.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>345</td>
<td>Market Channel Structure and Strategy</td>
<td>3 hrs.</td>
<td>Marketing channels as a functional area and the alternative choices available to marketing management in developing overall marketing strategy. Institutional structures and dynamic interrelationships in distribution logistics. Prerequisite: MKT 301. Lab fee: Level 2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>414</td>
<td>New Product Development</td>
<td>3 hrs.</td>
<td>Comprehensive review of the new product development process. Specialized application of marketing research and marketing strategy to new product development, concept development and concept testing. Prerequisites: MKT 301, MSC 325, MKT 343, MKT 344. Lab fee: Level 2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>415</td>
<td>International Marketing</td>
<td>3 hrs.</td>
<td>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. Prerequisite: MKT 301 and senior standing. Lab fee: Level 2. F, W. (Same as 515)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>470</td>
<td>Seminar in Marketing</td>
<td>3 hrs.</td>
<td>Review of selected classics in the literature. Recent developments in marketing theory and application to marketing problem solving. Prerequisite: senior standing. Lab fee: Level 2. F.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 major functional areas. Identification and selection
of market opportunities. Competitive strategies and development of marketing
policies and programs. Prerequisite: MSC 325, MKT 332, MKT 343, MKT 344,
and senior standing. Lab fee: Level 2. Sp.

485  Marketing Case Studies  3 hrs.
Discussion-style analysis and exercises in marketing decision making using current
organizations as case subjects; business enterprises, nonprofit and service
organizations or government agencies. Prerequisites: MKT 332, MKT 343, and
senior standing. W.

490  Special Projects  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  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.
Prerequisite: Senior standing, approval of Department Chair, and subject to
colleges’ guidelines on internship.

Graduate Courses (for details, see Graduate Catalog)

515  International Marketing  3 hrs.
570  Seminar in Marketing  3 hrs.
580  Marketing Management  3 hrs.
606  Strategic Marketing Management  3 hrs.

Procurement Management (PRM)

301  Introduction to Procurement  3 hrs.
Explores the primary aspects of the procurement and management of material
resources necessary for government or business operation. Introduction will be
made to the broad concepts of procurement and material management to include
the generation of a require ment, forecasting, funding, the procurement cycle
through award of a contract, inventory control, and distribution. Prerequisite: MSC
385. Lab fee: Level 1. F.

302  Contract Administration  3 hrs.
Intensive review of contract administration functions and responsibilities beginning
when a contract is awarded and continuing until the contract is terminated or
delivery is made and all aspects of the contract have been performed. It includes
consideration of the roles of small business and sub-contractors. Prerequisite: PRM
301. Lab fee: Level 2. W.

303  Cost and Price Analysis  3 hrs.
Presents the tools and techniques available to the student for cost/price estimating,
cost/price analysis, projection techniques, factors affecting profit or fee, the
weighted guidelines technique of profit analysis and application of the learning
curve theory. After cost/price analysis has been performed, negotiation strategies and techniques are developed. Prerequisite: PRM 301. Lab fee: Level 2. W.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>404</td>
<td>Negotiation Techniques</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Develops principles, skills and techniques for effective negotiation of procurement actions. Includes verbal and nonverbal mannerisms, need to communicate, team approach, buyer’s preparation for negotiations, and various tactics and strategies for negotiating. Prerequisites: senior standing and PRM 303. Lab fee: Level 2. Sp.</td>
<td></td>
</tr>
<tr>
<td>405</td>
<td>Government Contract Law</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Application of the legal principles governing government contracts as evolved from common law, statutes, regulations, and court and board decisions. Application of law to each step of the federal procurement and federal assistance process. Prerequisites: senior standing, PRM 302, 303 and BLS 211. Lab fee: Level 2. Sp.</td>
<td></td>
</tr>
</tbody>
</table>

Graduate Courses (for details, see Graduate Catalog)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>671</td>
<td>Acquisition Management I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>672</td>
<td>Acquisition Management II</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

120
College of Engineering

Dean Lynn D. Russell, BSME, MSME, Ph.D., P.E., Professor of Mechanical Engineering; Associate Dean Kenneth O. Thompson, B.S., B.A.E., B.B.A., M.S., Ph.D., Associate Professor Emeritus.

Chemical Engineering
Professor Emeritus Grohse; Associate Professor Smith; Assistant Professors Thomas, Toghiani.

Civil Engineering
Professor Emeritus Kubitza; Professor Gilbert, Assistant Professors Crull, Schonberg, Uber; Lecturers Aston, Pope, Worden.

Electrical and Computer Engineering
Professors Audeh, Biggs, Halijak, Jarem, Johnson, Padulo, Polge, Poularikas, Singh; Adjunct Professor, Stern; Associate Professors Ho, Stensby, Kulick; Associate Professor Emeritus Thurstone; Assistant Professors Abushagur, Adhami, Gheen, Hofmann, Katsinis, McCullough, Mirsalehi; Instructor Jones; Lecturer Romine.

Industrial and Systems Engineering
Professors Brown (chair), Schroer, Wyskida; Associate Professors Lovett, Tytula, Walker, Yarbrough; Adjunct Associate Professor Dorsett; Adjunct Assistant Professors Lawler; Assistant Professor Lulu, Messimen, Riggs; Adjunct Assistant Professors Lawler, Safie.

Mechanical Engineering
Professors Chung, Cost, Harwell, Hung, Karr (chair), Liu, Russell, Shih, Wallace, Wessling, Wu; Professor Emeritus Herman; Associate Professors Brainerd; Associate Professor Emeritus Thompson; Assistant Professors Bower, Musielak.

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, Redstone Arsenal and much of...
Alabama's fastest growing technological industry gives the College of Engineering a special character that leads to outstanding educational opportunities for its students. This special setting combined with a high quality faculty affords maximum growth potential for those desiring to pursue a career in engineering.

The UAH College of Engineering is strongly committed to the advising of both undergraduate and graduate students. As such, students are requested to contact the Dean's Office as soon as possible for initial advising.

Degrees and Programs

Bachelor of Science in Engineering degrees can be earned in chemical engineering, civil engineering, computer engineering, electrical engineering, industrial and systems engineering, mechanical engineering (including an option in aerospace engineering), and optical engineering. The undergraduate engineering programs are built around a core consisting of courses in mathematics, the physical sciences, humanities, and engineering. Students then take additional engineering courses in the areas of their specializations. The net result is that at UAH, engineering students first develop breadth in important fundamental areas and then depth in their particular field of specialization. This gives an added dimension to UAH engineering graduates that enhances their professional performance. The UAH engineering student is also able to obtain real world engineering experience through the Cooperative Education Program or by part-time work with the many governmental and industrial facilities in Huntsville. Graduate degrees offered in engineering include the Master of Science in Engineering, a Master of Science in Operations Research and the Ph.D. in electrical, computer, industrial and systems, and mechanical engineering. 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.

Requirements for an Engineering Minor

Students with nonengineering majors who choose an minor in engineering, must take a minimum of 21 hours in engineering courses selected with the assistance of an engineering advisor and approved by the chairman of one of the engineering departments.

Course Numbers

Course numbers are coded for engineering by prefixes as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Prefix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering</td>
<td>CHE</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>CE</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>CPE</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>EE</td>
</tr>
<tr>
<td>Industrial and Systems Engineering</td>
<td>ISE</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>ME</td>
</tr>
<tr>
<td>Optical Engineering</td>
<td>OPE</td>
</tr>
</tbody>
</table>

Undergraduate Engineering Program

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, liberal arts, 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 serve as a foundation for creative participation in most areas of engineering, especially those High School Preparation, Prerequisite Courses and Transfer associated with new evolving technologies. All engineering students follow a common curriculum with specialization in the junior and senior years in chemical engineering, civil engineering, computer engineering, electrical engineering, industrial and systems engineering, optical engineering, or mechanical engineering. The chemical engineering, civil engineering, electrical engineering, industrial and systems engineering, and mechanical engineering options are accredited by the Accreditation Board for Engineering and Technology (ABET). The other options are under preparation for ABET accreditation evaluation. The degree awarded is the Bachelor of Science in Engineering (B.S.E.)

High School Preparation, Prerequisite Courses, and Transfer Credit

Students who intend to pursue the BSE degree should carefully read the section Admission to the Freshman Class. Students who have had inadequate preparation or who are placed in certain lower-level classes because of results of placement tests will have to take one or more of the following courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH 003</td>
<td>Basic English</td>
<td>No credit</td>
</tr>
<tr>
<td>EH 101</td>
<td>Freshman Composition</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>CH 101</td>
<td>General Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>CH 105</td>
<td>General Chemistry Laboratory</td>
<td>1 hr.</td>
</tr>
<tr>
<td>MA 119</td>
<td>Precalculus I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>MA 121</td>
<td>Precalculus II</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

These courses carry the academic credit indicated and will appear on transcripts of students who successfully complete the courses. Since these courses are prerequisite to courses required for the B.S.E., credit earned in one or more of these courses cannot be applied toward the minimum requirement for the B.S.E.

Credit for engineering courses taken in schools with ABET accredited programs is transferrable to UAH. Engineering courses taken in non-ABET accredited programs may also be applied to a B.S.E. degree based on an appropriate examination (written or oral) at the discretion of the respective department. All inquiries concerning applicability of credit should be made to the Associate Dean of Engineering.

Each student 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. Failure to do so may extend the time required for graduation. Each student should seek counseling and advice from the appropriate department or from the office of the dean.

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 BSE 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. At UAH only one repeat attempt or a total of two attempts are allowed in any of these prerequisite courses.

To register for an engineering course at the 300-level or above, with the exceptions of ISE 321, EE 300, and ME 362, an undergraduate student must be admitted to an option in the College of Engineering, or the desired course must be listed on the student's approved program of study.
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.

**Course Requirements**

Students must successfully complete courses in each of six categories. The normally required courses are shown; however, the Dean of Engineering may approve other courses which also meet ABET guidelines.

<table>
<thead>
<tr>
<th>Semester Hours</th>
<th>1. Engineering core (25 hours):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FORTRAN Programming - EE 197 .......... 3</td>
</tr>
<tr>
<td></td>
<td>Statics - ME 271 .................... 3</td>
</tr>
<tr>
<td></td>
<td>Electrical Circuits I - EE 300 .......... 3</td>
</tr>
<tr>
<td></td>
<td>Electronic Instrumentation Lab - EE 301 .......... 1</td>
</tr>
<tr>
<td></td>
<td>Electronic Instrumentation - EE 311 .......... 3</td>
</tr>
<tr>
<td></td>
<td>Engineering Economy - ISE 321 .......... 3</td>
</tr>
<tr>
<td></td>
<td>Dynamics - ME 362 .................... 3</td>
</tr>
<tr>
<td></td>
<td>Introduction to Engineering Design - ME 493 ........... 2</td>
</tr>
<tr>
<td></td>
<td>2. English - EH 301 .................... 3</td>
</tr>
<tr>
<td></td>
<td>3. Humanities and social sciences (18 hours)</td>
</tr>
<tr>
<td></td>
<td>Engineering students are required to take a total of 18 semester hours (in addition to EH) in the humanities and social sciences, including EC 239 and AHS 392. The remaining 12 semester hours should be a balanced choice from the following areas: art history, literature, history, music appreciation, philosophy, sociology, psychology, political science, economics, and foreign languages other than a student’s native language(s). No more than six hours should be at the introductory level (courses with no prerequisites), and a two-course sequence in a given area is necessary to develop depth. ABET does not accept CM 110, 113, 201, or 301 as satisfying humanities and social science requirements. Courses should be selected to fulfill an objective appropriate to the engineering profession. Courses treating subjects such as accounting, industrial management, finance, personnel administration, and ROTC normally do not fulfill this objective regardless of their general value in the total engineering curriculum.</td>
</tr>
<tr>
<td></td>
<td>4. Mathematics (18 hours)</td>
</tr>
<tr>
<td></td>
<td>Calculus and Analytic Geometry - MA 153, 154, 233, 251 .......... 12</td>
</tr>
<tr>
<td></td>
<td>Linear Algebra - MA 244 ............. 3</td>
</tr>
<tr>
<td></td>
<td>Differential Equations - MA 352 .......... 3</td>
</tr>
<tr>
<td></td>
<td>5. Basic Sciences (12 and additional hours)</td>
</tr>
<tr>
<td></td>
<td>General Physics - PH 111, 112 .......... 8</td>
</tr>
<tr>
<td></td>
<td>Chemistry - CH 121, 125 .......... 4</td>
</tr>
<tr>
<td></td>
<td>Additional courses are listed under each option.</td>
</tr>
<tr>
<td></td>
<td>6. Engineering options</td>
</tr>
<tr>
<td></td>
<td>Students are required to take one of the following options as listed below:</td>
</tr>
</tbody>
</table>

**Chemical Engineering Option.**

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 and chemical reaction kinetics constitute the heart of chemical engineering. Chemical engineers work in many diverse fields ranging from production of the many basic chemical products required by our industrial society to research on major technical and social problems, including energy resources development and pollution control.
Additional Basic Sciences
Chemistry - CH 123, 126, 223, 331, 332 ..................................................17
Advanced science electives from approved area ........................................7

Chemical Engineering Option
ME 198 - Engineering Graphics ............................................................. 2
CHE 244 - Stoichiometry ................................................................. 3
ME 341 - Thermodynamics I ............................................................... 3
CHE 344 - Chemical Engineering Thermodynamics .................................. 3
ME 352 - Fluid Mechanics I ............................................................... 3
ME 396 - Numerical Methods and Computations .................................... 2
CHE 440 - Unit Operations Laboratory .................................................. 3
ME 442 - Introduction to Heat and Mass Transfer .................................. 4
CHE 443 - Mass Transfer Operations .................................................. 3
CHE 445 - Chemical Process Control .................................................. 3
CHE 447 - Chemical Engineering Design I ......................................... 3
CHE 448 - Chemical Engineering Design II ......................................... 3
CHE 441 - Chemical Kinetics and Reactor Design ................................ 3

Suggested Schedule of Courses for Full-time Chemical Engineering Students

<table>
<thead>
<tr>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>HU/SS</td>
<td>MA 153 3</td>
<td>EE 197 3</td>
</tr>
<tr>
<td>CH 121 &amp; 125 4</td>
<td>MA 233 3</td>
<td></td>
</tr>
<tr>
<td>ME 198 2</td>
<td>CH 223 4</td>
<td></td>
</tr>
<tr>
<td>CH 331 3</td>
<td>CHE 244 3</td>
<td></td>
</tr>
<tr>
<td>PH 111 4</td>
<td>EC 239 3</td>
<td></td>
</tr>
<tr>
<td>MA 251 3</td>
<td>ME 352 3</td>
<td></td>
</tr>
<tr>
<td>ME 198 2</td>
<td>ME 362 3</td>
<td></td>
</tr>
<tr>
<td>HU/SS: 12 hours in humanities/social sciences</td>
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<tr>
<td>+ Sci. Elec.: 7 hours from an approved area of concentration with courses or above the 300 level.</td>
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</tr>
</tbody>
</table>

Total Hours 134
Civil Engineering Option

The six main branches of Civil Engineering are: Structural Engineering, Hydraulic Engineering, Geotechnical Engineering, Environmental Engineering, Transportation Engineering, and Construction Engineering and Management. Civil Engineers in these disciplines are involved in the planning, analysis, and design of various projects, including buildings, bridges, dams, rocket launching platforms, canals, hydroelectric plants, large space structures, offshore drilling platforms, water treatment and distribution systems, wastewater treatment plants, groundwater quality monitoring and restoration systems, highways, gas and oil pipelines, office complexes, and industrial parks. In their work Civil Engineers use traditional design and analysis approaches as well as advanced experimental and computational techniques.

Additional Basic Sciences
Chemistry - CH 123, 126 .......................................................... 4

Civil Engineering Option
ME 198 - Engineering Graphics ................................................... 2
ME 341 - Thermodynamics I .......................................................... 3
ME 352 - Fluid Mechanics I .......................................................... 3
ME 370 - Mechanics of Materials .................................................. 4
ME 396 - Numerical Methods and Computations ................................ 2
CE 325 - CAD Seminar .................................................................. 0
CE 371 - Structural Analysis I ....................................................... 3
CE 372 - Soil Mechanics ................................................................. 4
CE 381 - Structural Analysis II ....................................................... 3
CE 382 - Land Surveying ............................................................... 3
CE 403 - Reinforced Concrete Design ............................................. 3
CE 404 - Structural Design ............................................................ 3
CE 472 - Hydraulic Engineering ..................................................... 3
CE 473 - Transportation Engineering and Design ................................ 3
CE 475 - Hydrology .................................................................... 2
CE 476 - Water Quality Control Processes ..................................... 3
CE 480 - Civil Engineering Design Project ...................................... 3
*Technical Electives .................................................................... 6
* Choose from CE 375, 376, 449, 450, 478, 481, 482, 485, ISE 390, 421, 422, ME 342, 378, 394, 442, 451, 454, 461, 470, 474, 477, 485, 486, 489, or other 300 level or above courses approved by the Civil Engineering program chairman.

Suggested Schedule of Courses for Full-time Civil Engineering Students

<table>
<thead>
<tr>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 121 &amp; 125</td>
<td>4</td>
<td>CH 123 &amp; 126</td>
</tr>
<tr>
<td>MA 153</td>
<td>3</td>
<td>MA 154</td>
</tr>
<tr>
<td>ME 198</td>
<td>2</td>
<td>PH 111</td>
</tr>
<tr>
<td>HU/SS</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>*Hu/SS</td>
<td>3</td>
<td>MA 244</td>
</tr>
<tr>
<td>MA 251</td>
<td>3</td>
<td>ISE 321</td>
</tr>
<tr>
<td>EC 239</td>
<td>3</td>
<td>*Hu/SS</td>
</tr>
<tr>
<td>*Hu/SS</td>
<td>3</td>
<td>EH 301</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

126
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 an option in Computer Engineering. The purpose of the program is to produce a well-educated individual, a practitioner of engineering design - one who becomes a specialist in the design, analysis and application of computer systems. The student will develop a background in non-engineering areas, such as English, mathematics, basic science and humanities and social sciences. In addition, the student will take the engineering core curriculum and courses from computer science. More importantly, the student will be deeply involved in engineering design and in specialty subjects in computer engineering. The computer engineer is a professional that considers carefully the ethical role of the engineer in dealing with a broad spectrum of commercial, legal, and moral issues. A graduate computer engineer will be involved in a number of technical specialties which include computer architecture, interface design, communications and networking, and software engineering.

Additional Basic Sciences

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Physics with Calculus III - PH 113</td>
</tr>
<tr>
<td>PH 116</td>
</tr>
<tr>
<td>Computer Engineering Option</td>
</tr>
<tr>
<td>CPE 201 Digital Logic Design Lab</td>
</tr>
<tr>
<td>EE 202 Introduction to Digital Logic Design</td>
</tr>
<tr>
<td>EE 303 Electrical Engineering Laboratory</td>
</tr>
<tr>
<td>EE 305 Electronics Laboratory I</td>
</tr>
<tr>
<td>EE 313 Electrical Circuits II</td>
</tr>
<tr>
<td>EE 315 Electronics I</td>
</tr>
<tr>
<td>ISE 390 Probability and Engineering Statistics I</td>
</tr>
<tr>
<td>EE 402 Design of Digital Computer</td>
</tr>
<tr>
<td>EE 429 Microcomputers</td>
</tr>
<tr>
<td>CPE 433 Advanced Techniques in Computer Design</td>
</tr>
<tr>
<td>CPE 427 Computer Engineering Design I</td>
</tr>
<tr>
<td>CPE 437 Computer Engineering Design II</td>
</tr>
<tr>
<td>CPE 447 Computer Engineering Design III</td>
</tr>
<tr>
<td>*Engineering Electives</td>
</tr>
<tr>
<td>CS 208 Introduction to Computer Science II</td>
</tr>
</tbody>
</table>
Suggested schedule of courses for full-time Computer Engineering students.

### First Year

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>HU/SS</td>
<td>3 MA 154</td>
<td>3 MA 233</td>
<td>3</td>
</tr>
<tr>
<td>MA 153</td>
<td>3 PH 111</td>
<td>4 PH 112</td>
<td>4</td>
</tr>
<tr>
<td>CH 121 &amp; 125</td>
<td>4 EE 197</td>
<td>3 EE 202</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>HU/SS</td>
<td>3 CPE 201</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>13</td>
</tr>
</tbody>
</table>

### Second Year

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>HU/SS</td>
<td>3 ME 294</td>
<td>4 HU/SS</td>
<td>3</td>
</tr>
<tr>
<td>PH 113</td>
<td>3 EC 239</td>
<td>3 ISE 321</td>
<td>3</td>
</tr>
<tr>
<td>PH 116</td>
<td>1 MA 244</td>
<td>3 ME 362</td>
<td>3</td>
</tr>
<tr>
<td>MA 251</td>
<td>3 CS 208</td>
<td>3 ME 352</td>
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<td>ME 271</td>
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### Third Year

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<tbody>
<tr>
<td>EE 300</td>
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<td>3 EE 303</td>
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<td>1 EE 383</td>
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<td>CS 308</td>
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### Fourth Year

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<th>Winter</th>
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<tbody>
<tr>
<td>CS 317</td>
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<td>3 CPE 447</td>
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<td>EE 402</td>
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<td>3 CS 490</td>
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<td>EE 429</td>
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<td>1 Eg. El.</td>
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<tr>
<td>CPE 427</td>
<td>1 ISE 390</td>
<td>3 ME 493</td>
<td>2</td>
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<tr>
<td></td>
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<td>10</td>
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</tbody>
</table>

Total Hours: 134

---

*Engineering courses at level 300 or above.
Electrical Engineering Option.
The electrical engineering option offers a background that enables a student to pursue careers in any of the many and diverse facets of electrical engineering such as electronics, network, power systems, instrumentation, computers, communications, and controls. The student may also select advanced undergraduate courses to develop individual and specific interests.

**Semester Hours**

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Physics with Calculus III - PH 113</td>
<td>3</td>
</tr>
<tr>
<td>PH 116</td>
<td>1</td>
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</tbody>
</table>

**Electrical Engineering Option**

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
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<tbody>
<tr>
<td>EE 202 - Introduction to Logic Design</td>
<td>3</td>
</tr>
<tr>
<td>ME 396 - Numerical Methods and Computation</td>
<td>2</td>
</tr>
<tr>
<td>EE 313 and 303 - Electrical Circuits II and Lab</td>
<td>4</td>
</tr>
<tr>
<td>EE 315 and 305 - Electronics I and Lab</td>
<td>4</td>
</tr>
<tr>
<td>EE 307 - Electricity and Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>ME 341 - Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>EE 382 - Analytical Methods for Continuous Time Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE 383 - Analytical Methods for Multivariable and Discrete Time</td>
<td>3</td>
</tr>
<tr>
<td>ISE 390 - Probability and Engineering Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>EE 425 - Introduction to Control and Robotic Systems</td>
<td>3</td>
</tr>
<tr>
<td>Electrical Engineering Electives*</td>
<td>15</td>
</tr>
</tbody>
</table>
*Technical Electives 3

*Suggested Schedule of Courses for Full-time Electrical Engineering Students*

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>HU/SS</td>
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<td>MA 154</td>
<td>3</td>
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<tr>
<td>MA 153</td>
<td>3</td>
<td>PH 111</td>
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<td>CH 121 &amp; 125</td>
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<td>EE 197</td>
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<td></td>
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<td>10</td>
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<tr>
<td>*Hu/SS</td>
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<td>*Hu/SS</td>
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</tr>
<tr>
<td>EC 239</td>
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<td>ME 294</td>
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<tr>
<td>PH 113/116</td>
<td>4</td>
<td>ME 271</td>
<td>3</td>
</tr>
<tr>
<td>MA 251</td>
<td>3</td>
<td>MA 244</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13</td>
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<td>12</td>
</tr>
<tr>
<td>ISE 390</td>
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<td>EE 382</td>
<td>3</td>
</tr>
<tr>
<td>ECE 300</td>
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<tr>
<td>ME 341</td>
<td>3</td>
<td>EE 311</td>
<td>3</td>
</tr>
<tr>
<td>ME 396</td>
<td>2</td>
<td>EE 313</td>
<td>3</td>
</tr>
<tr>
<td>EE 305</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>11</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

*Technical course at level 300 or above.*
*Hu/SS: 12 hours in humanities/social sciences.

**Industrial and Systems Engineering Option.**

Industrial and systems engineering is concerned primarily with integration of people, machines and materials and operating procedures into a functional and economic whole called a system. Thus the specialization includes consideration not only of the usual engineering science, but also requires some knowledge of social, psychological, and human values to identify and satisfy needs of ultimate users of engineering systems.

Additional Basic Sciences

<table>
<thead>
<tr>
<th>Additional Basic Sciences</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science Elective</td>
<td>4</td>
</tr>
</tbody>
</table>

**Industrial Engineering Option**

<table>
<thead>
<tr>
<th>ME 198 - Engineering Graphics</th>
<th>2</th>
</tr>
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<tbody>
<tr>
<td>ISE 326 - Production and Operation Systems I</td>
<td>3</td>
</tr>
<tr>
<td>ISE 327 - Production and Operation Systems II</td>
<td>3</td>
</tr>
<tr>
<td>ME 370 - Mechanics of Materials</td>
<td>4</td>
</tr>
<tr>
<td>ISE/ME 378 - Materials and Manufacturing Process</td>
<td>3</td>
</tr>
<tr>
<td>ISE 390 - Probability and Engineering Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>ISE 423 - Statistical Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>ISE 424 - Introduction to Ergonomics: Work Development</td>
<td>3</td>
</tr>
<tr>
<td>ISE 427 - Management Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ISE 428 - Systems Analysis and Design I</td>
<td>3</td>
</tr>
<tr>
<td>ISE 429 - Systems Analysis and Design II</td>
<td>3</td>
</tr>
<tr>
<td>ISE 430 - Modern Manufacturing/Production Systems</td>
<td>3</td>
</tr>
<tr>
<td>ISE 447 - Introduction to Digital Simulation</td>
<td>3</td>
</tr>
<tr>
<td>ISE 490 - Probability and Engineering Statistics II</td>
<td>3</td>
</tr>
<tr>
<td>AC 211 - Accounting I</td>
<td>3</td>
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</tbody>
</table>

**Industrial Engineering Electives**

*Technical Electives* .......................... 6

* Choose from EE 202, 303/313, 305/315, ME 341, 352, EE 382, ME 396, EE 421, 425, 488, ISE 422, 426, or other upper-level courses approved by the Department of Industrial and Systems Engineering.

**Suggested Schedule of Courses for Full-time Industrial and Systems Engineering Students**

<table>
<thead>
<tr>
<th>Fall</th>
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<th>Spring</th>
</tr>
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<tbody>
<tr>
<td>MA 153</td>
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<td>MA 154</td>
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<td>*HU/SS Elec.</td>
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<td>CH 121 &amp; 125</td>
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<td>PH 111</td>
</tr>
<tr>
<td>EE 197</td>
<td>3</td>
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</tbody>
</table>

130
Mechanical Engineering Option.

Mechanical engineering is a broad field that traditionally comprises three primary subfields: energy, mechanisms and machinery, and manufacturing. The work done by mechanical engineers includes the design, construction, and use of systems for the conversion of energy available from natural sources (water, fossil fuels, nuclear fuels, solar radiation) to other forms of useful energy (for transportation, heat, light, power); design and production of machines to lighten the burden of servile human work and to do work otherwise beyond human capability; processing of materials into useful products; and creative planning, development, and operation of systems using energy, machines, and resources.

Semester Hours

Additional Basic Sciences
Chemistry - CH 123, 126 ......................................................... 4

Mechanical Engineering Option
ME 198 - Engineering Graphics ............................................. 2
ME 341 - Thermodynamics I .................................................. 3
ME 342 - Thermodynamics II ................................................ 3
ME 352 - Fluid Mechanics I .................................................. 3
ME 364 - Kinematics and Dynamics of Machines ....................... 4
ME 370 - Mechanics of Materials ........................................... 4
ME/ISE 378 - Materials and Manufacturing Processes .................. 3
ME 396 - Numerical Methods and Computations ........................ 2
ME 442 - Introduction to Heat and Mass Transfer ...................... 4
ME 447 - Energy Conversion and Power Generation I .................. 3
ME 446 - Design of Thermal Systems ...................................... 3
ME 454 - Fluid Mechanics II ................................................ 3
ME 465 - Engineering Design ................................................ 3
**Suggested Schedule of Courses for Full-time Mechanical Engineering Students**

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 153</td>
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<td>MA 154</td>
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<td>CH 121 &amp; 125</td>
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<td>MA 244</td>
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<td>ME/ISE 378</td>
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<td>ME 465</td>
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<td>Tech. Elec.</td>
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<td></td>
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<td>Total hours</td>
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*Hu/SS: 12 hours in humanities/social sciences
Graduate Engineering Programs

The College of Engineering offers programs leading to the degrees of Master of Science in Engineering, Master of Science in Operations Research, and Doctor of Philosophy. Specializations for the M.S.E. and Ph.D. are in the following areas:

Electromagnetic Fields  Therodynamics, Heat and Mass Transfer
Network Theory  Energy/Power
Communications and Information Theory  Systems Engineering
Computer Engineering  Environmental Engineering
Control Sciences  Applied Mechanics
Human Factors Engineering  Solar Terrestrial Environment System
Engineering Management  Solid State Electronics
Optical Engineering  Materials Engineering
Operations Research  Manufacturing Systems Engineering
Reaction Engineering  Process Dynamics
Composites  Structural Engineering
Product Assurance  Propulsion Combustion

In addition to the above, the College of Engineering participates in a Ph.D. level Material Science program which is awarded jointly by The University of Alabama (Tuscaloosa), The University of Alabama in Birmingham, and The University of Alabama in Huntsville.

Detailed information on the above graduate degrees is presented in the Graduate Catalog of the University of Alabama in Huntsville.

Engineering

Chemical Engineering (CHE) Courses

244  Stoichiometry  3 hrs.
Introduction to basic calculations of chemical engineering, emphasizing material and energy balances on physical and chemical processes. Prerequisites: PH 111, CH 123, ECE 197.

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, ME 341.

440  Unit Operations Laboratory  3 hrs.
Experimental studies covering topics from reaction kinetics, fluid flow, heat transfer, and chemical thermodynamics with emphasis placed on written and oral laboratory report presentation techniques. Lab fee: Level 6. Prerequisite: CHE 344 or senior standing.

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. (Same as CHE 541.)

443  Mass Transfer Operations  3 hrs.
Theory of mass transfer phenomena, with applications to both stagewise and diffusion controlled distillation, gas absorption/desorption, humidification and extraction processes. Prerequisites: CHE 344, ME 442.
445 Chemical Process Control 3 hrs.
Fundamental principles of chemical process control; control system design for chemical processes. Lab fee: Level 6. Prerequisites: MA 352, CHE 244.

447 Chemical Engineering Design I 3 hrs.
Component design of individual chemical engineering equipment to include solid/liquid handling, contacting devices and distribution systems. Introductory topics in computer-aided design will be discussed. Lab fee: Level 5. Prerequisites: CHE 443, 445, ME 493.

448 Chemical Engineering Design II 3 hrs.
An overall team design effort, using modern computer-aided design techniques, to perform a preliminary design, simulation and economic evaluation of a chemical production flow sheet. Lab fee: Level 5. Prerequisites: CHE 447, 441.

449 Introduction to Environmental Engineering 3 hrs.
Engineering aspects of air, water, and thermal pollution. Hydrologic cycle, water sources and uses; industrial and other sources of primary and secondary pollutants. Transport process in environmental problems and in their control. Prerequisite: ME 442. (Same as CHE 549.)

450 Environmental Control 3 hrs.
Engineering design and synthesis of environmental control systems. Control of multiphase systems with application to air and water pollution control. Prerequisite: ME 442. (Same as CHE 550.)

452 Introduction to Air Pollution 3 hrs.
Technology of air pollution dealing with air pollutants, effects, sources, combustion processes, and abatement and control technology. Engineering contributions to both the problems and their solutions. Nature of air pollution problem and fundamental technological approaches to its solution. Prerequisite: graduate standing. Offered upon demand.

Graduate Chemical Engineering Courses (CHE)

540 Physical Properties of Fluids
541 Chemical Kinetics and Reaction Design (Same as CHE 441)
549 Introduction to Environmental Engineering (Same as CHE 449)
550 Environmental Control (Same as CHE 450)
559 Selected Topics in CHE
641 Advanced Thermodynamics
644 Introduction to Electro-Chemistry
646 Thermodynamics of Materials
649 Transport Phenomenon
652 Introduction to Air Pollution
657 Advanced Process Control
Civil Engineering (CE) Courses

325 CAD Seminar no credit
Use of Computer Aided Design (CAD) systems and other appropriate topics. Seminar Course. Satisfactory/Unsatisfactory grading system. Prerequisite: Junior Standing.

371 Structural Analysis I 3 hrs.
Reactions, shears, moments in determinate structures. Influence lines, energy methods in computing deformations. Introduction to indeterminate structures. Prerequisites: ME 362, 370.

372 Soil Mechanics 4 hrs.
Index properties and characteristics of soils. Compaction shear, compressibility and permeability. Application to analysis and design of foundation elements. Laboratory included. Lab fee: Level 5. Prerequisites: ME 352, 370.

375 Hydraulics 3 hrs.
Conservation principles of mass, momentum, and energy and their applications to hydraulic problems. Open channel flows, pipe flows and their application to water supplies in sanitary engineering, flow measurements. Prerequisite: ME 352.

376 Hydraulics Lab 1 hr.
Experiments on water table, open channels, Venturi meter, Pelton and Francis turbines, data analysis, head loss in pipe flow, and pitot static tubes. Lab fee: Level 5. Prerequisite: CE 375.

380 Engineering Design Project Credit to be Arranged
Individualized design project under supervision of instructor. Prerequisite: Junior Standing.

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

382 Land Surveying 3 hrs.
Use of surveying tools and techniques with application to planimetric and topographic mapping, traverse and area computations, stadia and construction surveys. History and methods of surveying public lands of the United States. Problems in resurveys of public lands. Computer applications. Laboratory work included. Lab Fee: Level 3. Prerequisites: ME 198 or consent of instructor.

403 Reinforced Concrete Design 3 hrs.
Design of reinforced concrete structures with emphasis on the ultimate strength method. Aspects of prestressed concrete design; computer applications. Prerequisite: CE 371, 381.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>404</td>
<td>Structural Design</td>
<td>3 hrs.</td>
<td>Principles of design of structures. Analysis and design of structural elements including beams, columns, connection details. Prerequisite: CE 371, 381.</td>
</tr>
<tr>
<td>449</td>
<td>Introduction to Environmental Engineering</td>
<td>3 hrs.</td>
<td>Engineering aspects of air, water, and thermal pollution. Hydrologic cycle, water sources and uses; industrial and other sources of primary and secondary pollutants. Transport processes in environmental problems and in their control. Prerequisite: ME 442 (Same as CE 549.)</td>
</tr>
<tr>
<td>450</td>
<td>Environmental Control</td>
<td>3 hrs.</td>
<td>Engineering design and synthesis of environmental control systems. Control of multi-phase systems with application to air and water pollution control. Prerequisite: ME 442. (Same as CE 550.)</td>
</tr>
<tr>
<td>459</td>
<td>Selected Topics in Civil Engineering</td>
<td>Credit to be arranged</td>
<td></td>
</tr>
<tr>
<td>472</td>
<td>Hydraulic Engineering</td>
<td>3 hrs.</td>
<td>Water-hammer analysis; hydraulic structures such as dams, spillways, stilling basins, flood control devices, locks, pipe-flow systems and water-supply facilities. Prerequisite: CE 325, ME 352.</td>
</tr>
<tr>
<td>473</td>
<td>Transportation Engineering and Design</td>
<td>3 hrs.</td>
<td>Theory, design, and operation of various modes of transportation. Prerequisites: CE 325, 372, 382.</td>
</tr>
<tr>
<td>475</td>
<td>Hydrology</td>
<td>2 hrs.</td>
<td>Hydrologic cycles, rainfall and runoff analysis, hydrograph analysis, water-shed studies, overland flow and flood routing, sediment transport, hydrologic forecast. Prerequisite: CE 325, ME 352.</td>
</tr>
<tr>
<td>478</td>
<td>Matrix Methods in Structural Mechanics</td>
<td>3 hrs.</td>
<td>Matrix application to formulation and solution of linear problems in structural mechanics. Stresses, vibrations, and stability of engineering structures. Prerequisite: CE 381. (Same as CE 578.)</td>
</tr>
<tr>
<td>480</td>
<td>Civil Engineering Design Project</td>
<td>3 hrs.</td>
<td>Analysis and design of complete civil engineering project including establishment of design criteria, cost estimates, specifications, and plans. Prerequisite: Senior Standing.</td>
</tr>
<tr>
<td>481</td>
<td>Advanced Soil Mechanics</td>
<td>3 hrs.</td>
<td>Continuum mechanics applied to soil behavior; cap model. Theoretical approaches to consolidation, shear strength, slope stability and soil stabilization. Prerequisite: CE 372. (Same as CE 581.)</td>
</tr>
<tr>
<td>482</td>
<td>Soil Dynamics</td>
<td>3 hrs.</td>
<td>Behavior of soils under dynamic, earthquake and blast loading. Analysis of foundation vibration and isolation. Lab fee: level 7. Prerequisite: CE 372. (Same as CE 582.)</td>
</tr>
</tbody>
</table>
485  Foundation Engineering 3 hrs.
Application of principles of soil mechanics to the determination of bearing capacity
of spread footings, mats, and pile foundations. Drilled piers and caissons. Methods
and techniques of site investigation. Lab fee: level 7. Prerequisite: CE 372. (Same
as CE 585.)

Graduate Civil Engineering Courses (CE)
549  Introduction to Environmental Engineering (Same as CE 449.)
550  Environmental Control (Same as CE 450.)
559  Selected Topics in Civil Engineering
577  Fundamentals of Experimental Mechanics (Same as ME 577.)
578  Matrix Methods in Structural Mechanics (Same as CE 478.)
581  Advanced Soil Mechanics (Same as CE 481.)
582  Soil Dynamics (Same as CE 482.)
585  Foundation Engineering (Same as CE 485.)
652  Introduction to Air Pollution
659  Selected Topics in Civil Engineering
670  Constitutional Laws of Engineering Media
673  Plasticity
675  Rock Mechanics
676  Viscoelasticity
678  Mechanics of Composite Materials
759  Selected Topics in Civil Engineering
765  Random Vibration of Elastic Systems
772  Theory of Structural Stability
773  Theory of Shells
778  Fracture Mechanics

Computer Engineering (CPE) Course Descriptions
201  Digital Logic Design Lab 1 hr.
Experiments on logic gates, combinational logic circuit design, flipflops, sequential
circuit design, counter registers, and shift registers. Lab fee: Level 5. In parallel
with EE 202.

203  Fundamentals of Software Engineering 3 hrs.
Introduction to structured programming - using Pascal. Search and sort algorithm.
Introduction to data structures. Applications to engineering related problems.
Prerequisite: EE 197.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>325</td>
<td>Principles of Digital Computer Systems</td>
<td>3 hrs.</td>
<td>Introduction to minicomputers and microcomputers. Topics include: machine organization and operation; information control and transfer within a machine; date transfer and communication with external devices; computer response time; engineering applications of computers. Lab fee: Level 5. Prerequisite: EE 311.</td>
<td></td>
</tr>
<tr>
<td>335</td>
<td>High Level Languages and Computer Hardware</td>
<td>2 hrs.</td>
<td>Application of high level languages in interrupt processing, real time clock management, device independent high level input/output operations, device drivers, microprocessor networks. Lab fee: Level 5. Prerequisite: EE 202.</td>
<td></td>
</tr>
<tr>
<td>427</td>
<td>Computer Engineering Design I</td>
<td>1 hr.</td>
<td>Senior design project course involving microcomputer based systems. First design course on digital system design. Lab fee: Level 5. Prerequisite: CS 308. Can be taken parallel with EE 402, EE 429.</td>
<td></td>
</tr>
<tr>
<td>437</td>
<td>Computer Engineering Design II</td>
<td>1 hr.</td>
<td>Senior design project course involving microcomputer based systems. Second design course on digital system design. Lab fee: Level 5. Prerequisite: EE 427.</td>
<td></td>
</tr>
<tr>
<td>447</td>
<td>Computer Engineering Design III</td>
<td>1 hr.</td>
<td>Senior design project course involving microcomputer based systems. Third design course on digital system design. Lab fee: Level 5. Prerequisite: EE 437.</td>
<td></td>
</tr>
</tbody>
</table>

**Electrical Engineering (EE) Course Descriptions**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>199</td>
<td>Computer Graphics</td>
<td>1 hr.</td>
<td>Principles of Computer Graphics; basic techniques, transforms in two and three dimensional space, perspective, hidden line removal. Includes hands-on experience with a color graphics system. Lab fee: Level 5. Prerequisites: a course in FORTRAN or BASIC and MA 153.</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>Introduction to Digital Logic Design</td>
<td>3 hrs.</td>
<td>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 197.</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>Electrical Circuits I</td>
<td>3 hrs.</td>
<td>Electric circuit concepts; transient and steady-state solution of simple circuits. Phasor analysis of ac circuits and network theorems. Prerequisite: PH 112. Prerequisite or parallel: MA 352.</td>
<td></td>
</tr>
</tbody>
</table>
301 Electronic Instrumentation Laboratory 1 hr.
Experiments related to elementary electronic instrumentation, solid state semiconductor devices, amplifying circuits, and experiments using analog computer. Must parallel EE 311. Lab fee: Level 5.

303 Electrical Engineering Laboratory 1 hr.
Experiments related to electrical circuits and to apply and verify principles presented in EE 313. Lab fee: Level 5. Prerequisite or parallel: EE 313 and EE 301.

305 Electronics Laboratory I 1 hr.
Experiments and reports related to amplifiers using bipolar JFET, MOSFET devices. Original design of individual circuits. Lab fee: Level 5. Prerequisite: EE 301 and must parallel EE 315.

307 Electricity and Magnetism 3 hrs.
Basic concepts of electrostatics, electric potential theory, electric fields and currents, fields of moving charge including relativistic treatment, magnetic fields, Maxwell’s equations. Prerequisite: EE 300.

Basic physical processes occurring in solids. Crystal structure of solids, Schrodinger equation and its applications, free electron model of metals, band theory of solids, and physics of semiconductor devices. Prerequisite: PH 113, ME 294, and MA 352 or parallel.

311 Electronic Instrumentation 3 hrs.
Ammeters, voltmeters, and bridges. Transducers, diode and transistor models, operational amplifiers, simple digital and analog instrumentation, introduction to analog computers. Prerequisites: EE 300 and must parallel EE 301.

313 Electrical Circuits II 3 hrs.
Steady-state response to sinusoidal driving functions, polyphase circuits, transfer functions, resonance, magnetically coupled circuits; basic concepts of network topology and analysis, matrix formulation of network equations, algorithms. Prerequisite: EE 300.

315 Electronics I 3 hrs.
Analysis of large and small signal electronic devices; piece-wise linear models of bipolar and FET devices; amplifiers and their frequency response, power supplies, and special circuit applications, computer simulation. Prerequisites: EE 311, 313 prerequisite or parallel, and must parallel EE 305.

382 Analytical Methods for Continuous Time Systems 3 hrs.

383 Analytical Methods for Multivariable and Discrete Time Systems 3 hrs.
Discrete time signals and systems, sampling techniques, Z and discrete Fourier transforms, multivariable systems. Introduction to digital signal processing. Prerequisite: EE 382.
402 Design of Digital Computer 3 hrs.
Functional organization of stored-program digital computers including number representation, computer hardware, micro-operations, and control logic; microprocessor architecture. Prerequisites: EE 202, 315.

404 Electrical Networks Laboratory 1 hr.
Experiments that apply and verify principles presented in EE 382 and 414. Lab fee: Level 5. Prerequisite or parallel: EE 414.

406 Electronics Laboratory II 1 hr.
Experiments and reports related to electronic devices such as oscillators, multi-stage amplifiers, modulation and switching circuits. Integrated circuits and microelectronics methods. Lab fee: Level 5. Prerequisite: EE 305 and must parallel EE 416.

407 Electromagnetic Waves 3 hrs.
Transient waves, steady-state waves on transmission lines, Smith chart, line matching, plane waves, and waveguides. Laboratory experiments included. Lab fee: Level 4. Prerequisites: EE 307, 313.

410 Selected Topics in Electrical Engineering Credit to be arranged

411 Electric Power System 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 Credits to be arranged
Continuation of ME 493 leading to design of an engineering system. Lab fee: Level 4. Prerequisites: ME 493, senior standing, and permission of instructor.

414 Passive Electrical Networks 3 hrs.
Driving point and transfer functions, frequency response of network, filter theory, and approximation for idealized network characteristics. Prerequisite: EE 313.

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

420 Random Signals and Noise 3 hrs.
Random variables and probabilistic description of signals. Introduction to random processes: autocorrelations, crosscorrelations, power spectral density. Noise analysis: thermal, shot, white, colored. Response of electrical systems to random inputs. Prerequisites: EE 382 (Same as EE 500.)

421 Electric Machines 3 hrs.
Direct and alternating current machines equivalent circuits and models, efficiency, input requirements and output characteristics, applications; graphical and mathematical aspects of electrical machines. Prerequisite: EE 313. (Same as EE 501.)

422 Advanced Logic Circuits 3 hrs.
Boolean algebra; the n-cube, star array, Karnaugh arrays; one-to-one transformations, partial transformations, DON'T CARES; symmetric switching
function synthesis and reduction with applications to multiple input adders; generator theory of flip-flops and stability condition; serial arithmetic and the binary comparator. Prerequisite EE 202. (Same as EE 502.)

424 **Instrumentation** 3 hrs.
Measurement techniques and conventional and electronic instruments. Construction, theory of operation, and proper use of bridge circuits, oscilloscope transducers, and digital instruments. Prerequisite: EE 315. (Same as EE 504.)

425 **Introduction to Control and Robotic Systems** 3 hrs.
The basic theories and analytical techniques for modeling, analysis and control of dynamical systems. Transfer functions, block-diagrams, frequency response, stability criteria, series and feedback controller design, digital control. Introduction to the dynamic analysis and control of robotic systems. Prerequisite: EE 382 or permission of Instructor. (Same as EE 505.)

426 **Communication Theory** 3 hrs.
Transmission of information including effects of networks, modulation systems, noise, and use of statistics in analysis of information transmission. Prerequisite: EE 420. ISE 390. (Same as EE 506.)

429 **Microcomputers** 3 hrs.
The microcomputer as a component in digital design. Laboratory experience in interfacing and design projects. Lab fee: Level 5. Prerequisites; EE 202 and 315; EE 436 recommended. (Same as EE 509.)

433 **Computer Simulation of Dynamic Systems** 3 hrs.
Techniques for analyzing the behavior of dynamic systems and processes using analog and digital computer simulation procedures. Emphasis on modern digital simulation techniques, including digital simulation languages. Review of modeling and model simplification techniques for lumped-parameter and continuum dynamic systems. Laboratory demonstrations and exercises. Prerequisite: EE 383 Lab Fee: Level 5. (Same as EE 513.)

436 **Digital Electronics** 3 hrs.
Electronic devices. Integrated-circuit logic families (DTL, TTL, etc.) and their design theory. MOSFET circuits and their design theory. Flip-flop, registers and counters. Arithmetic operations. Semi-conductor memories. Analog switches. Analog-to-digital conversion. Prerequisites: EE 202 and 315. (Same as EE 516.)

439 **Digital Electronics Laboratory** 1 hr.
Experiments and reports related to logic circuit realization of digital hardware. RTL, DI, TT, ECI families for combinational and sequential switching circuits. Lab fee: Level 6. Must parallel EE 436. (Same as EE 519.)

452 **Optical Systems Design** 3 hrs.
Introduction to the geometrical design and analysis of optical systems, and to the design principles of lens systems. Prerequisite: EE 461 or equivalent. Lab fee: Level 7. (Same as EE 532.)

461 **Optics I** 3 hrs.
Review of basic optics; Electromagnetic waves; Huygen's principle; Fresnel's laws, geometrical optics, optical systems; polarization and optical fibers. Prerequisite: EE 307. (Same as EE 541.)
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
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<tr>
<td>500</td>
<td>Random Signals and Noise</td>
<td>3 hrs.</td>
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<td></td>
<td>(Same as EE 420.)</td>
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<tr>
<td>501</td>
<td>Electric Machines</td>
<td>3 hrs.</td>
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<td></td>
<td>(Same as EE 421)</td>
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<tr>
<td>502</td>
<td>Advanced Logic Circuits</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>(Same as EE 422)</td>
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</tr>
<tr>
<td>504</td>
<td>Instrumentation</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>(Same as EE 424)</td>
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<tr>
<td>505</td>
<td>Introduction to Control and Robotic Systems</td>
<td>3 hrs.</td>
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<td>(Same as EE 425)</td>
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<tr>
<td>506</td>
<td>Communication Theory</td>
<td>3 hrs.</td>
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<td></td>
<td>(Same as EE 426)</td>
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<tr>
<td>509</td>
<td>Microcomputers</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>(Same as EE 429)</td>
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<tr>
<td>510</td>
<td>Selected Topics in Electrical Engineering</td>
<td>Credit to be arranged</td>
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<tr>
<td>513</td>
<td>Computer Simulation of Dynamic Systems</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>(Same as EE 433)</td>
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<tr>
<td>516</td>
<td>Digital Electronics</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>(Same as EE 436)</td>
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<tr>
<td>519</td>
<td>Digital Electronics Laboratory</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>(Same as EE 439)</td>
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<tr>
<td>532</td>
<td>Optical Systems Design</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>(Same as EE 452)</td>
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<tr>
<td>541</td>
<td>Optics I</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>(Same as EE 461)</td>
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</tr>
<tr>
<td>542</td>
<td>Optics II</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>(Same as EE 462)</td>
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</tr>
<tr>
<td>543</td>
<td>Electro-Optical Engineering</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>595</td>
<td>Microprocessor Development Systems</td>
<td>3 hrs.</td>
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<tr>
<td>600</td>
<td>Bit-Slice Design</td>
<td>3 hrs.</td>
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<tr>
<td>601</td>
<td>Linear Systems</td>
<td>3 hrs.</td>
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<tr>
<td>602</td>
<td>Digital Computer Design</td>
<td>3 hrs.</td>
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<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
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<tr>
<td>603</td>
<td>Computer Methods in Power Systems</td>
<td>3 hrs.</td>
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<tr>
<td>604</td>
<td>Digital Image Processing</td>
<td>3 hrs.</td>
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<tr>
<td>605</td>
<td>Control System Design</td>
<td>3 hrs.</td>
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<tr>
<td>606</td>
<td>Statistical Communications Theory</td>
<td>3 hrs.</td>
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<tr>
<td>607</td>
<td>Robotic Systems Control</td>
<td>3 hrs.</td>
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<tr>
<td>608</td>
<td>Electromagnetic Field Theory I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>609</td>
<td>Electromagnetic Field Theory II</td>
<td>3 hrs.</td>
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<tr>
<td>610</td>
<td>Selected Topics in Electrical Engineering</td>
<td>Credit to be arranged</td>
</tr>
<tr>
<td>611</td>
<td>Signal Analysis</td>
<td>3 hrs.</td>
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<tr>
<td>612</td>
<td>Graduate Design Project</td>
<td>3 hrs.</td>
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<tr>
<td>613</td>
<td>Laser Electronics</td>
<td>3 hrs.</td>
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<tr>
<td>614</td>
<td>Linear Graphs and Electrical Networks</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>615</td>
<td>Active Networks Synthesis</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>616</td>
<td>Microelectronic Devices and Integrated Circuits</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>617</td>
<td>Very Large Scale Integration Devices</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>618</td>
<td>Very Large Scale Integrated (VLSI) Circuits</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>619</td>
<td>Introduction to Radar Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>623</td>
<td>Design of Knowledge Based Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>631</td>
<td>Detection of Optical and Infrared Radiation</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>632</td>
<td>Coherent Optical Systems &amp; Holography</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>633</td>
<td>Electro-Optical Engineering</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>634</td>
<td>Optical Communications</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>635</td>
<td>Fiber Optics</td>
<td>3 hrs.</td>
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<tr>
<td>642</td>
<td>Data and Digital Communications</td>
<td>3 hrs.</td>
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<tr>
<td>645</td>
<td>Modulation and Phase Locked Techniques</td>
<td>3 hrs.</td>
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<tr>
<td>699</td>
<td>Master's Thesis</td>
<td>3 or 6 hrs.</td>
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<tr>
<td>700</td>
<td>Sampled Data Control Systems</td>
<td>3 hrs.</td>
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<tr>
<td>701</td>
<td>Advanced Linear Control Theory</td>
<td>3 hrs.</td>
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<tr>
<td>702</td>
<td>Theory of Automata</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>703</td>
<td>Disturbance Accomodating Control</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>704</td>
<td>Nonlinear Control Systems</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>
705 Theory of Optimal Control 3 hrs.
706 Stochastic Control Theory 3 hrs.
707 Information Theory 3 hrs.
708 Digital Signal Processing 3 hrs.
710 Selected Topics in Electrical Engineering Credit to be arranged
711 Antenna Theory 3 hrs.
715 Digital Filters with Switched Capacitors 3 hrs.
716 Device Modeling for Integrated Circuit Design 3 hrs.
717 Space Applications of Electromagnetics 3 hrs.
718 Microwave Techniques 3 hrs.
719 Advanced Electromagnetic Field Theory 3 hrs.
720 Computer-Aided Design of Multivariable Systems 3 hrs.
721 Control Engineering for Large-Scale Systems 3 hrs.
722 Adaptive and Self-Organizing Control 3 hrs.
725 Advanced Radar Techniques 3 hrs.
726 Decision and Estimation Theory 3 hrs.
727 Numerical Methods in Electromagnetics 3 hrs.
735 Statistical Optics 3 hrs.
737 Channel Characterization and Communication in Random Media 3 hrs.
738 Optical Transforms and Pattern Recognition 3 hrs.
744 Digital Communication & Spread Spectrum 3 hrs.
747 Random Fields, Image Processing and Pattern Recognition 3 hrs.
799 Doctoral Dissertation 3-6 hrs.

Industrial and Systems Engineering (ISE) Courses

321 Engineering Economy 3 hrs.
Economic evaluation of engineering alternatives. Interest, depreciation, time-value of investments, learning curves, income tax break-even and minimum-cost analysis, and replacement analysis. Prerequisite: EC 239, MA 154. Not open to Freshmen.

326 Production and Operation Systems I 3 hrs.
Quantitative methods used in planning, analysis, design, and control of production systems. Lab fee: Level 4. Prerequisites: MA 154, EE 197.

327 Production and Operation Systems II 3 hrs.
Continuation of ISE 326 with additional quantitative methods for analysis,
designing, and control of productive systems. Lab fee: Level 4. Prerequisites: ISE 326, ISE 390.

378 Materials and Manufacturing Processes 3 hrs.
Manufacturing processes. Technical and economic feasibility of different processes. Control by mechanical and metallurgical means of properties of both ferrous and nonferrous materials. Manufacturing equipment, tooling, and process design. Field trip included. Prerequisites: ME 362, 370. (Same as ME 378.)

390 Probability and Engineering Statistics I 3 hrs.
Engineering uses of probability theory, discrete and continuous probability distributions including the binomial, Poisson, hypergeometric, Gaussian, uniform, gamma, beta, lognormal, exponential, and extreme value distributions. Applications of statistical sampling, estimation, and hypothesis testing of means, variances, and proportions. Prerequisite or parallel: MA 251.

421 Measurement and Instrumentation in Industrial Processes 3 hrs.
Principles and methods of measurement used in the collection of operating information from industrial processes. Laboratory work includes the use of currently available transducers. Prerequisites: EE 301, 311. (Same as ISE 521.) Lab fee: Level 9.

422 Logistics Planning and Control 3 hrs.
Basic nature of logistics systems. Quantitative analysis of two networks and their interaction, the logical network for project-planning and control, and the physical distribution network, charting, milestone method, lines of balance, PERT-CPM, resource allocation and leveling, and maximum flow and minimum cost algorithms. Prerequisite: ISE 390. (Same as ISE 522.) Lab fee: Level 4.

423 Statistical Quality Control 3 hrs.
Statistical theory and techniques to control quality of manufactured products. Prerequisite: ISE 390. (Same as ISE 523.)

424 Introduction to Ergonomics: Work Development 3 hrs.
Philosophy, methodology, and techniques related to providing optimal match between job requirements and worker skills. Intensive use of actual industrial requirements and experience in practical applications. Prerequisites: ISE 390; ISE 327 or graduate standing. (Same as ISE 524.) Lab fee: Level 5.

425 Metal Processing and Metrology 3 hrs.
Theory and practice of metal removal, including cutting mechanics, interactions of cutting tools and materials; thermal considerations and probabilistic nature of tool life; effect of tool design on process behavior and optimization. Includes laboratory. Prerequisite: ME 370 and senior standing. Lab fee: Level 5.

426 Design and Analysis of Experiments 3 hrs.
Advanced topics in statistical experiments with emphasis on the design aspect. Confounding, fractional replication, factorial and nested design. Prerequisite: ISE 490. (Same as ISE 526.)

427 Management Systems Analysis 3 hrs.
Formal organization structures and functions. Analysis of informal organization function within formal organizations. Techniques for making decisions within formal organizations, together with ethical constraints. Prerequisites: ISE 327, 390.
428 Systems Analysis and Design I 3 hrs.
Philosophy and methods of industrial and nonindustrial systems analysis and design. Methods of systems definition, analysis, simplification, evaluation, and optimization. Design project required. Prerequisite: ISE 327, 490; ME 493 and senior standing.

429 Systems Analysis and Design II 3 hrs.
Continuation of design project begun in ISE 428. Prerequisite: ISE 428.

430 Modern Manufacturing/Production Systems 3 hrs.
Overview of modern manufacturing and production systems, including principles, theory and practical applications of integrated manufacturing systems with and without robotics and automated materials handling. Includes review of classical systems, Japanese production systems, and group technology. Prerequisite: Senior Standing. (Same as ISE 530.) Lab fee: Level 4.

431 Microprocessor Applications in Manufacturing 3 hrs.
The use of minicomputers, microprocessors, and programmable controllers to control manufacturing processes with extensions into adaptive control. Real systems will be modeled in the laboratory using concepts of physical systems simulation. Prerequisite: 421 (Same as ISE 531.) Lab fee: Level 9.

439 Selected Topics in Industrial and Systems Engineering Credit to be arranged

447 Introduction to Digital Simulation 3 hrs.
Philosophy and elements of digital simulation. Review of queueing models and stochastic process models; discrete-event simulation with emphasis on analysis of systems and models. Prerequisite: EE 197, ISE 390 or equivalent. (Same as ISE 547.) Lab fee: Level 7.

471 Systems Simulation Laboratory I - GPSS 2 hrs.
Modeling and digital simulation of systems using GPSS. Prerequisite: EE 197. (Same as ISE 571.)

472 Systems Simulation Laboratory II - SIMAN 2 hrs.
Modeling and digital simulation of systems using SIMAN. Prerequisite: EE 197. (Same as ISE 571.)

473 Systems Simulation Laboratory III - DYNAMO 2 hrs.
Modeling and simulation of dynamic feedback systems. Prerequisite: EE 197. (Same as ISE 573.)

490 Probability and Engineering Statistics II 3 hrs.
Continuation of ISE 390 with regression analysis, analysis of variance, and nonparametric statistics. Design of engineering experiments, quality control, and computer solution of large-scale problems. Prerequisite: ISE 390.

Graduate Industrial and Systems Engineering Courses (ISE)

521 Measurement and Instrumentation in Industrial Processes 3 hrs.
(Same as ISE 421)

522 Logistics Planning and Control 3 hrs.
(Same as ISE 422)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>523</td>
<td>Statistical Quality Control</td>
<td>3 hrs.</td>
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<td>(Same as ISE 423)</td>
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<tr>
<td>524</td>
<td>Introduction to Ergonomics: Work Development</td>
<td>3 hrs.</td>
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<td>(Same as ISE 424)</td>
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<tr>
<td>526</td>
<td>Design and Analysis of Experiments</td>
<td>3 hrs.</td>
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<tr>
<td>(Same as ISE 426)</td>
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<tr>
<td>530</td>
<td>Modern Manufacturing/Production Systems</td>
<td>3 hrs.</td>
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<tr>
<td>(Same as ISE 430)</td>
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<tr>
<td>531</td>
<td>Microprocessor Applications in Manufacturing</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>(Same as ISE 431)</td>
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<td></td>
</tr>
<tr>
<td>539</td>
<td>Selected Topics in Industrial Engineering</td>
<td>Credit to be arranged</td>
</tr>
<tr>
<td>541</td>
<td>Quality Assurance</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>547</td>
<td>Introduction to Digital Simulation</td>
<td>3 hrs.</td>
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<tr>
<td>(Same as ISE 447)</td>
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<tr>
<td>571</td>
<td>System Simulation Laboratory I-GPSS</td>
<td>2 hrs.</td>
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<tr>
<td>(Same as ISE 471)</td>
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<tr>
<td>572</td>
<td>System Simulation Laboratory II - SIMAN</td>
<td>2 hrs.</td>
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<tr>
<td>(Same as ISE 472)</td>
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<tr>
<td>573</td>
<td>Systems Simulation Laboratory III - DYNAMO</td>
<td>2 hrs.</td>
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<td>(Same as ISE 473)</td>
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<tr>
<td>620</td>
<td>Engineering Management I</td>
<td>3 hrs.</td>
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<tr>
<td>622</td>
<td>Research and Development Management</td>
<td>3 hrs.</td>
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<tr>
<td>623</td>
<td>Engineering Economic Analysis</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>624</td>
<td>Advanced Ergonomics: Man-Machine Interfaces</td>
<td>3 hrs.</td>
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<tr>
<td>626</td>
<td>Introduction to Operations Research</td>
<td>3 hrs.</td>
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<tr>
<td>627</td>
<td>Introduction to Systems Engineering</td>
<td>3 hrs.</td>
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<tr>
<td>628</td>
<td>Engineering Management II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>630</td>
<td>Automation: Numeric Control to Computer-Aided Manufacturing</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>631</td>
<td>Management Information Systems</td>
<td>3 hrs.</td>
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<tr>
<td>632</td>
<td>Stochastic Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>633</td>
<td>Industrial Forecasting and Analysis I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>634</td>
<td>Value and Decision Theory</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>635</td>
<td>Linear Programming</td>
<td>3 hrs.</td>
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</tbody>
</table>
636 Systems Modeling 3 hrs.
638 Engineering Reliability 3 hrs.
639 Selected Topics in Industrial and Systems Engineering Credit to be arranged
641 Product Assurance 3 hrs.
647 Systems Simulation 3 hrs.
648 Reliability, Availability, and Maintainability 3 hrs.
671 Acquisition Management I (Same as PRM 671) 3 hrs.
672 Acquisition Management II (Same as PRM 672) 3 hrs.
690 Statistical Methods for Engineers 3 hrs.
699 Master's Thesis 3 or 6 hrs.
729 Advanced Nonlinear Programming 3 hrs.
730 Multi-criteria Decision Analysis 3 hrs.
733 Industrial Forecasting and Analysis II 3 hrs.
735 Discrete Optimization 3 hrs.
739 Selected Topics in Industrial and Systems Engineering Credit to be arranged
747 Advanced Simulation Design and Analysis 3 hrs.
790 Advanced Statistical Applications 3 hrs.
799 Doctoral Dissertation 3-6 hrs.

Mechanical Engineering (ME) Courses
198 Engineering Graphics 2 hrs.
Principles of engineering graphical expression: sketching, instrument drawing, orthographic projections. Descriptive geometry problems involving locations, relationships of points, lines, areas, and bodies, and intersection of surfaces. Dimensioning for production, pictorial design, vector geometry, and monographs. Prerequisite: MA 119. Lab fee: Level 5.
271 Statics 3 hrs.
Topics include: forces, resultant forces, moments, couples equivalent force systems, equilibrium, distributed loads, two force members, trusses, centroids, moments of inertia, shear and bending moment diagrams, static and kinematic friction. Prerequisites or parallel MA 251, PH 112.
Structure of matter, basic concepts of phase transformation, mechanical, electrical, magnetic, and thermal properties, and corrosion. Basic properties of metals,
plastics, elastomers, and ceramics with emphasis on methods of changing properties. Laboratory included. Typical experiments include microstructure analysis, hardness testing, mechanical-properties testing, equilibrium-phase diagrams, corrosion, creep behavior, and semiconductor analysis. Prerequisite: CH 121, PH 112. Lab fee: Level 7.

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. Prerequisites: CH 121, PH 112. Lab fee: Level 7.

342 Thermodynamics II 3 hrs.
Continuation of ME 341. Thermodynamic cycles, thermodynamic relations among properties, chemical reactions, and phase and chemical equilibrium. Prerequisite: ME 341.

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 compressible fluids. Laboratory included. Prerequisites: ME 341, 362, MA 352. Lab fee: Level 7.

362 Dynamics 3 hrs.
Kinematics and kinetics of particle and systems of particles with applications to central force motion, impact, relative motion, vibrations, and variable mass systems. Dynamics of rigid body in plane motion, relative motion in rotating coordinates, and gyroscopic motion. Prerequisite: ME 271.

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: ME 362. Lab fee: Level 5.

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 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. Prerequisites: ME 271, 294.

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: ME 370. (Same as ISE 378.)

394 Introduction to CAD/CAM 3 hrs.
Introduction to computer aided graphics. Representation of systems and bodies using computers, graphic file organization. Elements of computer graphics.
manipulation of elements, rotation of views, and use of intergraph CAD systems. Laboratory projects. Prerequisite: ME, 198, 271. Lab fee: Level 5.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>398</td>
<td>Selected Topics in Mechanical Engineering</td>
<td>Credit to be arranged</td>
<td>Prerequisite: permission of instructor.</td>
</tr>
<tr>
<td>442</td>
<td>Introduction to Heat and Mass Transfer</td>
<td>4 hrs.</td>
<td>Principles of heat and mass transfer; application of principles to problems in conductive, convective, and radiative-heat transfer and mass transfer; laminar and turbulent flow processes; boiling and condensation; heat exchangers. One credit hour laboratory included. Prerequisites: ME 341, 352, 396, MA 352. Lab fee: Level 6.</td>
</tr>
<tr>
<td>444</td>
<td>Analysis and Design of HVAC Systems</td>
<td>3 hrs.</td>
<td>Analysis and design of heating, ventilation, and air-conditioning (HVAC) systems. Design requirements for human comfort, exterior weather conditions, and energy conservation. Calculation of heating and cooling loads for residential and commercial buildings, air and liquid distribution systems, selection and specification of system components, energy recovery and system efficiency, and commercially available systems. Prerequisites: ME 341, 352, 396, MA 352. Lab fee: Level 6.</td>
</tr>
<tr>
<td>446</td>
<td>Design of Thermal Systems</td>
<td>3 hrs.</td>
<td>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: ME 342, 442. (Same as ME 544.)</td>
</tr>
<tr>
<td>447</td>
<td>Energy Conversion and Power Generation I</td>
<td>3 hrs.</td>
<td>Application of principles of thermodynamics and fluid mechanics and economics to analysis and design of conventional hydro and steam power plants. Energy sources and end uses, fossil fuels, combustion equipment, steam generators, and pollution control devices. Hydro, steam, and wind turbines. Prerequisites: ME 352, 442, 454, ME 446 recommended. (Same as ME 547.)</td>
</tr>
<tr>
<td>449</td>
<td>Introduction to Environmental Engineering</td>
<td>3 hrs.</td>
<td>Engineering aspects of air, water, and thermal pollution. Hydrologic cycle, water sources and uses; industrial and other sources of primary and secondary pollutants. Transport processes in environmental problems and in their control. Prerequisite: ME 442.</td>
</tr>
<tr>
<td>451</td>
<td>Atmospheric Fluid Dynamics</td>
<td>3 hrs.</td>
<td>A study of fluid dynamics in the atmosphere. Coriolis acceleration, scale analysis, and appropriate approximations of the complete governing equations. Numerical analysis and interpretation of weather phenomena. Prerequisites: MA 352, ME 341, ME 352 or equivalent. (Same as ME 551, ES 551.)</td>
</tr>
</tbody>
</table>
454 Fluid Mechanics II 3 hrs.
Continuation of ME 352 - differential form of basic equations, dimensional analysis, boundary layers, one-dimensional compressible flow, potential flow, turbomachinery. Prerequisites: ME 352.

459 Selected Topics in Engineering Credit to be arranged

461 Vibrations of Elastic Systems 3 hrs.
Formulation of the equations of motion of discrete and continuous systems, analytical and numerical methods of solution, eigenvalue problems and dynamic response. Prerequisite: ME 488. (Same as ME 561.)

465 Mechanical Engineering Design 3 hrs.
Senior design project. Prerequisites: ME 493, senior standing, and permission of instructor. Lab fee: Level 4.

466 Mechanics and Design of Machine Elements 3 hrs.
Detailed design and selection of machine elements such as gears, shafts, and bearings. Analysis of stresses and deformations under combined static and dynamic loads, stress concentrations, and fatigue. Prerequisites: ME 198, 364, 370.

470 Mechanics of Materials II 3 hrs.

474 Applied Mechanics of Solids 3 hrs.
Stresses and strains at a point, theories of failures, stress concentration factors, thick-walled cylinders, torsion of noncircular members, curved beams, unsymmetrical bending, and shear center. Prerequisite: ME 370. (Same as ME 574.)

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: ME 370 and Junior Standing. Lab fee: Level 7. (Same as ME 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 471. (Same as ME 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: ME 454, 488. (Same as ME 580.) Lab fee: Level 7.

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: ME 396. (Same as ME 585.) Lab fee: Level 7.

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<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>486</td>
<td><strong>Numerical Engineering Analysis</strong></td>
<td>4 hrs.</td>
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<tr>
<td></td>
<td>Finite elements and finite differences in solving various engineering problems. Numerical applications to fluid mechanics, heat transfer, structural mechanics, and machine design. Prerequisite: ME 396. (Same as ME 586.)</td>
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<tr>
<td>488</td>
<td><strong>Analysis of Engineering Systems</strong></td>
<td>3 hrs.</td>
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<td></td>
<td>Mathematical modeling of physical systems and determining their dynamic response. Mechanical, electrical, electromechanical, heat transfer, fluid-mechanical, and other engineering problems. Prerequisite: senior engineering standing.</td>
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<tr>
<td>489</td>
<td><strong>Computer-Aided Engineering</strong></td>
<td>4 hrs.</td>
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<tr>
<td></td>
<td>Application of computer methods in the analysis and design of structural, thermal, and dynamical systems. Uses of state-of-the-art finite element and finite difference computer programs. Practical guidelines for discrete modeling; analysis of modeling errors. Comparison of exact and approximate solutions to boundary value problems. Use of microcomputers in engineering design and analysis. Prerequisite: ME 396.</td>
<td></td>
</tr>
<tr>
<td>493</td>
<td><strong>Introduction to Engineering Design</strong></td>
<td>2 hrs.</td>
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<tr>
<td></td>
<td>Application of basic design principles and concepts. Design methodology, decision making, creativity, product liability, human factors, patents, and others. Team design projects. Prerequisite: ISE 321, ME 362, ECE 300.</td>
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</tr>
<tr>
<td>496</td>
<td><strong>Selected Topics in Mechanical Engineering</strong></td>
<td>Credit to be arranged</td>
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</table>

**Graduate Mechanical Engineering courses (ME)**

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<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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<tbody>
<tr>
<td>540</td>
<td><strong>Physical Properties of Fluids</strong></td>
<td>3 hrs.</td>
</tr>
<tr>
<td>542</td>
<td><strong>Internal Combustion Engines</strong></td>
<td>3 hrs.</td>
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<tr>
<td>545</td>
<td><strong>Heat Distribution System Design</strong></td>
<td>3 hrs.</td>
</tr>
<tr>
<td>546</td>
<td><strong>Solar Energy Systems</strong></td>
<td>3 hrs.</td>
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<tr>
<td>547</td>
<td><strong>Energy Conversion and Power Generation I</strong></td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>(Same as ME 447)</td>
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</tr>
<tr>
<td>548</td>
<td><strong>Energy Conversion and Power Generation II</strong></td>
<td>3 hrs.</td>
</tr>
<tr>
<td>551</td>
<td><strong>Atmospheric Fluid Dynamics</strong></td>
<td>3 hrs.</td>
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<tr>
<td>553</td>
<td><strong>Atmospheric Radiation</strong></td>
<td>3 hrs.</td>
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<tr>
<td>556</td>
<td><strong>Turbomachinery</strong></td>
<td>3 hrs.</td>
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<tr>
<td>557</td>
<td><strong>Fundamentals of Aerodynamics</strong></td>
<td>3 hrs.</td>
</tr>
<tr>
<td>558</td>
<td><strong>Dimensional Analysis and Similitude</strong></td>
<td>3 hrs.</td>
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<tr>
<td>559</td>
<td><strong>Selected Topics in Mechanical Engineering</strong></td>
<td>Credit to be arranged</td>
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<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
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<tr>
<td>561</td>
<td>Vibrations of Elastic Systems (Same as ME 461)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>563</td>
<td>Intermediate Dynamics</td>
<td>3 hrs.</td>
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<tr>
<td>570</td>
<td>Mechanical Behavior of Engineering Materials</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>574</td>
<td>Applied Mechanics of Solids (Same as ME 474)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>577</td>
<td>Fundamentals of Experimental Mechanics (Same as ME 477)</td>
<td>3 hrs.</td>
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<tr>
<td>578</td>
<td>Matrix Methods in Structural Mechanics (Same as ME 478)</td>
<td>3 hrs.</td>
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<tr>
<td>580</td>
<td>Aircraft Stability and Control (Same as ME 480)</td>
<td>3 hrs.</td>
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<tr>
<td>581</td>
<td>Atmospheric Thermodynamics</td>
<td>3 hrs.</td>
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<tr>
<td>585</td>
<td>Numerical Methods and Computation II (Same as ME 485)</td>
<td>3 hrs.</td>
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<tr>
<td>586</td>
<td>Numerical Engineering Analysis (Same as ME 486)</td>
<td>3 hrs.</td>
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<tr>
<td>589</td>
<td>Computer-Aided Engineering</td>
<td>3 hrs.</td>
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<tr>
<td>601</td>
<td>Physical Metallurgy</td>
<td>3 hrs.</td>
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<tr>
<td>641</td>
<td>Advanced Thermodynamics</td>
<td>3 hrs.</td>
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<tr>
<td>642</td>
<td>Radiative Sources and Detectors</td>
<td>3 hrs.</td>
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<tr>
<td>643</td>
<td>Intermediate Heat Transfer</td>
<td>3 hrs.</td>
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<td>644</td>
<td>Information Retrieval in Remote Sensing</td>
<td>3 hrs.</td>
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<td>645</td>
<td>Propulsion</td>
<td>3 hrs.</td>
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<td>649</td>
<td>Transport Phenomena</td>
<td>3 hrs.</td>
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<tr>
<td>651</td>
<td>Viscous Fluid Mechanics</td>
<td>3 hrs.</td>
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<td>652</td>
<td>Compressible Fluid Mechanics</td>
<td>3 hrs.</td>
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<tr>
<td>653</td>
<td>Computational Fluid Dynamics I</td>
<td>3 hrs.</td>
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<tr>
<td>654</td>
<td>Computational Fluid Dynamics II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>655</td>
<td>Computational Fluid Dynamics III</td>
<td>3 hrs.</td>
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<tr>
<td>657</td>
<td>Potential Flow</td>
<td>3 hrs.</td>
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<td>659</td>
<td>Selected Topics in Mechanical Engineering</td>
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<tr>
<td>660</td>
<td>Structural Dynamics</td>
<td>3 hrs.</td>
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<td>661</td>
<td>Advanced Dynamics</td>
<td>3 hrs.</td>
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<td>Course Code</td>
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<td>Credits</td>
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<tr>
<td>663</td>
<td>Astrodynamics</td>
<td>3 hrs.</td>
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<tr>
<td>671</td>
<td>Continuum Mechanics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>672</td>
<td>Theory of Elasticity</td>
<td>3 hrs.</td>
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<tr>
<td>673</td>
<td>Plasticity</td>
<td>3 hrs.</td>
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<tr>
<td>674</td>
<td>Finite Element Analysis I</td>
<td>3 hrs.</td>
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<tr>
<td>676</td>
<td>Viscoelasticity</td>
<td>3 hrs.</td>
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<tr>
<td>677</td>
<td>Experimental Stress Analysis</td>
<td>3 hrs.</td>
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<tr>
<td>678</td>
<td>Mechanics of Composite Materials</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>683</td>
<td>Graduate Seminar in Mechanical Engineering</td>
<td>No Credit</td>
</tr>
<tr>
<td>692</td>
<td>Graduate Engineering Analysis I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>693</td>
<td>Graduate Engineering Analysis II</td>
<td>3 hrs.</td>
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<tr>
<td>699</td>
<td>Master’s Thesis</td>
<td>3-6 hrs.</td>
</tr>
<tr>
<td>741</td>
<td>Statistical Thermodynamics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>742</td>
<td>Hypersonic Flow</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>743</td>
<td>Direct Conversion of Energy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>745</td>
<td>Combustion Theory</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>746</td>
<td>Convective Heat Transfer</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>748</td>
<td>Radiative Transfer</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>749</td>
<td>Mass Transport</td>
<td>3 hrs.</td>
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<tr>
<td>750</td>
<td>Computational Fluid Dynamics IV</td>
<td>3 hrs.</td>
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<tr>
<td>751</td>
<td>Boundary Layer Theory</td>
<td>3 hrs.</td>
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<td>752</td>
<td>Mechanics of Rarified Gases</td>
<td>3 hrs.</td>
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<tr>
<td>753</td>
<td>Magneto-Gas Dynamics</td>
<td>3 hrs.</td>
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<tr>
<td>754</td>
<td>Compressible Fluid Mechanics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>755</td>
<td>High Speed Flow Theory</td>
<td>3 hrs.</td>
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<tr>
<td>758</td>
<td>Turbulence</td>
<td>3 hrs.</td>
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<tr>
<td>759</td>
<td>Selected Topics in Mechanical Engineering</td>
<td>Credit to be arranged</td>
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<tr>
<td>760</td>
<td>Analytical Methods in Nonlinear Dynamics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>762</td>
<td>Wave Motion of Continuous Elastic Bodies</td>
<td>3 hrs.</td>
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<tr>
<td>765</td>
<td>Random Vibration of Elastic Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>768</td>
<td>Dynamics of Aerospace Vehicles</td>
<td>3 hrs.</td>
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<td>Course Code</td>
<td>Course Title</td>
<td>Hours</td>
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<tr>
<td>772</td>
<td>Theory of Structural Stability</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>773</td>
<td>Theory of Shells</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>774</td>
<td>Finite Element Analysis II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>778</td>
<td>Fracture Mechanics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>780</td>
<td>Theory of Acoustics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>781</td>
<td>Nonlinear Effects in Plasma</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>782</td>
<td>Plasma Turbulence</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>799</td>
<td>Doctoral Dissertation</td>
<td>3-6 hrs.</td>
</tr>
</tbody>
</table>

155
The College of Liberal Arts provides educational experiences and programs of study in the major fields of the arts, humanities, and social sciences. These programs are designed to contribute to the personal and intellectual development of our students and to assist them in preparing for successful careers. These programs emphasize the development of communication skills, patterns of critical thinking, and problem-solving capabilities. They contribute to the development of an understanding of the relationships within ourselves and others, and between ourselves and the elements of the physical and biological world in which we live.

The arts and the humanities, encompassing art, history, languages and literatures, music, and philosophy, lead to an understanding and appreciation of life as humankind had perceived it and as individuals have lived it. This study leads to a heightened critical faculty and a greater ability to use, evaluate and appreciate values and ideas, to be more effective in utilizing language and to the cultivation of taste. The study of the arts and the humanities is essential to a broad and sensitive awareness of humankind as it has been, is, and aspires to be.

The social sciences encompass the knowledge that deals with the behavior of humankind and the culture it has created, knowledge that becomes more necessary as the world grows more complex and interrelated. Social scientists perform a dual function, assembling and ordering complex systems of technical knowledge related to human relationships and providing a continual appraisal of the value systems in our society. The social science programs at UAH, history, 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 it 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, question of values.

The College of Liberal Arts offers courses of study that provide its students with an in-depth study of at least one field in the liberal arts and sciences and the intensive professional training in the field of education that are needed for the teacher to meet the challenges of teaching in the modern world.

Throughout its curriculum, the College of Liberal Arts attempts to utilize and build upon the richness and diversity of our tradition and diverse talents of our faculty in preparing persons to be secure, productive, and successful in a free and humane society in a high technology age. Its goals are to aid in the development of more sensitive and successful scientists, more creative and powerful artists, and more disciplined students of the humanities. In sum, it is our desire to contribute to the individual’s development as a well-rounded and capable person and professional who is prepared to undertake successfully, and to provide leadership in effectively confronting, the many challenges of life.
Undergraduate Degrees and Study

The College of Liberal Arts awards a Bachelor of Arts degree. Each student must file an official program of study no later than the close of the sophomore year. This program of study must include a major and a minor or supporting cognate studies. The major must be chosen from the following disciplines: Art, Communication Arts, Education, English, Foreign Languages and International Trade, French, German, History, Music, Political Science, Psychology, Russian Studies, or Sociology. Besides these majors, courses are offered in Linguistics, Philosophy, Physical Education, Russian, and Spanish. The major will consist of a minimum of 30 semester hours in a program of study in a single department with at least 21 of these hours at the 300 level or above.

The supporting studies must include one of the following variations:
1. A minor drawn from any discipline with a minimum of 12 hours at the 300 level or above.
2. An approved cognate area of closely related courses approved by the major department with 12 semester hours at the 300 level or above. (See individual department programs for specific requirements of each minor or consult with an advisor in the major department for the development of an approved cognate area.)

Any minor chosen by a student is subject to approval by the department offering the minor. Any area of cognate studies chosen by a student is subject to approval of the chairman of the student’s major department. All programs of study are subject to approval by the dean of the College.

Arts, Humanities, and Social Sciences (AHS)

300 Statistical Analysis 4 hrs.
Collection, classification, and presentation of social science data, measures of central tendency and dispersion, introduction to probability distribution and sampling theory, confidence limits and tests of significance, chi-square and ‘t’ distribution. Includes laboratory. Prerequisite: MA 105 or 119. Lab fee: Level 4.

392 Engineering Ethics and Professional Behavior 3 hrs.
Examination of ethical aspects of decisions made by engineers, including consideration both of the kinds of professional and organizational situations confronting the engineer and philosophic bases of choosing and evaluation. Examination of broader values and responsibilities of the engineer as a professional person. Prerequisite: junior standing.

Honors (H)

100 Honors Forum 1 hr.
Regularly scheduled enrichment experiences for Honors Program students. Using lectures, concerts, exhibits, and other events. The course provides exposure to a broad range of University disciplines. Prerequisite: admission to Honors Program.

105 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.

153 Honors Mathematics 153 3 hrs.
(See description of Mathematics 153 under offerings of the Department of Mathematics and Statistics.) Required for all students who enter the Honors Program before completing Mathematics 153 or before completing the mathematics element within the general education.
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.

Art and Art History Department

Associate Professors Crouse, Dempsey, Pope (Chair); Assistant Professors Dasher, Stew­art; Adjunct Assistant Professors Davis, Mikell, Milberger.

The Department of Art and Art History, an institutional member of the College Art Association and the Southeastern College Art Conference, offers a B.A. in art and art history. The UAH chapter of Kappa Pi, international art honorary fraternity, is Epsilon Tau. The student art club is FOCAL. The art program provides preparation not only for a life of cultural fulfillment, but for a professional career or graduate study in art.

Art and Art History Majors

The art curriculum is multifaceted, providing the possibility of teacher certification as well as a variety of programs leading to the baccalaureate degree. The department also offers courses intended either as introductory or skill-enhancing experiences in the art discipline. The Bachelor of Arts degree requires specialization in either art history or the studio arts. The art history curriculum, which prepares students for graduate work or museum-related careers, examines the various styles found in western art, emphasizing their relation to both personal experiences and cultural contexts. The studio curriculum includes a core program followed by two years of upper division work offering breadth and/or depth in the following concentrations: communication graphics, interior design, painting, photography/media, printmaking and sculpture.

The communication graphics concentration consists of courses in advertising layout, typographic and lettering design and commercial art processes. A free informative booklet, "Careers in Communication Graphics," is available on request from the Department of Art and Art History. The interior design concentration is intended for persons preparing for work in this profession. The curriculum includes basic design, design analysis, and residential and commercial space planning. Technical development includes the basic knowledge of architectural structural planning, building equipment and components, textiles, specifications, professional boards and ethics.

Previous art experience or aptitude is not a requirement for admission to the core program courses, and should not be considered a critical factor in those courses.

Studio courses require a laboratory fee and additional supplies to be secured by the student. Students who have financial aid or tuition assistance should include an amount for supplies and fees in their funding request. Most studio courses do not require textbooks; thus, the overall cost of course materials is not excessive.

Transfer Students

Art students transferring to UAH must submit information on previous training and representative samples of art work to the art faculty for evaluation before registration. Advanced placement in art courses will be determined by the art faculty. Transfer candidates for a degree with a specialty in art must take at least 12 semester hours of art courses at UAH numbered 300 or above. A student minoring in art must take 6 semester hours at the 300 level or above at UAH.

Selected examples of student art work may be retained in the permanent collection of the department.
Art for Non Majors

Students majoring in other departments are encouraged to consider various level art courses as electives. Development of one’s human faculties and understanding through art is universally recognized. All art courses are open to any UAH student.

Programs of Study for the Art Major

Three basic programs of study have been established for the degree candidates in art. They are Studio, Art History and the Studio Discipline with Teacher Certification.

I. The Studio Discipline

The program consists of a lower-division foundation core curriculum of nine courses which is designed to provide the basic vocabulary and syntax of the visual art language. The upper-division program is composed of eight courses offering the student the option of selecting broad studio experiences or specializing within a discipline. It is strongly advised that no more than two studio courses be taken in any one term.

A. Freshman—Sophomore Core Art Requirements

(27 semester hours or 21 semester hours when ARH 100 or ARH 101 are included in the cluster or minor)

1. Art Studio Requirements

ARS 120—Two-Dimensional Form in Design
ARS 121—Color in Design
ARS 140—Three-Dimensional Design
ARS 150—Photography for Drawing and Design
ARS 160—Introduction to Drawing

AND TWO OF THE FOLLOWING:

ARS 240—Introduction to Sculpture
ARS 250—Intermediate Photography
ARS 260—Intermediate Drawing
ARS 267—Drawing for Design and Illustration
ARS 270—Introduction to Painting
ARS 280—Introduction to Printmaking

2. Art History Requirements

ARH 100—Art History Survey: Ancient to Renaissance
ARH 101—Art History Survey: Renaissance to Modern

There are no prerequisites for ARH 100 and 101, ARS 120, 121, 140, 150 and 160 which introduce the student to the basic concepts and skills regarding the visual arts. Students planning to specialize in the Interior Design discipline must complete ARH 209.

B. Junior Level

(15 semester hours)

Five courses are required at the 300-level with no more than three courses to be taken in any one studio discipline. A student may elect to specialize in one discipline by taking three junior and three senior courses in that discipline.
Interior Design—ARS 310, ARS 311, ARS 312 and ARH 209
Communication Graphics—ARS 330, ARS 331 and ARS 332
Sculpture—ARS 340, ARS 341, ARS 342 and ARS 346
Photography/Media—ARS 350, ARS 351 and ARS 352
Painting—ARS 375, ARS 376 and ARS 377
Printmaking—ARS 380, ARS 381 and ARS 383
Other—ARS 360 and ARS 390

To fulfill Junior level 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; and ART 308, Advanced Jewelry.

C. Senior Level
(9 semester hours)

Senior level courses are to be taken only after the successful completion of a minimum of three 300-level studio courses or proper prerequisites. No other studio courses should be taken while completing senior requirements except in the areas of communication graphics and interior design.

Students electing to specialize in communication graphics must complete ARS 430, 431 and 432 which may be taken in any sequence, provided proper prerequisites are satisfied.

Interior design specialists must complete ARS 410, 411 and 412 in numerical sequence.

All other studio students must complete ARS 400, 401, and 402 which may be taken in any sequence. (See details in course listings.)

D. Total Number of Hours

Students enrolled in the art studio program of study are required to complete 51 semester hours or 45 semester hours when ARH 100 and 101 are included in the minor or cognate studies.

Art History would be an appropriate minor for studio specialists.

II. Art History Discipline

Lower Division Program (27 semester hours)—During the first year ARH 100 and ARH 101 should be completed. One course at the 200-level and two courses at the 300-level should be completed during the second year. During the first two years 9 hours of studio courses (3) at the 100-level and a 3-hour studio course at the 200 level should be selected in consultation with the art history advisor. The 3 courses at the 100-level must be from three different studio disciplines.

Upper Division Program (15 semester hours)—During the junior year three additional art history courses at the 300-level should be completed. Two courses in art history at the 400-level or above should be completed during the senior year. An 18-hour minor or 21-hour cognate studies program is required. All courses for the minor or cognate studies must be taken outside of the Department of Art History.

III. Studio Discipline with Teacher Certification

The program for teacher certification available to art degree candidates offers the qualifications for teaching art in Alabama’s nursery through secondary schools. General education requirements for certification differ from those of the preceding programs. The student should consult the catalog description for the Department of Education for GER specifics professional courses, and information relevant to the program outlined below.

161
A. Required Studio Courses:
ARS 120 Two Dimensional Form in Design
ARS 121 Color in Design
ARS 140 Three Dimensional Design
ARS 150 Photography for Drawing and Design
ARS 160 Introduction to Drawing
ARS 240 Introduction to Sculpture
ARS 280 Introduction to Printmaking
ARS 375 Traditional Oil Painting Techniques
ARS 380 Printmaking: Intaglio

B. Advised Electives (choose two)
ARS 351 Photography: Audio-Visual and Film Application
ARS 376 Contemporary Painting Approaches
ARS 383 Screenprinting
ARS 330 Fundamentals of Advertising Design

C. Choose one:
ARS 340 Sculpture: Additive Process
ARS 346 Sculpture: Figure Modeling

D. Required Art History Courses:
ARH 100 Art History Survey: Ancient to Renaissance
ARH 101 Art History Survey: Renaissance to Modern

E. Advised Electives (choose three)
ARH 300 Colonial & 19th Century American Art
ARH 303 Renaissance
ARH 304 Twentieth Century Art
ARH 306 Baroque and Rococo

Minors and Cognate Studies Programs

1. Art History Minor
A total of 18 hours is required. Required courses are ARH 100 and ARH 101. In addition, one (1) art history course at the 200-level and three courses at the 300-level or above are required.

2. Art History Cognate
A total of 21 hours is required. Required courses: ARH 100 and ARH 101. A minimum of three (3) art history courses at the 300-level or above are required. Two courses in related disciplines must be selected at the 300-level, to be approved by the departments concerned.

3. Art for Second Area of Study (with Elementary Education)
Required courses: (choose three) ARS 120, ARS 121, ARS 140, ARS 150, ARS 160 and ARS 280. Choose four additional courses from ARS 340, ARS 346, ARS 351, ARS 375, ARS 376 or ARS 380. ARH 100 or ARH 101 should be taken to fulfill the general studies requirement for the Elementary Education Program.

4. Studio Art Minor or Cognate for Non-Art Majors
Any student majoring in another area but desiring to pursue a minor in art is encouraged to do so regardless of previous experience or perceived aptitude. The program must total 18 semester hours of which 12 must be at the 300-level. The minor program will be tailored to best serve the needs and interests of the student; however, a typical studio-oriented minor
would be as follows: one 100-level studio course, one 200-level studio course and four studio courses at the 300-level or above. A cognate study consists of 21 hours of which 12 must be 300-level or above.

**UAH Galleries of Art**
The Department of Art and Art History currently sponsors art exhibitions and events in two galleries at UAH. The Old Church Gallery, which was erected circa 1890 in a style reminiscent of Greek Revival, was donated to the University by Mr. and Mrs. Franklin Bendall in 1973, at which time it was relocated to its present location in Bi-Centennial Park on the UAH campus.

The University Center Art Gallery, located off the main lobby of the UAH University Center, offers additional exhibition space in a contemporary environment. Both galleries are operated with the assistance of a student staff.

**UAH Visiting Artist Series**
The Department of Art and Art History sponsors campus visits of distinguished artists, critics, and art historians. Presentations include studio and classroom sessions as well as public lectures.

**The FOCAL Exhibition**
The UAH student art organization, FOCAL, in conjunction with the Department of Art and Art History sponsors a biennial regional juried exhibition for college art students of the southeastern states.

**Art Studio (ARS)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>120</td>
<td>Two-Dimensional Form in Design</td>
<td>3 hrs.</td>
<td>Introduction to the elements and principles of two-dimensional design. Studio work exploring form and intuitive theories of composition. Lab fee: Level 3, F, Sp.</td>
</tr>
<tr>
<td>121</td>
<td>Color in Design</td>
<td>3 hrs.</td>
<td>Physiological, psychological, and physical properties of color with studio work in subjective and objective evaluation of color usage. Lab fee: Level 3, W.</td>
</tr>
<tr>
<td>140</td>
<td>Three-Dimensional Design</td>
<td>3 hrs.</td>
<td>Introduction to three-dimensional imagery and processes through investigation and handling of form in space, providing a broad design base upon which students can build toward any art or design program. Lab fee: Level 3, Sp, F.</td>
</tr>
<tr>
<td>150</td>
<td>Photography for Drawing and Design</td>
<td>3 hrs.</td>
<td>Understanding and practice of photography through its use as a creative drawing and design medium. It is not necessary to own photographic equipment. Lab fee: Level 3, F, W.</td>
</tr>
<tr>
<td>160</td>
<td>Introduction to Drawing</td>
<td>3 hrs.</td>
<td>Basic drawing skills and self expression using a variety of traditional and contemporary media including pencil, chalk, charcoal, inks, collage. Lab fee: Level 3, F.</td>
</tr>
</tbody>
</table>
240 Introduction to Sculpture 3 hrs.
Introduction to basic sculptural concepts and materials. Lab fee: Level 3. 
Prerequisites: ARH 100 or 101 and two studio courses at the 100-level or approval 
of instructor. W.

250 Intermediate Photography 3 hrs.
Personal exploration of photography as a fine arts medium with emphasis on 
production of finished works. Prerequisites ARH 100 or 101 and two studio courses 
at the 100 level or approval of instructor. Lab fee: Level 3. W,*.

260 Intermediate Drawing 3 hrs.
Development of drawing skills and individual expression through the study and 
practice of selected drawing approaches. Lab fee: Level 3. Prerequisites: ARH 100 
or 101 and two studio courses at the 100-level or approval of instructor. W,*.

267 Drawing for Design and Illustration 3 hrs.
Drawing techniques for illustration. Expressive and objective drawing styles in 
professional media. Freehand sketching, perspective studies, rendering techniques, 
and composition in line, form, value, and color. Required for interior design 
students and recommended for communication graphics discipline. Prerequisites: 
ARH 100 or 101 and two studio courses at the 100-level or approval of instructor. Lab fee: Level 3. F,*.

270 Intermediate Painting 3 hrs.
Studio practice in painting. Development of individual creative expression, through 
a variety of contemporary and traditional painting approaches. Prerequisites: ARH 
100 or 101 and two studio courses at the 100 level or approval of instructor. Lab 
fee: Level 3. W*.

280 Introduction to Printmaking 3 hrs.
Basic printmaking techniques and processes used for generating ideas and images. 
Monoprint, relief prints, collagraph, and nontraditional approaches to printmaking. 
Prerequisites: ARH 100 or 101 and two studio courses at the 100-level or approval 
of instructor. Lab fee: Level 3. W.

Upper Division

310 Introduction to Interior Design 3 hrs.
Basic design terms and styles of furniture. Introduction to design principles; 
furniture arrangements; elements of color, window treatments, accessories and 
lighting; consumer buying of furniture and floor and wall coverings. Prerequisites: 
ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. 
Lab fee: Level 3. F.

311 Applications of Interior Design 3 hrs.
Principles and practices of interior design; activities and space planning; color 
schemes and theory; interior materials and design of major interior elements. 
Designing and developing the floor plan or the entire house including basic materials 
and furniture arrangement; exterior design and cost factors. Prerequisites: ARS 
310, or approval of instructor. Lab fee: Level 3. W.
312 Interior Design: Introductory Architectural Planning  
Survey of architectural planning and drawing, primarily as these topics relate to interior decoration. Basic drawing and sketching; planning processes for home and light-commercial buildings; construction materials; elements of construction methods; introduction to preparation of architectural drawings. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. W.

330 Fundamentals of Advertising Design  
Introduction to the tools, techniques, and practices of the professional artist in the advertising agency. Preparation of art and photography for reproduction in newspaper and magazines. Functional lettering techniques. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. Sp.

331 Advertising and Typographic Design  
Instruction in the basic skills required of the contemporary graphic designer. Trademark and corporate identity programs. Preparation of full color comprehensives and camera ready art. Prerequisites: ARH 100 or 101 and 3 studio courses at the 100 level or approval of instructor. Lab fee: Level 3. F.

332 Illustration in Black and White  
The design and production of one color art for the print media using gouache, ink, ink wash, pencil and other commercial drawing materials. Advanced illustrational and rendering techniques. Practical experience in preparing illustrations for publication by offset lithographic reproduction. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. W.

340 Sculpture: Additive Process  
Emphasis on the creation of original work using additive sculptural processes and materials. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. W.

341 Sculpture: Subtractive Process  
The creation of original work through the sculptural use of subtractive processes and materials. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. Sp.

342 Sculpture: Casting  
Approaches to the production of cast sculpture. Casting materials, such as plaster, wax, or metals. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. F.

346 Sculpture: Figure Modeling  
Exploration of the human form utilizing various sculpture mediums. Prerequisites ARH 100 or ARH 101 and three studio courses at the 100 level or approval of instructor. Lab fee level: 3. Sp.

350 Advanced Photography  
Advanced use of black/white and color photography as a fine art. Emphasis on personal expression. Prerequisites: ARH 100 or 101 and 3 studio courses at the 100-level or approval of instructor. Lab fee: Level 3. W, *.

165
351 Photography: Audio-Visual and Film Applications 3 hrs.
Individual and group production of video and slide dissolve projects. Field trips to professional production facilities assure familiarity with current developments. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. Sp.

352 Non-Silver Photography 3 hrs.
Investigation and use of alternative processes such as gum-bichromate, xerography and related media to produce works of photographic art. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. W.*.

360 Advanced Drawing 3 hrs.
Drawing with both traditional and contemporary methods and materials encouraging the development of personal expression. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. W.*.

375 Traditional Oil Painting Techniques 3 hrs.
Essentially representational painting with techniques ranging from under-painting and glazing to alla-prima oils. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. W.

376 Contemporary Painting Approaches 3 hrs.
Direct personal expression on canvas, through both spontaneous and deliberate handling of acrylic tempera and other painting media. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. Sp.

377 Painting with Mixed and Non-Traditional Media 3 hrs.
Individual expression involving use of mixed wet and dry materials, assemblage, collage, shaped and contoured canvasses and related media. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. Sp*.

380 Printmaking: Intaglio 3 hrs.
Beginning studio practice in etching, engraving, aquatint, photo-etching and dry-point. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. F.

381 Printmaking: Lithography 3 hrs.
Beginning studio practice in autographic and photographic lithography processes utilizing aluminum plate and stone. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. Sp.

383 Printmaking: Screenprinting 3 hrs.
Introduction to silkscreen processes, including the latest professional handcut film and photographic methods. Recommended for communication graphics students. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. F.

390 Mixed Media 3 hrs.
Study and practice of art approaches which combine elements of various art forms such as design, painting or photography/film and may include elements otherwise
foreign to the visual arts, such as theatrical or industrial processes and materials. Prerequisites: ARH 100 or 101 and three studio courses at the 100-level or approval of instructor. Lab fee: Level 3. TBA.

Senior level studio courses are to be taken only after the successful completion of a minimum of three 300-level studio courses or the proper prerequisites. Communication graphics specialists must complete ARS 430, 431, and 432 which may be taken in any sequence. Interior design specialists must complete ARS 410, 411 and 412. ARS 411 and 412 must be in the same quarter. All other studio students must complete ARS 400, 401 and 402 which may be taken in any sequence; however, no other studio courses should be attempted while completing these courses.

400 Senior Problems in Studio Art: Lab fee: Level 2 3 hrs.
401 Senior Problems in Studio Art: Lab fee: Level 2 3 hrs.
402 Senior Problems in Studio Art: Lab fee: Level 2 3 hrs.

One section of this latter series will be offered each term, and will be conducted by a different member of the studio faculty. Each of these senior level courses will consist of the production and critical evaluation of exhibition quality works in any medium for which the student is qualified by previous experiences (100 through 300 levels).

410 Textiles in Interior Design 3 hrs.
Textiles, emphasizing fibers, yarns, fabric construction, and finishes in relation to use, serviceability and care in residential and commercial applications. Prerequisite: Upper division standing. Lab fee: Level 3. F.

411 Interior Design: Advanced Residential and Commercial Design 3 hrs.
Advanced development of skills in residential and commercial planning and drawing relating to interior design. Development of residential and commercial floor plans, kitchen fixture planning, bathroom and restroom facilities, restoration, fire code material resistance, lighting specifications, space planning and presentation techniques. Prerequisites: ARS 310, 311, 312, and 410, and should be taken in the same quarter as 412. Lab fee: Level 3. Sp.

412 Advanced Application of Interior Design Principles 3 hrs.


Type design fundamentals. History and practice of typography. Advanced layout and design techniques for four color publications. Preparation of portfolio projects. Prerequisite: ARS 331. Lab fee: Level 3. W.

490 Honors Project 3 hrs.
Independent work in studio leading to a solo exhibition. Course must be followed by ARS 491. TBA.

491 Honors Project 3 hrs.
Independent work in studio leading to solo exhibition in last term of senior year. Prerequisite: ARS 490. TBA.

495 Technical Problems 3 hrs.
Technical problems in studio disciplines for which advance courses are not available. Course can be repeated for a total of 6 hours credit. Prerequisites: Advanced standing in studio disciplines concerned and permission of instructor. TBA.

Art History (ARH)

100 Art History Survey: Ancient to Renaissance 3 hrs.
Major monuments, periods and movements in the history of art from the caves of Lascaux to the revival of classical art in Renaissance Italy. Fundamentals of art historical inquiry. F, Sp.

101 Art History Survey: Renaissance to Modern 3 hrs.
Designed to acquaint the student with developments in art since the Renaissance. Major themes, artists and critical issues will be examined. W.

102 History of Architecture 3 hrs.
A survey of architectural styles from the classical period to the present. TBA.

201 Contemporary Art & Issues 3 hrs.
Major movements since World War II, including abstract expressionism, color field painting, pop art, conceptual art, minimalism, earthworks, performance art and video, new realism and photo-realism, neo-expressionism and graffiti. Prerequisites: ARH 100 and 101 or approval of instructor. TBA.

209 The History of Design 3 hrs.
A survey of the historical development of European and American interior design styles including Victorian, the Arts and Crafts Movement, Art nouveau, the Bauhaus, and contemporary trends. Prerequisites: ARH 100 and 101 or approval of instructor. Required for Interior Design Specialists. W.

Upper Division

300 Colonial and Nineteenth Century American Art 3 hrs.
American art, architecture and design prior to World War I. Emergence of a national style and its relationship to European art. Prerequisites: ARH 100 and 101 or approval of instructor. Prerequisites for non-majors and non-minors are HY 101, 102 and EH 205, 206 or EH 240, 241. W.
303 Renaissance Art

The art of Europe from 1250 to 1527. The rise of the artist as a creative individual, and his expanding role in society. The works of such northern and southern masters as Van Eyck, Durer, Da Vinci, Michelangelo, and Titian will be studied. Prerequisites: ARH 100 and 101 or approval of instructor. Prerequisites for non-majors and non-minors are HY 101, 102 and EH 205, 206 or EH 240, 241. F.

304 Twentieth Century Art

A survey of the developments in Europe and America from 1890 to World War II. Major movements including Cubism through Dada and Surrealism, to abstract expressionism. Prerequisites: ARH 100 and 101 or approval of instructor. Prerequisites for non-majors and non-minors are HY 101, 102 and EH 205, 206 or EH 240, 241. Sp.

306 Baroque and Rococo Art

Development of baroque and rococo art in Europe. Architecture of Borromini, sculpture of Bernini, painting of Rubens, Rembrandt, Velasquez, Poussin and Watteau will be examined. Prerequisites: ARH 100 and 101 or approval of instructor. Prerequisites for nonmajors and non-minors are HY 101, 102 and EH 205, 206 or EH 240, 241. F, *.

310 Nineteenth Century Art in Europe

Survey of developments in art from 1780 to 1890: neo-classicism, romanticism, realism, impressionism and symbolism will be studied through the works of such artists as David, Goya, Courbet, Van Gogh and others. Prerequisites for non-majors and non-minors are HY 101, 102 and EH 205, 206 or EH 240, 241. W, *.

320 Special Topics in Art Since the Renaissance

Special topics in art history since the Renaissance period as offered. Senior-level courses involve independent initiative of the degree candidate. The student should have completed all foundation courses and all GER before commencing senior program. ARH 400 and 500 include discussion and guided research on artists, works of art, and subjects closely related to art. Prerequisites: 100 or 101 or approval of instructor. Sp, *.

400 Art History Seminar: Special topics

Methods of developing a scholarly research paper on special topics in art history as offered. Prerequisites: upper-division standing or approval of instructor. TBA.

500 Special Problems in Art History

Directed reading and research. Prerequisites: Advanced standing, 12 semester hours of art history, previous course work in area to be studied, and approval of the instructor. TBA.

* Offered alternate years

TBA - to be announced
Communication Arts Department

Assistant Professor and Acting Chair Roach; Assistant Professors D. Whillock and R. Whillock; Adjunct Associate Professor James; Instructors Kaylor, Langford, and Pierce; Adjunct Faculty McCauley, Hughes, and Humphreys.

The Department of Communication Arts offers a comprehensive program of study leading to a Bachelor of Arts (B.A.) degree. The program is designed to provide students with a core background in the intellectual foundations of the power of speech, including historical, theoretical, and critical work in rhetoric, and to study strategies for creating and evaluating influence in a wide variety of communication situations, including relational, organizational, public, and mass communication settings.

Major in Communication Arts

A major in Communication Arts consists of 36 hours of coursework within the department, at least 21 hours of which must be at or above the 300 level. Students are encouraged to work closely with a faculty advisor to plan a program of study.

Twenty-one (21) of the thirty-six (36) hours within the department are core requirements and must be completed by all majors. These courses are

CM 113 (Introduction to Rhetorical Communication)
CM 230 (Mass Media in America: Theory and Criticism)
CM 250 (Communicating in Relationships)
   or CM 251 (Decision-Making in Groups)
CM 309 (History of Rhetoric) or
CM 322 (History of Theatre)
   or CM 333 (History of International Cinema)
CM 310 (Persuasion)
   or CM 315 (Argumentation and Debate)
CM 431 (Senior Seminar in Communication Arts)

A major in Communication Arts can also include approved coursework in allied disciplines. For example, students may select a technical writing course (EH 300), a course in civil liberties (PSC 471), a course in graphic art (ARS 330, 331) or an independent study in any discipline germane to the study of communication arts. To elect this option, a student must secure permission of the chair of the department.

Minor in Communication Arts

A minor in Communication Arts consists of twenty-one (21) hours of coursework taken within the department, at least twelve (12) hours of which must be taken at or above the 300 level. Nine (9) hours of coursework must be completed by all minors: CM 113 (Introduction to Rhetorical Communication); CM 230 (Mass Media in America: Theory and Criticism); and one history of communication course selected from CM 309 (History of Rhetoric), CM 322 (History of Theatre), or CM 333 (History of International Cinema).

Communication Arts (CM)

110 Voice and Diction 3 hrs.
   Introductory course of language, speech, and hearing. Development of individual vocal skills. (Does not satisfy College of Engineering HU/SS requirement.)

113 Introduction to Rhetorical Communication 3 hrs.
   Study of rhetorical theories and practice of public communication. Prerequisite: EH 101. (Does not satisfy College of Engineering HU/SS requirement.)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>122</td>
<td>Theatre Appreciation</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>An introductory survey of theatre art focusing on understanding performance components and genres.</td>
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<tr>
<td>201</td>
<td>News Writing</td>
<td>3 hrs.</td>
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<tr>
<td>214</td>
<td>Oral Performance of Literature</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Study and practice in intellectual, artistic, and communication skills required to read prose, poetry, and drama aloud effectively. Prerequisite: CM 110 or CM 113, or approval of instructor.</td>
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<tr>
<td>230</td>
<td>Mass Media in America: Theory and Criticism</td>
<td>3 hrs.</td>
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<td></td>
<td>Mass communication theory, history of American mass media, and criticism of contemporary forms and functions of mass communication in the United States.</td>
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<tr>
<td>240</td>
<td>Communication Arts Practicum</td>
<td>1 hr.</td>
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<td></td>
<td>Credit for execution of major responsibility in communication arts activities under faculty supervision. May be repeated up to three times. Prerequisite: Approval of communication arts faculty before registration.</td>
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<tr>
<td>250</td>
<td>Communicating in Relationships</td>
<td>3 hrs.</td>
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<td></td>
<td>Study of interpersonal skills, including listening, empathy, conflict resolution, and building and maintaining relationships. Prerequisite: CM 113 or approval of instructor.</td>
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<tr>
<td>251</td>
<td>Decision-Making in Small Groups</td>
<td>3 hrs.</td>
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<td></td>
<td>Introduction to the theories and techniques of group discussion and decision-making emphasizing the skills of leadership, participation, and oral presentation. Offered alternate years. Prerequisite: CM 113.</td>
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<tr>
<td>301</td>
<td>News Editing</td>
<td>3 hrs.</td>
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<td></td>
<td>Standard symbols and copy-editing techniques, headline writing, and unit counts. Techniques of cover layout and page design. Prerequisite: CM 201 or approval of instructor. (Does not satisfy College of Engineering HU/SS requirement.) Lab fee: Level 4.</td>
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<tr>
<td>309</td>
<td>History of Rhetoric</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>History of rhetoric and persuasion from ancient Greece and Rome through late 19th century. Prerequisite: CM 113 or approval of instructor. (Does not satisfy College of Engineering HU/SS requirement.)</td>
<td></td>
</tr>
<tr>
<td>310</td>
<td>Persuasion</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Principles and practices in persuasive communication, emphasizing observation and analysis of persuasive events on qualitative and quantitative levels. Prerequisite: Junior standing.</td>
<td></td>
</tr>
<tr>
<td>311</td>
<td>Interviewing in Organizations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Study and practice of interviewing with emphasis on employment and appraisal settings. Prerequisite: Junior standing.</td>
<td></td>
</tr>
<tr>
<td>315</td>
<td>Argumentation and Debate</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Theory and practice of argumentation and debate. Argumentation is examined as a mode of inquiry for presenting the processes by which people give reasons to justify their acts, beliefs, and values. Prerequisite: CM 113 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
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<tr>
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<td>---------</td>
</tr>
<tr>
<td>322</td>
<td>History of Theatre</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>330</td>
<td>Psychology of Communication</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>333</td>
<td>History of International Cinema</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>334</td>
<td>History of American Cinema</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>340</td>
<td>Special Topics in Communication Arts</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>350</td>
<td>Organizational Communication</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>410</td>
<td>Political Communication</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>413</td>
<td>Business and Professional Speaking</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>415</td>
<td>Contemporary American Public Address</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>431</td>
<td>Senior Seminar in Communication Theory and Research</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>433</td>
<td>Critical Methods in Film and Television Analysis</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Explores various methodologies and develops academic critical thinking about film and television. Prerequisites: CM 230, 333, 334 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>450</td>
<td>Studies in Organizational Communication</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Examines various research methods and findings in the interpretive tradition. Special emphasis on investigations of symbolic inducement of meanings and ways in which the research and writing processes reflect them. Offered alternate years. Prerequisites: CM 350 and senior standing.</td>
<td></td>
</tr>
<tr>
<td>636</td>
<td>Seminar in Organizational Communication</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>
Education Department

Professors Emeriti Wharry, Engle; Associate Professor Emerita Kilgo; Associate Professors Brindley, Gibson, Adjunct Associate Professor Kirkpatrick; Assistant Professors Allen, Butts (chairman), Piersma; Adjunct Instructors Bell, Bowling, McHugh.

Graduate and undergraduate programs are offered by the department.

Undergraduate Study in Education

Students who plan to major in teacher education 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 must also consult advisors from other approved academic departments to coordinate planning of programs of study. The Nursery-Grade 12 certification programs are available only in art and music.

Admission to the Teacher Education Program

During the sophomore year, students should apply for admission to the Teacher Education Program. Transfer students who have completed two years of undergraduate study must submit the application after completion of nine semester hours of work at UAH. Applicants must: (1) have a cumulative GPA of 2.50 on all work attempted, (2) have completed at least 70% of the GER (3) have presented acceptable confidential evaluations prepared on proper forms, (4) have satisfactory performance on the Alabama State Department of Education English Language Proficiency Test, (5) have satisfactory interview(s) with representatives of the Department of Education, and (6) have a minimum score of 16 on the ACT taken within five years prior to admission or equivalent SAT scores. Students may elect to be re-examined on all tests. (7) Students must successfully complete (with a grade of "C" or higher) ED 230, 261, 263 (or equivalent courses) before admission to the teacher education program.

Note: Students who began collegiate study prior to June 1, 1977, may have items (4) and (6), as listed above, waived.

Students who have not been accepted into the teacher education program may not have accumulated more than 12 semester hours of coursework in education courses taken beyond the 12 hour limit may not be counted toward certification. No student will be approved for a major or a minor in education without being admitted to the teacher education program.

All students admitted to the program will have a teacher education advisor assigned to them, as well as an advisor in the teaching field(s).

Application for Student Teaching

Students must apply for student teaching at least two academic terms before the term requested. For example, students who plan to student teach during the Fall term must apply prior to the beginning of the preceding Spring term. The following criteria must be met before the internship assignment is made: (1) a GPA of 2.50 on all work attempted, (2) a GPA of 2.50 on all work attempted in the teaching field(s), (3) a GPA of 2.50 in all work attempted in education courses, with no grade lower than a "C", and (4) satisfactory completion of all appropriate general education requirements.

Initial Certification

Near the end of the teacher education program, a student who wishes to apply for an Alabama teaching certificate should complete the Alabama State Department of Education certification application at the Office of Admissions and Records or the Education Department office.
To be recommended for the teaching certificate a student, in addition to fulfilling the general degree requirements, must satisfactorily complete an approved program with at least a 2.50 GPA on all work attempted and at least a 2.50 GPA on all work attempted in the teaching field(s) and in professional education.

Additionally, the student must pass a comprehensive examination.

Successful completion of the bachelor’s program in teacher education leads to Alabama Class B certification which is valid for eight years. This certification may be renewed upon verification of successful teaching for four of the eight years and completion of an approved professional development program; or earning upper division or graduate level credit in the certification areas. Teachers are encouraged to earn Class A certification which may be incorporated into their employer’s professional development program.

Students seeking certification in other states may have to meet the specific requirements of those states. Some states have reciprocity with Alabama through interstate agreements of the State Departments of Education.

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

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition (EH 101 and EH 102)</td>
<td>6</td>
</tr>
<tr>
<td>Survey of Literature (EH 205 and EH 230)</td>
<td>6</td>
</tr>
<tr>
<td>Foreign Languages (two courses at 200 level or placement at that level)</td>
<td>6</td>
</tr>
<tr>
<td>Origin and Development of the Contemporary World (HY 101 and HY 102)</td>
<td>6</td>
</tr>
<tr>
<td>Fine Arts (ARH 100 or ARH 101 or ARS 110 or MU 100 or MU 110 or CM 122)</td>
<td>3</td>
</tr>
<tr>
<td>Lower Division Humanities Course (PHL 101 or any humanities course at the 200 level chosen from English, Philosophy—excluding PHL 201—or History) Course must be outside major and minor except for teacher education students</td>
<td>3</td>
</tr>
<tr>
<td>Upper Division Humanities or Fine Arts Elective. Chosen from English (excluding EH 300, EH 301, and EH 302), History, Philosophy, Art, Music, Foreign Languages (Literature Courses only), or Communication Arts (CM 309 or CM 322). Course must be outside major or minor except for teacher education students</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics. One course at Level II or above</td>
<td>3</td>
</tr>
<tr>
<td>Laboratory Science. Two courses in a single discipline and one course in a second laboratory science discipline. The choices must include some biological and some physical science. (BYS, AST, CH PH, or ES). Social Sciences. (PSC 101, PSC 135, SOC 100, SOC 200, PY 103, EC 142, and EC 143) Teacher education students must take at least one EC courses and may substitute ED 230 and ED 263 for two of these courses. Four courses must be taken.</td>
<td>12</td>
</tr>
<tr>
<td>Upper division Social Science Elective. Chosen from Political Science, Sociology, Psychology, or Economics</td>
<td>3</td>
</tr>
<tr>
<td>Additional Requirements. Students who complete all requirements for teacher certification may take either ED 360 (for elementary education students) or ED 510 (for secondary education students). HPE (including either HPE 291 or HPE 294)</td>
<td>3</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition (EH 101 and EH 102)</td>
<td>6</td>
</tr>
<tr>
<td>Survey of Literature (EH 205 and EH 230)</td>
<td>6</td>
</tr>
</tbody>
</table>
Foreign Language and Communication Skills:
(a) two courses at the 200 level, or ........................................ (6)
(b) three courses in communication skills (CS 108 or CS 113; CM 113; EH 301) ......................................................... (9)
Origin and Development of the Contemporary World (HY 101 and HY 102) ................................................................. 6
Fine Arts (ARH 100 or ARH 101; ARS 110; MU 101 or MU 110; PHL 101 or PHL 202 or PHL 311) ........................................ 6
Social and Behavioral Sciences: Economics, Political Science, Psychology, or Sociology. Six semester hours must be taken in one discipline. Teacher education students must take at least one Economics course ........................................... 6
Mathematics. One course at Level III or above ........................................... 3
Laboratory Science and Technical Studies:
Note: Laboratory sciences are—Astronomy, Biological Science, Chemistry, Environmental Science, and Physics.
(a) Two courses in a single laboratory science, outside of major/minor, and ......................... 8
(b) Coursework (to include at least one laboratory) in any department or program (outside or major/minor) in the Schools of Science and Engineering ................................. 7-8
Note: Teacher education students must have within major/minor and/or general education requirements, work in both biological and physical sciences.
HPE (Including either HPE 291 or HPE 294) ........................................... 3

ELEMENTARY EDUCATION
The curriculum in elementary education provides a broad liberal education base and professional studies, including the study of a single discipline. It prepares the elementary teacher for the general responsibilities expected of all teachers and the specific competencies of the elementary classroom. In addition, this curriculum provides a base for movement into the middle school, if the teacher so desires.
Because of the scope of the elementary education program the student must inform the Education Department of his/her goals as early as possible. The student will be assigned an advisor to aid in planning an effective course of study. This planning also requires the student to seek counseling from an adviser in the department of the student’s cognate area of study.
Upon successful completion of the elementary education program, the student will be awarded a B.A. degree, will be recommended for the Alabama Class B Elementary Professional Teachers Certificate, and will be qualified to teach in grades 1-6.

Course Requirements for an Elementary Education major:

General Education Requirements (See B.A., above.)

Major
Program of Study—Elementary Education
ARS 215 (Art for Elementary Teacher) ........................................ 3
MU 215 (Music for Elementary Teacher) ........................................ 3
ED 215 (P.E. for Elementary Teacher) ........................................ 3
ED 230 Human Development ........................................ 3
ED 261 Foundations of Education ........................................ 3
ED 263 Educational Psychology ................................................. 3
ED 300 Group Processes ......................................................... 3
ED 360 Diagnostic & Prescriptive Teaching ............................. 3
ED 372 Teaching Elementary Social Studies ............................. 3
ED 373 Teaching Elementary Science ...................................... 3
ED 374 Teaching Elementary Mathematics ............................... 3
ED 375 Teaching Elementary Reading .................................... 3
ED 371 Language Arts or
ED 400 Literature for Children and Adolescents ..................... 3
ED 408 Teaching Reading in the Content Area ......................... 3
ED 493 Student Teaching ...................................................... 9
ED 593 Educating Exceptional Child & Youth .......................... 3

\[54 \text{ hrs.}\]

Minor

Cognate Area (Sociology, Psychology, Mathematics, History, English, etc.) 18 hrs. minimum (most are 21-24 hrs.) which must include 15 hrs. of 300-or-above level courses.

A student planning to teach in an elementary field must select a cognate area from any academic department that offers an approved program. Approved programs in the College of Liberal Arts are art, English, communications, history, French, German, Russian, Spanish, music, political science, psychology and sociology. Approved programs in the College of Science are biology, chemistry, mathematics and physics. Economics is an approved program in the College of Administrative Science. Other cognate fields may be approved by petitioning for special consideration.

MIDDLE/JUNIOR HIGH SCHOOL EDUCATION

The curriculum in middle/junior high school education is planned to provide a broad liberal base, professional studies in middle school education, and an in-depth study of two disciplines or of selected comprehensive fields (social science, language arts or general science) to prepare teachers for serving in traditional junior high schools or the emerging middle schools. Students may, at their option, add certification in an adjacent field, i.e., high school education, with additional coursework and internships. This program is designed to prepare teachers especially trained in dealing with youngsters undergoing the developmental changes of late childhood, puberty, and early adolescence. The emphasis will be on preparing academic generalists rather than specialists in subject fields.

Students should seek counseling as early as possible. Advisors will be assigned in both professional education and in the teaching fields. The student will earn a B.A. or B.S. depending on the chosen field(s). Upon successful completion of the program the student will be recommended for the Alabama Class B Middle/Junior High School Certificate and will be qualified to teach in grades 4-8.

Course Requirements for a Middle/Junior High School major:

General Education Requirements (See B.A./B.S. pages 73-75)

Major

Program of Study
Middle/Junior High School Education
In addition to the above the student is required to have two teaching fields or one comprehensive teaching field. The one exception to this rule is mathematics which can stand alone.

Approved single teaching fields are French, German, Russian, Spanish, English, mathematics, biology, chemistry, physics, economics, history, political science, psychology and sociology. Approved comprehensive teaching fields are language arts, general science, and social science. The total number of semester hours in a student’s program will vary from a low of some 130 hours to a high of about 145 hours, depending on the teaching field. The student should seek advisement from the Education Department on this matter. The specific program of studies in the teaching field(s) will be developed with advisors from the chosen field.

Students seeking middle school certification are encouraged to consider selecting the comprehensive programs as they are felt to be the better preparation for teaching at that level.

HIGH SCHOOL EDUCATION

The curriculum in high school education is planned to provide a broad liberal base, professional studies in high school teaching, and an in-depth study of two disciplines or of selected comprehensive fields (social science, language arts, general science) for the purpose of preparing teachers for service in senior high schools. Students may, at their option, also seek certification in middle/junior high school education, with additional coursework and internships. Preparation will be rigorous and will equip the teacher to work in the high school setting and to deal with adolescents.

Students should seek counseling as early as possible. Advisors will be assigned in both professional education and in the teaching field(s). The student will earn a B.A. or B.S. depending on the field chosen. Upon successful completion of the program the student will be recommended for the Alabama Class B High School Certificate, and will be qualified to teach in grades 7-12.

Course Requirements for a Secondary Education major:

General Education Requirements (See B.A./B.S. pages 73-75)

Program of Study—Secondary Education
ED 230 Human Development .............................................. 3
ED 261 Foundations of Education in the U.S. ................................ 3
ED 263 Educational Psychology ............................................. 3
ED 300 Group Processes or ED 360 Diagnostic & Prescriptive Teaching .............................................. 3
ED 375 Teaching of Reading, or ED 400 Literature for Children & Adolescents .............................................. 3
ED 388 Teaching Middle and High School Subjects .............................................. 3
ED 408 Reading in the Content Areas .............................................. 3
ED 490 Senior Seminar in Education .............................................. 3
ED 495 Middle School Internship .............................................. 9
ED 510 Foundations of Educational Evaluation .............................................. 3
ED 593 Education of Exceptional Children and Youth .............................................. 3

In addition to the above the student is required to have two teaching fields or one comprehensive teaching field. The one exception to this rule is mathematics which can stand alone.

Approved single teaching fields are French, German, Russian, Spanish, English, mathematics, biology, chemistry, physics, economics, history, political science, psychology and sociology. Approved comprehensive teaching fields are language arts, general science, and social science. The total number of semester hours in a student’s program will vary from a low of some 130 hours to a high of about 145 hours, depending on the teaching field. The student should seek advisement from the Education Department on this matter. The specific program of studies in the teaching field(s) will be developed with advisors from the chosen field.

Students seeking middle school certification are encouraged to consider selecting the comprehensive programs as they are felt to be the better preparation for teaching at that level.

HIGH SCHOOL EDUCATION

The curriculum in high school education is planned to provide a broad liberal base, professional studies in high school teaching, and an in-depth study of two disciplines or of selected comprehensive fields (social science, language arts, general science) for the purpose of preparing teachers for service in senior high schools. Students may, at their option, also seek certification in middle/junior high school education, with additional coursework and internships. Preparation will be rigorous and will equip the teacher to work in the high school setting and to deal with adolescents.

Students should seek counseling as early as possible. Advisors will be assigned in both professional education and in the teaching field(s). The student will earn a B.A. or B.S. depending on the field chosen. Upon successful completion of the program the student will be recommended for the Alabama Class B High School Certificate, and will be qualified to teach in grades 7-12.

Course Requirements for a Secondary Education major:

General Education Requirements (See B.A./B.S. pages 73-75)

Program of Study—Secondary Education
ED 230 Human Development .............................................. 3
ED 261 Foundations of Education in the U.S. ................................ 3
ED 263 Educational Psychology .............................................. 3

178
In addition to the above, the student is required to have two teaching fields or one comprehensive teaching field. The one exception to this rule is mathematics which can stand alone.

Approved single teaching fields are French, German, Russian, Spanish, English, mathematics, biology, chemistry, physics, economics, history, political science, psychology and sociology. Approved comprehensive teaching fields are language arts, general science, and social science.

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

N-12 EDUCATION
Programs are available in art and in music leading to Alabama Class B Certification for grades N-12. There is one program available in art education and two programs in music education (Instrumental, and Vocal/Choral). These programs are also devoted to providing a broad liberal base of studies. Preparation in the arts has traditionally been rigorous and extensive and these programs are no exception. Students should expect to take more than the minimum of 132 hours required for graduation. Early counseling with advisors is strongly recommended.

Course Requirements for an Art Education Major

General Education Requirements (See B.A. pages 73-74)

Major

Area of Concentration—Art Education

ARS 215 Art for the Elem. Teacher ................................................................. 3
ED 230 Human Development ................................................................. 3
ED 261 Foundations of Education in U.S. ............................................... 3
ED 263 Educational Psychology ............................................................. 3
ED 388 Teaching Middle & High School Subjects .................................... 3
ED 408 Teaching Reading in the Content Areas ....................................... 3
ED 490 Senior Seminar in Education ..................................................... 3
ED 499 Internship .................................................. 9
ED 510 Foundations of Educational Evaluation ....................................... 3
ED 593 Education of Exceptional Children & Youth .................................. 3

Art:

The major in art education is made up of some 51 semester hours of work, part of which may be included in the general studies component. This program should be planned with the Art Department providing advice and approval.
Course Requirements for a Music Education Major

General Education Requirements (See B.A. pages 73-74)

Major

Area of Concentration—MUSIC EDUCATION: Instrumental or Vocal/Choral

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 230</td>
<td>Human Development</td>
<td>3</td>
</tr>
<tr>
<td>ED 261</td>
<td>Foundations of Education in U.S.</td>
<td>3</td>
</tr>
<tr>
<td>ED 263</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>ED 388</td>
<td>Teaching Middle &amp; High School Subjects</td>
<td>3</td>
</tr>
<tr>
<td>ED 408</td>
<td>Teaching Reading in the Content Areas</td>
<td>3</td>
</tr>
<tr>
<td>ED 490</td>
<td>Senior Seminar in Education</td>
<td>3</td>
</tr>
<tr>
<td>ED 499</td>
<td>Internship</td>
<td>9</td>
</tr>
<tr>
<td>ED 510</td>
<td>Foundations of Educational Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>ED 593</td>
<td>Education of Exceptional Children &amp; Youth</td>
<td>3</td>
</tr>
<tr>
<td>MUE 225</td>
<td>Introduction to Music Education</td>
<td>1</td>
</tr>
<tr>
<td>MUE 326</td>
<td>Teaching General Music in Elementary Schools</td>
<td>3</td>
</tr>
<tr>
<td>MUE 327</td>
<td>Teaching General Music in Secondary Schools</td>
<td>3</td>
</tr>
<tr>
<td>MUE 428</td>
<td>Organizing and Directing Vocal Groups in Secondary Schools</td>
<td>2</td>
</tr>
<tr>
<td>MUE 429</td>
<td>Organizing and Directing Instrumental Groups in Secondary Schools</td>
<td>2</td>
</tr>
</tbody>
</table>

Music: Instrumental or Vocal/Choral

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

Other Considerations

Students seeking certification in elementary, middle, high school, or N-12 education programs will have opportunity for electives by judicious planning of their general studies courses and within their major(s).

Students may substitute appropriate courses taken at another institution with permission of the Education Department if equivalency is established.

It should be noted that the requirements for the bachelor’s degree will exceed 132 hours in most areas.

Multiple Certification

Under the new State of Alabama plan, there are five levels of certification of teachers, namely: N-3, 1-6, 4-8, 7-12, and N-12. UAH offers all options except the N-3 option. For a person certified for grades 1-6 under the new standards, adding middle school endorsement would also permit teaching in grades 7 and 8 in the teaching field(s) for which the person has completed the requirements as otherwise outlined in this Catalog. For a person with high school certification, adding middle school endorsement would also permit teaching in grades 4-6 in the teaching field(s) for which the person has completed the requirements. A person beginning with a middle school program would have the option of moving to either high school endorsement or elementary school endorsement.
Changing from One Field to Another

Elementary education students who wish to extend their preparation to include endorsement in grades 7 and 8 may obtain a middle school endorsement by completing an approved program consisting of the following:

1. a course in the understanding of the purposes and design of the middle school, including its curriculum;
2. a course in the appreciation for and an understanding of the unique nature of the developing human organism during the preadolescent and early adolescent years;
3. an appropriate teaching field of at least 27 semester hours selected from those approved at UAH.

High School education students who wish to extend their preparation to include endorsement in grades 4-6 may obtain a middle school endorsement by completing an approved program consisting of the following:

1. a methods course in using instructional strategies, media, and materials, appropriate for effective teaching of preadolescents;
2. a course in the understanding of the purposes and design of the middle school as an institution, including its curriculum;
3. a course in the appreciation for and an understanding of the unique nature of the developing human organism during the preadolescent and early adolescent years;
4. a course designed for developing the knowledge and skills necessary to guide the continued growth and development of reading skills appropriate for the middle school child;
5. an appropriate teaching field major of at least 27 semester hours.

Education (ED)

111 Career Exploration 1 hr.
Educational and vocational planning. Prerequisites: 9 hours college credit and placement tests.

115 Effective Reading and Study skills 3 hrs.
Basic reading-skill development in class activities to raise skills on literal, interpretive, critical, and creative levels of comprehension.

230 Human Development 3 hrs.
Overview of human development stressing continuity from conception to adulthood. Practical applications for teachers and parents.

261 Foundations of Education in the United States 3 hrs.
Survey of social, cultural, historical, and philosophical foundations of education; interrelationships of society and education, effects of social change and influences of social-cultural values upon education; educational ideas and processes as they attempt to shape curricula. The perennial search for the meaning of education, perceived not merely as schooling, but as a process of enculturation and socialization.

263 Educational Psychology 3 hrs.
Psychological principles basic to an understanding of the learner, the learning process, and the learning situation. Prerequisites: sophomore standing.
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).

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

Mental Health in the School 3 hrs.
Dynamics of behavior, recognition of minor maladjustments, criteria for referral, and classroom practices supporting good mental health. Prerequisite: ED 263 or equivalent or junior standing.

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

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

Environmental Education 3 hrs.
The general nature of ecological life systems, relationships of humankind and environment, major conservation problems facing the world today, exploration of alternate solutions and the tasks for educators.

Foundations of Education Evaluation 3 hrs.
Measurement process with emphasis on its relationship to problems of educational evaluation. Evaluation as an integral part of overall educational planning in addition to its use in measurement and evaluation of academic achievement.

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

Education of Exceptional Children and Youth 3 hrs.
Introduction to the field of exceptional children and youth, including observations. This course, or equivalent, is a prerequisite to certification. (Same as DL 593)

Elementary Education

Physical Education for the Elementary Teacher 3 hrs.
Basic understanding of body alignment, developmental exercises and movement exploration activities for physical education in elementary grades. Study of student needs to provide proper equipment, facilities, and leadership for the overall program.

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

Group Processes 3 hrs.
Major principles of group dynamics and their effective use in education. Informal group counseling experiences for better understanding of self and others as an integral part of the course methodology. Course is graded S/U only. (Enrollment for less than 3 hours credit only with permission of the instructor.)
360 Diagnostic and Prescriptive Teaching 3 hrs.
Strengths and deficiencies of student in academic area and a program to enhance strengths and remedy weaknesses. Group and individual processes. Prerequisites: ED 263, junior standing and admission to the Teacher Education Program.

371 Teaching Elementary Language Arts 3 hrs.
An 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.

372 Teaching Elementary Social Studies 3 hrs.
Curriculum instructional approach, and materials for teaching social studies in grades 1-6. Helping beginning teachers acquire background skills in organizing and teaching units of work. Prerequisite: Admission to the teacher education program.

373 Teaching Elementary Science and Health 3 hrs.
Review of the major concepts taught in the elementary classroom in natural and health science. 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.

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 math instruction for an elementary school classroom. Prerequisite: admission to the Teacher Education Program.

375 Teaching Elementary Reading 3 hrs.
An introduction to the basic principles of reading instruction in the elementary grades including theoretical bases for instruction, methods of instruction, materials, and assessment of individual needs. Prerequisite: admission to the Teacher Education Program.

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.

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 230, 261, 263, 300, 360, three methods courses or equivalent approved courses, and an approved application for student teaching.

493 Elementary School Internship 9 hrs.
The course will focus on an apprenticeship training in a natural teaching-learning-environment. During the assignment the role of the student teacher will vary from that of being an interested observer to that of being responsible for the day-to-day teaching and learning activities within an assigned classroom. The student teacher
is expected to assimilate university training and on-the-site activities in order to synthesize methods and strategies for future professional use. A minimum of 75 clock hours of actual teaching is required. Prerequisite General Education Requirements: ED 230, 261, 263, 300, 360 and three methods courses, or equivalent.

494 Elementary School Internship
This course is essentially the same as ED 495. However, it will require a minimum of only 100 clock hours, including a minimum of some 25 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 chairman.

Middle and High School Education

494 Elementary School Internship 3 hrs.
This course is essentially the same as ED 495. However, it will require a minimum of only 100 clock hours, including a minimum of some 25 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 chairman.

408 Teaching Reading in the Content Area 3 hrs.
Provides knowledge of certain basic developmental and remedial reading skills, practices, and concepts. Extends those learned in previous, more fundamental, reading courses and shows how to apply fundamental skill and knowledge to the regular middle school/high school classroom. This will include adapting fundamentals of reading instruction to the various subject-matter areas (i.e., the sciences, social studies, English, etc.). Survey of special reading programs such as remedial reading and reading instruction as practiced in special education. Prerequisite: junior standing.

490 Senior Seminar in Education 3 hrs.
Course to be taken concurrently with student teaching. Prerequisites: ED 388 and senior standing.

495 Middle School Internship 9 hrs.
The course will focus 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 75 clock hours of actual teaching and some 300 hours overall is required. Prerequisites: all required professional educational courses should be complete before admission to the program.

496 Middle School Internship 3 hrs.
This course is essentially the same as ED 495. However, it will require a minimum of only 100 clock hours, including a minimum of 25 hours of responsible teaching. It is to be used by persons seeking dual certification or by post-graduate students seeking additional areas of endorsement. Prerequisite: permission of the Department Chair.

497 High School Internship 9 hrs.
Observation and student teaching in secondary schools. Prerequisites: ED 263, 388, 408, 510 and approved application for student teaching.
498 **High School Internship** 3 hrs.
This course is essentially the same as ED 497. However, it will require a minimum of only 100 clock hours, including a minimum of some 25 hours of responsible teaching. It is to be used by persons seeking dual certification or by post-graduate students seeking additional areas of endorsement. Prerequisite: permission of the Department Chair.

**Other Internships**

499 **N-12 Internship (Art, Music)**
Supervised teaching experience in local schools. A minimum of 75 clock hours of actual teaching and some 300 hours overall is required. Concurrent conferences arranged as needed. Prerequisite: an approved application for student teaching.

**Graduate Study in Education**
Master's degrees are available in several academic areas and in certain professional areas, all leading to State of Alabama certification at the Class A level. Some options not leading to certification are also available. See the Graduate Catalog.

522 **Space Orientation for Teachers: Elementary** 3 hrs.
532 **Space Orientation for Teachers: Secondary** 3 hrs.
600 **Special Problems in Education** 1-3 hrs.
601 **Public School Organization and Administration** 3 hrs.
602 **The Principal as Educational Leader** 3 hrs.
603 **Sources of American Educational Thought** 3 hrs.
604 **Contributions of Psychology to Education** 3 hrs.
606 **Principles of Curriculum Development** 3 hrs.
607 **The Educational Leader as Evaluator** 3 hrs.
608 **Reading in the Content Areas** 3 hrs.
610 **Legal Aspects of Public School Administration** 3 hrs.
611 **Principles of Guidance** 3 hrs.
622 **Space Orientation for Teachers: Elementary** 3 hrs.
626 **Modern Middle School Programs** 3 hrs.
630 **Modern Secondary School Programs** 3 hrs.
632 **Space Orientation for Teachers: Secondary** 3 hrs.
641 **Staff Development** 3 hrs.
647, 648, 649 **Field Experience Practicum** 1 hr. each
661 **Major Issues and Trends in Instructional Leadership** 3 hrs.
662 **Instructional Leadership** 3 hrs.
698 **High School Internship** 6 hrs.
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>532</td>
<td>Space Orientation for Teachers: Social Science</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>632</td>
<td>Space Orientation for Teachers: Social Science</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>
English Department
Professors Martin, Wilson (Linguistics); Professors Emeriti, Francis, Hutchens, Welker, Woodard; Associate Professors Moore (Chair), Mebane, Munson, Neff; Associate Professor Emerita Harrison; Assistant Professors Dillard, Mangum, Norman, Schenker; Instructors Allen, Gilroy; Lecturers Lavan, Singer, Singh, Chasteen.

The Department of English offers courses leading to a minor, a B.A. and an M.A. in English. The department also offers a Cognate Studies option in Technical Writing as well as courses in Linguistics and English Language Studies leading to certificate in Teaching English to Speakers of Other Languages (T.E.S.O.L.).

### English Major Semester Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sophomore Survey (as described in GER)</td>
<td>6</td>
</tr>
<tr>
<td>Shakespeare (EH 360)</td>
<td>3</td>
</tr>
<tr>
<td>American literature (EH 330, 331, 339, 430, 431, 532, 533)</td>
<td>3</td>
</tr>
<tr>
<td>Literature before 1800 (EH 380, 381, 450, 460, 470, 472, 474, 492, 551, 571)</td>
<td>6</td>
</tr>
<tr>
<td>Literature after 1800 (EH 330, 331, 390, 391, 418, 420, 421, 430, 493, 500, 533, 594)</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>36</td>
</tr>
</tbody>
</table>

One course in the novel is required; additional novel courses must be counted as English electives. Six semester hours must be taken in courses numbered 400 or above. Transfer students majoring in English must take at least 12 semester hours of upper division English courses (numbered 300 or above) at UAH. No more than 3 semester hours' credit in creative writing may be applied to an English major or minor without special approval. Any English course deemed appropriate by the advisor may be incorporated into the program of study. Programs of study for teacher certification are available from faculty advisers.

The English major as defined above will form a part of a program that must include one of the following variations: (1) A minor drawn from one discipline that includes a minimum of 21 semester hours, 6 hours of which must be numbered 300 or above, (2) a major from another discipline, (3) an area of cognate studies drawn from two or more disciplines that includes a minimum of 21 semester hours, of which 9 hours must be in courses numbered 300 or above.

At the beginning of the sophomore year, the English major should request an advisor for help in planning a program of study as early as possible.

### English Minor

A minor in English should include a minimum of 21 semester hours of which at least 3 hours must be taken in courses numbered 400 or above, identified as:

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic courses (GER in composition and literature)</td>
<td>12</td>
</tr>
<tr>
<td>Shakespeare (EH 360)</td>
<td>3</td>
</tr>
<tr>
<td>Course numbered 400 or above</td>
<td>3</td>
</tr>
<tr>
<td>Electives in English</td>
<td>21</td>
</tr>
</tbody>
</table>

6 hours of electives must be numbered 300 or above.

A student with a minor in English must take at least 6 semester hours of advanced English courses (numbered 300 or above) at UAH.
Cognate Studies in Technical Writing
Preparation for a career in the field of technical writing should combine intensive training in writing with practical experience and fundamental technical skills. The 21-hour cognate studies curriculum brings together all three. All students must take EH 301 (Technical Writing), EH 302 (Technical Editing), and EH 320 (Practicum in Writing) in sequence. Students from any major may enroll. Those with non-technical majors should plan early to take courses in technical or scientific fields. Students with technical majors should consult the Coordinator of Business and Technical Writing for current requirements. A typical program for a non-technical major is:

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Writing (EH 301)</td>
<td>3</td>
</tr>
<tr>
<td>Technical Writing (EH 302)</td>
<td>3</td>
</tr>
<tr>
<td>Language Course (EH 307 or 508)</td>
<td>3</td>
</tr>
<tr>
<td>Practicum in Writing (EH 320)</td>
<td>3</td>
</tr>
<tr>
<td>Technical Courses (in Science, Math, Computer)</td>
<td>9</td>
</tr>
</tbody>
</table>

21

English for Second Area of Study
Students majoring in elementary or secondary education may select English as their second area of study. This area consists of minimum of fifteen hours beyond the freshman composition requirement (EH 101 and 102) and the sophomore literature requirement (EH 205 and 230). These hours must be in courses numbered 300 or above and must be selected from the courses listed below with the approval of a faculty advisor in the Education Department and the chair of the English Department.

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>American literature (EH 330, 331, 339, 430, 431, 530, 532, 533)</td>
<td>3</td>
</tr>
<tr>
<td>Shakespeare (EH 360)</td>
<td>3</td>
</tr>
<tr>
<td>Structure of Modern English (EH 307)</td>
<td>3</td>
</tr>
<tr>
<td>Literature before 1800 (EH 380, 381, 418, 450, 460, 470, 472, 474, 492, 551, 571, 572)</td>
<td>6</td>
</tr>
<tr>
<td>Literature after 1800 (EH 330, 331, 390, 391, 418, 420, 421, 430, 492, 493, 500, 532, 533, 595, 594)</td>
<td>6</td>
</tr>
</tbody>
</table>

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

Graduate Program
For information on the graduate degree program in English, see the UAH Graduate Catalog.

English (EH)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>003 Basic English</td>
<td>No credit</td>
<td>Required for students whose placement test score or class performance indicates the need of remedial work.</td>
</tr>
<tr>
<td>101 Freshman Composition</td>
<td>3 hrs.</td>
<td>Emphasis on writing, including at least one documented paper; readings in the essay and other non-fiction prose models. Prerequisite: placement.</td>
</tr>
<tr>
<td>102 Freshman Composition</td>
<td>3 hrs.</td>
<td>Emphasis on writing related to close critical reading of fiction, drama, and poetry. Prerequisite: EH 101.</td>
</tr>
</tbody>
</table>
105 Honors English Seminar
Interpretive and comparative readings in texts of enduring intellectual, esthetic, and ethical importance; critical and analytic writing and research. Prerequisite: formal admission to the University Honors Program.

Courses below are open to students who have completed 6 hours of freshman composition, with exceptions as indicated.

205 Survey of English Literature 3 hrs.
Anglo-Saxon period through Milton.

206 Survey of English Literature 3 hrs.
Restoration through twentieth century.

210 Fiction Writing 3 hrs.
Practice in writing of fiction from conception to revision. Prerequisites: EH 206 and approval of instructor.

230 Survey of American Literature 3 hrs.
Survey of writers, genres, and periods from the Puritans to the present day.

240 World Literature 3 hrs.
Selected major contributions to Western civilization; Homer to the Renaissance.

241 World Literature 3 hrs.
Selected major contributions to Western civilization; Rabelais to the present.

242 Mythology 3 hrs.
Archetypal, metaphorical, and historical significance of deities and myths.

250 Honors World Literature Seminar I: 3 hrs.
Major texts from the Ancient World to 1700. Prerequisite: EH 105 or admission to Honors Program.

251 Honors World Literature Seminar II: 3 hrs.
Major texts from 1700 to the present. Prerequisite: EH 105 or admission to Honors Program.

300 Strategies for Business Writing 3 hrs.
Practical business writing with emphasis on rhetoric, organization, and research. Prerequisites: 6 hours of freshman composition; CM 113, BIB 230, 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: Level 4.

301 Technical Writing 3 hrs.
Practical writing, especially technical or scientific reports and proposals, with emphasis on organization, research, and presentation. Prerequisites: EH 101 and junior standing; EH 102 recommended. Does not count toward English minor except for Cognate Studies in Technical Writing. Lab fee: Level 4.

302 Technical Editing 3 hrs.
Clarifying, expanding, reducing, and rewriting technical reports and other documents created by others. Emphasis on elements of style and usage, revision, proofreading, and application of rhetorical techniques to the work of engineers, scientists, and technicians. Prerequisites: EH 300 or EH 301. Does not count toward English minor except for cognate studies in technical writing. Lab fee: Level 4.
307 Structure of Modern English 3 hrs.
Analysis and description of major aspects of the phonological, morphological, and syntactic components of Modern English. An eclectic grammatical approach which includes traditional, structural, and transformation grammar. Emphasis is on analysis and practical application of grammar. Prerequisite: successful completion of basic English requirements or approval of the instructor.

310 Advanced Fiction Writing 3 hrs.
Workshop in advanced fiction writing. Prerequisite: Approval of instructor.

320 Practicum in Writing 1-3 hrs.
Writing and editing under the supervision of professionals. May be repeated up to three separate terms for no more than 3 hours total credit. Prerequisites: EH 301, EH 302, enrollment for Cognate Studies in Technical Writing, permission of the Coordinator of Business and Technical Writing, and a successful interview with the participating technical supervisor. Enrollment requires advance planning. Does not count toward English minor except for Cognate Studies in Technical Writing.

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

330 Major American Writers 3 hrs.
Major writers from the Colonial period to Whitman and Melville.

331 Major American Writers 3 hrs.
Dickinson to Eliot and Faulkner.

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.

345 Special Topics in Film, Literature, and Film Theory 3 hrs.
Offered periodically on varying topics.

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.
Dryden, Swift, Pope, and others.

381 Later Eighteenth Century 3 hrs.
Johnson, Boswell, and others.

390 The Romantic Period 3 hrs.
Poetry and nonfictional prose, 1780-1832.

391 The Victorian Period 3 hrs.
Poetry and nonfictional prose, 1832-1901.

418 Representative Texts by Women Writers 3 hrs.
Focus on women’s contribution to the literary tradition.

190
<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>418</td>
<td>Representative Texts by Women Writers</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Focus on women's contribution to the literary tradition.</td>
<td></td>
</tr>
<tr>
<td>420</td>
<td>Modern Poetry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>American and British poetry from the 1890's to the present—Yeats, Pound, Eliot, Frost, Stevens, and others. Poets will be studied against the background of the social, political, and technological revolutions that characterize the present century.</td>
<td></td>
</tr>
<tr>
<td>421</td>
<td>Modern Drama</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>New movements in drama from Ibsen to the present.</td>
<td></td>
</tr>
<tr>
<td>430</td>
<td>The American Novel</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Theme and form of the American novel from Cooper to James.</td>
<td></td>
</tr>
<tr>
<td>431</td>
<td>The American Novel</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Representative works from the school of naturalism to the present.</td>
<td></td>
</tr>
<tr>
<td>450</td>
<td>Chaucer</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>The Canterbury Tales and other major works.</td>
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</tr>
<tr>
<td>460</td>
<td>Sixteenth-Century Poetry and Prose</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>More, Wyatt, Sidney, Spenser, and others.</td>
<td></td>
</tr>
<tr>
<td>470</td>
<td>Milton</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Milton's minor poems, selected prose, and Paradise Lost. Recommended prerequisite: one upper level English course.</td>
<td></td>
</tr>
<tr>
<td>472</td>
<td>Seventeenth-Century Poetry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Seventeen-century poetry, excluding Milton.</td>
<td></td>
</tr>
<tr>
<td>474</td>
<td>Seventeenth-Century Prose 1600-1660</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Major prose writers of the period, with emphasis on the transitional nature of their ideas and styles, and on rhetorical background and genres. Recommended prerequisite: one upper level English course.</td>
<td></td>
</tr>
<tr>
<td>492</td>
<td>The English Novel</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Defoe to Jane Austen: critical reading of representative novels accompanied by historical study of the emergence of the genre.</td>
<td></td>
</tr>
<tr>
<td>493</td>
<td>The English Novel</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Dickens through Hardy: critical reading of representative novels accompanied by historical survey of major trends.</td>
<td></td>
</tr>
</tbody>
</table>

Courses listed below are for undergraduate students of exceptional ability or who have senior standing.
Graduate students in these courses are given additional assignments and are expected to perform at a higher level.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>Literary Criticism and Theory</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Representative texts and approaches from Plato to the present.</td>
<td></td>
</tr>
<tr>
<td>501</td>
<td>Special Topics in Writing</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Analysis and research on a topic to be announced in advance.</td>
<td></td>
</tr>
</tbody>
</table>
505  Survey of General Linguistics 3 hrs.
A survey of the field of linguistics, including language typology, distribution of major languages of the world, cognition, topics in socio- and psycholinguistics, theories of grammar, and an introduction to writing mini-grammars. Course draws on comparative examples of English with other world languages. Prerequisite: junior-senior or graduate standing.

506  Introduction to Old English 3 hrs.
Introduction to the phonology, morphology, and syntax of Old English; intensive reading of Old English prose and verse text which characterize the Anglo-Saxons. Prerequisite: EH 508 recommended.

Traditional, structural, and transformational approaches to Modern English. Emphasis on theoretical concepts of grammar and the underlying analytical models used in describing language.

508  History of the English Language 3 hrs.
Phonological, morphological, syntactic, and semantic changes in the English historical events that have influenced and effected these changes.

530  Special Studies in American Literature 3 hrs.
Intensive study of one or more writers, groups, or movements; announced in advance. Prerequisite: junior standing.

532  Southern Literature 3 hrs.
Selected figures and movements from colonization to the present. Prerequisite: junior standing.

533  William Faulkner 3 hrs.
Biography, background, and critical study of the major novels.

540  Special Studies in English Literature 3 hrs.
Intensive study of one or more writers, groups, movements; announced in advance. Prerequisite: junior standing.

551  Middle English Literature 3 hrs.
The literature of later medieval England, excluding Chaucer, chosen from the Gawain poet, Malory, romance and dream vision, the drama, and the short poem.

571  Renaissance Drama 3 hrs.
Major plays of the sixteenth and early seventeenth centuries, including Marlowe, Jonson, and others. Excludes Shakespeare.

Major novelists: their depiction of reality in response to the post-Darwinian world.

609  Applied English Linguistics II: Strategies for Research and Teaching in TESOL 3 hrs.

610  Applied English Linguistics III: Practicum in TESOL 3 hrs.

620  Studies in Modern Poetry 3 hrs.

630  Studies in American Literature to 1865 3 hrs.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>631</td>
<td>Studies in American Literature since 1865</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>649</td>
<td>Special Studies</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>650</td>
<td>Chaucer</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>660</td>
<td>Shakespeare</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>665</td>
<td>Renaissance Poetry and Prose</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>670</td>
<td>Milton</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>680</td>
<td>Eighteenth-Century Studies</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>690</td>
<td>Studies in English Romanticism</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>691</td>
<td>Studies in the Victorian Period</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>699</td>
<td>Master's Thesis</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

**English as a Second Language (ESL) Courses**

The English Department offers courses in English as a Second Language (ESL) for those non-native speakers of English who need to improve their English language skills. ESL 101 and 102 are designed primarily to assist students to improve their oral production, aural comprehension, and vocabulary; ESL 103 and 104 are designed to assist students in improving their reading comprehension and composition skills. Placement tests are given prior to the commencement of quarters; 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.

ESL courses are offered at the intermediate/advanced levels; ESL courses at the beginning level are offered through the Division of Continuing Education.

**ESL (English as a Second Language)**

**101 ESL Spoken English I**

Course in spoken English emphasizing the sound system (including pronunciation, intonation patterns, basic sentence patterns and their transforms, and vocabulary improvement expansion). Includes general conversational topics and topics directly related to the academic environment. Prerequisite: Minimum of mid-beginning ESL oral-aural English skills.

**102 ESL Spoken English II**

A course in spoken English for non-native speakers at the midintermediate to mid-advanced ESL level. Course emphasizes oral English used in the academic environment and prepares students to participate freely in classroom discussions, on panels, and in interviews. Prerequisite: Minimum of mid-intermediate skills in ESL oral-aural skills.

**103 ESL Composition I**

A course in basic composition emphasizing those skills necessary to write effective sentences and paragraphs. This course includes basic mechanics, vocabulary expansion, and the concepts of unity and coherence. Students receive an introduction to planning and writing compositions. Prerequisite: mid-beginning to mid-intermediate ESL composition skills.
An advanced ESL composition course designed to further the writing skills of non-native speakers. This course provides the student with instruction and practice in writing whole works, essays, research papers. It focuses on both form and content. Prerequisite: mid-intermediate to advanced ESL composition skills.

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 (T.E.S.O.L). Students may select a set of courses which will provide them with a background in Linguistics, English Language, Old English, and Middle English. For those who are interested in the Teaching of English to Speakers of Other Languages (T.E.S.O.L.), the department offers a certificate in T.E.S.O.L. in conjunction with M.A. degree. Interested undergraduates may take courses which would be helpful, should they eventually want to go on for the T.E.S.O.L. certificate and M.A. degree. Such students should consult with the chairperson or the director of the T.E.S.O.L. Program.
Foreign Languages and Literatures Department

Professor White (acting chair), Professor Emeritus Penot; Associate Professor Emerita Heller, Associate Professor Goebel; Assistant Professors Cachan, Hahn, Helms, Nielsen, Stromecky, Traylor.

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

Acquisition of a second language, and through it an understanding of another culture, is not only a personally enriching experience, it is also, today, a valuable and salable commodity.

The language programs are designed to enable effective use of modern foreign language, both oral and written, in social, business and professional life.

The department offers the B.A. in French and German, minors in French, German, Russian, and Spanish, and participates in the Russian Area Studies Program, a B.A. degree program. A composite major in Foreign Languages and International Trade (in cooperation with the College of Administrative Science) with French, German, Russian, or Spanish is also available and leads to a B.A. degree. *Japanese and Latin courses can be taken to satisfy the language requirements or as electives.

General Education Requirements and Placement Procedures

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

Students who studied a foreign language in high school will be placed on four (4) different levels according to the chart shown below:

Any student taking a language course at a level lower than official placement will receive no degree credit for such course(s).

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

*Minimum grade of C required for a unit to be counted.

Native and quasi-native speakers of a language may not take an introductory course, nor the first advanced conversation course in that language. Students in this category must make an appointment with the appropriate language coordinator for placement purposes. 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.

Foreign Language Major

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

A student seeking teacher certification in a language must take 36 semester hours of credit in the language of choice. Nine hours or three courses must be at the 300 level and six hours...
or two courses must be at the 400 level. See further instructions under Programs involving Teacher Education/Certification.

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

**Foreign Language Minor**

A foreign language minor consists of 12 semester hours above the basic-course sequence in a single language. Students beginning the language on the 101 level must take a total of 24 semester hours. Conversation, advanced grammar and composition, and one of the introduction to literature courses are required. An additional course on the 300 or 400 level completes the requirement for the minor. Students beginning the language on the 300 level must still take a total of 21 hours even if they exceed the 12 hours above the basic course sequence normally required for a minor.

**Program of Study Models**

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

**Program of Study with French Major**

Required courses: FH 301, 302, 305, 306, three courses on the 400 level, and one elective from either the 300 or 400 level.

**Program of Study with German Major**

Required courses: GN 301, 302, 305, 306, three courses on the 400 level, and one elective from either the 300 or 400 level.

**Program of Study with Slavic Area Studies Major**

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

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

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

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN 101, 102, 201, 202, 301, 302, 304, 305, 306, and three 400-level courses</td>
</tr>
<tr>
<td>HY 101, 102, 375, 376, 479 and 490</td>
</tr>
<tr>
<td>PSC 101, 135, and nine hours drawn from 246, 336, 337 and 338</td>
</tr>
<tr>
<td><strong>Total 69</strong></td>
</tr>
</tbody>
</table>
In addition to the general education requirements for the B.A. degree, the student’s program must include the following courses:

**Foreign Languages**
- Intermediate Foreign Language (French, German, Russian or Spanish) 6 Hrs.
- 301 Conversation 3 Hrs.
- 302 Advanced Composition 3 Hrs.
- 303 Business and Professions 3 Hrs.
- 304 Culture 3 Hrs.
- 305 or 306 Survey of Literature 3 Hrs.
- 400 Foreign Language Electives 6 Hrs.
- 410 Practicum 3 Hrs.

Total 30 Hrs.

**Administrative Science Cognate**
- ECN 142, 143 Principles of Economics 6 Hrs.
- ACC 211, 221 Principles of Accounting I 3 Hrs.
- ACC 212, 222 Principles of Accounting II 3 Hrs.
- BLS 211 Legal Environment of Business 3 Hrs.
- FIN 301 Principles of Finance 3 Hrs.
- MGT 301 Principles of Management 3 Hrs.
- MKT 301 Principles of Marketing 3 Hrs.
- Administrative Science/International Business elective (one course selected from FIN 454, MGT 450, or MKT 415) 3 Hrs.

Total 27 Hrs.*

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

**Other Requirements**
- AHS 300 Statistical Analysis 3 Hrs.
- HY 392 Europe Since 1815 3 Hrs.
- HY 479 Modern Europe 3 Hrs.
- HY 490 Research Seminar in History 3 Hrs.
- PSC 343 International Law and Organization 3 Hrs.

One of the following appropriate to language studied:
- HY 337 Contemporary Latin America 3 Hrs.
- HY 341 Modern France 3 Hrs.
- HY 343 Modern Germany 3 Hrs.
- HY 376 Twentieth Century Russia 3 Hrs.

Total 18 Hrs.

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

**Programs Involving Teacher Education/Certification**
A student majoring in Elementary Education may utilize French, German, Russian or Spanish for a Cognate area (second area of study). The cognate area in foreign languages will total 27 hours and must include 15 hours 300 or above level courses, 9 hours of which must be 300 level courses and 6 hours which must be 400 level courses. A student seeking
certification in Middle/Junior High School Education or High School Education who wishes to have a single teaching field in French, German, Russian or Spanish must conform to the requirements of a language major.

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

### French (FH)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Elementary French I</td>
<td>3 hrs.</td>
<td>Lab fee: Level 3.</td>
</tr>
<tr>
<td>102</td>
<td>Elementary French II</td>
<td>3 hrs.</td>
<td>Lab fee: Level 3. Prerequisite: FH 101 or placement.</td>
</tr>
<tr>
<td>201</td>
<td>Intermediate French I</td>
<td>3 hrs.</td>
<td>Lab fee: Level 3. Prerequisite: FH 102 or placement.</td>
</tr>
<tr>
<td>202</td>
<td>Intermediate French II</td>
<td>3 hrs.</td>
<td>Lab fee: Level 3. Prerequisite: FH 201 or placement.</td>
</tr>
<tr>
<td>302</td>
<td>Advanced French Composition</td>
<td>3 hrs.</td>
<td>Composition with emphasis on grammar review and idiomatic expression. Prerequisite: FH 202, or approval of instructor.</td>
</tr>
<tr>
<td>303</td>
<td>French for Business and Professions</td>
<td>3 hrs.</td>
<td>The reading and translation of materials, documents, and forms pertinent to commerce and professions. Prerequisite: FH 202 or approval of instructor.</td>
</tr>
<tr>
<td>304</td>
<td>French Culture</td>
<td>3 hrs.</td>
<td>Cultural patterns of French-speaking peoples. Prerequisite: FH 202 or approval of instructor.</td>
</tr>
<tr>
<td>305</td>
<td>Survey of French Literature I</td>
<td>3 hrs.</td>
<td>French literature from the medieval period through the eighteenth century. Prerequisite: FH 301, FH 302 or approval of instructor.</td>
</tr>
<tr>
<td>306</td>
<td>Survey of French Literature II</td>
<td>3 hrs.</td>
<td>French literature from 1800 to the present. Prerequisite: FH 301, FH 302 or approval of instructor.</td>
</tr>
<tr>
<td>403</td>
<td>Sixteenth Century French Literature</td>
<td>3 hrs.</td>
<td>Intellectual, philosophical, and aesthetic trends and developments in Renaissance France, using representative works of the period. Prerequisite: FH 305 or 306 or approval of instructor.</td>
</tr>
<tr>
<td>404</td>
<td>Seventeenth Century French Literature</td>
<td>3 hrs.</td>
<td>Masterpieces of the period with emphasis on the plays of Corneille, Racine, and Moliere. Prerequisite: FH 305 or 306 or approval of instructor.</td>
</tr>
</tbody>
</table>
### Eighteenth Century French Literature 3 hrs.
French thought and writing in le Siècle des Lumières. Representative works from Voltaire to Chenier. Prerequisite: FH 305 or 306 or approval of instructor.

### Nineteenth Century French Novel 3 hrs.
Principal novelists of the nineteenth century: Balzac, Stendhal, Flaubert, Zola. Prerequisite: FH 305 or 306 or approval of instructor.

### French Drama 3 hrs.
The most influential French dramatists from the nineteenth century to the present. Prerequisite: FH 305 or 306 or approval of instructor.

### Twentieth Century French Novel 3 hrs.
The most influential French novelists from the beginning of the century to the present. Prerequisite: FH 305 or 306 or approval of the instructor.

### Famous Women Writers 3 hrs.
Famous feminine writers throughout French literature: Madame de LaFayette, Madame de Sevigne, Madame de Stael, Colette, Georges Sand, Françoise Sagen, Natalie Sarraute. Prerequisite: approval of instructor.

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

### Independent Studies 1-3 hrs.
Prerequisite: approval of department chairman.

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### German (GN)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Elementary German I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab fee: Level 3</td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>Elementary German II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab fee: Level 3 Prerequisite: GN 101 or placement.</td>
<td></td>
</tr>
<tr>
<td>201</td>
<td>Intermediate German I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab fee: Level 3 Prerequisite: GN 102 or placement.</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>Intermediate German II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab fee: Level 3 Prerequisite: GN 201 or placement.</td>
<td></td>
</tr>
<tr>
<td>301</td>
<td>German Conversation</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Oral practice, communication and reports, emphasizing topics of daily experiences, travels, and contemporary German life. Prerequisite: GN 202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>302</td>
<td>Advanced German Composition and Usage</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Composition with emphasis on grammar review and idiomatic expression. Prerequisite: GN 202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>303</td>
<td>German for Business and Professions</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>The reading and translation of materials, documents, and forms pertinent to commerce and the professions. Prerequisite: GN 202 or approval.</td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Hours</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------</td>
</tr>
<tr>
<td>304</td>
<td>German Culture</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>German cultural patterns: their cause and effect. Prerequisite: GN 202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>305</td>
<td>Survey of German Literature I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>German literature from its beginning to 1785. Prerequisite: GN 301 or GN 302 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>306</td>
<td>Survey of German Literature II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>German literature from the end of the eighteenth century to the present. Prerequisite: GN 301 or GN 302 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>410</td>
<td>Practicum</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Student oral presentations, guest speakers, periodicals and brochures are utilized for instructional purposes. Prerequisite: GN 303 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>412</td>
<td>Goethe, Schiller and Major Writers of Eighteenth Century</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Contributions of Goethe and Schiller to German literature compared with significant works of other writers of the era. Prerequisite: GN 305 or 306 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>413</td>
<td>German Romanticism</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>German literature of the romantic period, its philosophy and theory. Prerequisite: GN 305 or 306 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>414</td>
<td>The German “Novelle” from Goethe to Kafka</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Important literary genre using representative novellas of the nineteenth and twentieth centuries. Prerequisite: GN 305 or 306 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>416</td>
<td>Twentieth Century German Literature</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Writers and works of the twentieth century with emphasis on post World War II German literature. Prerequisite: GN 305 or 306 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>418</td>
<td>Modern German Drama</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>German drama from the nineteenth century to present showing development and diversity of modern German drama. Prerequisite: GN 305 or 306 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>419</td>
<td>German Poetry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Interpretation of selected masterpieces of major German poets from the seventeenth to the twentieth centuries. Prerequisite: GN 305 or 306 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>499</td>
<td>Independent Studies</td>
<td>1 - 3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: approval of department chairman.</td>
<td></td>
</tr>
</tbody>
</table>

**Japanese (JE)**

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

**Latin (LN)**

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

**Russian (RN)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Elementary Russian I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab fee: Level 3.</td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>Elementary Russian II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab fee: Level 3. Prerequisite: RN 101 or placement.</td>
<td></td>
</tr>
<tr>
<td>201</td>
<td>Intermediate Russian I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Lab fee: Level 3. Prerequisite: RN 102 or placement.</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>Intermediate Russian II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: RN 201 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>301</td>
<td>Russian Conversation</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: RN 202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>302</td>
<td>Advanced Grammar and Composition</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: RN 202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>303</td>
<td>Russian for Business and Professions</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>The reading and translation of (two-way) materials, documents, and forms pertinent to commerce and the professions. Individualized instruction. Prerequisite: RN 202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>304</td>
<td>Russian Culture</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Russian cultural patterns: their cause and effect. Prerequisite: RN202 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>305</td>
<td>Survey of Russian Literature I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Russian literature from its beginning to Pushkin. Prerequisite: RN 301 or RN 302 or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>306</td>
<td>Survey of Russian Literature II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Russian literature from Pushkin to the present. Prerequisite: RN 301 or RN 302 or approval of instructor.</td>
<td></td>
</tr>
</tbody>
</table>
410 Practicum 3 hrs.
Student oral presentations, guest speakers, periodicals and brochures are utilized for instructional purposes. Prerequisite: RN 303 or approval of instructor.

433 Major Writers of the Nineteenth Century 3 hrs.
Representative works from Pushkin through Chekhov. Prerequisite: RN 305 or 306 or approval of instructor.

438 Russian Poetry 3 hrs.
Russian verse from its beginning to Pushkin. An examination of Russian literary-poetic language, with consideration of the role of Church Slavonic, regional dialects, and foreign influences as well as the contribution of particular authors. Prerequisite: RN 202.

439 Gogol 3 hrs.
Gogol's major works, especially Dead Souls. An examination of his style, philosophy and technique. Prerequisite: RN 305 or 306 or approval of instructor.

440 Dostoevsky 3 hrs.
Major works by Dostoevsky, regarding style, ideology, philosophies, and technique. Prerequisite: RN 305 or 306 or approval of instructor.

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

Spanish (SH)

101 Elementary Spanish I 3 hrs.
Lab fee: Level 3.

102 Elementary Spanish II 3 hrs.
Lab fee: Level 3. Prerequisite: SH 101 or placement.

201 Intermediate Spanish I 3 hrs.
Lab fee: Level 3. Prerequisite: SH 102 or placement.

202 Intermediate Spanish II 3 hrs.
Lab fee: Level 3. Prerequisite: SH 201 or placement.

301 Spanish Conversation and Pronunciation 3 hrs.
Prerequisite: SH 202 or approval of instructor.

302 Advanced Spanish Grammar and Composition 3 hrs.
Composition with emphasis on grammar review and idiomatic expressions. Prerequisite: SH 202 or approval of instructor.

303 Spanish for Business and Professions 3 hrs.
The reading and translation of materials, documents, and forms pertinent to commerce and the professions. Prerequisite: SH 202 or approval of instructor.

304 Hispanic Culture 3 hrs.
Study of Hispanic cultural patterns. Prerequisite: SH 202 or approval of instructor.

305 Survey of Spanish Literature I 3 hrs.
Spanish literature from the beginning to 1700. Prerequisite: SH 301 or SH 302 or approval of instructor.
306 Survey of Spanish Literature II 3 hrs.
Spanish literature from 1700 to the present. Prerequisite: SH 301 or SH 302 or approval of instructor.

410 Practicum 3 hrs.
Student oral presentations, guest speakers, periodicals, and brochures are utilized for instructional purposes. Prerequisite: SH 305 or 306 or approval of instructor.

423 Cervantes 3 hrs.
Study of this famous writer and his extraordinary significance in Spanish literature. Prerequisite: SH 305 or 306 or approval of instructor.

424 Golden Age Drama 3 hrs.
Drama of the sixteenth and seventeenth centuries, with emphasis on the major dramatists: Lope de Vega, Tirso, and Calderon. Representative works. Prerequisite: SH 305 or 306 or approval of instructor.

427 Spanish American Novel 3 hrs.
Representative novels of the modern and contemporary period. Prerequisite: SH 305 or 306 or approval of instructor.

429 The Generation of '98 3 hrs.
The study of the major Spanish writers from the late nineteenth and early twentieth centuries. Prerequisite: SH 305 or 306 or approval of instructor.

499 Independent Studies 1-3 hrs.
Prerequisite: approval of Department Chair.

Health and Physical Education Program
Director: Dr. Joe Manjone

Health and Physical Education Offerings
Fitness, active participation, and good health habits are essential in modern society. Through a variety of health and physical education activity courses, (HPE 100 through 199) the student can increase fitness, learn skills for a lifetime of participation, and gain a conceptual knowledge of health practices and skills.

Activity Courses
These activity courses carry 1 semester hour of credit with no more than 6 hours counting toward graduation. In the College of Science, no more than 3 hours may count toward graduation. Courses may not be repeated for credit except for varsity sports credit. Grades of satisfactory or unsatisfactory are given, based primarily on a student's improvement in skill rather than on the level of ability or knowledge brought to the course. A participant in a varsity sport may not enroll in a regular activity course in that sport.

Professional Training Courses
Because of demonstrated community need, courses (HPE 200 through 500) that provide professional training in aspects of Health and Physical Education and related fields are offered in the HPE program. Many of these courses meet certification standards with certificates awarded upon completion. They require both skill and academic training. Normal letter-grade system and other academic standards apply to such courses.

203
<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Lab Fee</th>
<th>Credits</th>
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<tbody>
<tr>
<td>100</td>
<td>Fitness Enhancement; Lab fee: Level 1</td>
<td></td>
<td>1 hr.</td>
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<tr>
<td>101</td>
<td>Slimnastics; Lab fee: Level 1</td>
<td></td>
<td>1 hr.</td>
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<tr>
<td>102</td>
<td>Aerobic Dance I; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>103</td>
<td>Jogging for Fitness and Weight Control; Lab fee: Level 1</td>
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<tr>
<td>104</td>
<td>Beginning Weight Training; Lab fee: Level 1</td>
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<tr>
<td>105</td>
<td>Beginning Karate; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>106</td>
<td>Beginning T’ai Chi; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>107</td>
<td>Beginning Stunts and Tumbling; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>108</td>
<td>Yoga; Lab fee: Level 1</td>
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<tr>
<td>109</td>
<td>Bicycle Touring; Lab fee: Level 1</td>
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<td>110</td>
<td>Beginning Swimming; Lab fee: Level 2</td>
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<tr>
<td>111</td>
<td>Slimnastics; Lab fee: Level 1</td>
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<tr>
<td>113</td>
<td>Basic Sailing; Lab fee: Level 3</td>
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<tr>
<td>114</td>
<td>Sailboat Cruising; Lab fee: variable</td>
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<tr>
<td>115</td>
<td>Badminton; Lab fee: Level 1</td>
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<tr>
<td>116</td>
<td>Racquetball; Lab fee: Level 1</td>
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<tr>
<td>117</td>
<td>Beginning Tennis; Lab fee: Level 1</td>
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<tr>
<td>118</td>
<td>Wilderness Survival; Lab fee: Level 2</td>
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<tr>
<td>119</td>
<td>Windsurfing; Lab fee: Level 3</td>
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<td>120</td>
<td>Beginning Roller Skating; Lab fee: Level 1</td>
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<tr>
<td>121</td>
<td>Ice Skating; Lab fee: Level 1</td>
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<tr>
<td>122</td>
<td>Social Dance; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>123</td>
<td>Frisbee; Lab fee: Level 1</td>
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<td>124</td>
<td>Backpacking; Lab fee: Level 2</td>
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<tr>
<td>125</td>
<td>Basic Horseback Riding; Lab fee: Level 12 (all-weather indoor arena available.)</td>
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<tr>
<td>126</td>
<td>Beginning Golf; Lab fee: Level 6</td>
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<tr>
<td>127</td>
<td>Beginning Bowling; Lab fee: Level 3</td>
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<tr>
<td>128</td>
<td>Spelunking; Lab fee: Level 1</td>
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<tr>
<td>129</td>
<td>Snow Skiing; Lab fee: Variable</td>
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<td>130</td>
<td>Basketball; Lab fee: Level 1</td>
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<td>131</td>
<td>Volleyball; Lab fee: Level 1</td>
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<tr>
<td>132</td>
<td>Softball; Lab fee: Level 1</td>
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<tr>
<td>133</td>
<td>Soccer; Lab fee: Level 1</td>
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<tr>
<td>134</td>
<td>Ice Hockey Instruction; Lab fee: Level 4</td>
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<tr>
<td>135</td>
<td>Sport Parachuting; Lab fee: Level 1</td>
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<tr>
<td>136</td>
<td>Jazz Dance; Lab fee: Level 1</td>
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<tr>
<td>137</td>
<td>Intermediate Jazz Dance; Lab fee: Level 1</td>
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<tr>
<td>138</td>
<td>Fencing; Lab fee: Level 4</td>
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<tr>
<td>139</td>
<td>Hand Gliding Fundamentals; Lab fee: Level 1</td>
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<td>140</td>
<td>Intermediate Ice-Skating; Lab fee: Level 4</td>
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<tr>
<td>141</td>
<td>Intermediate Swimming; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>142</td>
<td>Intermediate Karate; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>143</td>
<td>Intermediate Tennis; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>144</td>
<td>Intermediate Racquetball; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>145</td>
<td>Intermediate Swimming; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>146</td>
<td>Intermediate Stunts and Tumbling; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>147</td>
<td>Intermediate Golf; Lab fee: Level 6</td>
<td></td>
<td>1 hr.</td>
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<tr>
<td>148</td>
<td>Intermediate Roller Skating; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<tr>
<td>149</td>
<td>Aerobic Dance II; Lab fee: Level 1</td>
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<tr>
<td>150</td>
<td>Advanced Lifesaving; Lab fee: Level 1</td>
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<tr>
<td>151</td>
<td>Advanced Tennis; Lab fee: Level 1</td>
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<td>152</td>
<td>Advanced Karate; Lab fee: Level 1</td>
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<tr>
<td>153</td>
<td>Advanced Swimming; Lab fee: Level 1</td>
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<tr>
<td>154</td>
<td>Advanced Racquetball; Lab fee: Level 1</td>
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<tr>
<td>155</td>
<td>Ballet; Lab fee: Level 1</td>
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<tr>
<td>156</td>
<td>Advanced Weight Training; Lab fee: Level 1</td>
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<td>1 hr.</td>
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<td>157</td>
<td>Advanced Bowling; Lab fee: Level 3</td>
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<tr>
<td>158</td>
<td>Advanced Ice-Skating; Lab fee: Level 4</td>
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<tr>
<td>159</td>
<td>Aerobic Dance III; Lab fee: Level 1</td>
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<tr>
<td>160</td>
<td>Intermediate T’ai Chi; Lab fee: Level 1</td>
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<td>1 hr.</td>
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161 Water-Safety Instruction; Lab fee: Level 2 1 hr.
162 Horseback Riding II - Field Riding; Lab fee: Level 12 1 hr.
163 Advanced Roller Skating; Lab fee: Level 1 1 hr.
164 Handgun Safety; Lab fee: Level 2 1 hr.
166 Karate Aerobics; Lab fee: Level 1 1 hr.
167 Intermediate Weight Training; Lab fee: Level 1 1 hr.
168 Intermediate Social Dance; Lab fee: Level 1 1 hr.
169 Basic Rowing; Lab fee: Level 1 1 hr.
170 Varsity Sports - Basketball; Lab fee: Level 1 1 hr.
171 Varsity Sports - Soccer; Lab fee: Level 1 1 hr.
172 Varsity Sports - Crew; Lab fee: Level 1 1 hr.
173 Varsity Sports - Tennis; Lab fee: Level 1 1 hr.
174 Varsity Sports - Ice Hockey; Lab fee: Level 1 1 hr.
175 Precision Dance Team; Lab fee: Level 1 1 hr.
176 Varsity Sports - Volleyball; Lab fee: Level 1 1 hr.
177 Varsity Sports - Golf; Lab fee: Level 1 1 hr.
178 Varsity Sports—Cross Country; Lab fee: Level 1 1 hr.
179 Varsity Sports - Athletic Training; Lab fee: Level 1 1 hr.
199 Special Topics in Health and Physical Education; Lab fee: Level 1 1 hr.

Professional Courses

210 Basketball Officiating 2 hrs.
Techniques, mechanics, and rules involved in officiating basketball for certification as an Alabama high school official. Experience and skill necessary to officiate basketball on elementary, secondary, and recreational levels.

211 Football Officiating 2 hrs.
Techniques, mechanics, and rules involved in officiating football for certification as an Alabama high school official. Experience and skills necessary to officiate football on elementary, secondary, and recreational levels.

212 Baseball and Softball Officiating 2 hrs.
Baseball and softball officiating techniques, mechanics, and rules for certification as an Alabama high school baseball official and an Amateur Softball Association umpire. Experience and skills necessary to officiate baseball and softball on various interscholastic and recreational levels.

213 Soccer Officiating 2 hrs.
Techniques, mechanics, and rules involved in the officiating of soccer. Experience and skills necessary to officiate soccer on elementary, secondary, and recreational levels. Lab fee: Level 1.
220 Scuba 2 hrs.
Basic skills, theories, techniques, and fundamentals of scuba-diving introduced, practiced, and refined. Open water diving. Scuba certification upon successful completion of course. Prerequisite: Instructor approval. Lab fee: Level 5.

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

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

269 Private Pilot Ground School 3 hrs.
Prepares student for FAA Private Pilot written exam. Provides student with necessary knowledge to progress into primary pilot flight training. Lab fee: Level 1.

279 Instrument Flying: Ground School 3 hrs.

280 History and Principles of Physical Education 3 hrs.

290 Care and Prevention of Athletic Injuries 3 hrs.
Provides working knowledge of the care and prevention of athletic injuries. For teachers, coaches, athletes, parents and those working in recreation, physical education, or athletics. Lab fee: Level 1.

291 CPR Instructor 1 hr.
Twenty-five hours of comprehensive techniques in the basics and instruction of cardiopulmonary resuscitation. Upon successful completion of the course, student is certified as a CPR Instructor. Lab fee: Level 3.

294 Contemporary Nutrition for Today's Lifestyle 1 hr.
Broad spectrum of nutritional topics. Nutritional philosophy, health hazards, dietary regimes. Lab fee: Level 1.

299 Field Work in Athletics, Physical Education, or Leisure Services 2 hrs.
Planned supervised 80-hour work experience with a physical education, athletic, or leisure service program. Written reports, a major project, and final oral report are required. Lab fee: Level 1.

301 Physical Fitness Assessment and Analysis 3 hrs.
Methods of Physical Fitness, Athletic Performance and Cardiovascular Disease Risk Factor Assessments and Analyses. Includes research techniques, use of laboratory equipment and testing devices. Lab fee: Level 3.

500 Boating Safety 3 hrs.
Techniques for teaching boating safety to elementary and secondary students. The Alabama Better Boating Home-study course, The Alabama young Boatmen’s Program, and water skiing safety will be stressed. Instructor's rating in boating safety will be awarded upon successful completion. Lab fee: Level 1.
History Department

Professors J. White (Chair), Boucher, Shields, C. White; Professor Emerita Roberts; Associate Professors Dunar, Williams; Associate Professor Emerita Parker; Assistant Professors Gerberding, Patton, Waring, Wren.

The Department of History offers the B.A. and M.A. degrees in history, and a minor in history.

History Major

A student in history must include in his or her academic program a minimum of 33 semester hours in history beyond HY 101-102 (GER). The U.S. survey courses, HY 221-222 are required. A student is required to take an additional 3 semester hours of sophomore work, but may take no more than a total of 12 semester hours in 200 level work including HY 221-222. A history major must take a minimum of 21 semester hours in courses numbered 300 or above; 9 semester hours must be 400 level courses, and must include HY 490. A history major is required to take a minimum of 6 semester hours in American history beyond HY 221 and 222 and a minimum of 6 semester hours in non-American history excluding HY 101-102 (GER). Students are encouraged to complete as many upper division courses as possible before enrolling in HY 490.

History students may also pursue an already approved and published composite major such as the Russian Area Studies Major. As currently established a composite major consists of a minimum of 36 semester hours 24 of which must be upper division. In the Russian Area Studies Major, history contributes beyond HY 101-102 (GER) six courses, three of which must be upper division and include HY 490, and three courses chosen by the student in conjunction with his or her history advisor from sophomore, junior or senior levels.

A student majoring in history will find a variety of programs of study enabling him or her to develop depth and breadth in history and some related areas from the other humanities, the social sciences, mathematics, and the natural sciences. Counseling is available in the History Department for programs of study including the following: graduate school preparation, general, preprofessional and prelaw preparation, international studies, secondary school teaching, and the fine arts. A student who wishes to plan his or her own program of study can do so through his history advisor and with the coordination of the Department Chair.

History Minor

A student interested in establishing a history minor should include appropriate history courses involving a minimum of 21 semester hours beyond HY 101-102 (GER) and including 12 semester hours in courses numbered 300 or above. The minor program must have the approval of the History Department chairman. Appropriate history courses may also form a part of an area of cognate studies with other disciplines to support another major program. Such a program must be approved by the student’s major department and must meet the requirement of a minimum of 12 upper division semester hours, of which 9 hours must be in history.

History for Second Area of Study

Students majoring in elementary education may select history as their second area of study. Major requirements can be found in the Education section of the catalog. Preliminary counseling is available in the Department of Education.

Graduate Program

For information on the graduate program in history, refer to the UAH Graduate Catalog.
### History (HY)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>101</td>
<td>Origins and Development of the Contemporary World, Part I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Major Western civilizations to 1500. Taught every term.</td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>Origins and Development of the Contemporary World, Part II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Major Western civilizations since 1500. Taught every term.</td>
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</table>

Courses below are open to all students other than beginning freshmen, with exceptions as indicated.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>221</td>
<td>The United States to 1877</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>The discovery of America through the Civil War and Reconstruction. Taught twice annually.</td>
<td></td>
</tr>
<tr>
<td>222</td>
<td>The United States Since 1877</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>The United States from the end of the Civil War era to the present. Taught twice annually.</td>
<td></td>
</tr>
<tr>
<td>225</td>
<td>History of Alabama</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>The state’s past from colonial times to the present with emphasis on its place in United States history.</td>
<td></td>
</tr>
<tr>
<td>229</td>
<td>Survey of Ancient Times</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>The ancient Near East, Greece, and Rome. Prerequisites: HY 101-102 or approval of instructor.</td>
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<tr>
<td>230</td>
<td>The Rise of Medieval Civilizations</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>A survey of the origins and development of the medieval world, 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.</td>
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<tr>
<td>245</td>
<td>Sub-Saharan Africa</td>
<td>3 hrs.</td>
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<td></td>
<td>A survey of the people of the land south of the Saharan Desert, especially in the Nile River Valley and along the Ivory and Gold coasts emphasizing their history, culture, and political systems.</td>
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</table>

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

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>318</td>
<td>Constitutional History of the United States</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>A study of the growth and development of the American Constitutional system with emphasis on those aspects of Constitutional growth which relate to the fundamental structure of American government and social order.</td>
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<tr>
<td>329</td>
<td>Imperial Rome</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>History of the Roman Empire from the Principate to the barbarian invasions.</td>
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<tr>
<td>337</td>
<td>Latin America and the United States</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Political and diplomatic relations between Latin America and the United States in the nineteenth and twentieth centuries.</td>
<td></td>
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<tr>
<td>341</td>
<td>Modern France</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Political, economic, social, and cultural developments from the opening of the reign of Louis XIV to the post-de Gaulle era of the Fifth Republic. Prerequisites: HY 101-102.</td>
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</table>
343 Modern Germany 3 hrs.
Modern German history from the Congress of Vienna in 1815 through the Second World War and Germany’s role in current history. Political, economic, and cultural factors in the development of the German nation. Prerequisites: HY 101 and 102.

347 English History to 1660 3 hrs.
A study of English history and society from Anglo-Saxon times to the Restoration with attention to the origins and evolution of governmental and legal institutions such as monarchy, common law, parliament, and the judiciary. Prerequisites: HY 101 and 102.

348 English History since 1660 3 hrs.
A study of the impact of revolution, industrialization and war on English society, the expansion of English liberties, and the development of the cabinet, political parties, the empire and the welfare state. Prerequisites: HY 101 and 102.

364 The Westward Movement in American History since 1803 3 hrs.
Pioneering society, Indian relations, land policies, expansion, and politics of the westward-moving frontier.

366 Blacks in Twentieth Century America 3 hrs.
The interrelationship of the Negro and the industrial-urban environment of the United States.

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

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

373 Foreign Relations of the United States to 1900 3 hrs.
American foreign relations from the Revolutionary era to the emergence of the United States as a world power. American territorial and commercial expansion and relations with the European powers.

374 Foreign Relations of the United States since 1900 3 hrs.
The United States as a world power. American involvement in both world wars, the development of the Cold War, and the growth of American presence in Asia and Latin America.

375 Imperial Russia 3 hrs.
The formation and development of the Russian Empire from the reign of Peter the Great until the Revolution of 1905. The multinational character of the Empire and its manifestation in political, economic, and cultural aspects of Russian life. Prerequisites: HY 101 and 102.

376 Twentieth-Century Russia 3 hrs.
The last years of Imperial rule, the constitutional experiment, World War I and the resulting revolutions of 1917, the rise and development of the Soviet Union from its inception until the present. Prerequisites: HY 101 and 102.
391 Europe, 1500-1815 3 hrs.
An examination of the economic, commercial, scientific, social, political, and cultural developments in Europe from the Renaissance to the close of the Napoleonic Wars.

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

Courses listed below are open to students who have completed 15 semester hours in history or 12 semester hours in history with senior standing.

413 The Old South 3 hrs.
A study of southern society, economics, politics and culture concentrating on the nineteenth century South through Reconstruction.

414 The New South 3 hrs.
A study of the post-Reconstruction South emphasizing the economic, social, and political readjustments made during the twentieth century.

424 The Atlantic World 3 hrs.
A survey in a comparative framework of the West European colonial empires from 1500 to 1763. Emphasis on the cultural interaction of African, Amerindian and European peoples. Character of slavery and the plantation colonies, the impact of the old world on the new, the maturation of the old colonial systems.

426 Colonial America 3 hrs.
A study of the development of political, religious, and economic institutions in the United States, 1607-1763.

427 The Age of the American Revolution 3 hrs.
A study of political, economic, military, social, and cultural developments in the revolutionary period of American history, 1763-1789.

428 The Early American Republic 3 hrs.
A study of political, social, and economic changes in the United States and its sections from the adoption of the Constitution to the Compromise of 1850.

437 The Transformation of the American Republic 3 hrs.
A study of the nationalization and modernization of the United States from the period of the Civil War through the Populist movement.

438 Modern America 3 hrs.
A study of American society focusing on social and cultural change, reform, imperialism, and economic trends from the depression of the 1890s to the outbreak of World War II.

439 Recent American History 3 hrs.
A study of contemporary America from World War II to the present analyzing both domestic and foreign affairs.

473 The High Middle Ages 3 hrs.
A study of the political, economic, and cultural features of Europe when medieval civilization was at its height.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>474</td>
<td>The Renaissance and Reformation</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>A study of Europe during the Renaissance and Reformation with emphasis upon political, social, economic, and cultural developments.</td>
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<tr>
<td>475</td>
<td>The Age of Absolutism</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>A study of Europe from the Edict of Nantes to the Peace of Utrecht with emphasis on political, cultural, and scientific change.</td>
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<tr>
<td>476</td>
<td>The Ancien Regime and the Enlightenment</td>
<td>3 hrs.</td>
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<td></td>
<td>A study of European intellectual and social movements from the Peace of Utrecht to the outbreak of the French Revolution.</td>
<td></td>
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<tr>
<td>477</td>
<td>The French Revolution and Napoleon</td>
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<tr>
<td></td>
<td>A study of European ideas, institutions, and events from the beginning of the French Revolution to the demise of the Napoleonic Empire.</td>
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<tr>
<td>478</td>
<td>Europe in the Nineteenth Century</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>A study of major political, social, economic, and intellectual developments in Europe from the Congress of Vienna to World War I.</td>
<td></td>
</tr>
<tr>
<td>479</td>
<td>Europe in the Twentieth Century</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>A study of major developments in Europe from 1914 to the present, including the two world wars and post-war reconstruction.</td>
<td></td>
</tr>
<tr>
<td>490</td>
<td>Research Seminar in History</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Historiography, research and writing, and recent interpretations in the field of history. Required of all history majors. Taught in winter term annually.</td>
<td></td>
</tr>
</tbody>
</table>

Courses at the 500 level are open to students who have completed 15 semester hours in history or 12 semester hours with senior standing. Those numbered 500-599 have the same basic content as their undergraduate (400 level) counterpart, with the exception that the graduate student will be given additional assignments and attention appropriate to graduate level study.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>513</td>
<td>The Old South</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>514</td>
<td>The New South</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>524</td>
<td>The Atlantic World</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>526</td>
<td>Colonial America</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>527</td>
<td>The Age of the American Revolution</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>528</td>
<td>The Early American Republic</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>537</td>
<td>The Transformation of the American Republic</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>538</td>
<td>Modern America</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>539</td>
<td>Recent American History</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>573</td>
<td>The High Middle Ages</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>574</td>
<td>The Renaissance and Reformation</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>575</td>
<td>The Age of Absolutism</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Hours</td>
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</tr>
<tr>
<td>576</td>
<td>The Ancien Regime and the Enlightenment</td>
<td>3 hrs</td>
</tr>
<tr>
<td>577</td>
<td>The French Revolution and Napoleon</td>
<td>3 hrs</td>
</tr>
<tr>
<td>578</td>
<td>Europe in the Nineteenth Century</td>
<td>3 hrs</td>
</tr>
<tr>
<td>579</td>
<td>Europe in the Twentieth Century</td>
<td>3 hrs</td>
</tr>
<tr>
<td>590</td>
<td>Research Seminar in History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>605</td>
<td>Recent Interpretations in Modern History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>614</td>
<td>Studies in Southern History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>618</td>
<td>Studies in Early American History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>619</td>
<td>Studies in Nineteenth Century American History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>620</td>
<td>Studies in Twentieth Century American History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>650</td>
<td>Research Methods in History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>655</td>
<td>Studies in British History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>656</td>
<td>Studies in French History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>657</td>
<td>Studies in Russian and Soviet History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>670</td>
<td>Studies in Medieval History</td>
<td>3 hrs</td>
</tr>
<tr>
<td>680</td>
<td>Studies in Early Modern Europe</td>
<td>3 hrs</td>
</tr>
<tr>
<td>690</td>
<td>Studies in Modern Europe</td>
<td>3 hrs</td>
</tr>
<tr>
<td>699</td>
<td>Master's Thesis</td>
<td>3 hrs</td>
</tr>
</tbody>
</table>
Music Department
Professors Boyer, Pales; Associate Professors Grabb, Graves (chair); Assistant Professor Contreras, Adjunct Lecturer Weaver.

The Department of Music, which offers the B.A. in Music and in Music Education, has two principal curricular goals: to provide a quality major in music which prepares students who wish to become public or private teachers, church musicians, or who wish to pursue graduate studies in music. The major is also suitable for students who have not established specific professional aspirations, but who desire a liberal arts education.

The curriculum for music majors is designed to provide students with knowledge of our musical heritage and the great masterworks of music literature, a foundation in theoretical studies and musical skills sufficient to allow them to deal intelligently with music, and performance experiences which develop technical skill and artistic sensitivity. Additional offerings will provide music education students with knowledge of the appropriate materials, teaching strategies and organizational skills necessary to become successful public school teachers.

All the department's programs are strongly based in the liberal arts, in the belief that a broad general education is an appropriate preparation for both the well-rounded musician and the educated individual.

Courses for the General Student (Non-Music Majors)
The following courses and ensembles are open to all university students; many require little or no musical experience. Upper-level credit is available for some courses. Students may receive studio instruction (private lessons) in voice and in nearly every musical instrument.

- **MU 100** Fundamentals of Music
- **MU 110** Introduction to Music Listening
- **MU 111** Popular Music in America: Beginnings to 1950
- **MU 112** Popular Music in America: 1950 to the Present
- **MU 210** Music with the Maestro
- **MUE 215** Music for the Young Child
- **MU 310** American Music
- **MU 410** Music in Western Civilization
- **MU 190/390** UAH Choir
- **MU 192/392** Huntsville Village Singers
- **MU 198/398** Huntsville Symphony Orchestra
- **MU 199/399** UAH Wind Ensemble
- **MU 290** Opera/Music Theatre Workshop
- **MU 296** Pep Band
- **MU 297** Jazz Ensemble

**Major**
The major in music, with emphasis in either performance or music literature, is a degree program of 134 credit hours. To minimize degree hours, a music major should choose a minor from the disciplines represented in GER. Students with dual interests and abilities will find many opportunities for combining the music major with other disciplines.

**Music Education Major**
The major in music education is a 158 credit hour degree program built upon a broad liberal arts base. The course of study integrates music and professional education courses
to develop a superior music teacher, certified to teach at all levels N-12 (Class B Professional Teacher's Certificate) with strength in either vocal or instrumental music. Students must demonstrate throughout their course of study competencies in both performance and teaching. Because of the demands of this program, there is little opportunity to elect courses other than those required and outlined below. With additional study of the principal instrument and a senior recital performance, music education students are eligible to receive a special performance certificate. Faculty approval is required.

**Bachelor of Arts in Music and Music Education**

Students wishing to pursue a music major should have pre-college training in their principal performing instrument or voice and have ability to read music fluently. Basic keyboard ability is helpful but not mandatory.

Entering freshmen and transferring students are required to take a placement examination in rudiments (scales, keys, intervals, triads, general notation), music reading and performance (principal instrument or voice). Deficiencies may be removed through remedial instruction.

I. General Education Requirement 66-72 hrs.

GER for the B.A. degree are listed in the academic information section. The student should include MU 110 to fulfill the Fine Arts option. Music education students must include ED 230, ED 263, ED 510 and at least one course in economics for the social science requirement; other music majors should choose at least one course in philosophy. Music education students must also include three hours of HPE courses (including either CPR or Nutrition), and should fulfill the upper division Humanities/Fine Arts requirement with MU 312.

II. Major (select A or B)

A. Music

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU 1-1/4-3</td>
<td>Principal Instrument* (12 terms; 6 hours upper level)</td>
</tr>
<tr>
<td>MU 1-0/2-0</td>
<td>Secondary Instrument** (6 terms)</td>
</tr>
<tr>
<td>MU 101, 102, 301, 302, 303</td>
<td>Theory-Harmony</td>
</tr>
<tr>
<td>MU 103, 104, 304, 305, 306</td>
<td>Musicianship Skills</td>
</tr>
<tr>
<td>MU 110</td>
<td>Introduction to Music Listening (include in GER)</td>
</tr>
<tr>
<td>MU 311, 312</td>
<td>Music History</td>
</tr>
<tr>
<td>MU 325</td>
<td>Conducting</td>
</tr>
<tr>
<td>Ensembles***</td>
<td></td>
</tr>
<tr>
<td>Junior recital</td>
<td></td>
</tr>
<tr>
<td>Senior recital</td>
<td></td>
</tr>
</tbody>
</table>

Minor

Selected minor from a discipline represented in the GER.

B. Music Education Emphasis (Composite Major-Minor) 92 hrs.

Music Performance, Theory, and Literature

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU 1-0/4-0</td>
<td>Principal Instrument (10 terms; 4 hours upper level)</td>
</tr>
<tr>
<td>Junior recital (solo and ensemble works)</td>
<td></td>
</tr>
</tbody>
</table>
Secondary instrument(s): (6 terms) ................................. 3-6
   Voice principals elect piano, MU 130-230
   Piano principals elect voice, MU 140-240
Instrument principals elect the following courses:
   Percussion, MU 184
   Strings, MU 154, 254
   Woodwinds, MU 164, 264
   Brasses, MU 174, 274 (one course to be deleted in
       principal instrument area)
Ensembles*** .............................................................. 7-10
(Combined secondary and ensembles must be 13 hrs.)
   MU 101, 102, 301, 302, 303 Theory-Harmony ...................... 10
   MU 103, 104, 304, 305, 306 Musicianship Skills .................. 5
   MU 110 Introduction to Music Listening (GER) ...................... 3
   MU 311, 312 Music History (include 312 in GER) .................. 6
   MU 416 Orchestration ............................................... 2
   MU 325 Conducting ................................................. 2
   MU 425 Advanced Conducting ...................................... 2

Music Education

   MUE 225 Introduction to Music Education ........................ 1
   MUE 326 Teaching General Music in Elementary Schools .......... 3
   MUE 327 Teaching General Music in Secondary Schools .......... 3
   MUE 428 Organizing and Directing Vocal Groups in Secondary Schools
       or
   MUE 429 Organizing and Directing Instrumental Groups
       in Secondary Schools ............................................ 2

Professional Education

   ED 230 Human Development (GER) .................................. 3
   ED 261 Foundations of Education in U.S. ........................ 3
   ED 263 Educational Psychology (GER) ............................. 3
   ED 408 Teaching Reading in the Secondary School .............. 3
   ED 490 Principles of High School Teaching ...................... 3
   ED 499 N-12 Internship**** ...................................... 9
   ED 510 Foundations of Educational Evaluation (GER) .......... 3
   ED 593 Education of Exceptional Children and Youth .......... 3

*Students electing the music literature emphasis will be limited to 8 hours rather than 12
   hours of studio instruction. Four hours of appropriate upper-level music literature and history
   courses replace studio work. Other special projects replace junior and senior recitals.
**All or part of the secondary requirement may be satisfied by examination.
***Students must complete a minimum of twelve terms of small or large ensemble expe­
   riences; however, a maximum of 6 hours may count towards the degree (10 in the music
   education emphasis).
****Students must pass a piano competency examination before internship. ED 490 must
   be taken concurrently with internship.
Music Minor

Students may select music as a supportive minor to their major discipline. A selection of combinations with majors in other disciplines is on file in the Music Department, or students may formulate their own with approval of representative faculty advisors from departments involved. Generally twenty-four hours of music are necessary (12 hours upper-level), including the following courses:

MU 1-0/2-0 Studio Instruction ........................................... 3
MU 101, 102, 301 Theory-Harmony ..................................... 6
MU 103, 104, 304 Musicianship Skills ................................. 3
MU 110 Introduction to Music Listening (include in GER) ....... 3
MU 312 History of Music II ................................................ 3
Ensemble (300 level) ....................................................... 6

Music for Second Area of Study

Students majoring in elementary education may select music as their second area of study. See major requirements in Education section. 24 hours in music are required:

MU 101, 102, 301 Theory of Music ..................................... 6
MU 103, 104, 304 Musicianship Skills ................................. 3
MU 110 Introduction to Music Listening .............................. 3
MU 310 American Music .................................................. 3
MU 312 Music History II .................................................. 3
MUE 326 Teaching General Music in Elementary School ....... 3
(Replacement for MUE 215 in the GER)
Ensembles (at 300 level) .................................................. 3

Music (MU)

100 Fundamentals of Music ............................................ 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.

101 Theory of Music I .................................................. 2 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 103) to be taken concurrently throughout theory program. Prerequisite: approval of instructor or Department Chair.

102 Theory of Music II .................................................. 2 hrs.
Continuation of MU 101. Prerequisites: MU 101 and 103.

103 Musicianship Skills I .............................................. 1 hr.
To be taken concurrently with MU 101 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.

104 Musicianship Skills II ............................................. 1 hr.
Continuation of MU 103. Prerequisites: MU 101 and 103.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>Introduction to Computers in Music</td>
<td>1 hr.</td>
<td>An introduction to the utilization of computers in music, including the fundamentals of sound synthesis. Emphasis on practical applications of hardware and software in the study of music and skills development. One class period and one lab weekly.</td>
</tr>
<tr>
<td>110</td>
<td>Introduction to Music Listening</td>
<td>3 hrs.</td>
<td>Basic course in music appreciation. Exploration of ideas and issues in various types of Western music through reading, listening and discussion.</td>
</tr>
<tr>
<td>111</td>
<td>Popular Music in America: Beginnings to 1950</td>
<td>3 hrs.</td>
<td>Basic appreciation course. Folk and Jazz (including Blues, Ragtime, and Dixieland) in the last century. Related socio-economic, demographic, and technological factors.</td>
</tr>
<tr>
<td>112</td>
<td>Popular Music in America: 1950 to the Present</td>
<td>3 hrs.</td>
<td>Basic appreciation course. History of Rock and Roll, with some time devoted to folk music and jazz of the period. Related socio-economic, demographic, and technological factors, with extra emphasis on the decade of the 1960's.</td>
</tr>
<tr>
<td>210</td>
<td>Music with the Maestro</td>
<td>3 hrs.</td>
<td>Survey of music masterpieces, (e.g. Beethoven 5th Symphony, Stravinsky “Firebird Suite,” works of J.S. Bach). Focus on live experiences with music and musicians. Classes with live performances, records, films, and informal discussion with musicians. Offered only on demand.</td>
</tr>
<tr>
<td>301</td>
<td>Theory of Music III</td>
<td>2 hrs.</td>
<td>Continuation of studies on a more advanced basis than MU 101-102. Prerequisites: MU 102 and 104.</td>
</tr>
<tr>
<td>302</td>
<td>Theory of Music IV</td>
<td>2 hrs.</td>
<td>Continuation of MU 301. Prerequisites: MU 301 and 304.</td>
</tr>
<tr>
<td>303</td>
<td>Theory of Music V</td>
<td>2 hrs.</td>
<td>Continuation of MU 302, with emphasis on twentieth century materials. Prerequisites: MU 302 and 305.</td>
</tr>
<tr>
<td>304</td>
<td>Musicianship Skills III</td>
<td>1 hr.</td>
<td>Continuation of MU 104. Prerequisites: MU 102 and 104.</td>
</tr>
<tr>
<td>305</td>
<td>Musicianship Skills IV</td>
<td>1 hr.</td>
<td>Continuation of MU 304. Prerequisites: MU 301 and 304.</td>
</tr>
<tr>
<td>306</td>
<td>Musicianship Skills V</td>
<td>1 hr.</td>
<td>Continuation of MU 305. Prerequisites: MU 301 and 305.</td>
</tr>
<tr>
<td>309</td>
<td>Analysis of Musical Form</td>
<td>2 hrs.</td>
<td>Analysis of representative small and large compositions of the sixteenth through the twentieth centuries for structure and form. Prerequisites: MU 110 and 303 or approval of instructor.</td>
</tr>
<tr>
<td>310</td>
<td>American Music</td>
<td>3 hrs.</td>
<td>A course designed for the non-music major. Important aspects of American musical art are presented, including the Colonial period, folksong and European influences, jazz, Broadway and film scores. The contemporary period, beginning with Charles Ives, is also covered.</td>
</tr>
</tbody>
</table>
311 History of Music I
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. Prerequisite: MU 110 and 301, or approval of instructor.

312 History of Music II
Music as an art in Western Civilization from 1750 to the present. Formal and stylistic problems through representative works and an understanding of musical concepts in light of their historical and general cultural context. Prerequisites: MU 110 and 301, or approval of the instructor.

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

314 Biographical Survey
Life and work of great composers. Variable topics. Prerequisites: MU 303 and 311 or 312.

315 History of Music in Liturgy
Beginning with pagan, Eastern and Hebraic sources, music in liturgical worship is traced to the present. Choral and organ music is studied for its practical usage and artistic value. Special attention is given to monumental works from the Medieval, Renaissance, Baroque, Classical, Romantic and Contemporary periods. Prerequisites: Junior standing, MU 110 and 301.

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

321 Piano Technology
Development of keyboard instruments, use of equal-temperament tuning, and minor piano action regulation and repair. Prerequisite: Ability to read music and familiarity with keyboard. Offered upon demand.

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

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

410 Music in Western Civilization
Major musical masterpieces and personalities are studied, with some emphasis on the effects of social, economic and political events on the evolution of musical style, form and performance media. Visual and literary arts are referenced and included in the readings, study and discussion. Prerequisites: MU 110, Junior standing or permission of instructor.

219
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>411</td>
<td>Musicum Practicum</td>
<td>1 hr.</td>
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<tr>
<td></td>
<td>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.</td>
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</tr>
<tr>
<td>412</td>
<td>Church Music Practicum</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Forty hours working with selected professional church musicians in the community. An internship providing hands-on experiences in real church situations. Supervised by music faculty. Prerequisites: senior standing, MU 315 and MU 415. Lab fee: Level 7.</td>
<td></td>
</tr>
<tr>
<td>415</td>
<td>Church Music Methods</td>
<td>2 hrs.</td>
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<tr>
<td></td>
<td>A practical approach preparing the church musician in choral and organ methods, liturgical planning, pastoral relations, and professional standards and goals. Prerequisites: MU 303 and MUE 326.</td>
<td></td>
</tr>
<tr>
<td>416</td>
<td>Orchestration</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Instruments of the band and orchestra, their ranges, transpositions, and capabilities. Practical experience in arranging for instruments. Prerequisite: MU 303.</td>
<td></td>
</tr>
<tr>
<td>420</td>
<td>Piano Literature</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Music for string keyboard instruments from the pre-pianoforte period to the present. Representative works from all periods. Prerequisites: MU 303, 306, 312 or approval of instructor.</td>
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<tr>
<td>425</td>
<td>Advanced Conducting</td>
<td>2 hrs.</td>
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<tr>
<td></td>
<td>Review of basic conducting patterns. Emphasis on communication as the role of the conductor. Detailed score preparation. Prerequisite: MU 325.</td>
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</tr>
<tr>
<td>510</td>
<td>Concert Band Literature and Conducting Critique</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Literature for concert band and wind ensemble. Variety of music (type, style, and difficulty) as well as in-depth study of a few scores by each student for critiques of rehearsal and conducting techniques. UAH Summer Band serving as reading and laboratory ensemble. Prerequisite: MU 425; or approval of instructor.</td>
<td></td>
</tr>
<tr>
<td>511</td>
<td>Master Class in Piano Literature and Pedagogy</td>
<td>2 hrs.</td>
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<tr>
<td></td>
<td>Topic of course varies: Examination of selected forms.</td>
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</tr>
</tbody>
</table>

**Studio Instruction In Vocal and Instrumental Music**

Students must fill out a "Request for Studio Instruction" card in the Music Department prior to each term 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 MU 130, 140, 150, 160 or 170, however, advanced students may enroll in MU 131, 141, etc., with permission of the instructor. A special studio instruction fee is charged (see Fees).

To advance to the next 100 level of studio instruction (i.e. from 133 to 231 or 130 to 230), each student must perform before a faculty jury. The jury may retain students at any level until proper achievement is reached for advancement or completion of degree performance competencies. The instructor's grade may be raised or lowered one letter to reflect jury performance. Non-majors may enroll in studio instruction as long as the instructor agrees that satisfactory progress is made; no jury is necessary.
Students taking studio instruction must attend performances, the monthly student recital program and special performance classes. A student may be excused only with written permission of the department chair.

As a part of studio instruction, students enrolled as full-time music majors must attend at least six approved concerts a term; other enrolled students must attend three.

**Prerequisites.** Prerequisites for each studio course include approval of the instructor and (for 200, 300, and 400 level courses) the previous 100 level of instruction.

**Numbering System.** Courses which have numbers ending in 1, 2, or 3 are generally for music majors’ principal instrument, although other advanced students may enroll for these courses through departmental audition. Courses ending in 0 are for non-majors, minors and music majors’ secondary instrument.

130, 230, 330, 430
- Studio Instruction in Keyboard (piano and organ).
- Studio instruction fee: Level 7.
131, 132, 133, 231, 232, 233, 331, 332, 333, 431, 432, 433
- Studio Instruction in Keyboard (piano and organ).
- Studio instruction fee: Level 9.
140, 240, 340, 440
- Studio Instruction in Voice.
- Studio instruction fee: Level 7.
141, 142, 143, 241, 242, 243, 341, 342, 343, 441, 442, 443
- Studio Instruction in Voice.
- Studio instruction fee: Level 9.
150, 250, 350, 450
- Studio Instruction in Strings (orchestral strings and guitar).
- Studio instruction fee: Level 7.
151, 152, 153, 251, 252, 253, 351, 352, 353, 451, 452, 453
- Studio Instruction in Strings.
- Studio instruction fee: Level 9.
154, 254
- Class Instruction in Strings.
  - For secondary instruments, instrumental music education majors.
  - Studio instruction fee: Level 7.
160, 260, 360, 460
- Studio Instruction in Woodwinds.
- Studio instruction fee: Level 7.
161, 162, 163, 261, 262, 263, 361, 362, 363, 461, 462, 463
- Studio Instruction in Woodwinds.
- Studio instruction fee: Level 9.
164, 264
- Class Instruction in Woodwinds.
  - For secondary instrument, instrumental music education students.
  - Studio instruction fee: Level 7.
170, 270, 370, 470
- Studio Instruction in Brass.
- Studio instruction fee: Level 7.
- Studio Instruction in Brass.
- Studio instruction fee: Level 9.
Studio Instruction in Brass
For secondary instrument, instrumental music education students.
Studio instruction fee: Level 7.

180, 280, 380, 480

Studio Instruction in Percussion
Studio instruction fee: Level 7.

181, 182, 183, 281, 282, 283, 381, 382, 383, 481, 482, 483

Studio Instruction in Percussion
Studio instruction fee: Level 9.

184

Class Instruction in Percussion
For secondary instrument, instrumental music education students.
Studio instruction fee: Level 7.

Ensembles
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 term a student is enrolled for degree requirements. A maximum of 6 semester hours in ensemble courses (MU 190-199, 290-299, 390-399) may be applied as credit toward total degree requirements in any discipline except Music Education, where the maximum is 10 hours. Students may continue to enroll, however, and repeatedly participate in ensembles throughout their university career. Only students who have held membership in an ensemble for six terms should enroll in 300 level instruction. Through audition students may receive upper-level credit after three terms of membership.

190, 390 UAH Choir
Mixed voices singing the serious choral repertoire. Open to all students by audition. Required attendance at rehearsals and performances.

192, 392 Huntsville Village Singers
A small, select ensemble of mixed voices. Open to all students by audition. Required attendance at rehearsals and performances.

193 Summer Chorus
Mixed voices singing a variety of choral music.

196, 396 Chamber Ensembles
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.

197 Summer Band
Rehearsal and performance of a variety of music for concert band. By audition with the conductor.

198, 398 Huntsville Symphony Orchestra
An orchestra of seventy-five players with international guest artists. Performance of major symphonic, operatic, and choral literature. By audition with the conductor. Required attendance at rehearsals and performances.

199, 399 UAH Wind Ensemble
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.
290 **Opera/Music Theatre Workshop**  
1 hr.  
Instruction in stage movement and mannerisms, character and vocal coaching leading to performances of scene excerpts. Prerequisites: Audition with the conductor. Required attendance at rehearsals and performances.

297 **UAH Jazz Ensemble**  
1 hr.  
Open to all students with the permission of the director. This group provides the participant with opportunities to perform a wide variety of jazz styles in varied settings. Individual instruction in arranging and composition available. Required attendance at rehearsals and performances.

298 **UAH Pep Band**  
1 hr.  
Open to all students with the permission of the director. This group provides appropriate music for selected UAH athletic events. Winter term only. Required attendance at rehearsals and performances.

**Music Education (MUE)**

215 **Music for the Young Child**  
3 hrs.  
A course for elementary and special education teachers, recreational therapists, church school, or prospective teachers not trained in music. Preparation to teach children ages 3-12 through experience in singing, reading, planning, and presentation. Elementary education majors using music as their second area of study must select MUE 326 rather than MUE 215 for their GER.

225 **Introduction to Music Education**  
1 hr.  
Philosophical orientation to music teaching. Observation and mini-teaching experiences with follow-up discussions. Prerequisites: MU301, 110 or approval of instructor.

326 **Teaching General Music in Elementary Schools**  
3 hrs.  
Materials and methods. Emphasis on developing teaching competencies. Prerequisites: MU 303, MUE 225 or permission of instructor.

327 **Teaching General Music in Secondary Schools**  
3 hrs.  
Materials and Methods. Emphasis on developing teaching competencies. Prerequisites: MU 303, MUE 225 or permission of instructor.

428 **Organizing and Directing Vocal Groups in Secondary Schools**  
2 hrs.  
Repertoire, procedures for administering and teaching school glee clubs, choirs, and vocal ensembles. Prerequisites: MUE 326, 327, MU 425 or permission of instructor.

429 **Organizing and Directing Instrumental Groups in Secondary School**  
2 hrs.  
Repertoire, procedures for administering and teaching school bands, orchestras and instrumental ensembles. Prerequisites: MUE 326, 327, 425 or permission of instructor.

520 **Arts in the Elementary School Curriculum**  
3 hrs.  
An interdisciplinary approach to teaching the arts in elementary school, including music, movement, theatre, and the visual arts. Practical experiences in playing instruments (percussion), moving, drawing, creating, singing, working in clay, play-acting and pantomime. Methodology for integrating the arts through active participation.
Philosophical Principles of Music Education 3 hr.
Philosophical base of music education, its justification in the public school curriculum, and criteria for determining its objectives. Application of aesthetic theory to analysis and evaluation of music.

Philosophy Program
Associate Professor Martine; Assistant Professors Cling, Lang.

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 which are seldom exposed to critical reflection. These interconnected presuppositions 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 our understanding of ourselves and the world around us. By examining the ideas of the western philosophical tradition and the positions of the influential contemporary thinkers, courses in the philosophy program offer students the opportunity to develop informed and responsible positions of their own.

Philosophy Minor
Students interested in a philosophy minor must take at least 21 semester hours in philosophy including PHL 201 and PHL 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 9 semester hours in courses numbered 300 or above.

Philosophy (PHL)

101 Introduction to Philosophy 3 hrs.
An 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 reasoning as applied to both formal and informal contexts.

202 Introduction to Ethics
Major ethical positions in both classical and modern thought.

204 Comparative Religions: Judaism, Christianity, Islam 3 hrs.
An analytical and comparative study of three of the world’s major religions: Judaism, Christianity, Islam. The origins, developments, traditions, and beliefs of these religions are compared and contrasted.

301 Ancient Philosophy 3 hrs.
Survey of classical philosophy from the Pre-Socratics through Aristotle. Prerequisite: PHL 101 or permission of the instructor.

302 Modern Philosophy 3 hrs.
Survey of the British and Continental traditions from Descartes through Kant. Prerequisite: PHL 101 or permission of the instructor.

303 Contemporary Philosophy 3 hrs.
Examination of some of the most important trends in late nineteenth and twentieth century thought. Prerequisite: PHL 101 or permission of the instructor.
310 Philosophy of Art 3 hrs.
Major aesthetic theories of the western tradition, with emphasis on the relation between artistic and discursive expression. Prerequisite: PHL 101 or permission of the instructor.

311 Philosophy of Science 3 hrs.
Critical assessment of the historical and logical foundations of the natural and theoretical sciences. Prerequisite: PHL 101 or permission of the instructor.

312 American Philosophy 3 hrs.
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 the instructor.

316 Classical Political Philosophy 3 hrs.
A 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 316).

317 Modern Political Philosophy 3 hrs.
A 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 317).

320 Symbolic Logic 3 hrs.
Symbolic deductive logic, including propositional calculus (truth-functional logic), predicate calculus (propositional functions and quantification), and the logic of relations. Prerequisite: PHL 201.

321 Ethics and the Professional 3 hrs.
Investigation of fundamental problems of conduct as they appear in medicine, law, and business. Prerequisite: PHL 101, PHL 202, or permission of the instructor.

385 Selected Topics in the History of Philosophy 3 hrs.
Intensive examination of particular problems, periods, or movements in the history of philosophy. Prerequisite: Determination in accordance with course content.

401 Metaphysics 3 hrs.
Critical examination of traditional and contemporary responses to questions surrounding the nature of reality, the relation between determinate and indeterminate being, being and becoming, the infinite and the finite. Prerequisite: 6 hours of PHL not including PHL 201.

402 Epistemology 3 hrs.
Investigation of fundamental problems of knowledge such as the relation of knowledge and belief, truth, certainty and skepticism, perception, logic, explanation, and justification. Prerequisite: 6 hours of PHL not including PHL 201.
Political Science Department
Professors Meek, Spitz; Associate Professors MacDougall, Williams (Chair); Assistant Professors Brown, Gitz, Pottenger; Adjunct Assistant Professors Burke, Schumann, Slaughter.

The Department of Political Science offers a minor and a B.A. degree in political science. In addition, the department offers the Master of Arts in Public Affairs.

General Education Requirements
PSC 101—American Government and/or PSC 135—Introduction to Comparative Government are the two courses to be used to fulfill General Education Requirements.

Political Science Major
A student who wishes to major in political science must include in his academic program a minimum of 36 semester hours in political science, including PSC 101, 135, 246, 311 and either 316 or 317 (15 hours). In addition, majors are required to take a minimum of three (3) hours from each of four fields of political science:
1. International Relations and Comparative Government (PSC 336, 337, 338, 343,465 and 467);
2. Law and Theory (PSC 271, 318, 371, 419, 471);
3. Sub-National Politics and Administration (PSC 221, 223, 323, 350, 423, and 450);
4. Political Process and Institutions (PSC 307, 308, 365, 369). The remaining nine (9) hours may be taken as electives from the above courses or other political science courses. A minimum of 15 semester hours must be in political science courses numbered 300 or above.

GER should include AHS 300—Statistical Analysis.
A student with a major in political science must choose a minor from another discipline; or, instead of a minor, the student has the option of choosing 21 hours of cognate studies, a group of courses drawn from two or more disciplines of which 12 hours must be in upper-level course work; a minimum of 6 hrs. must be in each discipline.

Freshmen considering a major in political science should consult with a faculty advisor in the department during their freshman year. Sophomores must file a program of study before the end of their sophomore year. Transfer students are advised to consult with a faculty member in the department before scheduling courses.

Guidelines for curriculum planning in political science are available in the department office. These guidelines are designed to consider such intellectual and vocational interests as prelaw training, international studies, public service, and graduate school preparation.

Political Science Minor
The student with a minor in political science must take 21 hours of course work including PSC 101, 135 and 246, and at least 6 hours of course work 300 or above.

Political Science for Second Area of Study
Students majoring in elementary education may select political science as their second area of study. Major requirements can be found in the Education section. Students seeking certification in secondary education should seek advisement from the Education Department where a program of study leading to endorsements in political science and/or the social sciences can be developed.
Internship Programs
The Department of Political Science has an internship program for majors and minors in political science, public administration, and prelaw. Internships bridge the gap between learning experience and entry into professional life. Interested juniors and seniors should apply to the Department of Political Science.

Graduate Program in Political Science
The department offers a Master of Arts in Public Affairs. The program focuses on the study of the theory and processes of policy making with a general emphasis on management problems of public organizations.

Political Science (PSC)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>101</td>
<td>American Government</td>
<td>3 hrs.</td>
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<tr>
<td>135</td>
<td>Introduction to Comparative Government</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Surveys the political cultures, governmental structures, and contemporary policy problems of parliamentary, communist and third world political systems. PSC 101 required.</td>
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</tr>
<tr>
<td>182</td>
<td>Issues in U.S. and World Politics</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Outstanding problems confronting America and/or world political systems. (For students who are not majors or minors in Political Science.)</td>
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</tr>
<tr>
<td>221</td>
<td>State and Local Government</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Introduction to state and local politics in America. Different governmental forms and their impact on public policies. PSC 101 recommended.</td>
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</tr>
<tr>
<td>223</td>
<td>Alabama and Southern Politics</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Surveys the government and politics of Alabama and provides an overview of the political culture in the American South. PSC 101 recommended.</td>
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<tr>
<td>246</td>
<td>Introduction to International Relations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Examinations of the basic factors underlying the conduct of international relations focusing upon the forces affecting the change and direction of the present state system. Special attention is given to the forces affecting war and peace. PSC 135 recommended.</td>
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</tr>
<tr>
<td>271</td>
<td>Introduction to American Legal Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Structure, jurisdiction, procedures, and impact of the courts in administration of justice. Focus on the roles of the major participants in the legal system. Both criminal and civil justice topics are covered. PSC 101 recommended.</td>
<td></td>
</tr>
<tr>
<td>280</td>
<td>Special Topics in Political Science</td>
<td>1-3 hrs.</td>
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<tr>
<td></td>
<td>Study of selected topics in local, state, national and world politics.</td>
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</tr>
</tbody>
</table>

Courses listed below are open to students who have Junior standing. Prerequisites may apply.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>307</td>
<td>Congress and State Legislatures</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>The American legislative process. Institutional setting and process of decision-making, recruitment and socialization of legislators, and relationships between Congress and the remainder of the political system. Prerequisite: PSC 101.</td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
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</tr>
<tr>
<td>308</td>
<td>American Presidency</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>311</td>
<td>Scope and Methods in Political Science</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>316</td>
<td>Classical Political Philosophy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>317</td>
<td>Modern Political Philosophy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>318</td>
<td>American Political Thought</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>323</td>
<td>American Federalism</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>336</td>
<td>Parliamentary Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>337</td>
<td>Communist Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>338</td>
<td>Third World Systems</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

228
343 International Law and Organization 3 hrs.
Contribution of international law and organization to world order since World War II. Role of the United Nations in the third world and to political and sociological origins of international law and its application to selected contemporary problems. PSC 135 or PSC 246 is recommended.

350 Public Administration 3 hrs.
Administrative principles and practices in public organizations and agencies. Prerequisite: PSC 101.

365 Elections and Public Opinion 3 hrs.
Examination of theories of electoral behavior and their utility in understanding voter decision making. The formulation, manipulation, and impact of public opinion on American politics are assessed. Prerequisite: PSC 101.

369 Political Parties and Interest Groups 3 hrs.
Reviews the roles of two major “linkage” institutions in U.S. politics. Considers the organizational features of these institutions and their impact upon the electoral and policy making processes. Prerequisite: PSC 101.

371 American Constitutional Law 3 hrs.
The policy-making role of the Supreme Court in the American political system through analysis of leading cases in interpreting the constitution. Prerequisite: PSC 101. PSC 271 is recommended.

382 Political Sociology 3 hrs.
Examination of concepts, theories, and research findings related to the structure of political institutions in society and their relation to other societal institutions. Stratification, correlates, bases, legitimation, and change of power in society. Prerequisite SOC 100 or PSC 101. (Same as SOC 382.)

399 Directed Study in Political Science 1-3 hrs.
Independent studies in an area of political science selected in consultation with faculty advisor. Approval of chairman required.

419 Contemporary Political Ideologies 3 hrs.
A critical examination of the nature and ideologies in contemporary politics. Among the major political belief systems studied will be important examples of conservatism, liberalism, socialism, communism and fascism in theory and practice. Prerequisite: Nine hours of PSC, Philosophy and/or History.

423 Urban Politics 3 hrs.
Examination of urban politics in America with attention given to urban problems, urban environment, governmental forms, power structures, and policy outputs. Prerequisite: PSC 101. PSC 221 or PSC 323 is recommended.

450 Public Bureaucracy 3 hrs.
An examination of the institutional and environment factors shaping governmental bureaucracy and the application of private organizational theory to the bureaucracy. Prerequisite: PSC 101.

465 American Foreign Policy 3 hrs.
Study of the institutions, processes and personalities affecting the formation of American foreign policy. Prerequisite: PSC 101. PSC 135 is recommended.
Soviet Foreign Policy 3 hrs.
An introductory examination of the nature of Soviet foreign policy, with a special emphasis upon East-West relations and the Soviet decision making and policy implementation processes. Recommended: PSC 246 and/or PSC 337.

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. PSC 271 and/or PSC 371 are recommended.

Special Topics in Political Science 1-3 hrs.
Study of selected topics in local, state, national and world politics.

Internship in Government 1-6 hrs.
Undergraduates may receive from one 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.

Special Topics in Political Science 1-3 hrs.
Study of selected topics in local, state, national and world politics.

Studies in Public Administration 1-3 hrs.
Special studies and projects in Public Administration.

Special Topics in Political Science 1-3 hrs.
Special studies and projects in political science. Approval of chairman required.

Courses listed below are for graduate students in the Master of Arts in Public Affairs Program.

See UAH Graduate Catalog for course descriptions

AHS 600 Graduate Statistical Analysis 4 hrs.
MGT 622 Human Behavior in Organization 3 hrs.
MGT 623 Organizational Theory 3 hrs.
MGT 624 Organizational Problems 3 hrs.
610 Statistics for Public Managers 3 hrs.
618 Public Values and Public Policy 3 hrs.
620 Intergovernmental Relations 3 hrs.
646 Seminar in International Politics 3 hrs.
652 Public Personnel Administration 3 hrs.
655 Budgetary Process 3 hrs.
657 Complex Organization in Industrial Society 3 hrs.
660 Public Policy Determination 3 hrs.
661 Public Policy Evaluation 3 hrs.
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>667</td>
<td>Soviet Foreign Policy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>668</td>
<td>National Security Policy</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>678</td>
<td>Administrative Law and Regulations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>680</td>
<td>Special Topics in Public Administration</td>
<td>1-3 hrs.</td>
</tr>
<tr>
<td>685</td>
<td>Problems on Public Administration</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>689</td>
<td>Public Policy Seminar</td>
<td>3-6 hrs.</td>
</tr>
<tr>
<td>695</td>
<td>Internship in Government</td>
<td>1-6 hrs.</td>
</tr>
<tr>
<td>699</td>
<td>Master’s Thesis</td>
<td>1 - 3 hrs.</td>
</tr>
</tbody>
</table>

231
Psychology Department
Professor Rogers; Associate Professors Hays, James, Kirkpatrick (chair), Sullins; Associate Professor Emeritus Coffield.

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

Psychology Major
A major in psychology consists of 33 hours in psychology with at least 24 hours of these courses numbered 300 or above. Required courses are PY 103, PY 302, two Issues courses (PY 410, 411, 412, 413, & 414), and PY 500 & PY 501. (Note that AHS 300 is a prerequisite for PY 302 but is not counted toward the 33 hours in psychology.)

The psychology major must be accompanied by a minor which meets the requirements specified by the selected discipline.

A student planning to major in psychology should complete PY 103, AHS 300 and PY 302 no later than the sophomore year. Before taking more advanced courses the student should seek advice in planning a program of study from a faculty member in the Psychology Department.

Psychology Minor
A minor in psychology consists of 21 hours of psychology courses, including PY 103, one Issues course (PY 410, 411, 412, 413 or 414), and an additional 12 hours of courses numbered 300 or above (which may include AHS 300).

Psychology for Second Area of Study
A student majoring in elementary education may choose psychology as the second area of study. See major requirements in the Education section. To meet university requirements, a student must select a minimum of 18 hours in psychology (including 15 hours at the 300 level or above) with the help of the education advisor and approval of the chairperson of the Psychology Department. This curriculum may require more than the minimum total of 128 hours for the degree.

Graduate Program
For information on the graduate program in psychology, see the UAH Graduate Catalog.

Psychology (PY)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>General Psychology</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Empirical findings of major areas of psychology. General methodology, development, personality, and abnormal and social psychology.</td>
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<tr>
<td>203</td>
<td>Principles of Behavioral Analysis</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Principles governing relationship between behavior and environment. Reinforcement, extinction, discrimination, and chaining.</td>
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<tr>
<td>207</td>
<td>Psychology of Personal Adjustment</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Application of basic principles in psychology to origin and resolution of personal conflicts. Prerequisite: PY 103.</td>
<td></td>
</tr>
<tr>
<td>215</td>
<td>Child Psychology</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Overview of information, topics, viewpoints and issues in child psychology with professional and personal applications. Prerequisite: PY 103.</td>
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</tbody>
</table>
302 Experimental Psychology 3 hrs.
Design and execution of experiments in psychology. Data analysis and manuscript preparation. Offered Fall and Spring. Course includes laboratory. Fee: Level 3. Prerequisite: 3 hours PY and AHS 300.

311 Individual Differences 3 hrs.
Factors, both learned and innate, that lead to individually unique patterns of behavior. Prerequisite: PY 103.

315 Developmental Psychology 3 hrs.
Study of cognitive, psychoanalytic, ethological, behavioral, and humanistic theories of development. Prerequisite: PY 103.

330 Psychology of Communication 3 hrs.
Theories, problems, and research in areas of interpersonal, nonverbal, and mass communication, formulating a psychological conception of man as an information-gathering and information-processing system. Empirical findings of modes, media, and effects of various communication forms. Prerequisite: PY 103. (Same as CM 330).

375 Social Psychology 3 hrs.
The fundamental principles of group behavior. Development of group solidarity, cohesion, intergroup conflict and cooperation, and effects of different patterns of leadership. Prerequisite: SOC 100 or PY 103. (Same as SOC 375).

390 Readings in Psychology 3 hrs.
Supervised in-depth readings in area of particular interest to student. Prerequisite: 15 hours PY and approval of instructor. May be taken twice for credit.

391 Special Topic in Psychology 1 hr.
Study of preannounced special areas in seminar discussion, laboratory work, or practicum. Prerequisite: 15 hours PY. May be taken twice for credit.

392 Special Topic in Psychology 2 hrs.
Study of preannounced special areas in seminar discussion, laboratory work, or practicum. Prerequisite: 15 hours PY. May be taken twice for credit.

401 Personality 3 hrs.
Examination of various theories of personality with possible implications for research. Prerequisite: PY 103.

410 Issues in Developmental Psychology 3 hrs.
Examination of issues, problems, and relevant research in developmental psychology. (Offered once each year.) Prerequisite: PY 315.

411 Issues in Motivation and Emotion 3 hrs.
Motivational and emotional dynamics relating to stress, depression, anxiety, and pleasure. (Offered every other year.) Prerequisite: Junior or senior standing.

412 Issues in Personality 3 hrs.
In-depth study of the problems, procedures and theoretical issues involved in the study of personality. (Offered at least every other year). Prerequisite: PY 401.

413 Issues in Applied Social Psychology 3 hrs.
Topics in social psychology as applied to situations of practical interests. Prerequisite: PY 375 or SOC 375.
414 **Issues in Learning** 3 hrs.
Analysis of learning principles from simple relationships with animals to the complexities of human language and problem-solving. (Offered once each year). Prerequisite: Junior or senior standing.

420 **Seminar in Psychology** 3 hrs.
Presentation and discussion of reports on psychological problems within a particular area. Prerequisite: 15 hours PY and approval of instructor. May be taken twice for credit.

422 **Individual Research** 3 hrs.
With advice of instructor, design and execution of original experiment in psychology. Prerequisite: 15 hours PY and approval of instructor. May be taken twice for credit.

426 **History and Systems in Psychology** 3 hrs.
History of psychology as it has led to development of systematic study within the field. Prerequisite: 15 hours PY.

433 **Abnormal and Health Psychology for the Human Service Professions** 3 hrs.
Individual patterns and social contexts of integrative and maladaptive emotions and behavior. Prerequisite: PY 103.

436 **Physiological Psychology** 3 hrs.
Neural and endocrinological systems underlying behavior. Prerequisite (either a or b): (a) 15 hours of PY or approval of instructor; (b) BYS 114 or BYS 313 and 6 hours of PY or approval of instructor. (Same as BYS 436).

500 **Human Research I** 2 hrs.
The study of human behavior by observation and/or experimentation. Students will design a study dependent upon the content of a previously completed Issues course, will engage in data collection and analysis, and will report their findings in a research paper. (Offered Winter term of each year). Includes laboratory. Fee: Level 3. Prerequisites: PY 302, and one Issues course (PY 410-414).

501 **Human Research II**
A required continuation of PY 500. (Offered Spring term of every year). Includes laboratory. Fee: Level 3. Prerequisite PY 500.

502 **Industrial and Organizational Psychology** 3 hrs.
Application of basic principles of learning, motivation, and perception to typical industrial and organizational problems.

503 **Advanced General Psychology** 3 hrs.
Survey. Various major areas of psychology. Open only to senior psychology majors and graduate students. Prerequisite: 24 hours PY and senior standing.

513 **Psychometrics** 3 hrs.
History and development of psychological testing with special emphasis given to both theory and process of effective evaluation. Prerequisites: AHS 300.

535 **Theory of Abnormal Psychology** 3 hrs.
Major behavior exceptionalities of childhood and adulthood with emphasis on empirical findings. Prerequisite: PY 433 or approval of instructor.
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>601</td>
<td>Advanced Developmental Psychology</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>602</td>
<td>Proseminar: Cognitive</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>604</td>
<td>Proseminar: Experimental</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>606</td>
<td>Language Development</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>611</td>
<td>Research Methods and Statistics I: Experimental Designs</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>613</td>
<td>Research Methods and Statistics II: Nonexperimental Designs</td>
<td>4 hrs.</td>
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<tr>
<td>615</td>
<td>Graduate Seminar</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>628</td>
<td>Human Learning Theory</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>629</td>
<td>Behavior Modification</td>
<td>3 hrs.</td>
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<tr>
<td>641</td>
<td>Directed Individual Study and Research I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>643</td>
<td>Directed Individual Study and Research II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>655</td>
<td>Symbolic Processes</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>699</td>
<td>Master’s Thesis</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

235
Sociology Department

Associate Professors Finley (chair), Haralick, Hodges, Tarter: Assistant Professors Colclough, Peacock.

The Department of Sociology offers the B.A. and a minor in sociology.

Sociology Major

A student who majors in sociology must complete 36 hours of sociology courses including SOC 100, SOC 102, SOC 300, SOC 465, and AHS 300. A minimum of 21 hours should be taken in courses numbered 300 or above.

Sociology Minor

A student developing a minor in sociology with a major in another discipline must complete 21 hours of sociology courses including SOC 100 and SOC 102. A minimum of 12 hours should be in courses numbered 300 or above. Sociology courses may also be used in conjunction with courses from other disciplines to form a cognate area of study. Such a program should be developed with the advice of the sociology faculty and approved by the chair of the student’s major department.

Sociology for a Second Area of Study

Students majoring in elementary education may select sociology as their second area of study. See major requirements in the Education section. To meet university requirements, students must complete a minimum of 18 hours in sociology, 15 of which must be above the 300 level in sociology. Courses should be chosen with the help of the education advisor and approval of the chair of the Department of Sociology. The following courses are especially useful for teachers: SOC 100, SOC 102, SOC 106, SOC 306, SOC 310, SOC 311, SOC 325, SOC 330, SOC 350, SOC 375, and SOC 452. This curriculum may require more than the minimum total of 128 hours for the degree.

Sociology (SOC)

100 Introduction to Sociology 3 hrs.
Perspective methods, concepts, and general findings of the sociologist. Historical and conceptual development of sociology.

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.

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 130).
200 Introduction to Anthropology 3 hrs.
Origin and development of man's ways of life. Analysis of preliterate societies.

Upper-division sociology courses are open to students who have taken SOC 100.

300 Research Methods 3 hrs.
Broad and balanced background in various types of social research methods. Fundamental logic and specific techniques in conducting research. Prerequisite: AHS 300. Lab fee: Level 4.

306 Sex Roles 3 hrs.
Social and sexual roles, their interrelationships, and articulation with societal institutions and agencies. Social upheaval that is both cause and effect of sex-role changes in societies in transition.

310 Sociology of Childhood 3 hrs.
Environmental influences on socialization of infants and children. Various family roles, the school, peer group, and culture as they affect the growing child and early adolescent.

311 Life Span Development 3 hrs.
Major social influences on human development, change, continuity, and discontinuity from birth to old age. Turning points and role throughout life span. Prerequisite: SOC 310.

315 Population and Ecology 3 hrs.
Growth and distribution of world population and environmental problems created in relation to population growth.

319 Deviance and Social Control 3 hrs.
Social construction of deviant behavior and societal reactions to it.

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 Minority Groups 3 hrs.
Nature of minorities: status differentiation and group structure, institutional trends, and intergroup relations.

333 Sociology of the South 3 hrs.
Examines the contemporary South focusing on unique social processes and cultural heritage leading to its development.

335 Future Social Trends 3 hrs.
Major social trends that leading forecasters project for the next 25 years. Nature, methods, and outlook of modern social and technical forecasters. (A course for students with a variety of majors. Sociology 100 helpful but not required.)

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. Course may be taken more than once for credit as long as subtitles differ.
345 Social Gerontology 3 hrs.
Theoretical and empirical approach to human aging process with its various social and cultural aspects. Major problems and issues in aging and current programs designed to meet needs of the elderly.

350 Social Stratification 3 hrs.
Social class, social status, and social mobility. Social power and prestige. Differential opportunities and resultant behaviors of upper, middle, and lower social classes.

375 Social Psychology 3 hrs.
Fundamental principles of group processes, social influence, and group structure. Development of group solidarity, cohesion, intergroup conflict and cooperation, communication, leadership, opinion, propaganda, and suggestion. Prerequisite: PY 103 or SOC 100. (Same as PY 375).

380 The Sociology of Science and Technology 3 hrs.
Survey of the social forces that shape the nature and direction of science and technology. Involves a critical look at modern science and technology. Prerequisite: SOC 100 helpful but not required.

382 Political Sociology 3 hrs.
Examination of concepts, theories, and research findings related to the structure of political institution in society and its relation to other social institutions. Stratification, correlates, bases, legitimation, and change of power in society. Prerequisite: SOC 100 or PSC 101. Same as PSC 382.

390 Readings and Individual Research 3 hrs.
Supervised readings or in-depth research or both in area of specialized interest to student or instructor. Permission of instructor. May be taken twice for credit with adviser's approval.

440 Sociology of Religion 3 hrs.
Sociological principles applied to religious institutions; interaction of religion and society. Sects and cults, the religious commune, religion and social change, and contemporary religious issues.

450 Medical Sociology 3 hrs.
Relationship of sociology and social psychology to medicine. Role and status of medical and paramedical personnel in the United States; Health-care delivery systems and problems encountered.

452 Sociology of Mental Health 3 hrs.
Social construction of mental health and mental illness. Mental hospitals, community mental health center, and mental health movement.

455 Sociology of Work and Occupations 3 hrs.
Contemporary work situations and experiences. Alienation in work, impact of technological change and bureaucratization, primary work groups and work culture, professionalization, unionization, workers' self-management experiments, and work-leisure relationship.
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. Prerequisite: SOC 100, 102, and junior or senior standing.

470 Social Organization
Introduction and critical exploration of the analysis of social units including groups, organizations, communities, societies, and the world system of societies. Various forms of analysis will be considered, from Marxist to Network approaches. Prerequisite: SOC 100.

657 Complex Organization in Industrial Society
This course will expose students to mainstream and critical sociological theories for understanding complex organization in industrial societies. Specific areas to be covered include: historical development, structure and processes, contradictions and conflict, and alternative forms. Prerequisite: Senior or Graduate standing/permission of instructor.
Interim Dean Reet Henze, B.S.N., M.S.N., Associate Professor

Professors Burge, Hincker; Associate Professors Anderson, Pearson, Rozell, Warren, Williamson, Witt; Assistant Professors Benedict, Cholewinski, Heaman, Holder; Lecturers Adams, Brookman, Calvert, Estes, Jones, Smith, Williams, Young.

The College of Nursing offers the undergraduate Bachelor of Science degree in Nursing and the Master of Science in Nursing in the graduate program. The professional components of the undergraduate and graduate programs are designed to give the student the theoretical and experiential base for current and future practice. The undergraduate curriculum provides general education options which foster personal development. The graduate program offers opportunity for specialization for advanced nursing practice.

The undergraduate program in Nursing is approved by the Alabama Board of Nursing. Both the baccalaureate and the masters programs in Nursing are accredited by the National League for Nursing.

Undergraduate Program

The undergraduate curriculum is divided into two components, the lower and upper divisions. Lower division courses establish the scientific base for future practice of nursing. The upper division concentrates on progressive experiences and professional nursing practice, as well as theory to support it. In addition, the student may select a cognate area of study or a minor. Graduates are prepared to accept employment in all beginning-level positions in nursing practice.

Beginning students are advised by the College of Nursing Advisement Office personnel. Continuing students are assigned an advisor from the nursing faculty and must meet with the adviser for program approval before registration each term.

Students transferring to UAH from other institutions should seek advisement from the College of Nursing before registration. The student transferring into the nursing program has the same options of testing for credit or advanced standing as other university students (see Admissions Information). Credit for at least one-half of the major nursing courses must be earned at UAH to complete requirements for the B.S.N. degree.

Registered Nurses

Registered nurses may be admitted to the undergraduate program to meet requirements for the Bachelor of Science in Nursing degree. A specific schedule of required courses must be pursued with the advisement of the Director of R.N. Education. Registered Nurses are allowed the opportunity, on the basis of their previous experience and licensure, to validate
designated courses in the nursing curriculum by successfully passing two NLN Nursing Mobility Profile Examinations. This planned program also offers opportunities for part-time study and nontraditional hours at UAH and off campus sites.

To be admitted to upper division clinical courses of the nursing major, a Registered Nurse must present evidence of (1) current RN license in good standing in Alabama (2) current professional liability coverage (3) current CPR certification, (4) a letter of reference documenting satisfactory work experience as a Registered Nurse for the time period immediately prior to admission to the clinical portion of the major, and (5) meet requirement listed under Policies for Registered Nurses, Health Service and Responsibility to Agencies.

BSN/MSN Articulation Program for Registered Nurses

Registered Nurses holding Associate Degrees or Diploma in Nursing and have completed 60 semester hours of general education requirements are eligible to sit for validation exams and earn 29 semester hours toward the BSN degree. Graduate level courses are taken while pursuing the BSN degree and are not repeated when admitted to the MSN program.

Policies for Registered Nurses

1. All academic policies established by UAH and the College of Nursing will apply to registered nurses in the BSN program.

2. Academic advisement will be provided on an individual basis to assure that students follow the required sequence of courses in the nursing major.

3. Candidates for admission to the RN completion program must show proof of a current licensure in the state of Alabama. Applicant will not be eligible for admission or continuance in the RN completion program if license is suspended or revoked. In addition, a letter of reference from last employer will be required, assuming employment within last five years. Credit by examination is optional. Through testing, students may validate all or part of the junior year courses. Students are encouraged to seek advisement regarding the validation process.

4. Recent graduates of associate degree or diploma nursing programs who are not yet licensed may be admitted to UAH to complete lower division coursework, but will not be eligible for admission to the RN completion program until they are licensed in Alabama.

5. Students in the RN completion program must submit a plan for completion of the nursing major to the director of the program during the first term of coursework. Time limits for completion of the program will be as stated in the UAH catalog.

6. Registered nurses will receive credit for junior year nursing courses, except NUR 330, on the basis of having obtained passing scores on the NLN Nursing Mobility Profile examinations. In addition NUR 384, Nursing Process in Professional Practice, must be successfully completed before progression to the senior level clinical courses. Arrangements for taking the NLN Nursing Mobility Profile exams are the responsibility of the registered nurse student.

7. Candidates may repeat each validation examination only one time. Failure to obtain a passing score after two attempts will result in the candidate having a successfully complete the appropriate course(s) in the junior year before progressing to the senior year.

8. Credits will be awarded for validation by examination only to students who have been admitted to UAH.

Health Requirements

The unique clinical experiences of students in the baccalaureate and graduate programs require a health surveillance program not applicable to other students in the university. The protection of the student's own health as well as that of the patient necessitates the following regimen before any experience in patient-care agencies:
1. Health examination by a physician or a certified Nurse Practitioner and a dentist prior to beginning clinical sophomore, junior, senior nursing courses is required. Results of the examination must be submitted on forms provided by the College of Nursing at least two weeks before registration. This information must be on file with the Director of the Undergraduate Program or the Director of the Graduate Program before registration.

2. Admission to patient-care agencies depends on satisfactory reports of mental and physical health.

3. Students are advised to obtain health insurance. Hospitals and health agencies provide emergency treatment to students for injury or illness occurring in the course of carrying out program activities at the agency. Such treatment shall, however, be at the expense of the student.

4. Immunization for hepatitis B is required prior to clinical nursing experience. The immunization is at the expense of the student.

Undergraduate Admission, Progression, Graduation Requirements

1. All lower division course requirements for the nursing major outlined in this section of the catalog must be completed before a student is admitted to the upper division component of the nursing major.

2. A minimum grade of C is required in all natural and behavioral science courses, mathematics, statistics, and in English composition courses.

3. A student admitted to the upper division major must have an overall 2.0 (C) average on all hours pursued, including all course work taken at other colleges and universities as well as at UAH.

4. A grade of C or above must be earned in required nursing courses. A student who receives a grade below C in a required nursing course may repeat the course one time only. (Required nursing courses include NUR 234, 321, 322, 330, 361, 372, 373, 423, 473, 480, 481.)

5. A student who receives two grades below C in required nursing courses at any time during the program, either in the same course or in separate courses, will not be permitted to continue in the program.

6. An overall 2.0 (C) average in all course work pursued, as well as in all courses taken in the nursing major, is required for graduation.

7. Activity courses credits accepted toward the degree will be limited as follows: Physical education—3 credits; military science—3 credits; music—2 credits; art activity—2 credits. A limit of four credits in any combination of these activity courses will be accepted toward meeting graduation requirements.

8. The practice of nursing requires high standards of personal qualities and behaviors as well as professional knowledge and skills. For this reason, a nursing student shall be subject to assessment of such qualities and behaviors as affective and emotional stability, maturity of judgment, responsibility, reliability, interpersonal relationships, integrity and ethical standards, physical and mental health, personal hygiene, compliance with campus and community standards of lawful conduct, and general moral character. A student whose suitability or fitness for nursing practice is deemed impaired by a deficiency in any of these areas may be dismissed from the nursing program. Such assessments shall be the responsibility of the faculty of the College of Nursing or a designated body of such faculty.

9. Students must meet standards for health as stated elsewhere in the catalog.

10. Requests for exceptions to any of the above requirements are to be directed to the Academic Affairs Committee of the College of Nursing.

11. In addition to the above requirements, registered nurse students must comply with Policies for Registered Nurses.
Responsibility to Agencies

Students practicing in patient-care agencies must be acceptable to those agencies and are responsible for complying with policies and procedures required by the agency, including coverage by malpractice insurance when enrolled in clinical courses. Failure to meet this requirement may mean that the student is excluded from required practice and prevented from completion of the program.

Baccalaureate Program of Studies

Lower Division: 63 semester hours

<table>
<thead>
<tr>
<th>Natural Science, Mathematics, and Statistics:</th>
</tr>
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<tbody>
<tr>
<td>Biological Sciences (BYS 112, 214, 313, 314)</td>
</tr>
<tr>
<td>Chemistry (CH 101, 105)</td>
</tr>
<tr>
<td>Mathematics (Level I)</td>
</tr>
<tr>
<td>(If placed at Level II or above, student may use 3 hours as an elective.)</td>
</tr>
<tr>
<td>Statistics (a statistics course offered in any department)</td>
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<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Social and Behavioral Sciences:

| Sociology (SOC 100, 106) | 6 |
| Psychology (PY 103) | 3 |
| Elective | 3 |
| **Total** | **12** |

Humanities:

| English composition (EH 101 and 102) | 6 |
| Literature or history (two courses in sequence) | 6 |
| Human Development | 3 |
| Elective | 3 |
| **Total** | **18** |

Nursing:

| Lower division core (NUR 234) | 4 |

Upper Division: 65 semester hours

| Clinical nursing core courses (NUR 361, 372, 373, 480, 481, 473) | 47 |
| Introduction to Pharmacology (NUR 321) | 2 |
| Nutrition in Nursing (NUR 322) | 2 |
| Introduction to Health Assessment (NUR 330) | 3 |
| Research Process in Nursing (NUR 423) | 2 |
| **Total** | **56** |

Summary

A total of 128 semester hours of credit is required for the B.S.N. degree. As specified in the program of studies, 60 semester hours of nursing constitute the major area of concentration.

Graduate Program

The College of Nursing offers the Master of Science in Nursing degree as well as the BSN/MSN articulation program for registered nurses, which builds upon and augments the
scientific and professional base provided in baccalaureate-level study. See Graduate Catalog for details.

Nursing (NUR)

234 Foundations of Nursing 4 hrs.
Theoretical foundations and clinical skills of nursing practice including nursing process, levels of prevention, adaptation, communication, role, and health-care systems. Laboratory and selected clinical experiences included. Lab fee: Level 7. Sp, S.

321 Pharmacology in Nursing 2 hrs.
Major drug classifications and therapeutic uses. Legal and ethical implications. Lab fee: Level 1. Prerequisite: NUR 234.

322 Nutrition in Nursing 2 hrs.
Knowledge and principles of nutrition applied to individual health needs. Lab fee: Level 1. Prerequisite: NUR 234.

325 Human Sexuality 3 hrs.

330 Introduction to Health Assessment 3 hrs.
Basic concepts and techniques of interviewing, history-taking, and physical assessment emphasizing normal findings. Lab fee: Level 7.

332 Nursing Care of Persons Experiencing Surgical Interventions 3 hrs.
A study of 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 the client and his family. Lab fee: Level 3. Senior standing.

334 Death and Dying 3 hrs.
Influence of death and dying upon attitudes and thinking gleaned from historical, cultural, philosophical, and scientific perspectives. Intimate reactions and beliefs concerning death and identifying coping resources. Elective. Lab fee: Level 2.

337 Nursing as a Political Force 3 hrs.
An 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.

338 Drug and Other Substance Abuse 3 hrs.
The study of issues arising from the intentional or inadvertent abuse or misuse of drugs and food; the legal and physical implications of such behavior. Emphasis is placed on theories of causation and treatment of methodologies. Elective. Open to non-majors. Lab fee: Level 1.

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. Lab fee: Level 3. Elective.
<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>372</td>
<td>Nursing Process across the Life Span</td>
<td>8 hrs.</td>
<td>Nursing theory and process related to caring for individuals of all ages experiencing alteration in health. Emphasis is placed on the impact of long term illness. Clinical experiences in acute, long term care, and rehabilitation are included. Lab fee: Level 8. Prerequisite: NUR 321, 322, 361.</td>
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<tr>
<td>373</td>
<td>Nursing Process in Care of the Developing Family</td>
<td>8 hrs.</td>
<td>Nursing process used to promote health and facilitate adaptation in child bearing and child-rearing families. Clinical experiences in maternity, community, and pediatric settings. Lab fee: Level 8. Prerequisite: NUR 361.</td>
<td></td>
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<tr>
<td>384</td>
<td>Nursing Process in Professional Nursing</td>
<td>2 hrs.</td>
<td>This course addresses the philosophical, social and ethical principles inherent in the practice of professional nursing. Emphasis is on the use of the nursing process and theoretical bases for professional nursing practice. Prerequisite: Registered Nurse. Lab fee: Level 2.</td>
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<tr>
<td>390</td>
<td>Independent Study</td>
<td>1-4 hrs.</td>
<td>Individualized independent study of specific nursing problem under sponsorship of a nursing faculty member with special preparation in the field. Elective.</td>
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<tr>
<td>402</td>
<td>Health Care and the Law</td>
<td>3 hrs.</td>
<td>A study in health care law designed to integrate pertinent aspects of law into the study and/or practice of health care. Lab fee: Level 1.</td>
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<tr>
<td>413</td>
<td>Applied Pathophysiology</td>
<td>3 hrs.</td>
<td>An exploration of human adaptation and alteration in system function as a basis for nursing decision making. Clinical simulations assist the student in selecting appropriate interventions. Elective. Prerequisite: Senior level or permission of instructor. Lab fee: Level 1.</td>
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<tr>
<td>480</td>
<td>Nursing Process in Community Health</td>
<td>8 hrs.</td>
<td>Nursing process used to promote health and foster adaptation in individuals, families, and communities. Clinical experiences in selected community health agencies and selected settings. Lab fee: Level 8.</td>
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<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
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<tr>
<td>500</td>
<td>Special Topics</td>
<td>2-4 hrs.</td>
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<td></td>
<td>Advanced study of selected topics in nursing. Elective. Prerequisite: approval of instructor.</td>
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<tr>
<td>601</td>
<td>Development of Nursing Theory</td>
<td>3 hrs.</td>
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<td>602</td>
<td>Seminar in Research</td>
<td>3 hrs.</td>
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<td>603</td>
<td>Professional Paper</td>
<td>4 hrs.</td>
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<tr>
<td>604</td>
<td>Use of Computers in Nursing</td>
<td>3 hrs.</td>
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<tr>
<td>605</td>
<td>Statistical Analysis</td>
<td>4 hrs.</td>
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<td>606</td>
<td>Advanced Health Assessment</td>
<td>3 hrs.</td>
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<td>607</td>
<td>Home Health Theory and Issues</td>
<td>3 hrs.</td>
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<td>608</td>
<td>Case Management in Home Health Nursing</td>
<td>3 hrs.</td>
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<tr>
<td>612</td>
<td>Pathophysiology</td>
<td>4 hrs.</td>
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<tr>
<td>614</td>
<td>Pharmacology in Advanced Practice</td>
<td>3 hrs.</td>
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<tr>
<td>627</td>
<td>Family Nursing</td>
<td>5 hrs.</td>
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<tr>
<td>628</td>
<td>Family Nursing in Community I</td>
<td>4 hrs.</td>
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<tr>
<td>629</td>
<td>Family Nursing in Community II</td>
<td>4 hrs.</td>
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<tr>
<td>630</td>
<td>Family Nursing in Community III</td>
<td>7 hrs.</td>
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<tr>
<td>631</td>
<td>Family Nursing in Acute Care I</td>
<td>4 hrs.</td>
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<tr>
<td>632</td>
<td>Family Nursing in Acute Care II</td>
<td>4 hrs.</td>
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<tr>
<td>633</td>
<td>Management Theory for Advanced Nursing Practice</td>
<td>3 hrs.</td>
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<tr>
<td>634</td>
<td>Curriculum Development in Nursing</td>
<td>3 hrs.</td>
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<tr>
<td>635</td>
<td>Teaching and Evaluation in Nursing</td>
<td>3 hrs.</td>
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<tr>
<td>636</td>
<td>Practicum in Supervision</td>
<td>3 hrs.</td>
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<tr>
<td>637</td>
<td>Practicum in Teaching</td>
<td>3 hrs.</td>
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<td>640</td>
<td>Concepts of Role Resocialization</td>
<td>2 hrs.</td>
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<tr>
<td>641</td>
<td>Issues in Professional Practice</td>
<td>2 hrs.</td>
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<tr>
<td>642</td>
<td>Home Health Care Nursing I</td>
<td>4 hrs.</td>
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<tr>
<td>643</td>
<td>Home Health Care Nursing II</td>
<td>4 hrs.</td>
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<tr>
<td>644</td>
<td>Home Health Care Practicum</td>
<td>4 hrs.</td>
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<tr>
<td>650</td>
<td>Independent Study</td>
<td>2 - 4 hrs.</td>
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<tr>
<td>699</td>
<td>Thesis</td>
<td>6 hrs.</td>
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</table>
School of Primary Medical Care

Interim Dean J. Ellis Sparks, B.S., M.D., Professor and Chief of Internal Medicine

Emergency Medicine
Clinical Associate Professor Throckmorton (chief); Clinical Instructor Beck; Lecturers Andrews, George, Marcus.

Family Medicine
Professor Emeritus Grant; Professor Bryan; Associate Professors Crump, Hubbard (acting chief); Clinical Associate Professor Moessner; Adjunct Associate Professor Fleming; Assistant Professor Chappell; Clinical Assistant Professor Garber; Instructor Caldwell.

Internal Medicine
Professor Sparks (chief); Associate Professor Franco-Browder; Clinical Associate Professors Patton, Schreeder, Tietke, R. Williams; Assistant Professor Robbins; Clinical Assistant Professors Boyer, Hull, Morgan.

Medical Sociology
Professor McCalister

Microbiology
Associate Professor Moore

Obstetrics and Gynecology
Emeritus Professor Corner; Associate Professor Di Placido (chief); Assistant Professors Green, Light; Clinical Assistant Professor R. Harris.

Pathology
Clinical Professor Litkenhous (chief); Lecturer Keebler

Pediatrics
Professors L. McKenzie, Montgomery (chief); Clinical Professors Lester, Overbach, Quirante, Stewart; Associate Professor Fleming; Assistant Professor Knight; Clinical Assistant Professor Powell.
The School of Primary Medical Care of the University of Alabama in Huntsville offers courses for undergraduates interested in learning more about the health professions before entering medical school, dental school, or other health professional educational programs. The school also offers for undergraduate credit a paramedical program at the highest level of training for emergency medical technicians. Both groups of undergraduate courses are listed in this section.

The UAH School of Primary Medical Care offers professional medical training on three levels. For junior and senior medical students in the University of Alabama School of Medicine, the UAH School of Primary Medical Care offers a complete clinical education program. Through the School of Primary Medical Care, UAH jointly offers with Huntsville Hospital a three-year residency in family practice for medical school graduates who want specialized training to qualify for certification by the American Board of Family Practice. The school also sponsors or cosponsors a variety of continuing medical education conferences and workshops to aid practicing physicians in maintaining licensure and certification requirements. All three programs are accredited through the University of Alabama School of Medicine (UASOM).

All UASOM freshman students are admitted to the parent school in Birmingham, where they complete their basic medical science training, which comprises the first two years of the undergraduate medical curriculum. Students then take their clinical clerkships and electives at the Birmingham, Huntsville, or Tuscaloosa campuses. Students who satisfactorily complete the medical curriculum at any of the three campuses are awarded diplomas from the University of Alabama School of Medicine.

Address correspondence about admission to the tri-campus UASOM to: Director of Admissions, University of Alabama School of Medicine, P.O. Box 100 University Station, Birmingham, Alabama 35294. Students or prospective students at UAH interested in premedical or predental baccalaureate programs are referred to the preprofessional advisor in the College of Science through the Office of the Dean of the College of Science.

Faculty and students of the School of Primary Medical Care are available for consultation with students interested in medicine and other health professions. Interested students are referred to the Office of Medical Student Affairs, UAH Clinical Science Center.

Goals

In accord with the mission, goals, and objectives of the UASOM, the mission of the program at Huntsville is to develop and maintain the following objectives:

1. A complete clinical program for junior and senior medical students that also demonstrates career options in primary-care disciplines.
2. Residency training programs in traditional primary-care disciplines to provide practicing physicians to meet the needs of Alabama.
3. Continuing medical education programs to provide physicians and other health-care professionals in North Alabama opportunities to stay abreast of advances in patient care.
4. Research in psychosocial and socioeconomic areas related to medicine and health care in general, as well as traditional biomedical research.

5. Ongoing patient-care services appropriate to the training of the school's residents and medical students and the health needs of North Alabama.

**Undergraduate Programs (UAH)**

Admissions committees of professional schools expect competitive applicants to be knowledgeable concerning their fields of interest. To this end, the School of Primary Medical Care faculty work with faculty of other schools and divisions of UAH to offer courses for pre-professional students.

The University's emergency medical service-paramedic training program is also offered through the SPMC. Upon successful completion of the program, the student is qualified to apply for licensure as an emergency medical technician-paramedic through the state Department of Public Health.

**Prehealth Studies and Emergency Medical-Paramedic Training (MED)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Introduction to the Health Professions</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>Career options for undergraduate students interested in health professions. Basics of health-care delivery systems and terminology of health care. Primarily for freshman and sophomores. (Same as BYS 100).</td>
<td></td>
</tr>
<tr>
<td>191</td>
<td>Emergency Medical Technician-Basic</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Basic techniques of prehospital stabilization in emergencies such as traumatic injuries, cardiac arrest, and other life-threatening health conditions.</td>
<td></td>
</tr>
<tr>
<td>193</td>
<td>Emergency Medical Technician-Basic Lab</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>Laboratory course concurrent with MED 191. Application of techniques taught in MED 191 to real or simulated situations. Qualification for examination for Alabama EMT-Basic license upon successful completion of lecture and laboratory courses. Prerequisite: MED 191 or concurrent enrollment.</td>
<td></td>
</tr>
<tr>
<td>291</td>
<td>Emergency Medical Technician—Intermediate I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Knowledge, understanding and skills needed to perform proper advanced airway management, proper administration of IV fluids and other advanced emergency care procedures. Prerequisites: MED 191 and 193, current Alabama EMT-Basic license, and admission qualifications as specified by the UAH EMT-Paramedic Educational Advisory Board.</td>
<td></td>
</tr>
<tr>
<td>292</td>
<td>Emergency Medical Technician—Intermediate II</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>Continuation of MED 291, focusing on medical emergencies and trauma life support. Lab fee: Level 8. Prerequisites: MED 291 and admission qualifications as specified by the UAH EMT-paramedic Educational Advisory Board.</td>
<td></td>
</tr>
<tr>
<td>293</td>
<td>Emergency Medical Technician—Intermediate Laboratory</td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Application of techniques taught in MED 291, 292 and 294 to real or simulated situations. Successful completion of all Intermediate courses qualifies student to apply for the Alabama EMT-Intermediate license. Lab fee: Level 7. Prerequisites: MED 291, 292 and 294, and admission qualifications as specified by the UAH EMT-Paramedic Educational Advisory Board.</td>
<td></td>
</tr>
<tr>
<td>294</td>
<td>Emergency Medical Technician—Intermediate Electrocardiology</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>A 40-hr. course which offers knowledge, understanding, and skills needed to</td>
<td></td>
</tr>
</tbody>
</table>
interpret cardiac dysrhythmias in Lead II ECG, to better understand cardiac cell electrophysiology, and to relate the theory of common cardiac disease to non-lethal as well as death-producing dysrhythmias. Prompt recognition and therapeutic management are emphasized. Prerequisites: Admission qualifications as set down by the EMT-Paramedic Educational Advisory Board for EMT students. Open to all health care professionals.

391 Emergency Medical Technician-Paramedic Training 6 hrs. Training in pharmacological intervention for emergency patients as identified by the State Committee on Public Health. Instruction in drugs endorsed by the American Heart Association as essential or useful for cardiac arrest. Training in psychological first aid. Successful completion of course enables student to give advanced cardiac life support under a physician’s direction. Prerequisite: admission qualifications as specified by the UAH EMT-Paramedic Educational Advisory Board.

393 Emergency Medical Technician-Paramedic Laboratory 6 hrs. Application of techniques taught in MED 391 to real or simulated situations. Successful completion of lecture and laboratory courses qualifies student to apply for the Alabama EMT-Paramedic license. Lab fee: Level 9. Prerequisites: MED 391 and admission qualifications as specified by the UAH EMT-Paramedic Educational Advisory Board.

401 Introduction to Clinical Medicine (Preprofessional) 3 hrs. On-site exposure and experience in clinical settings for preprofessional student. Student works in a minimum of five clinical areas in a local hospital. Weekly lectures cover topics from human anatomy to pathophysiology of disease. Prerequisite: junior or senior status and permission of instructor.

402 Social Epidemiology 3 hrs. Predisposing and contributory social and cultural variables in acquisition and resolution of disease in human subpopulations. Interpretative models and logic of social epidemiology and relevant concepts and methods of descriptive and analytic epidemiology. Prerequisite: sophomore status.

403 Clinical Medical Sociology 3 hrs. Systematic analysis of problematic behaviors of patients and health professionals in the acquisition, diagnosis, treatment, and resolution of illness. General and role-specific behaviors, contexts and interaction styles as variables in problem resolution or circumvention. Prerequisite: Junior or senior status.

Medical Programs (UASOM)

The medical student curriculum is determined by the School of Primary Medical Care faculty with the agreement of the Curriculum Committee of UASOM. The family practice residency curriculum is determined by the SPMC faculty in family medicine with the agreement of Huntsville Hospital and approval of the joint Residency Review Committee for Family Practice and the Accreditation Council for Graduate Medical Education. The medical-student and resident curricula of the UAH School of Primary Medical Care are subject to change through the mechanisms described above without prior notice.
Student Medical Education

The two-year clinical program of the School of Primary Medical Care completes the qualifications of students for the M.D. degree and for taking the Part II Examination of the National Board of Medical Examiners. The special focus of the program is on general clinical competencies in medicine, pediatrics, obstetrics and gynecology, surgery, and psychiatry that qualify a student for graduate training in all disciplines. It is intended that a student completing the program will be qualified to enter an approved residency in any field of medicine.

The clinical experiences are oriented toward the primary-care emphasis on comprehensive health maintenance, behavioral medicine, continuity of care, and consideration of the family as a unit of health care. In general, both the core and elective experiences involve a combination of inpatient and outpatient assignments, the latter including clinic and private office experience. Clinical conferences appropriate to each specific core clerkship and elective are scheduled.

Required clerkships in the clinical program include these areas:

- Obstetrics and Gynecology
- Psychiatry
- Pediatrics
- Family Medicine
- Internal Medicine
- Surgery

Medical Student Elective Program

Clinical electives offered by the UAH School of Primary Medical Care are characterized by:

1. A one-to-one faculty-student relationship in most offerings.
2. Experience with both hospital and ambulatory patient care.
3. Experience in early diagnosis of illness.
4. Experience through private practice exposure in nonmedical aspects of health care and practice.

Electives

- Clinical Elective in Cardiology
- Clinical Elective in Dermatology
- Clinical Elective in Gastroenterology
- Clinical Elective in Infectious Disease
- Clinical Elective in Medical Oncology
- Clinical Elective in Nephrology
- Clinical Elective in Neurology
- Clinical Elective in Pulmonary Medicine
- Senior Subinternship in Medicine
- Clinical Elective in Ambulatory Pediatrics
- Clinical Elective in Pediatric Allergy
- Clinical Elective in Private Pediatric Practice
- Senior Subinternship in Neonatal Intensive Care
- Senior Subinternship in Pediatrics
- Developmental Pediatrics
Senior Elective in Obstetrics and Gynecology
Clinical Elective in Anesthesiology
Clinical Elective in Ear, Nose, and Throat
Clinical Elective in Neurological Surgery
Clinical Elective in Ophthalmology
Clinical Elective in Orthopedics
Clinical Elective in Plastic and Reconstructive Surgery
Clinical Elective in Cardiovascular Surgery
Senior Subinternship in General Surgery
Clinical Elective in Urology
Clinical Elective in Colon and Rectal Surgery
Senior Elective in Emergency Medicine
Research Elective in Health Behaviors
Research Elective in Social Factors in Human Reproduction
Clinical Elective in Radiology and Nuclear Medicine
Clinical Elective in Psychiatry
Clinical Clerkship in Family Medicine in North Alabama
Senior Elective in Clinical Pathology
  During the clinical electives, student works in both hospital and office settings at the
discretion of physician-supervisor, who extends graduated responsibility to student for care
of private patients.

Family Practice Residency
  The Family Practice Residency Program of UAH and Huntsville Hospital was the first
approved residency in family practice in Alabama and the first residency program of any
kind to be implemented in Huntsville. The purpose of the residency is to aid developing
physicians in acquiring knowledge, skills, and attitudes necessary to become proficient family
physicians who can provide families with comprehensive health care on a continuing basis.
In acknowledgement of the need for continued medical education to maintain professional
excellence, residents are encouraged to develop habits of learning and understanding that
will help them assimilate current health-care information for the duration of their careers.
  The residency training program is based in the UAH Family Practice Center, which is
located in the UAH Medical Clinics across the street from the main building of Huntsville
Hospital. Each family practice resident is assigned patients to be followed in the UAH
Medical Clinics with necessary inpatient care at Huntsville Hospital. In the first year residents
see family practice patients one-half day per week. The patient load increases during the
second and third year of the program.
  The residents begin their training with concentrated in-hospital medicine. The first year
consists of three months rotations in inpatient medicine pediatrics, obstetrics and gynecology,
and surgery. These rotations are intensive in-hospital experiences combined with appropriate
rotations of ambulatory and special intensive service areas. The family practice residents
work closely with medical students on all of the core rotations. In the second and third years
of the residency program the emphasis is on ambulatory care with increasing responsibility
for both inpatient and outpatient hospital care. Rotations include one month each of neurology,
orthopedics, cardiology, consultation medicine, dermatology, and two months of pediatrics. There is also a two-month block of general internal medicine during which the second year residents supervise and teach the first year residents and medical students.

Five months of the second and third years are spent on the Family Practice service. The residents see patients in their modules nine half days per week and manage patients that require hospitalization from their module. Rotations are also provided in ENT, Ophthalmology, Urology, Radiology and Psychiatry. Behavioral medicine is an integrated experience throughout the residency.

Of the seven months of electives during the second and third years of the residency, one month is allotted to a rural preceptorship. This month of rural preceptorship affords the resident direct exposure to a community practice in Alabama and offers the opportunity for a "real life" experience in medical care.

Further information on the UAH-Huntsville Hospital Family Practice Residency Program is available from: Director of the Family Practice Residency, UAH Medical Clinics, 201 Governors Drive, S.W., Huntsville, Alabama 35801.

Resources and Facilities

In all aspects of its work, the UAH School of Primary Medical Care depends upon active cooperation of hospitals and medical professionals of North Alabama. Huntsville Hospital with 578 beds is the largest hospital in North Alabama and serves as the primary teaching hospital in training family-practice residents.

Ownership and operational control of the hospital are vested in the Health Care Authority of the City of Huntsville. Because of its diversified medical staff, capacity, and specialized facilities, Huntsville Hospital serves as a regional referral health care center for northern Alabama and southcentral Tennessee. Huntsville Hospital and the Clinical Science Center and UAH Medical Clinics of the UAH School of Primary Medical Care form a geographic and functional nucleus for health-care education and delivery.

The UAH Medical Clinics building has been arranged, staffed, and equipped to facilitate demonstration of how primary physicians' office practices, consultant services, and community resources may be integrated to provide continuing comprehensive care to individuals and families. The area of the building devoted to health services on a fee-for-service basis includes a number of practice modules, each with its own examination and consultation rooms, nursing station, supply room, and waiting room. The modules are staffed by teams of faculty, residents, medical students, nurses, co-professionals, nursing students, and secretary-receptionists.

The UAH Medical Clinics facility also has a clinical laboratory, a radiology unit, an ambulatory surgical unit, and a pharmacy. The computerized business information system makes readily available accounts receivable data for patient billings and management-systems reports. The VA Outpatient Medical Clinic, located in the UAH Medical Clinics buildings, provides primary medical care on an outpatient basis for eligible veterans living in North Alabama. The Birmingham VA Medical Center continues to provide hospitalization and specialized laboratory and x-ray techniques and will continue to provide other specialty outpatient services for North Alabama veterans. The clinic in the UMC is staffed by SPMC faculty and family practice residents, and there is medical student participation. The UAH Clinical Science Center houses administrative and faculty offices, medical student facilities, and academic support services. The location of the school's Health Sciences Library in this building in the Huntsville medical district makes the collection conveniently available to area physicians and other health professionals as well as to medical students, residents, and faculty. The SPMC Library also serves as the primary literature resource and repository for Huntsville Hospital.
Through the UAH Library, of which it is a component, the SPMC Health Sciences Library has access to the Redstone Scientific Information Center at Redstone Arsenal. In addition, the professional staff of the Health Sciences Library works closely with library staff and services at Lister Hill Library in Birmingham and the National Library of Medicine in Bethesda, Maryland. The MEDLINE terminal in the SPMC Health Sciences Library makes available to the faculty, residents, medical students, and other members of the Huntsville medical community on-line searches through the data base of the National Library of Medicine.

The UAH Clinical Science Center also contains the laboratory and offices of the UAH Consortium for the Space Life Sciences. The Consortium, a multidisciplinary collaboration among the SPMC, the Johnson Research Center, and the Colleges of Science, Engineering, and Liberal Arts, conducts research in the space life sciences for NASA and other institutions, businesses, and agencies. All medical services that the SPMC provides in educational settings for its medical students and residents are part of services provided by UAH to the region and state. The School of Primary Medical Care is one of a growing number of medical programs integrated into the life of their communities, drawing on existing facilities and professional personnel, and, in return, expanding and diversifying health services available.
Realizing that the acquisition of scientific knowledge and expertise is not only a profession but also a vital support to other disciplines, the College of Science offers programs designed to meet various educational, vocational and professional goals. Students may select programs of study for career opportunities in mathematical, life and physical sciences or as background requirements for professional studies in medicine, engineering and education. In addition, the faculty assists students in preparation for advanced studies and in planning research projects to enhance course work. By encouraging intellectual as well as technical development, the faculty seeks to introduce students to scientific inquiry as an orderly thought process.

The College of Science consists of five academic departments: Biological Sciences, Chemistry, Computer Science, Mathematical Sciences, and Physics. Programs are administered by these five departments and the Office of the Dean. The Optical Science degree is administered through the Physics Department. Specific departmental degree requirements along with course descriptions are listed in the sections that follow.

Undergraduate Degrees and Study

The College of Science awards the Bachelor of Science and the Bachelor of Arts Degree. Majors are offered in biological sciences, chemistry, computer science, mathematics, mathematics education, optical science, and physics. A certificate program in environmental science is offered to undergraduates majoring in sciences or mathematics and to graduates with these majors. In addition, courses are offered in atmospheric science and statistics.

Specific degree programs include:
- Atmospheric and Environmental Science
- Biological Sciences
- Chemistry
- Computer Science
- Mathematics
- Mathematics Education
- Optical Science
- Physics

Certificate
B.S., B.A.
B.S.
B.S., B.A.
B.S.
B.S.
B.S.

257
Junior College Work (After 64 Semester Hours)

After a student majoring in the College has earned more than 64 semester hours of credit (UAH plus transfer), course work taken at a junior college will normally not be accepted for transfer. Exceptions to this policy may be obtained only by prior written approval of the dean of the College.

Health and Physical Education Courses

Students who major in the College of Science may count up to three semester hours of health and physical education courses toward their requirements for graduation.

Graduate Degrees and Study

The College of Science offers graduate programs which lead to the Master of Science degree in biological sciences, chemistry, computer science, mathematics and physics and to the Master of Arts in mathematics. Doctoral programs are offered in applied mathematics, computer science, materials science and physics. A proposal to offer the Ph.D. degree in Atmospheric Science is presently being reviewed by the Alabama Commission on Higher Education for implementation in the fall of 1989. The Doctor of Philosophy degree in chemistry is available through a cooperative program with the University of Alabama, Tuscaloosa. A certificate in environmental science is available in conjunction with graduate degrees in science and mathematics. For graduate course offerings and programs, refer to the Graduate Catalog.

Atmospheric and Environmental Science Program

Adjunct Professors Hung, Schroer; Research Professors Essenwanger, Vaughan; Associate Professors Modlin (Acting Coordinator), McNider.

Atmospheric and 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 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 his GER. Other required courses can be taken as electives, permitting the fully prepared bachelor's candidate to complete requirements for his degree and the certificate with the usual number of credit hours required for the bachelor's degree alone.

Composite Major in Environmental and Biological Sciences

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER ( humanities and social sciences, ECN or PSC recommended)</td>
<td>36</td>
</tr>
<tr>
<td>Mathematics (including ST 281 if Level III placement)</td>
<td>9</td>
</tr>
<tr>
<td>Physics—Ph 101, 102 or 111, 112</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 335, 361, 362</td>
<td>22</td>
</tr>
<tr>
<td>Environmental Science—ES 101, 102 or 202, 303 or 304, 312, 321</td>
<td>17</td>
</tr>
<tr>
<td>Biological Sciences—BYS 113, 114, 221, 312, 319, and MS 507, BYS 531</td>
<td>23</td>
</tr>
</tbody>
</table>

or BYS 561

258
BYS electives .................................................................................. 12-14
One from 315, 317, 378 ................................................................. 4-5
One from 562, 563, 564 ................................................................. 4
One from 364, 371, 372 ................................................................. 4-5
Computer Science—CS 108 ............................................................... 3
Electives (to include statistics if not MA level III placement) ............ 0-3

Requirements for the Environmental Science Certificate
Basic science courses (unless exempted by advanced placement and/or testing in each case): Biological Sciences 113, 114; Chemistry 121, 123, 125, 126; Environmental Science 101, 102; Physics 111, 112; two basic courses in statistics and/or computer science.

Environmental certificate core courses:
BYS 312 Principles of Ecology
ES 321 Pollution Problems
ES 521 Environmental Data Analysis

Advanced level specialization (9 hours required in courses in student’s major or area of interest chosen from the following):
BYS 526 Microbial Ecology
BYS 561 Physiological Ecology
BYS 562 Community Ecology
BYS 563 Population Ecology
BYS 564 Limnology
MS 502 Marine Geology
MS 509 Marine Ecology
MS 510 Marsh Ecology
CH 525 Environmental Chemistry
ISE 422 Systems Analysis
ISE 427 Management Science
ISE 524 Introduction to Human Engineering
ME 549 Environmental Engineering
ME 559 Selected Topics in Mechanical Engineering
ES 303 Climatology
ES 304 Meteorology
ES 305 Hydrology
ES 593 Directed Studies in Environmental Science

Requirements for a Minor in Atmospheric and Environmental Science
A student in any area of study may build a minor in atmospheric and environmental science with approval of the advisor in his department. A minor is tailored to the student’s needs through consultation with the department advisor and the Atmospheric and Environmental Science Coordinator.

Atmospheric and 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 are also part of the course. This course is 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>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Planetary and Atmospheric Science I</td>
<td>4 hrs.</td>
<td>Spatial relationships of earth, moon and sun that determine earth motions, seasons, atmospheric and oceanic circulation, weather and climates. Practical and field work. Lab fee: Level 4. Prerequisite: MA 105.</td>
</tr>
<tr>
<td>102</td>
<td>Planetary and Atmospheric Science II</td>
<td>4 hrs.</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: Level 4. Prerequisite: ES 101 or approval of instructor.</td>
</tr>
<tr>
<td>202</td>
<td>Physical Geology</td>
<td>3 hrs.</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.</td>
</tr>
<tr>
<td>303</td>
<td>Classification and Physical Causes of Climates</td>
<td>3 hrs.</td>
<td>Basic atmospheric structure and physical processes, climate history and climate change, microclimates, topoclimates. Prerequisites: ES 101, MA 105 or approval of instructor.</td>
</tr>
<tr>
<td>304</td>
<td>Meteorology</td>
<td>3 hrs.</td>
<td>Physical properties and dynamics of atmosphere, factors that govern weather conditions, meteorological factors affecting design and operation of aircraft, and weather research. Prerequisites: ES 201 and MA 151 or MA 154 or approval of instructor.</td>
</tr>
<tr>
<td>305</td>
<td>Hydrology</td>
<td>3 hrs.</td>
<td>Movement and behavior of surface and groundwater, interaction with geological structures, hydrologic prediction, contamination and purification of groundwater. Prerequisite: ES 202.</td>
</tr>
<tr>
<td>312</td>
<td>Principles of Ecology</td>
<td>4 hrs.</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: Level 4. Prerequisites: BYS 113, 114, CH 101 (121); BYS 238 desirable.</td>
</tr>
<tr>
<td>321</td>
<td>Pollution Problems</td>
<td>3 hrs.</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>
</tr>
<tr>
<td>490</td>
<td>Selected Topics in Environmental Science</td>
<td>1-3 hrs.</td>
<td>Special offerings to students in areas of interest not covered in present curriculum. Prerequisite: Approval of instructor. Lab fee: Level 4.</td>
</tr>
<tr>
<td>512</td>
<td>Environmental Transport</td>
<td>3 hrs.</td>
<td>Atmospheric transport and dispersion of pollutants, dispersion modeling, ground</td>
</tr>
</tbody>
</table>

521 Environmental Data Management and Analysis 3 hrs.
Overview of computer hardware, software, communications, and terminals. Management information systems, overview of techniques of data archival and retrieval. Introduction to graphical and image analysis systems. Prerequisites: Computer programming and statistics.

525 Environmental Chemistry 3 hrs.
Principles of quantitative analyses related to minor components of a sample. Applications selected from principal analyses necessary to maintain environmental quality of air, water, and soil. Selection of conditions for collecting reliable samples, concentration of components with techniques for increasing concentration of selected component, relationships between physical and chemical changes in sample and signal output of predominant transducers, and translation of chemical analysis into meaningful specifications. Lecture only. Prerequisite: CH 521 or 123; EG 311, 342. (Same as CH 525).

532 Space Orientation for Teachers: Science 3 hrs.
This course introduces the teacher to a variety of space-related subjects and techniques which may be used in the classroom. The curriculum is designed to reflect current research and technological development in a hands-on experience with the space program. It will include a number of experiments which can be duplicated in the classroom. Offered in cooperation with the Alabama Space and Rocket Center.

551 Atmospheric Fluid Dynamics (same as ME 551) 3 hrs.
A study of fluid dynamics in the atmosphere. Coriolis acceleration, scale analysis and appropriate approximations of the complete governing equations. Numerical analysis and interpretation of weather phenomena. Prerequisites: MA 352, ME 341, ME 352 or equivalent.

553 Atmospheric Radiation (same as ME 553) 3 hrs.

581 Atmospheric Thermodynamics (same as ME 581) 3 hrs.
An introduction to thermodynamics of the atmosphere and relation to weather phenomena. Review first and second law, special atmospheric thermodynamics variables, treatment of air-water systems, atmospheric thermodynamic diagrams, atmospheric statics and vertical stability. Prerequisites: MA 352, PH 321 or ME 341.

591 Environmental Quality Planning 3 hrs.

593 Directed Studies in Atmospheric and Environmental Science 1-4 hrs.
Supervised compilation, summarization, and discussions of special topics in atmospheric and environmental science.

594 Cultural Resources 2 hrs.
Biological Sciences Department

Professors Campbell, Dimopoulos, Leonard, Wilson, Young; Professor Emeritus Adams; Adjunct Professor Montgomery; Associate Professors Eley, Garstka, Lawton, Modlin (interim, chair), Moore; Assistant Professors Johnson, Moriarity, Zahorchak; Adjunct Assistant Professor Meehan.

Undergraduate Programs

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 some of the humanities, social sciences, and economics.

Biological Science Major

The biological sciences program must include BYS 112, 113, and 114 or the equivalent. Only one of these may count toward the major; the other two are needed to satisfy a portion of the general education requirements (GER). A major in biological sciences includes the following core courses:

a. One course in anatomy and physiology chosen from the following: BYS 313/314, 315, 317, 371, 372, 378, 544, or 571.

b. One course in physiology chosen from the following: BYS 313/314, 435, 531, 532, or 561.

c. General genetics (BYS 319)

d. One course in biochemistry, which may be included in major or minor as BYS or CH.

e. One credit hour of seminar to be taken during the junior or senior year. The seminar requirement can also be met at the Marine Environmental Sciences Consortium at Dauphin Island.

BYS 313 or 314 each can satisfy only the anatomy or the physiology requirement. BYS 313 and 314 together can meet both the anatomy and physiology core requirements. BYS 492 is required for students in curricula preparatory for graduate study. Additional hours elected to constitute the minimum of 26 semester hours above the 100 level that are required for a major in biological sciences may be taken in accordance with the individual student’s goal.

Curricula are available for students who elect premedical technology, preprofessional, graduate preparatory, environmental science, or secondary education programs. Curricula I-XI are offered as models of appropriate programs to fulfill the University's degree requirements and achieve diverse goals in the biological sciences with related areas of emphasis. Any curriculum may be modified to fit individual aims with approval of the biology faculty.

All B.S. degree programs in biological sciences include 8 semester hours of physics (PH 101/102, or 111/112 required for certain programs), CH 113 or 331, CH 223, one biochemistry course in the major or minor, and 9 semester hours of mathematics including at least one calculus course. Biological science majors should take at least one course in statistics,
which may be required in certain programs. ST 281 can count toward mathematics GER for
the B.S. degree, if Mathematics placement is Level III.

**Biological Science Minor**
A minor in biological sciences consists of 21 semester hours that include BYS 112, 113
(or 114), and 319 with at least 6 hours numbered 300 or above. Additionally, CH 101, 105,
and 113 are required ancillary courses for a biological science minor. A course in biochemistry
(BYS or CH 301) supports the minor but is not required.

**Curriculum I**
B.A. degree appropriate for biological sciences major with an associated minor in social
sciences.

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>36-42</td>
</tr>
<tr>
<td>Biological sciences core courses and biological sciences electives</td>
<td>30-32</td>
</tr>
<tr>
<td>Chemistry (101, 105, 113, or 331, 301)</td>
<td>8-11</td>
</tr>
<tr>
<td>Physics</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics</td>
<td>3-6</td>
</tr>
<tr>
<td>Humanities, social sciences, economics, or associated cluster</td>
<td>21</td>
</tr>
<tr>
<td>Electives</td>
<td>27-30</td>
</tr>
</tbody>
</table>

**Curriculum II**
B.A. or B.S. degree with a major in Biological Sciences. This plan meets requirements
for an Alabama Class B High School Teachers Certificate.

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>36-42</td>
</tr>
<tr>
<td>Biological Sciences core courses and electives to include BYS 312</td>
<td>30-36</td>
</tr>
<tr>
<td>Chemistry (to include CH 113, or 331, and 361, depending on B.A. or B.S.)</td>
<td>8-22</td>
</tr>
<tr>
<td>Mathematics (depending on placement and B.A. or B.S.)</td>
<td>3-9</td>
</tr>
<tr>
<td>Physics — PH 101 and 102 (depending on B.A. or B.S.)</td>
<td>4-8</td>
</tr>
<tr>
<td>Second Teaching Area</td>
<td>27</td>
</tr>
<tr>
<td>Professional Education Courses</td>
<td>33</td>
</tr>
</tbody>
</table>

**NOTES:**
1. This curriculum may require more than the minimum 128 total semester hours.
2. Students considering this curriculum should consult the Department of Education early
   in their program.
3. A GENERAL SCIENCES COMPOSITE MAJOR covering the areas of chemistry, biological sciences, environmental sciences and physical sciences is possible under this curriculum. Interested students should consult the Biological Sciences or Education De-
   partments.

**Curriculum III**
B.S. degree with emphasis in Biochemistry.

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>36-42</td>
</tr>
<tr>
<td>Biological sciences core courses and BYS 221, 361, 362, 364, 519, and 543</td>
<td>42-44</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 333, 335, 336, (347 and 345 desirable)</td>
<td>21-25</td>
</tr>
</tbody>
</table>
Mathematics—MA 153, 154 ................................................. 6  
Physics—PH 111, 112 ....................................................... 8  
Electives .................................................................. 3-15

**Curriculum IV**  
B.S. degree with chemistry minor, preparatory for graduate study.  

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>36-42</td>
</tr>
<tr>
<td>Biological sciences core courses and biological sciences electives</td>
<td>30-32</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 335, 361, 362</td>
<td>22</td>
</tr>
<tr>
<td>Mathematics—(depending on placement)</td>
<td>9</td>
</tr>
<tr>
<td>Physics—PH 101, 102, (PH 111, 112 may be taken)</td>
<td>8</td>
</tr>
<tr>
<td>Electives</td>
<td>15-23</td>
</tr>
</tbody>
</table>

**Curriculum V**  
B.S. degree with physics-chemistry cognate studies, preparatory for graduate study.  

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>36-42</td>
</tr>
<tr>
<td>Biological sciences core courses and biological sciences electives</td>
<td>30-32</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 331, 332, 335, 361, 362</td>
<td>18</td>
</tr>
<tr>
<td>Mathematics—(depending on placement)</td>
<td>15</td>
</tr>
<tr>
<td>Physics—PH 111, 112, 201, 241, 331, 351</td>
<td>20</td>
</tr>
<tr>
<td>Electives</td>
<td>1-9</td>
</tr>
</tbody>
</table>

**Curriculum VI**  
B.S. degree, premedical, predental, preveterinary. (See chemistry section for an alternate premedical curriculum.)  

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>36-42</td>
</tr>
<tr>
<td>Biological sciences core courses and biological sciences electives</td>
<td>30-32</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 333, 335, 336 (341 desirable)</td>
<td>21</td>
</tr>
<tr>
<td>Mathematics—MA 121, 153, 154</td>
<td>9</td>
</tr>
<tr>
<td>Physics—PH 111, 112</td>
<td>8</td>
</tr>
<tr>
<td>Electives</td>
<td>16-24</td>
</tr>
</tbody>
</table>

**Curriculum VII**  
B.S. degree, microbiology emphasis, preparatory for: (a) the National Registry of Microbiologist Examination for Registered Microbiologists with the American Academy of Microbiology; (b) graduate study in microbiology.  

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>36-42</td>
</tr>
<tr>
<td>Mathematics (depending on placement)</td>
<td>9</td>
</tr>
<tr>
<td>Physics—101, 102, or 111, 112</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry—121, 123, 125, 126, 223, 331, 332, 335, 361, 362</td>
<td>22</td>
</tr>
<tr>
<td>Electives (to include statistics if not in GER)</td>
<td>12</td>
</tr>
<tr>
<td>Biological sciences core courses and BYS 221, 421, 430, 435, 521, 525)</td>
<td>33</td>
</tr>
</tbody>
</table>
Curriculum VIII

B.S. degree, medical technology emphasis, preparatory for the Medical Technologist certification examinations of the National Certification Agency for Medical Laboratory Personnel and the Board of Registry of the American Society of Clinical Pathologists. This curriculum satisfies academic requirements for a B.S. in Biological Sciences with a Medical Technology emphasis. It is offered with the cooperating clinical laboratories in Huntsville and the School of Health Related Professions at the University of Alabama at Birmingham (UAB). The degree program is accomplished in three phases: (I) Completion of academic prerequisite courses during the preclinical phase at UAH, (II) Completion of Medical Technology courses at UAB during Summer, Fall and Winter Terms, with the transfer of credits back to UAH, and (III) Completion of Clinical Practice courses at the cooperating clinical laboratories in Huntsville during the Spring and Summer Terms, with transfer of credits to UAH. Upon satisfactory completion of these three phases of the program, the BS degree in Biological Sciences with emphasis in Medical Technology is awarded by the University of Alabama in Huntsville. The candidate is then eligible to apply for certification as a medical technologist. Enrollment in the UAH phase does not automatically grant admission to the UAB phase; however, a student who has earned a UAH grade point average of 2.5 or better, has earned a C or better in all BYS and CH courses, and has been recommended by the Chairperson of the Department of Biological Sciences will automatically be accepted into the UAB phase upon application. The application deadline is January 15. Applications received after January 15 are considered on a space available basis. The three phases of the curriculum are outlined below. Students must consult with an advisor during their first semester at UAH.

Phase I, UAH

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>36-42</td>
</tr>
<tr>
<td>Physics — PH 101, 102</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics (depending on placement)</td>
<td>9</td>
</tr>
<tr>
<td>Biological Sciences 221, 313, 314, 319, 320, 361, 362, 421, seminar</td>
<td>25</td>
</tr>
<tr>
<td>Chemistry — 121, 123, 125, 126, 223, 331, 332, 335</td>
<td>18</td>
</tr>
<tr>
<td>Computer Science - CS 108</td>
<td>3</td>
</tr>
<tr>
<td>Statistics (if not taken as mathematics requirement)</td>
<td>3</td>
</tr>
</tbody>
</table>

Phase II, UAB (see UAB catalog for course descriptions)

Summer

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MT 300 Laboratory Techniques</td>
<td>1</td>
</tr>
<tr>
<td>MT 301 Clinical Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>MT 302 Clinical Immunology</td>
<td>3</td>
</tr>
<tr>
<td>MT 303 Clinical Mycology/Parasitology</td>
<td>3</td>
</tr>
<tr>
<td>MT 305 Clinical Bacteriology</td>
<td>3</td>
</tr>
<tr>
<td>MT 306 Clinical Urinalysis</td>
<td>2</td>
</tr>
</tbody>
</table>

Fall and Winter

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MT 400 Clinical Chemistry II</td>
<td>8</td>
</tr>
<tr>
<td>MT 401 Hematology</td>
<td>10</td>
</tr>
<tr>
<td>MT 402 Hemostasis</td>
<td>2</td>
</tr>
<tr>
<td>MT 403 Clinical Microbiology</td>
<td>10</td>
</tr>
<tr>
<td>MT 404 Immunohematology</td>
<td>7</td>
</tr>
<tr>
<td>MT 405 Laboratory Management I</td>
<td>2</td>
</tr>
</tbody>
</table>

265
MT 412 Management Practicum ............................................. 4
MT 490 Health Care Issues .................................................. 2
MT 495 Basic Research Concepts .......................................... 4

Phase III, Cooperating Clinical Laboratories in Huntsville
Spring and Summer
MT 406 Laboratory Management II ....................................... 2
MT 407 Chemistry Clinical Practice ...................................... 4
MT 408 Hematology Clinical Practice .................................... 4
MT 409 Immunohematology Clinical Practice .......................... 3
MT 410 Immunology Clinical Practice ................................... 1
MT 411 Microbiology Clinical Practice .................................. 4

Curriculum IX
B.S. degree, preparatory for graduate study in biological sciences-mathematics (biometrics).

Semester Hours

GER (humanities and social sciences) ......................................... 36-42
Biological sciences core courses and biological sciences electives .......... 30-32
Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 335, 361, 362 .................. 22
Mathematics—MA 153, 154, 233, 244, 251, 385, 585 ................................. 21
Physics—PH 101, 102, or 111, 112 .................................................. 8
Electives (ST 281, recommended) ............................................... 3-11

Curriculum X
B.S. degree, environmental biology emphasis, preparatory for graduate study in ecology or environmental science.

Semester Hours

GER (humanities and social sciences) ......................................... 36-42
Biological sciences core courses, biological sciences electives,
and BY 221, 312, 371 or 378, and two from BYS 561, 562, 563,
and 564 ........................................................... 30
Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 335, 361, 362 ............... 22
Physics—PH 101, 102, or 111, 112 ............................................. 8
Mathematics—(including ST 281 if Level III placement) ....................... 9
Environmental science—ES 102 or 202 ....................................... 4
Computer science—CS 108, 208 ............................................... 6
Electives (to include statistics if not mathematics Level III placement) ........ 7-13

Curriculum XI
B.S. degree, composite major in biological-environmental sciences. An additional 6 hours from advanced ES courses with this program qualifies student for an environmental science certificate.

Semester Hours

GER (humanities and social sciences, EC or PSC recommended) ............... 42
Mathematics (including ST 281 if Level III placement) .......................... 9
Physics—PH 101, 102, or 111, 112 ............................................. 8
Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 335, 361, 362 ............... 22
Environmental sciences—ES 102, 303, or 304, 311, 321 ........................... 13
Biological sciences—BYS 113, 114, 221, 312, 319, and MS 507,
BYS 531, or BYS 561 .................................................. 23
### Biological Science (BYS)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td><strong>Introduction to Health Professions</strong></td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>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. (Same as MED 100).</td>
<td></td>
</tr>
<tr>
<td>112</td>
<td><strong>General Biology</strong></td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Introduction to biological principles: cellular and subcellular structure and function; introduction to biological chemistry and molecular biology including photosynthesis, glycolysis, Kreb’s cycle, protein and fatty acid synthesis; cell reproduction and gametogenesis (meiosis); principles and applications of Mendelian genetics; concepts of evolution; taxonomic principles in the classification of plants and animals. One lab per week. Lab fee: Level 4.</td>
<td></td>
</tr>
<tr>
<td>113</td>
<td><strong>General Botany</strong></td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Biological principles related to the Plant Kingdom; Cells, tissues and functional anatomy of plants. Prerequisite: BYS 112. One lab a week. Lab fee: Level 4.</td>
<td></td>
</tr>
<tr>
<td>114</td>
<td><strong>General Zoology</strong></td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Biological principles related to the Animal Kingdom; biological organization of animals; structure and function of musculo-skeletal, respiratory, cardiovascular, digestive, excretory, nervous and endocrine systems; homeostasis; reproduction and development; ecological principles; animal phylogeny. One lab per week. Prerequisite: BYS 112. Lab fee: Level 4.</td>
<td></td>
</tr>
<tr>
<td>214</td>
<td><strong>Infection and Immunity</strong></td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Principles of microbiology with emphasis on infectious disease of humans; epidemiological and immunological aspects. No credit for students who have credit for BYS 221 or advanced microbiology courses. Prerequisites: BYS 114, CH 101. Two 2-hour labs a week. Lab fee: Level 5.</td>
<td></td>
</tr>
<tr>
<td>221</td>
<td><strong>General Microbiology</strong></td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Cultivation and observation of microorganisms and their relation to foods, water, and industrial processes; environment and disease. Two 2-hour labs a week. Not recommended for students in School of Nursing. No credit for students who have</td>
<td></td>
</tr>
</tbody>
</table>
completed BYS 214. Take no later than sophomore year. Prerequisites: BYS 112, 114; CH 101 or 121 or equivalents. Lab fee: Level 5.

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: Level 3.

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 114 and CH 113 or 123. (Same as CH 301.)

311 Principles of Ecology 4 hrs.
Ecological principles controlling plant and animal populations. Development of ecosystems, communities, and habitats. Prerequisites: BYS 112, 113, 114, CH 121. One four-hour lab a week. Lab fee: Level 4. Field trip required.

312 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 for students preparing for professional schools or graduate study in physiology or development. Prerequisites: BYS 114, CH 101, and 105 (CH 113 recommended). One lab a week. Lab fee: Level 5.

313 Anatomy and Physiology II 4 hrs.
Continuation of BYS 312 stressing structural and functional relationships of major organs, organ systems, and their interdependent regulation. Not for students preparing for professional schools or graduate study in physiology or development. Prerequisites: BYS 313, CH 101 and 105 (CH 113 recommended). One lab a week. Lab fee: Level 5.

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 114. Lab fee: Level 4.

317 Vertebrate Zoology 5 hrs.
Morphology of vertebrate animals. Relationship of organs and systems and their phylogenetic significance. Prerequisite: BYS 114. Two three-hour labs a week. Lab fee: Level 5.

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 114 or 313.

319 General Genetics 3 hrs.
Hereditary basis of all living organisms, including the study of (a) genes—the discrete nature of inheritance, (b) genes in organisms and (c) genes in populations. Mendelian principles and evolutionary processes. Includes replication, transcription and translation. Prerequisites: BYS 112 and CH 101 or equivalent.
320 Genetics Laboratory 1 hr.
Practical applications of modern genetic techniques. Prerequisite or concomitant: BYS 319. One 3-hour lab a week. Lab fee: Level 5.

340 Introduction to Cellular and Developmental Biology 4 hrs.
Modern approach to embryology relating cell structure and function to mechanisms involved in development. Prerequisites: BYS 112, CH 101, 105, 113, or 331. BYS 319 recommended. It is strongly recommended that biological science majors and preprofessional students take BYS 543, 544, and 545 instead of BYS 340. One laboratory a week. Lab fee: Level 5.

361 General Biochemistry 3 hrs.
Molecules that comprise living systems. Their nomenclature structure, properties, and functions in metabolism. Enzymatic properties and function, major and minor biosynthetic and catabolic pathways, their interrelations and control mechanisms. Glycolysis and gluconeogenesis, Kreb’s cycle, photosynthesis and lipids, amino acids and proteins, and nucleic acids. Prerequisites: BYS 112, CH 332, and CH 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. (Same as CH 362). One 4-hour lab a week. Lab fee: Level 6.

363 General Biochemistry II 3 hrs.
A continuation of BYS 361 to include biosynthesis of biomolecules, metabolism, DNA and RNA, the genetic code, protein biosynthesis, genes and molecular physiology. (Same as CH 363). Prerequisite: BYS 361.

364 Biogeography 3 hrs.
Principles of plant and animal distribution and dispersal, using the communities of North America as prime examples. Prerequisites: BYS 113, 114, 312 recommended.

365 General Biochemistry Laboratory II 1 hr.
An experimental course illustrating the topics in BYS 363. (Same as CH 364). Prerequisite: BYS 361 and BYS 362. Parallel BYS 363. Lab fee: Level 4.

371 Nonvascular Cryptogamic Botany 5 hrs.
Introduction to the biology of ray fungi, cellular and slime molds, fungi, algae, lichens, liverworts, hornworts, and mosses, emphasizing their ontogeny, structure, and phylogenetic lines of development. Prerequisite: BYS 113. Two 3-hour labs a week. Lab fee: Level 5.

372 Biology of Vascular Plants 5 hrs.
Comparative anatomy and morphology of vascular plants and their relationship in various phylogenetic lines of development. Vascular cryptogams as well as ferns, gymnosperms, and angiosperms. Not a field course. Prerequisite: BYS 113. Two 3-hour labs a week. Lab fee: Level 4.

378 Invertebrate Zoology 5 hrs.
Invertebrate phyla emphasizing anatomy, morphology, physiology, embryology, ecology, and phylogenetic relationships. Prerequisite: BYS 114. Two 3-hour labs a week. Lab fee: Level 5.

269
421 Introduction to Medical Microbiology 5 hrs.
Medically significant microorganisms and their relation to human diseases. Bacterial, fungal, and viral agents and their properties, pathogenesis, and laboratory diagnosis. Prerequisites: BYS 221, BYS or CH 361, and BYS 430 recommended. Two 3-hour labs a week. Lab fee: Level 5.

430 Immunology 4 hrs.
Basic course in immunology. Immunoglobulins, antigens, immune responses, complement, immediate and cell-mediated hypersensitivities, and transplantation and tumor immunology. Prerequisites: BYS 221. BYS 319 and BYS/CH 361 strongly recommended. One 4-hour lab a week. Lab fee: Level 5.

435 Bacterial Physiology and Metabolism 4 hrs.
Aspects of bacterial physiology such as nutrition, growth, energy, and biosynthetic mechanisms of bacteria. Prerequisite: BYS 221. Biochemistry strongly recommended. One 4-hour lab a week. Lab fee: Level 5.

436 Physiological Psychology 3 hrs.
Functional analysis of neural and endocrine systems underlying behavior. Prerequisites: (either a or b): (a) 15 hrs. of PY or approval of instructor; (b) BYS 114 or 313, and 6 hrs. of PY or approval of instructor. (Same as PY 436).

464 Evolution 3 hrs.

490 Special Topics in Biological Sciences 1-4 hrs.
Literature search relative to topics of special interest under direct supervision of instructor.

492 Undergraduate Research 2-4 hrs.
Individual investigations into biological problems under direct supervision of instructor. For advanced-level biological science students with biological science grade of 3.5 or above. May be taken at the Marine Environmental Sciences Consortium, Dauphin Island, Alabama. Prerequisite: approval of instructor. Lab fee: Level 3 for 2 hours, Level 4 for 3 hours, and Level 5 for 4 hours.

496, 497, 498, 499 Seminar 1 hr. each
Student discussions and presentations of biological literature from current library monographs and journals. Prerequisite: junior standing. Pass/fail grading. Biological sciences major requirement, one seminar. No more than 3 seminar credits can count in biological sciences major. May be taken at the Marine Environmental Sciences Consortium.

Advanced Undergraduate — Graduate Courses

519 Gene Structure and Function 3 hrs.
Molecular basis for inheritance and gene expression. Advanced studies of replication, transcription, translation. Includes regulation of gene expression, gene cloning and recombinant DNA technology. Prerequisites: BYS 319 and BYS/CH 361.
521 Medical Mycology (UAH) 4 hrs.
Basic and applied studies of the various classes of fungi pathogenic to humans; reproduction, morphology, classification, classification of disease states, pathogenesis, laboratory diagnosis and chemotherapy. Prerequisite: BYS 421; BYS 430 is recommended. Two 2-hour labs per week. Lab fee: Level 4.

524 Mycology (UAH and A&MU) 4 hrs.
Lines of phycymycetes using representative species; various series of actinomycetes; representative pathogenic (crop and vegetative pathogens) and nonpathogenic heterobasidiomycetidae organisms; order and families of homobasidiomycetidae. Ontogenetics, cellular, and structural study applied to all divisions, classes, series, orders and families. Lab fee: Level 4.

525 Medical Parasitology (UAH) 5 hrs.
Basic and applied studies of the various classes of parasites pathogenic to humans and their laboratory identification. Arthropods and their relationship as vectors of parasites. Immunology and chemotherapy of parasitism. Prerequisite: BYS 221 or equivalent. Two 2-hour labs per week. Lab fee: Level 3.

531 Plant Physiology (UAH) 4 hrs.
A general introductory study of life processes of plants, including water relations, mineral utilization, metabolism, photosynthesis, digestion, respiration, assimilation, and growth as affected by growth hormones. Prerequisites: BYS 113, 371, or 372, CH 113 or 331. One 3-hour lab a week. Lab fee: Level 3.

532 Animal Physiology (UAH) 4 hrs.
Basic course in organismal function. Membrane physiology with respect to transport phenomena, muscle, nerve, synapse, and sensory receptor physiology. Physiology of respiration, heart, circulation, kidney, and gastrointestinal tract as individual systems with emphasis on regulation. One laboratory session a week illustrating physiological principles discussed in lecture. Prerequisites: senior classification with a major or cluster in biological science; 16 hours completed in AOC and CH 113 or 331 or graduate standing. Lab fee: Level 4.

543 Cellular and Developmental Biology (UAH) 3 hrs.
Cellular structure and function coupled with relevant aspects of developmental mechanisms. Lectures on mitosis, gametogenesis, nuclear-cytoplasmic interactions, role of genes in development, mechanisms of hormone action on cellular function and development and cell movements and affinities. Prerequisites: BYS 113, 114, 319, CH 101, 105, and 113 or CH 123, 126 and 331 (may be taken concomitantly).

544 Cellular and Developmental Biology (UAH) 3 hrs.
Continuation of BYS 543 and selected morphogenesis of germ-layer derivatives. Prerequisite: BYS 543.

545 Cellular and Developmental Biology Laboratory (UAH) 2 hrs.
Experimental techniques illustrating concepts of cellular, molecular and developmental biology. Take course after BYS 543 and concurrently with BYS 544. Lab fee: Level 5.

547 Biochemistry I (UAH) 3 hrs.
Structural chemistry and function of biomolecules, mechanisms of biochemical
548 Biochemistry II (UAH) 3 hrs.
Metabolism, biosynthesis of macromolecular precursors, storage, transmission, expression of genetic information, and molecular physiology. Prerequisite: CH 561 or BYS 547. (Same as CH 561).

561 Physiological Ecology (UAH) 4 hrs.
Physiological and behavioral responses of organisms to natural changes in their chemical and physical environment. Prerequisite: BYS 312 or approval of instructor. BYS 361 or 532 recommended. Lab fee: Level 3.

562 Community Ecology (UAH) 4 hrs.
Detailed consideration of ecological principles and concepts, as well as biotic and abiotic factors relative to development of plant communities and ecosystems. Prerequisites: BYS 312 and taxonomy. One 4-hour lab a week. Lab fee: Level 3. Field trips required.

563 Population Ecology (UAH) 4 hrs.
Distribution, population dynamics and behavior of animal population in relation to environmental factors. Prerequisites: BYS 312 and organic chemistry. One 4-hour lab a week. Lab fee: Level 3. Field trips required.

564 Limnology (UAH) 4 hrs.
Fresh-water environments and organisms exemplified by lakes, ponds, and streams in North Alabama. Laboratory and required field trips. Occasional Saturday field trips required instead of week's laboratory session. Prerequisites: BYS 312 and 315. 371 or 378. One 4-hour lab a week. Lab fee: Level 4.

571 Plant Anatomy (UAH and A&MU) 4 hrs.
Ontogeny, differentiation, and maturation of tissues and organs of angiosperms. Problems in growth and development of an angiosperm, using histological techniques. Prerequisite: BYS 372 or approval of instructor. Two 3-hour labs a week. Lab fee: Level 4.

578 Aquatic Arthropod Biology 4 hrs.
Systematics, Physiology, Ecology and Importance of the Crustacea, Insecta and Arachnida that inhabit freshwater and estuarine ecosystems. Particular attention will be given to those arthropods common to the aquatic systems in and around Alabama. Since all field trips are required, prospective students should consult with the instructor prior to registration. Prerequisite: BYS 378. Lab fee: Level 4.

621 Pathogenic Bacteriology (UAH) 4 hrs.
624 Immunology (UAH) 4 hrs.
633 Endocrinology (UAH) 3 hrs.
641 Advanced Cell Biology (UAH and A&MU) 4 hrs.
643 Microscopy (UAH) 4 hrs.
644 Topics in Cell and Developmental Biology 2 hrs.
646 Molecular Genetics (UAH and A&MU) 3 hrs.
647 Enzymology (UAH) 4 hrs.
648 Enzymology Laboratory (UAH) 2 hrs.
653 Taxonomy of the Immature Insect (UAH and A&MU) 4 hrs.
660 Ecosystem Dynamics (UAH) 3 hrs.
661 Advanced Population Ecology (UAH) 3 hrs.
690 Seminar (UAH and A&MU) 1 hr.
691 Special Topics (UAH and A&MU) 1-4 hrs.
692 Research (UAH and A&MU) 2-4 hrs.
699 Master’s Thesis (UAH and A&MU) 1-4 hrs.

Advanced Undergraduate-Graduate Courses at Alabama A&M University

Courses offered jointly by Alabama A&M University and UAH but which are taught on the A&M campus are listed below for ready reference. See Graduate Catalog for details.

510 Radiation Biology (A&MU) 4 hrs.
Characteristics of radioisotopes, detection and counting techniques and instrumentation, tracer techniques, health and safety system. Prerequisite: Consultation with instructor.

511 Biological Control (A&MU) 4 hrs.
Components of resistance, use of parasites, predators and microorganisms, foreign exploration, shipment, release and establishment of imported parasites and predators.

512 Histotechniques (A&MU) 3 hrs.
Microscopic study of the various tissues and organs of the animal systems.

522 Microbial Physiology (A&MU) 3 hrs.
Relationship between structure and biochemical functions in microorganisms. Prerequisite: Microbiology, organic chemistry, and biochemistry. Lab fee: Level 4.

523 Principles of Virology (A&MU) 4 hrs.
Principles of viral infectivity, multiplication, and chemical constitution; laboratory techniques for their isolation, cultivation, identification, and enumeration. Prerequisite: BYS 221.

526 Microbial Ecology (A&MU) 4 hrs.
Relationship of soil and aquatic microorganisms and their importance in ammonification, nitrification, and other biological processes. Prerequisite: BYS 221.

533 Medical Physiology I (A&MU) 4 hrs.
Nerve and muscle cell function, fluid and electrolyte environment of body tissues, blood, heart, circulatory, and nervous systems. Prerequisite: Organic chemistry, preferably biochemistry.
534 Medical Physiology (A&MU) 4 hrs.
Continuation of Mammalian Physiology I with consideration of kidney function, respiratory, digestive, reproductive, and endocrine systems. Prerequisite: Medical Physiology I.

535 Endocrinology (A&MU) 4 hrs.
Current developments on anatomy, physiology, chemistry, and regulations of major endocrine glands. Laboratory sessions in biological and chemical assays of hormones. Prerequisite: ZOO 409.

540 Molecular Biology (A&MU) 4 hrs.
Structure, behavior, and function of larger biological molecules including biological oxidations, metabolism of carbohydrates, lipids, amino acids, and genetic aspects of metabolism. Prerequisite: CHE 301 Organic Chemistry.

546 Cytogenetics (A&MU) 4 hrs.
Analysis of composition, morphology, and behavior of genes, especially as they relate to function, development, and heredity. Prerequisite: BIO 406.

549 Analytical Biochemistry Laboratory (A&MU) 2 hrs.
Advanced laboratory course dealing with modern techniques of molecular biology and biochemistry.

551 Insect Physiology (A&MU) 4 hrs.
Metabolism and utilization of carbohydrates, lipids, and nitrogen compounds; energy production, neuromuscular mechanisms, hormones and morphogenesis; role of organs and organ systems in metabolism. Prerequisites: general entomology or equivalent, advanced biochemistry.

552 Insect-Pest Management (A&MU) 4 hrs.
Insect surveys, ecological basis for control, plant and animal resistance to insects, control by parasites, predators, microorganisms, management by genetics principles, chemical attractants, chemical repellents, sterilization, insecticides, and integrated systems of pest management. Prerequisite: general entomology or advanced applied entomology.

560 Environmental Biology (A&MU) 3 hrs.
Principles of interaction between living systems and their resources. Current problems in management of our natural resources including new approaches in management of pest populations.

570 Plant Pathology (A&MU) 4 hrs.
History, nonparasitic, and parasitic diseases incited by bacteria, fungi, plasmodiophorales, nematodes, and viruses. Disease control through exclusion, eradication, protection, and post resistance. Prerequisite: BIO 344.

572 Plant Taxonomy (A&MU) 4 hrs.
Principles of classifying, naming, and identifying vascular plants with emphasis on flowering plants. Ecologic factors influencing vegetational distribution.

590 Problems in Biological Sciences (A&MU, Plan III Only) 4 hrs.
Problems of elementary and secondary school teachers of science in all areas of biological sciences. Relations of biological organisms to their environment, stressing climatic and soil factors that influence their distribution and adaptations. Provision for individual investigation in biological science.
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied and Industrial Microbiology (A&amp;MU)</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>Advanced Virology (A&amp;MU)</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>Medical Pharmacology (A&amp;MU)</td>
<td>5 hrs.</td>
</tr>
<tr>
<td>Cardiovascular Physiology (A&amp;MU)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Advanced Cell Physiology (A&amp;MU)</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>Human Cytogenetics and Its Clinical Application (A&amp;MU)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>Advanced Applied Entomology (A&amp;MU)</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>Advanced Systematic Botany (A&amp;MU)</td>
<td>4 hrs.</td>
</tr>
</tbody>
</table>

**Marine Sciences (MS)**

Courses are offered only at the Marine Environmental Sciences Consortium Sea Lab at Dauphin Island, Alabama.

Courses that can be included in a biological sciences major or minor:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine Biology</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>202 Marine Biology</td>
<td></td>
</tr>
<tr>
<td>Survey of invertebrates, vertebrates, and marine plants as communities with local examples of groups. Examination of marshland, estuarine, beach, dune inlet and neritic habitats, and niches. Lectures, laboratory, and field work. Prerequisite: general biology.</td>
<td></td>
</tr>
<tr>
<td>Coastal Zone Management</td>
<td>2 hrs.</td>
</tr>
<tr>
<td>304 Coastal Zone Management</td>
<td></td>
</tr>
<tr>
<td>Examination of ecological features and physical management policies design for coastal communities and a review of the Federal and State programs that impinge upon coastal ecological communities.</td>
<td></td>
</tr>
<tr>
<td>Marine Botany</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>502 Marine Botany</td>
<td></td>
</tr>
<tr>
<td>Marine Invertebrate Zoology</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>503 Marine Invertebrate Zoology</td>
<td></td>
</tr>
<tr>
<td>Local examples of principal groups of marine invertebrates. Reproduction, distribution, taxonomy, systematics, and ecology. Lecture, laboratory, and field work. Opportunity to acquire collection of local fauna. Prerequisite: General biology.</td>
<td></td>
</tr>
<tr>
<td>Marine Vertebrate Zoology</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>505 Marine Vertebrate Zoology</td>
<td></td>
</tr>
<tr>
<td>Marine Zoogeography</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>506 Marine Zoogeography</td>
<td></td>
</tr>
<tr>
<td>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</td>
<td></td>
</tr>
</tbody>
</table>
Atlantic, and Caribbean regions. Prerequisite: 12 semester hours of biological sciences.

507 Physiology of Marine Animals
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

509 Marine Ecology
Bioenergetics, community structure, population dynamics, predation, competition, and speciation in marine ecosystems. Lecture, laboratory, and field work. Students admitted without previous marine courses. For engineers and other nonbiologists 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
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
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
Principles and methods of marine fishery biology and their application to conservation. Lecture and laboratory work. Prerequisite: General biology.

513 Fisheries Economics

515 Coastal Ornithology
Coastal and pelagic birds with emphasis on ecology, taxonomy, and distribution. Food habits, field identification, and population dynamics. Prerequisite: Introductory zoology.

517 Marine Technical Methods III
Advances laboratory instrumentation and techniques; individual projects with one of the following: Liquid scintillation counting, electrophoresis, atomic absorption spectrophotometry, UV-visible spectrophotometry or fluorometry or other techniques. Prerequisites: Science major; permission of instructor.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>590</td>
<td>Seminar</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>Current research, scientific progress, and problems in marine environment. Participation by students, faculty, and visiting scientists. Students are not required to enroll in seminar, but must attend to qualify for credit in any other course.</td>
<td></td>
</tr>
<tr>
<td>599</td>
<td>Research</td>
<td>1-4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Enrollment by special arrangement in any subjects listed. Prerequisite: Arrangements with and approval of project supervisor and liaison officer. Students should note which term 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.</td>
<td></td>
</tr>
<tr>
<td>610</td>
<td>Marine Systems Ecology</td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>The following courses cannot be taken for credit toward a biological sciences major or minor but can be used for a marine science minor.</td>
<td></td>
</tr>
<tr>
<td>203</td>
<td>Natural History of Commercial Invertebrates</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Basic understanding of behavior, physiology, development and ecology of commercially important invertebrates. Some previous biology recommended. Labs, field trips, and lecture material. For nonmajors.</td>
<td></td>
</tr>
<tr>
<td>204</td>
<td>Commercial Marine Fisheries of Alabama</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Biology, harvesting technology, and processing of commercial valuable fish and shellfish species of Alabama.</td>
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</tr>
<tr>
<td>301</td>
<td>Marine Technical Methods I</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Research equipment, methods, and techniques in marine science. Training in operation and field maintenance of major pieces of sampling gear. Prerequisite: Introductory biology, chemistry, or physics.</td>
<td></td>
</tr>
<tr>
<td>302</td>
<td>Marine Technical Methods II</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Equipment and techniques in laboratory analysis of water and other marine samples. Emphasis on water quality parameters. Prerequisite: Introductory biology, chemistry, or physics.</td>
<td></td>
</tr>
<tr>
<td>303</td>
<td>Coastal Climatology</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Physical factors that result in climatic conditions in and near coastal region. Emphasis on northern Gulf of Mexico.</td>
<td></td>
</tr>
<tr>
<td>501</td>
<td>Introduction to Oceanography</td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Physics, chemistry, biology, and geology of oceans. For graduate students and those preparing for graduate school or intending to enter marine sciences professionally. Prerequisites: College algebra, general physics, and general chemistry.</td>
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</tr>
<tr>
<td>514</td>
<td>Estuarine Science</td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Physical, chemical, and biological parameters of estuarine ecosystems. Field experience and lecture material. Mobile Bay in detail. Prerequisite: Introductory zoology, chemistry, physics, or geology.</td>
<td></td>
</tr>
<tr>
<td>516</td>
<td>Scientific Data Management</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Key techniques and principles in evaluating and expressing experimental data. Mapping, profiling, contouring, applied statistics, and graphical and tabular representation of results. Not a substitute for basic statistics courses.</td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>------------</td>
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</tr>
<tr>
<td>520</td>
<td>Marine Geology</td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Sampling techniques, laboratory analysis of sediments, application of research process to problems in identifying sedimentary environments, topography, sediments, and history of world oceans. Beneficial for understanding sedimentary substrate on or in which a large percentage of marine organisms live. Lecture, laboratory, and field work. Prerequisite: physical geology.</td>
<td></td>
</tr>
<tr>
<td>521</td>
<td>Recent Marine Sedimentation</td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Investigations in properties of marine sediments, coastal sedimentary environments, continental margin sediments, reef and associated sediments, deep-sea sediments and marine geophysics. Erosinal and depositional effects of waves and currents. Prerequisite: marine geology or oceanography.</td>
<td></td>
</tr>
<tr>
<td>522</td>
<td>Marine Paleoecology</td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>601</td>
<td>Oceanology of Gulf of Mexico</td>
<td>4 hrs.</td>
</tr>
</tbody>
</table>
Chemistry Department
Professors Arendale, Baird (chair), Gregory, Harris, Loo, McManus, Riley; Research Professor Fredericks; Adjunct Professor Clunie; Associate Professors Coble, Emerson, Meehan, Setzer; Adjunct Associate Professors Vlasse, Young; Assistant Research Professors Kaukler, Sedaghat-Herati.

Undergraduate Programs
The University of Alabama in Huntsville is on the American Chemical Society’s list of approved schools in recognition of its strong faculty and excellent facilities for high quality undergraduate instruction. The Chemistry Department offers courses leading to the B.S. degree with major in chemistry and supports undergraduate programs in other disciplines.

Six chemistry major curricula are offered which provide preparation for: (1) medical school, dental school, or veterinary school; (2) the Alabama Class B High School Teachers Certificate; (3) graduate study in chemistry and/or employment as an industrial chemist; (4) general education in chemistry; (5) graduate study combining chemistry and physics; and (6) employment as a biochemist or clinical chemist.

Chemistry Major
Requirements for the chemistry major include:
1. The minimum total semester hours required for the B.S. is 128. Of these, at least 39 semester hours must be in courses numbered 300 or higher.
2. Mastery of the calculus by successful completion of MA 153, 154, 233, and 251 (Note, however, Curriculum VI below requires only MA 153 and 154.)
3. Successful completion of PH 111, 112, plus 3 to 4 additional hours of physics, usually PH 113, chosen in consultation with a chemistry faculty advisor. (Note: Curriculum VI requires only PH 111 and PH 112.)
4. Completion of the university’s General Education Requirements (GER). For a chemistry major, the GER requirement (a) consists of the following:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>English (6 hours of composition and 6 hours of literature)</td>
<td>12</td>
</tr>
<tr>
<td>History (HY 101 and HY 102)</td>
<td>6</td>
</tr>
<tr>
<td>Social Science (one discipline)</td>
<td>6</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>6</td>
</tr>
<tr>
<td>Mathematics (MA 153)</td>
<td>3</td>
</tr>
</tbody>
</table>

Foreign Language and Communication Skills
This requirement may be satisfied by choosing either
1. Foreign language up to 12 hours
   one language, usually German or Russian. If the language has not been studied previously, the full 12 hours will be required.
   or
2. Communication Skills (CS 108 or 113; CM 113; EH 301)                      | 9     |
   Laboratory Science and Technical Studies (c)
   1. Two courses in a single laboratory science outside the major and the minor (d) | 8     |
   and
   2. Coursework (to include at least one laboratory science) in any department or program (outside the major and the minor) in the Colleges of Science and/or Engineering (c) | 7-8   |

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Notes: 
(a) The section of the catalog dealing with the GER requirements of the university should also be consulted for details.
(b) If the student's minor is mathematics, this requirement is waived.
(c) Applicable laboratory sciences are Astronomy, Biological Sciences, Environmental Science, Physics, and some courses in the College of Engineering.
(d) Ordinarily met by taking PH 111 and PH 112.
(e) Ordinarily met by taking PH 113 and 3-4 hours of an applicable laboratory science.

If the minor is not mathematics, then PH 113, 116, and MA 154 satisfy this requirement.

5. Completion of a minor consisting of at least 21 hours of course work in any subject other than chemistry. The course requirements for minors can be found in the sections of this catalog dealing with the various departments. An educationally compatible combination of courses from more than one department can be substituted for the minor. This is called Cognate Studies.

6. Completion of sufficient electives to meet overall minimum hour requirements for the degree.

7. Completion of one of the six chemistry curricula shown below, or another developed in consultation with a Chemistry Department advisor. The student is allowed considerable flexibility in planning his program, but all course patterns that differ from those listed below require faculty approval.

**Curriculum I Premedical Program**
The premedical program conforms to requirements of most medical schools and contains sufficient chemistry to meet the requirements of a chemistry major. Prospective medical students should explore their areas of interest outside of the sciences and strive for maximum scholastic achievement. Students should consult with the Preprofessional Advisory Committee early in their college program and prepare to take the Medical College Aptitude Test during the spring of their junior year. (For alternative premedical curricula, see Chemistry Curriculum VI and Biological Sciences Curriculum VI.)

<table>
<thead>
<tr>
<th>GER (humanities and social sciences)</th>
<th>54-58</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331,</td>
<td>35</td>
</tr>
<tr>
<td>332, 333, 335, 336, 341, 342, 343, 345 plus 6 hours at the 300 level or above</td>
<td></td>
</tr>
<tr>
<td>Biological Sciences—BYS 112, 114, 319, 361 and 362 are recommended.</td>
<td></td>
</tr>
</tbody>
</table>

**Curriculum II Class B High School Teachers Certificate**
B.S. degree with major in chemistry. This plan meets the requirements for an Alabama Class B High School Teachers Certificate.

<table>
<thead>
<tr>
<th>Semester Hours</th>
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</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 333, 335, 336, 337, 341, 342, 343, 345, 346, 401, 493, plus 3 hours at the 300 level or above</td>
</tr>
<tr>
<td>Mathematics—MA 244</td>
</tr>
<tr>
<td>Biological Sciences (minimum requirements)</td>
</tr>
<tr>
<td>Second Teaching Area</td>
</tr>
<tr>
<td>Professional Education Courses</td>
</tr>
</tbody>
</table>
NOTES:
1. This curriculum will probably require more than the minimum total of 128 hours.
2. Students pursuing this curriculum should consult with the Department of Education early in their program.
3. A general sciences composite major covering the areas of chemistry, biological sciences, environmental science and physical sciences is possible under this curriculum. Interested students should consult the Education Department.

**Curriculum III Graduate Preparatory Program**
This curriculum is approved by the American Chemical Society’s Committee on Professional Training. It is designed for a student who plans to do graduate work or desires an industrial position that requires a strong chemical background. German is the recommended language for this program.

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>54-58</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 333, 335, 336, 337, 341, 342, 343, 345, 346, 401, 402, 421, 493 plus 3 hours at the 300 level or above</td>
<td>46</td>
</tr>
<tr>
<td>Math—MA 244 and 352</td>
<td>6</td>
</tr>
</tbody>
</table>

**Curriculum IV General Education Curriculum**
General education curriculum with a chemistry major. Deficiencies may exist with respect to graduate school entrance requirements.

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>54-58</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 333, 335, 336, 337, 341, 342, 343, 345, 346, 401, and 493 plus 3 hours at the 300 level or above</td>
<td>41</td>
</tr>
<tr>
<td>Math—MA 244</td>
<td>3</td>
</tr>
</tbody>
</table>

**Curriculum V Physics Curriculum**
Chemistry-physics program appropriate for pregraduate education.

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>54-58</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 333, 335, 336, 337, 341, 342, 343, 345, 346, 401, and either 493 or 553</td>
<td>42</td>
</tr>
<tr>
<td>Physics—PH 301, 302, 337, 431, 432</td>
<td>16</td>
</tr>
</tbody>
</table>

**Curriculum VI Chemistry—Biochemistry Curriculum**
Typical chemistry-biological sciences program appropriate for employment in biochemistry or clinical chemistry and for admission to some Ph.D. granting graduate departments of biochemistry. Although less dependent on quantitative skills, this curriculum also provides a satisfactory foundation for admission to medical school.

Curriculum VI meets the minimum requirements of the American Association of Clinical Chemistry. A person completing one year of acceptable experience in clinical chemistry
subsequent to the B.S. degree may apply for certification as a clinical chemical technologist. Further successful experience may lead to certification as a clinical chemist.

Semester Hours

GER (humanities and social sciences) .................................................. 54-58
Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 333, 335, 336, 345, 346, 347, 348, 361, 362, 363, 364, 401, 402, and 421. .......................................................... 45
Biological sciences—BYS 112, 114, 221, 319, 543 and 544 ......................... 21

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.
(c) No credit toward the chemistry major is given for CH 101, 105, or any mathematics course numbered lower than MA 153. A student requiring these courses should understand that the total credit hours of course work required to meet all the degree requirements may exceed the minimum of 128 hours required for the B.S. degree.
(d) Unless attention is given to the sequence in which courses are scheduled, chemistry majors may experience difficulty in completing the required courses within a four-year period. Students should plan to take CH 223, 333, and PH 113 before the fall term of their junior year.

Chemistry Minors
Typical course sequences for students wishing to minor in chemistry include the following. Each requires at least 21 hours of chemistry including 6 or more hours numbered 300 or above.

1. CH 121, 125, 123, 126, 223, 331, 332, 333, 335, and 336 for premedical and predental students.
2. CH 121, 125, 123, 126, 223, 331, 332, 335, 361, 362 for some biology and medical technology majors.
3. CH 121, 125, 123, 126, 331, 332, 335, 341, 342, 343 for physics and mathematics majors.
4. CH 121, 123, 125, 126, 223, 331, 332, 335, 347 for biology majors taking BYS 361 and 362.

Graduate Program
For graduate courses and programs, refer to the UAH graduate catalog.

Chemistry (CH)

101 Introduction to Chemistry 3 hrs.
Properties of solids, liquids, gases, and solutions, atomic theory and bonding, concentration concepts, and physical and chemical properties of the more common elements and their compounds. CH 101 does not count toward the chemistry major or minor. Chemistry majors or minors taking CH 101 get elective credit only. CH 101 may be used with CH 105 and CH 113 to fulfill the laboratory science requirement of the GER. No placement examination is required for enrollment in
CH 101. The student may opt to take CH 101 even if he has achieved a satisfactory score on the placement examination for enrollment in CH 121. Prerequisite: MA 105 or 119 or mathematics Level II placement. Parallel: CH 105.

105 **Introductory Chemistry Laboratory** 1 hr.
Laboratory fundamentals and basic chemical principles. A student enrolled in a B.S. degree program who plans to take CH 121 and CH 125 and has had chemistry laboratory experience may be exempt from CH 105 by permission of Chemistry Department chairman. 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: Level 4.

113 **Elementary Organic Chemistry** 4 hrs.
Nomenclature, structure, functional groups, and properties of organic compounds. Recommended for nursing majors, some biology minors, and as a sequence to CH 101 and 105 for an 8-hour laboratory science requirement for nonscience majors. Not open to chemistry majors and minors. Laboratory included. Prerequisite: CH 101, 105; equivalent or placement examination. Lab fee: Level 4.

121 **General Chemistry** 3 hrs.
For science and engineering majors. Properties of gases, liquids, solids, and solutions. Nature of the chemical bond, kinetics, chemical equilibrium, electrochemistry, thermochemistry, chemical properties of elements, their periodic groups, and their compounds. Introduction to nuclear chemistry. Prerequisites: CH 101 or placement test and MA 105 or MA 119 or placement Level II mathematics: parallel: CH 125.

123 **General Chemistry** 3 hrs.
Continuation of 121 with in-depth study of topics listed. Prerequisite: CH 121. Parallel: CH 126.

125 **General Chemistry Laboratory** 1 hr.
Laboratory work complements the lecture material for CH 121. Parallel: CH 121. Lab fee: Level 4.

126 **Qualitative Inorganic Analysis Laboratory** 1 hr.
Chemical equilibrium applied to the systematic separation and qualitative detection of the elements. Application of chemical and physical properties of numerous metal and complexions and compounds. Parallel: CH 123. Lab fee: Level 4.

223 **Quantitative Analysis** 4 hrs.
Background in fundamental quantitative analytical chemistry with an introduction to instrumentation. Data treatment, ionic equilibria, elementary electrochemical, spectrochemical, gravimetric, and volumetric techniques. Laboratory included. Lab fee: Level 5. Prerequisite: CH 126.

301 **Elementary Biochemistry** 3 hrs.
Biochemistry and energetics of living cells, metabolism, structure and function of carbohydrates, lipids, proteins and nucleic acid. Enzymes, coenzymes, vitamins, blood, endocrine glands, DNA synthesis and gene expression, nutrition, drugs and biochemistry of specialized tissues. Prerequisites: BYS 114 and CH 101. No credit given to chemistry majors or minors. Credit in CH 361 precludes credit in CH 301. (Same as BYS 301).
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>331</td>
<td>Organic Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Chemistry of organic compounds. Synthetic methods, theory, and reaction mechanisms. Prerequisites: CH 123, 126; CH 223 recommended.</td>
<td></td>
</tr>
<tr>
<td>332</td>
<td>Organic Chemistry</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Continuation of CH 331. Prerequisite: CH 331.</td>
<td></td>
</tr>
<tr>
<td>333</td>
<td>Organic Chemistry</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Continuation of CH 332. Prerequisite: CH 332.</td>
<td></td>
</tr>
<tr>
<td>335</td>
<td>Organic Chemistry Laboratory I</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>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: Level 5.</td>
<td></td>
</tr>
<tr>
<td>336</td>
<td>Organic Chemistry Laboratory II</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>Continuation of CH 335. Prerequisite: CH 335. Prerequisite or parallel: CH 332. Lab fee: Level 5.</td>
<td></td>
</tr>
<tr>
<td>337</td>
<td>Organic Chemistry Laboratory III</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>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: Level 6.</td>
<td></td>
</tr>
<tr>
<td>341</td>
<td>Chemical Thermodynamics</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Theory of classical thermodynamics and its application to the chemistry of solids, liquids, gases, and solutions. Prerequisites: CH 223, PH 111. Prerequisite or parallel: MA 233, PH 112.</td>
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</tr>
<tr>
<td>342</td>
<td>Chemical Dynamics</td>
<td>2 hrs.</td>
</tr>
<tr>
<td></td>
<td>Kinetic theory of gases, theory and formulation of rate equations, mechanisms of chemical reactions, and applications. Prerequisite: CH 343.</td>
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</tr>
<tr>
<td>343</td>
<td>Introduction to Quantum Chemistry</td>
<td>2 hrs.</td>
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<tr>
<td></td>
<td>Quantum mechanical treatment of the chemical bond. Concepts from linear algebra and differential equations will be developed and used in this course. Students uncomfortable with this format should take MA 244 and 352 before taking CH 343. Prerequisite: CH 341.</td>
<td></td>
</tr>
<tr>
<td>345</td>
<td>Experimental Physical Chemistry I</td>
<td>1 hr.</td>
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<tr>
<td></td>
<td>Laboratory investigations into thermodynamics. Prerequisite: CH 223 and 341 or 347. Lab fee: Level 5.</td>
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</tr>
<tr>
<td>346</td>
<td>Experimental Physical Chemistry II</td>
<td>1 hr.</td>
</tr>
<tr>
<td></td>
<td>Laboratory investigations into kinetics and spectroscopy. Prerequisite: CH 345. Parallel: CH 342 or 348. Lab fee: Level 6.</td>
<td></td>
</tr>
<tr>
<td>347</td>
<td>Biophysical Chemistry I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>348</td>
<td>Biophysical Chemistry II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Viscosity, diffusion, sedimentation, electrophoresis, determination of molecular</td>
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</tbody>
</table>

284

361 General Biochemistry I
3 hrs.
Detailed study of molecules that comprise living systems. Their nomenclature, structure, properties, and functions in metabolism. Enzymatic properties and function; major and minor biosynthetic and catabolic pathways, their interrelations and control mechanism. Glycolysis and gluconeogenesis, Kreb's cycle, photosynthesis, lipids, amino acids and protein, and nucleic acids. Prerequisites: BYS 114, CH 332, and CH 335. (Same as BYS 361).

362 General Biochemistry Laboratory I
1 hr.
Practical experience in isolation, qualitative identification, and quantitative estimation of biomolecules. Prerequisite or parallel: CH 361. Prerequisite: CH 223. (Same as BYS 362). One 4-hour lab a week. Lab fee: Level 6.

363 General Biochemistry II
3 hrs.
A continuation of CH 361 to include biosynthesis of biomolecules, metabolism, DNA and RNA, the genetic code, protein biosynthesis, genes and molecular physiology. Prerequisite: CH 361. CH 348 is recommended. (Same as BYS 363).

364 General Biochemistry Laboratory II
1 hr.
An experimental course illustration the topics in CH 363. Prerequisites: CH 361 and CH 362. Parallel CH 363. (Same as BYS 365) Lab fee: Level 5.

401 Inorganic Chemistry
3 hrs.
Fundamental topics in inorganic chemistry. Atomic structure, chemical bonding, periodic relationships, acid-base theories, nonaqueous solvents, and reaction mechanisms. Prerequisite or parallel: CH 342 or 348.

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: Level 6.

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: CH 346. Lab fee: Level 6.

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 chairman required. Registration utilizes last digit of course number to designate semester-hour credit. Student normally may elect only up to 6 hours. Lab fee: Level 4 for CH 492, Level 5 for CH 493. No fee for CH 491.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>521</td>
<td>Chemical Instrumentation</td>
<td>4 hrs.</td>
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<tr>
<td></td>
<td>Use of basic instrumentation in electrochemical, chromatographic, and spectrophotometric analysis. Laboratory work emphasizes utility of operational amplifiers in making chemical measurements. Introduction to digital logic. Prerequisite: CH 346. Lab fee: Level 6.</td>
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</tr>
<tr>
<td>525</td>
<td>Environmental Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Principles of quantitative analyses related to minor components of a sample. Applications selected from principal analyses necessary to maintain environmental quality of air, water, and soil. Selection of conditions for collecting reliable samples, concentration of components with techniques for increasing concentration of selected component, relationships between physical and chemical changes in sample and signal output of predominant transducers, and translation of chemical analysis into meaningful specifications. Lecture only. Prerequisites: CH 521 or 123; EG 311, 342. (Same as ES 525).</td>
<td></td>
</tr>
<tr>
<td>531</td>
<td>Theoretical Organic Chemistry</td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Molecular orbital theory and bonding, molecular structure, frontier molecular orbitals, pericyclic reactions, and reactive intermediates. Extensive computational laboratory work included. Prerequisites: CH 333, and 342 or 348 or approval of instructor. Lab fee: Level 5.</td>
<td></td>
</tr>
<tr>
<td>540</td>
<td>High Polymer Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Theory of polymer formation and structural dependence of polymer properties. Prerequisites: CH 337 and 342 or 348.</td>
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<tr>
<td>549</td>
<td>Spectroscopy and Molecular Structure</td>
<td>3 hrs.</td>
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<tr>
<td></td>
<td>Intermediate level treatment of principles of spectroscopy and their application to determination of molecular structure. Prerequisite: CH 343.</td>
<td></td>
</tr>
<tr>
<td>553</td>
<td>Introductory Quantum Mechanics I</td>
<td>3 hrs.</td>
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<td></td>
<td>Prerequisites: CH 343, PH 351, MA 244, 251, 352. (Same as PH 551).</td>
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</tr>
<tr>
<td>554</td>
<td>Introductory Quantum Mechanics II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: CH 553. (Same as PH 552).</td>
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<tr>
<td>560</td>
<td>X-Ray Structure Determination</td>
<td>4 hrs.</td>
</tr>
<tr>
<td></td>
<td>The course will examine both theoretical and practical aspects of molecular structure determination by x-ray diffraction methods. Topics include diffraction of x-rays, symmetry operations and space groups, methods of data collection, theory of structure factors and Fourier synthesis, least squares methods of structure refinement. Extensive laboratory and computer work included. Prerequisites: senior standing in chemistry or physics and approval of the instructor. Lab fee: Level 6.</td>
<td></td>
</tr>
<tr>
<td>561</td>
<td>Biochemistry I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Structural chemistry and function of biomolecules, mechanisms of biochemical reactions, enzyme kinetics, and energy transfer. Prerequisite: CH 333 or CH 361. (Same as BYS 547).</td>
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<tr>
<td>562</td>
<td>Biochemistry II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td></td>
<td>Metabolism, biosynthesis of macromolecular precursors, storage, transmission, and expression of genetic information, and molecular physiology. Prerequisite: CH 561. (Same as BYS 548).</td>
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<tr>
<td>Course</td>
<td>Title</td>
<td>Credits</td>
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</tr>
<tr>
<td>565</td>
<td>Molecular Biochemistry Laboratory</td>
<td>2 hrs.</td>
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<td></td>
<td>Practical experience in isolation and characterization of biomolecules. Prerequisite: CH 562. Lab fee: Level 6.</td>
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</tr>
<tr>
<td>600</td>
<td>Advanced Inorganic Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>601</td>
<td>Structural Methods in Inorganic Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>602</td>
<td>Chemistry of Coordination of Compounds</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>603</td>
<td>Chemistry of Nonmetal Compounds</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>621</td>
<td>Methods of Chemical Analysis</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>627</td>
<td>Instrumental Methods for Materials Characterization</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>631</td>
<td>Advanced Organic Chemistry I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>632</td>
<td>Advanced Organic Chemistry II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>640</td>
<td>Advanced Chemical Thermodynamics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>641</td>
<td>Statistical Thermodynamics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>642</td>
<td>Advanced Chemical Dynamics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>643</td>
<td>Quantum Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>644</td>
<td>Chemical Electrodynamics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>646</td>
<td>Thermodynamics of Materials</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>647</td>
<td>Polymer Physical Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>661</td>
<td>Biological Macromolecules</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>699</td>
<td>Master’s Thesis</td>
<td>3 to 6 hrs.</td>
</tr>
<tr>
<td>705</td>
<td>Selected Topics in Inorganic Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>721</td>
<td>Selected Topics in Analytical Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>735</td>
<td>Selected Topics in Organic Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>745</td>
<td>Selected Topics in Physical Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>746</td>
<td>Solid State Chemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>765</td>
<td>Selected Topics in Biochemistry</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>780</td>
<td>Chemistry Seminar</td>
<td>1 hr.</td>
</tr>
<tr>
<td>799</td>
<td>Doctoral Dissertation</td>
<td>3, 6 or 9 hrs.</td>
</tr>
</tbody>
</table>
The computer science program at UAH prepares students to contribute to the rapidly changing world of computing. The program combines mathematical fundamentals with laboratory experience to build a base of practical knowledge.

The program contains a CS core and electives in a wide variety of areas, such as artificial intelligence, graphics, theory of program development, UNIX, and languages such as Ada, C and Fortran. Students are required to complete the General Education Requirements, the core computer science courses, a minor in mathematics and may elect to pursue a second minor in Engineering. Computing lab fees are associated with all computer science courses. Computing hardware labs are normally scheduled by the instructor and will require a minimum of 2 hours per week outside of normal class hours.

The computer science department offers courses leading to the B.S., M.S. and Ph.D. degrees with a major in computer science. The graduate catalog should be consulted for M.S. and Ph.D. program descriptions.

Computer Science Major

The minimum number of hours required for the B.S. degree with a major in computer science is 131, divided as follows:

GER Requirements
English Composition (EH 101 and EH 102) ........................................... 6
Origin and Development of Contemporary World (HY 101 and HY 102) .......... 6
Foreign Language/Communication Skills
  CS 108 and two 200 level foreign language courses or CM 113 and EH 301 .......... 9
Literature (any one of the following sequences) EH 205 and EH 206; EH 205 and
  EH 241; EH 205 and EH 230; EH 206 and EH 240; EH 230 and EH 240 ............ 6
Fine Arts (6 hours from two of the following options) ARH 100 or ARH 101;
  ARS 101; MU 100 or MU 110; PHL 101 or PHL 202 or PHL 311 .............. 6
Social & Behavioral Sciences (6 hours in one discipline)
  Economics, Political Science, Psychology, Sociology ................................. 6
Mathematics (MA 153) .......................................................... 3
Laboratory Science
  a. Physics 111, 112 ........................................................................... 8
  b. Additional laboratory coursework ..................................................... 8
     (CH 121, 125 and CH 123, 126) or (BYS 112 and either BYS 113 or 114) or
     Engineering coursework with labs.

Computer Science Major Core:
CS 208, 214, 308, 309, 314, 317, 415, 424, 490, 499 ................................. 30
Computer Science Seminar - Ethics and Professionalism, CS 105 ............... 1

Computer Science Electives
Electives are designed to add in depth knowledge to the core courses areas and must be preapproved by the computer science advisor.
3 electives (two at 300 level or above, one at 400 level or above) ............... 9

Mathematics Minor
MA 154, 233, 244, 251, 385, 415, 440 or 352 ........................................ 21
Electives (to bring total number of hours to 131) .......................................... 12

Students may elect to earn a second minor in engineering by combining elective hours with 8 hours of engineering lab courses taken as part of the general education requirements. An approved sequence of courses may be obtained from the departmental office or from the student’s advisor. The elective hours may also be used to obtain a second major in mathematics.

A suggested schedule of courses for full-time students majoring in computer science is shown below.

**Freshman Year (semester hour credit in parenthesis)**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EH 101</td>
<td>EH 102</td>
<td></td>
<td>(3)</td>
</tr>
<tr>
<td>MA 153</td>
<td>MA 154</td>
<td>MA 233</td>
<td>(3)</td>
</tr>
<tr>
<td>HY 101</td>
<td>HY 102</td>
<td>CS 214</td>
<td>(3)</td>
</tr>
<tr>
<td>CS 105</td>
<td>CS 108</td>
<td></td>
<td>(3)</td>
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<td></td>
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<td>12</td>
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</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature</td>
<td>SBS 1*</td>
<td>SBS 2*</td>
<td>(3)</td>
</tr>
<tr>
<td>MA 251</td>
<td>MA 244</td>
<td>MA 352</td>
<td>(3)</td>
</tr>
<tr>
<td>PH 111</td>
<td>PH 112</td>
<td>EG elective**</td>
<td>(3)</td>
</tr>
<tr>
<td>CS 208</td>
<td>CS 308</td>
<td>CS 314</td>
<td>(3)</td>
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</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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</thead>
<tbody>
<tr>
<td>FL*** or</td>
<td>FL*** or</td>
<td>Fine Arts</td>
<td>(3)</td>
</tr>
<tr>
<td>CM 113</td>
<td>EH 301</td>
<td>CS elective</td>
<td>(3)</td>
</tr>
<tr>
<td>MA 385</td>
<td>MA 415</td>
<td>EG elective**</td>
<td>(3)</td>
</tr>
<tr>
<td>Lab Science or</td>
<td>Lab Science or</td>
<td>CS 309</td>
<td>(3)</td>
</tr>
<tr>
<td>EG Lab**</td>
<td>EG Lab**</td>
<td></td>
<td>(3)</td>
</tr>
<tr>
<td>CS 317</td>
<td>CS 424</td>
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**Senior Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Fine Arts</td>
<td>Electives</td>
<td>Electives</td>
<td>(0-6)</td>
</tr>
<tr>
<td>CS 490</td>
<td>CS 499</td>
<td>CS electives</td>
<td>(6)</td>
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<tr>
<td>Electives</td>
<td>CS 415</td>
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**Degree Total hours**

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<tbody>
<tr>
<td></td>
<td>131</td>
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</tbody>
</table>

*Social and Behavioral Sciences
**Students pursuing engineering minor only
***Foreign Language
Computer Science Minor

Students majoring in other fields may obtain a minor in computer science. A minimum of 21 hours of coursework is required for a minor in computer science and the request for a minor should be initiated in the student’s major department. Typical course sequences are listed below; other sequences should be pre-approved by the Computer Science department.


Computer Science (CS)

100 Introduction to Computers and Programming 3 hrs.

105 Computer Science Seminar - Ethics and Professionalism 1 hr.
This seminar will cover issues associated with the ethical use of computers in the current information age. Ethics, professionalism, software piracy, copywriting software, ethical standards and the impact of computers on society will be covered. Familiarization with the local computing environment will also be covered. Lab fee: Level 4.

108 Computer Science I with Pascal 3 hrs.
Overview of hardware and software components of computer systems. Techniques of problem analysis and algorithm development. Principles of program design, coding, and testing. Introduction to the Pascal programming language, with extensive experience in programming solutions to both numerical and non-numerical problems. Prerequisites: MA 121 or MA 143 (or Level III placement). Lab fee: Level 4.

113 FORTRAN Programming 3 hrs.
Introduction to the FORTRAN programming language. Components of algorithms such as assignment, looping, conditional branching, and input/output. Problem analysis and algorithm development. Basic algorithms for sorting, searching, table look-up. Definition and use of functions and subroutines. Prerequisite: MA 121 (or Level III placement). Lab fee: Level 4.

208 Computer Science II - Data Structures with Pascal 3 hrs.
Continuation of CS 108, with emphasis on advanced features of the Pascal programming language, including recursion, pointers, and files. Introduction to elementary data structures such as linked lists, stacks, queues, and simple binary trees. Basic search and sort algorithms. Additional instruction in the principles of good programming. Practical experience in the design and implementation of larger programs illustrating these topics. Prerequisites: CS 108 and MA 151 or MA 153. Lab fee: Level 4.

211 Introduction to Computers in Business 3 hrs.
Information processing and computer fundamentals; computer systems, programming planning, and introductory COBOL programming. Table handling and hierarchical data structure. Lab fee: Level 4. Prerequisite: CS 108 or CS 113 or CS 201. Same as MIS 211.

290
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. Prerequisite: CS 108 and MA 154. Lab fee: Level 4.

308 Computer Organization and Assembly Language Programming 3 hrs.
Computer hardware organization; representation of numbers and characters; memory and memory addressing techniques. Functions of central processing unit; instruction representation and execution. Overview of software systems: loaders, assemblers, compilers, interpreters, operating systems. Functional description of input/output and mass storage devices. Structure and operation of assemblers. Programming experience in a representative assembly language. Prerequisite: CS 208. Lab fee: Level 5.

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. Prerequisites: CS 214 or MA 244. Lab fee: Level 4.

311 Advanced Software Development using COBOL 3 hrs.
Business systems and data-processing procedures and impact of data-processing methods on economic structure of business. User communications, file design, report control, documentation. Data bases, information collection, planning and control, and systems design concepts. COBOL. Prerequisite: CS 208. Lab fee: Level 3.

312 System Software Development Using C 3 hrs.
The role of major system software components and the interfacing and integration of these components in the process of program development and execution. The C language and the UNIX system will be used to develop the class of software. Prerequisite: CS 208. Lab fee: Level 4.

313 Advanced Software Development Using FORTRAN 3 hrs.
Introduction to the FORTRAN language. Programming in FORTRAN, programming support environments, basic principles of design and implementation using FORTRAN. Use of FORTRAN in a Cray XMP environment. Optimizing and vectorizing compilers. Prerequisite: CS 208. Lab fee: Level 4.

314 Data Organization and File Processing 3 hrs.

317 Introduction to Design and Analysis of Algorithms 3 hrs.
Review of basis data structures such as stacks, queues, lists, and binary trees. 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
<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>330</td>
<td>Symbolic Programming with LISP and PROLOG</td>
<td>3 hrs.</td>
<td>Use of the LISP language. Computing with symbolic expressions, e.g., algebraic expressions, logical expressions, patterns graphs, and computer programs themselves. Building and controlling abstractions. Object oriented programming, prototyping. Introduction to PROLOG. Prerequisite: CS 208. Lab fee: Level 4.</td>
<td>MA 244, CS 208 and one of CS 311, CS 312, CS 313, CS 314.</td>
<td>Level 4.</td>
</tr>
<tr>
<td>390</td>
<td>Unix Programming</td>
<td>3 hrs.</td>
<td>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. Prerequisite: CS 208. Lab fee: Level 4.</td>
<td>CS 208.</td>
<td>Level 4.</td>
</tr>
<tr>
<td>403</td>
<td>Introduction to Formal Languages and Automata Theory</td>
<td>3 hrs.</td>
<td>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. Prerequisite: CS 317. Lab fee: Level 4.</td>
<td>CS 317.</td>
<td>Level 4.</td>
</tr>
<tr>
<td>424</td>
<td>Introduction to Programming Languages</td>
<td>3 hrs.</td>
<td>Data and control structures and run-time considerations for modern programming languages such as Pascal, Ada, and LISP. Their applications in areas illustrating typical usage and characteristics. Prerequisite: CS 317. Lab fee: Level 4.</td>
<td>CS 317.</td>
<td>Level 4.</td>
</tr>
</tbody>
</table>
495 Selected Topics in Undergraduate Computer Science 3 hrs.
Course will cover selected areas of Computer Science. Prerequisites: To be arranged with the instructor. Lab fee: Level 4.

499 Senior Project 3 hrs.
A combination of lectures on proven software development approaches, and team working sessions. Each student will participate in a sizable, complex software development project based on a team approach. Each team will be required to provide oral and written documentation on their work. Prerequisite: CS 317. Lab fee: Level 4.

513 Introduction to Computer Architecture 3 hrs.
(Not open to CS majors—See Graduate Catalog.)

517 Data Organization and Analysis of Algorithms 3 hrs.
(Not open to CS majors—See Graduate Catalog.)

530 Introduction to Artificial Intelligence 3 hrs.
Basic introduction to AI concepts and methods for problem solving, heuristic search, planning hypothesis formation, modeling and knowledge representation, knowledge acquisition (learning), and AI's programming methodologies and tools. Applications of AI in areas of automatic programming, theorem proving, game playing, machine vision, natural language systems and robots. Prerequisites: CS 317, CS 424. Lab fee: Level 4.

537 Neutral Networks 3 hrs.
The purpose of this course will be to learn the fundamentals of neural networks. Specific problems will be examined to contrast the connectionist approach to functionalism. The most common neural net models will be implemented and applied to various machine learning applications. Prerequisite: CS 530 or CS 535.

551 Object Oriented Software Development 3 hrs.
Object oriented methods and design concepts, languages and systems for object oriented development, object oriented programming environments, application of object oriented techniques. Lab fee: Level 4. Prerequisites: CS 208, CS 424.

555 Theory of Program Development 3 hrs.
Propositional and predicate calculi, reasoning about programs, weakest precondition, program development, developing invariants, efficiency consideration, and program documentation. Prerequisite: CS 424. Lab fee: Level 4.

586 Microprocessor Architecture 3 hrs.

590 Programming Environments with UNIX 3 hrs.
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.

293
Process and interprocess communications. Prerequisite: CS 390 or two years experience in Unix. Lab fee: Level 4.

595 Selected Topics in Computer Science 3 hrs.
Investigations into selected areas of Computer Science. Prerequisites: To be arranged with the instructor. Lab fee: Level 4.

603 Formal Languages and Automata Theory 3 hrs.
612 Compiler Design 3 hrs.
613 Computer Architectures 3 hrs.
617 Design and Analysis of Algorithms 3 hrs.
624 Programming Languages 3 hrs.
630 Artificial Intelligence 3 hrs.
635 Computational Models of Cognition 3 hrs.
640 Automatic Pattern Recognition 3 hrs.
645 Interactive Computer Graphics 3 hrs.
646 Computer Geometry Modeling 3 hrs.
647 Numerical Grid Generation 3 hrs.
650 Software Engineering 3 hrs.
651 Software Requirements and Design Methodologies 3 hrs.
652 Software Testing and Reliability 3 hrs.
653 Software Project Management and Quality Assurance 3 hrs.
660 Large Scale Scientific Computing 3 hrs.
670 Computer Networks 3 hrs.
686 Bit Slice Microcomputer Systems 3 hrs.
687 Data Base Systems 3 hrs.
690 Operating Systems 3 hrs.
695-698 Selected Topics in Computer Science 3 hrs.
699 Master’s Thesis 3 hrs.
703 Theory of Programming Languages 3 hrs.
713 Distributed Processing Systems 3 hrs.
717 Advanced Algorithm Design and Analysis 3 hrs.
730 Expert Systems and Heuristic Programming 3 hrs.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>735</td>
<td>Computer Vision</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>742</td>
<td>Image Processing Algorithms and Architectures</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>750</td>
<td>Advanced Software Engineering</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>770</td>
<td>Supercomputing Applications in Fluid Dynamics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>780</td>
<td>Computer System Reliability</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>787</td>
<td>Advanced Data Base Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>790</td>
<td>Advanced Operating Systems</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>795-798</td>
<td>Advanced Selected Topics</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>799</td>
<td>Doctoral Dissertation</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>
Mathematical Sciences Department

Professors Chang, Doss, Gibson (Chair), Hoomani, Padulo, Slater; Adjunct Professor Lehnigk; Associate Professors Cook, Dow, Forte, Friedman, Howell, Morales, Roach, Siegrist; Assistant Professors Adebiyi, Epperson, Fehribach, Phanord, Assistant Research Professors Reynolds, Vargas; Adjunct Assistant Professors Miller, Welstead; Lecturers Cantey, Spilman.

Undergraduate Programs

The mathematical sciences faculty offers courses in mathematics (MA) and statistics (ST) for a Bachelor of Arts or Bachelor of Science degree in mathematics, a Bachelor of Arts or Bachelor of Science degree in mathematics education, and a minor or second major in mathematics for students majoring in other areas of study. Courses also satisfy individual needs to supplement other areas of study and to satisfy general education requirements (GER).

General Education Requirements

Students who are not planning to continue in mathematics but who need 3 to 9 hours to satisfy GER should make their choice from the sequence MA 105, 143, 151, 244, ST 281, MA 333, and 385 beginning with the course indicated by their placement level.

Students who plan to continue in mathematics and need 3 to 9 hours to satisfy GER should make their choice from the sequence MA 119, 121, 153, 154, 233, 244, beginning with the course indicated by their placement level.

Placement

No student may enroll in his first MA course at UAH before determination of his placement level. Students are placed at the appropriate level according to their high school mathematics background, their ACT scores in mathematics, their previous college credit (if any), and a placement test.

Students with various placement levels must begin their MA courses for credit as follows:

- Level I—MA 105 or 119;
- Level II—MA 121 or 143;
- Level III—MA 151 or 153.

No credit can be obtained for an MA course below a student's placement level, and no more than 3 hours credit is awarded at each level.

Mathematics Major

All majors in mathematics must include MA 153, 154, 233, 244, 251, 440, and 452 (basic core - 21 semester hours). Only MA courses numbered 153 or above may be included in a mathematics major, and an overall average of C is required for all University of Alabama in Huntsville MA courses included in a mathematics major. Information on other MA course requirements are given in Curricula I and II below. Students who think that substitutions in those curricula can produce a program better suited to their needs should consult their faculty advisor about the feasibility of such substitutions. All MA electives must be approved by the student's faculty advisor prior to registering for the courses. Majors in mathematics must also include CS 108, PH 111 and 112, and ST 281.

Mathematics Minor or Second Major

Students majoring in other academic areas who wish to minor in mathematics may select in consultation with and approval of the mathematical sciences faculty at least 21 semester hours of appropriate courses in mathematics, including 6 semester hours in courses numbered 300 or above. Only MA courses numbered 153 or above may be included in a mathematics minor, and an overall average of C is required for all University of Alabama in Huntsville MA courses included in a minor. A typical mathematics minor consists of MA 153, 154, 233, 244, 251, and two approved MA courses numbered above 300. All minors must include MA 153 and 154.
Students majoring in other academic areas who wish to obtain a more solid background in mathematics than is provided by a minor may pursue a second major in mathematics rather than a minor in mathematics. The courses required for the second major are used to replace the minor courses and some of the free electives in the requirements for programs of study leading to a B.A. or B.S. degree.

Curriculum I
B.A. or B.S. degree with a major in mathematics

Mathematics - MA basic core, MA 352, 425 and 9 hours of electives numbered 300 or above, including at least one 500 level course, preapproved by student's mathematics advisor .......................................................... 36
Computer Science - CS 108 ......................................................... 3
Physics - PH 111, 112 .............................................................. 8
Statistics - ST 281 ................................................................. 3
Minor .................................................................................. 21-24

General Education Requirements and Electives (to total 128 semester hours) ................................................. 54-57

GER for the B.A. and B.S. degrees are listed in the academic information section.

Curriculum II
B.A. or B.S. degree with a major in mathematics that meets requirements for an Alabama Class B Middle/Junior High School Teacher's Certificate or an Alabama Class B High School Teacher's Certificate.

Mathematics - MA basic core, MA 333, 385 and 6 hours of electives numbered 300 or above, including at least one 500 level course, preapproved by student's mathematics advisor .......................................................... 33
Computer Science - CS 108 ......................................................... 3
Physics - PH 111, 112 .............................................................. 8
Statistics - ST 281 ................................................................. 3
Professional Education Courses ................................................. 33

General Education Requirements and Electives ................................................. 48

NOTES:
1. See Education Department section for general education requirements and professional education courses.
2. Students pursuing this curriculum should consult with the Education Department early in their program.

Curriculum III
B.A. or B.S. degree with a double major in mathematics education and elementary education. This plan meets requirements for an Alabama Class B Elementary Teacher's Certificate.

Mathematics Education (minimum requirements applicable to this AOC only.) MA 153, 154, 233, 244, 333, 385, 440 and two MA electives numbered 300 or above which have been preapproved by student's mathematics advisor .......................................................... 27
NOTES:
1. See Education Department section for general education requirements and professional education courses.
2. Students pursuing this curriculum should consult with the Education Department early in their program.
3. Students who elect this curriculum will not be adequately prepared for graduate study in mathematics.
4. This curriculum will probably require more than the minimum total of 128 hours.

Appropriate Minors for Mathematics Major
A student who majors in mathematics is strongly encouraged to select a minor in science or engineering. Typically, such a student minors in computer science, physics, operations research, or chemistry, but other options are available. Any minor must include at least 21 hours in one discipline, with a minimum of 6 hours at 300 level or above. All courses in a minor must be approved by the department concerned and the student’s mathematics faculty advisor.

Graduate Programs
Programs leading to the Master of Arts and Master of Science degrees in mathematics and the Doctor of Philosophy degree in applied mathematics are offered. Description of these programs and of courses at 600 level or above are presented in the Graduate Catalog.

Mathematics (MA)

NOTE:
1. No student may receive more than 6 hours credit for MA courses numbered below 150 or more than 3 hours credit for MA courses numbered below 120.
2. Students placed at Level II may receive no more than 3 hours credit for MA courses numbered below 150.
3. Students placed at Level III will receive no credit for MA courses numbered below 150.
4. Students with deficiencies of high school algebra or high school geometry credit must remove these deficiencies before enrollment in MA courses numbered 100 or above.
5. No student may enroll in his first MA course at UAH before determination of his placement level.

004 Basic Algebra
For students with a deficiency in high school credit in algebra or who need an algebra review.

033 High School Geometry
For students with a deficiency in high school credit in geometry. Prerequisite: Basic algebra.

105 College Algebra
Rational expressions, roots and radicals, algebraic and absolute value equations, inequalities, relations, functions, inverse functions and their graphs, systems of equations, conic sections, exponential and logarithmic functions. No credit given to students who have received credit for another MA course or who place at Level II or above. Prerequisite: Level I placement or removal of mathematics deficiencies.
119 Precalculus I 3 hrs.
Should be taken only by students who are going on to the calculus sequence (MA 153, 154,...). Real numbers systems, exponents, radicals, factoring, absolute value, inequalities, function notation, functions, inverse functions, graphing techniques, polynomial and rational functions, operations with complex numbers, conic sections, and theory of equations. No credit given to students who have received credit for another MA course or who place at Level II or above. Prerequisite: Level I placement or removal of mathematics deficiencies.

121 Precalculus II 3 hrs.
Should be taken only by students who are going on to the calculus sequence (MA 153, 154,...). Exponential and logarithmic functions, trigonometric functions of angles and real numbers, graphing trigonometric functions, inverse trigonometric functions, solving trigonometric equations, verifying identities, laws of sines and cosines, vectors, trigonometric form of complex numbers, DeMoivre’s theorem, summation notation, arithmetic and geometric sequences and series. No credit given to students who have successfully completed an MA course numbered above 121 or who place at Level III. Prerequisite: Level II placement or MA 119 with a grade of C or better.

143 Finite Mathematics 3 hrs.
Linear models, matrix theory, linear programming, graphical and simplex methods of solving systems, sets, counting, probability, decision theory and algebra review. No credit given to students who have successfully completed MA 121 or a higher level MA course or who place at Level III. Prerequisite: Level II placement or MA 105.

151 Survey of Elementary Calculus 3 hrs.
Limits, continuity, derivatives, chain rule, derivative tests, logarithm and exponential functions, applications of the derivative, antiderivatives, fundamental theorem of calculus, applications of the integral. No credit given to students who have received credit for any other calculus course. Designed for students who do not plan further study in calculus. Students planning to continue in calculus should begin with MA 153 instead of this course. Prerequisite: Level III placement or MA 143.

153 Calculus I 3 hrs.
Limits, continuity, derivatives, differentials, chain rule, implicit differentiation, applications of the derivative, conic sections. Designed for students who plan further study in Calculus. Prerequisite: Level III placement or MA 121 with a grade of C or better.

154 Calculus II 3 hrs.
Definite and indefinite integrals, exponential and logarithmic functions, trigonometric functions, hyperbolic functions, l’Hospital’s Rule, techniques of integration, improper integrals, applications of the integral. Prerequisite: MA 153 with a grade of C or better.

233 Calculus III 3 hrs.
Polar coordinates, sequences and series, vectors and analytic geometry in three dimensions, vector-valued functions. Prerequisite: MA 154 with a grade of C or better.
Introduction to Linear Algebra 3 hrs.
No credit given to students who have successfully completed either MA 440 or MA 502. Such students must substitute MA 544. Systems of linear equations, matrices, matrix operations, determinants, vector spaces, bases, dimension of a vector space, inner product, Gram-Schmidt process, linear transformations, change of basis, similar matrices, eigenvalues and eigenvectors, diagonalization, symmetric matrices, and applications. Prerequisite: MA 233 or MA 143, 151.

Calculus IV 3 hrs.
Partial differentiation, chain rule, directional derivatives, tangent plane, Lagrange multipliers, multiple integration, vector fields, line integrals, Green’s Theorem, divergence and curl, surface integrals. Prerequisite: MA 233.

Introduction to Geometry 3 hrs.
Axiomatic development of geometry. Introduction to nonEuclidean geometries with emphasis in elliptic and hyperbolic geometries. Selected topics in Euclidean geometry. Prerequisite: MA 244 or approval of instructor.

Introduction to Differential Equations 3 hrs.
First-order differential equations, linear differential equations with variable and constant coefficients, variation of parameters, Laplace transforms, series solutions, selected applications. Prerequisite: MA 251. MA 244 recommended before taking this course.

Mathematical Techniques in Computer Graphics 3 hrs.
A study of some of the mathematics used in computer graphics. Rotations, translations, viewing transformations including orthographic and perspective projections, homogeneous coordinates, hidden line and surface removal. Students participate in computer demonstrations and projects illustrating the techniques discussed in class. Prerequisites: MA 244, 251, CS 108. Lab fee: Level 4.

Introduction to Probability 3 hrs.
No credit given to students who have successfully completed MA 585. Finite probability spaces, conditional probability, random variables, expectations, variances, covariances, introduction to binomial, Poisson, uniform, exponential, and normal distributions. Prerequisites: MA 151 or 154, and one MA course at the 200 level or above.

Introduction to Numerical Methods 3 hrs.
Iterative methods for solution of nonlinear equations, error analysis, acceleration of convergence, interpolation and approximation of functions, numerical integration. Prerequisites: MA 244, 251, CS 108 or equivalent. Lab fee: Level 4.

Introduction to Mathematical Modeling 3 hrs.
The purpose of this course is to apply mathematics by formulating, analyzing, and criticizing mathematical models of various phenomena. Examples will be chosen from the physical, biological, and social sciences. The course 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, 352.

Algebraic Structures with Applications 3 hrs.
Logic and mathematical proofs, mappings, binary operations, equivalence relations, groups and subgroups, Lagrange’s theorem, homomorphisms and
isomorphisms, normal subgroups and quotient groups, rings, integral domains, fields, error correcting codes, linear codes, decoding, partially ordered sets, lattices, Boolean algebras, and applications. Prerequisites: MA 244 and at least one MA course at 300 level or above.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>452</td>
<td>Introduction to Real Analysis</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>490</td>
<td>Selected Topics in Undergraduate Mathematics</td>
<td>1-3 hrs.</td>
</tr>
<tr>
<td>502</td>
<td>Introduction to Real Analysis (See MA 452)</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>515</td>
<td>Introduction to Numerical Analysis</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>521</td>
<td>Introduction to Complex Analysis</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>525</td>
<td>Intermediate Differential Equations</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>526</td>
<td>Partial Differential Equations I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>530</td>
<td>Introduction to Fourier Analysis</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>540</td>
<td>Combinatorial Enumeration</td>
<td>3 hrs.</td>
</tr>
</tbody>
</table>

452 Introduction to Real Analysis 3 hrs.
Sequences, limits, continuity, differentiation of functions of one real variable, Riemann integration, uniform convergence, sequences and series of functions, power series, and Taylor series. Prerequisite: MA 352 or 440 or approval of instructor.

490 Selected Topics in Undergraduate Mathematics 1-3 hrs.
Courses in requested undergraduate topics. Prerequisite: approval of instructor.

502 Introduction to Real Analysis (See MA 452) 3 hrs.

515 Introduction to Numerical Analysis 3 hrs.
Numerical solution of ordinary differential equations, solution of linear and nonlinear algebraic systems, iterative methods in matrix algebra, error analysis, and convergence properties of selected methods. Prerequisites: MA 244, 352, CS 108 or equivalent. Lab fee: Level 4. MA 415 recommended before taking this course.

521 Introduction to Complex Analysis 3 hrs.
Complex algebra, analytic functions, Cauchy-Riemann equations, exponential, trigonometric, and logarithmic functions, integration, Cauchy integral theorem, Morera's theorem, Liouville's theorem, maximum modulus theorem, residue theory, Taylor and Laurent series, and applications. Prerequisite: MA 502 or approval of instructor.

525 Intermediate Differential Equations 3 hrs.
Systems of linear ordinary differential equations, first order systems with constant coefficients, plane autonomous systems, stability, and selected topics related to properties and characterization of solutions. Prerequisites: MA 244 and 352.

526 Partial Differential Equations I 3 hrs.
Systems of first order ordinary differential equations, first order quasilinear partial differential equations, general first order partial differential equation by Cauchy's method of characteristics, higher-order equations, canonical forms, separation of variables, Fourier series, wave equation, heat equation, and potential equation. Prerequisites: MA 244 and MA 352.

530 Introduction to Fourier Analysis 3 hrs.
Fourier series and Fourier transforms with emphasis on one- and two-dimensional transforms. Topics include the basic properties of the Fourier transform, the computation and analysis of the transforms of various functions and generalized functions, Green's functions, convolution, correlations, sampling, the discrete transform, and applications. Prerequisites: MA 244, 352.

540 Combinatorial Enumeration 3 hrs.
Counting, pigeonhole principle, permutations and combinations, generating functions, principle of inclusion and exclusion, Polya's theory of counting. Prerequisite: MA 440 or approval of instructor.
542 Algebra  
Topics from group theory and ring theory: subgroups, normal subgroups, quotient groups, homomorphisms, isomorphism theorems, ideals, principal ideal domains, Euclidean domains, fields, extension fields, elements of Galois theory. Prerequisite: MA 440 or approval of instructor.

544 Linear Algebra  
Vector spaces, bases, linear transformations, matrices, determinants, eigenvalues, similarity, Jordan canonical forms, dual spaces, bilinear forms, quadratic forms, orthogonal and unitary transformations. Prerequisites: MA 244 and at least one MA course at 300 level or above.

551 Functions of Several Variables  
Topology of $\mathbb{R}^n$, limits, continuity, and differentiation of functions of several real variables, Jacobians, implicit function and inverse function theorems, Riemann integration of functions of several real variables, and change of variables theorem for multiple integrals. Prerequisite: MA 502.

570 Metric Spaces with Applications  
Metric spaces, continuous functions, compactness, connectedness, completeness, Arzela-Ascoli theorem, Stone-Weierstrass theorem, Hilbert spaces, contraction mappings, applications to existence and uniqueness of solutions of differential and integral equations. Prerequisites: MA 502 and at least one other MA course at the 500 level or above.

585 Probability  
Probability theory and its applications. Independent trials, discrete and continuous random variables, law of large numbers, basic distributions, sums of independent random variables, sequences of random variables, central limit theorem, and convergence in distribution. Prerequisites: MA 251 and one of MA 385, ISE 390, ST 281, or approval of instructor.

590 Selected Topics in Mathematics  
Courses in requested selected topics.

614 Numerical Methods for Linear Algebra  
3 hrs.

615 Numerical Methods for Partial Differential Equations I  
3 hrs.

620 Asymptotics and Perturbation Methods  
3 hrs.

621 Special Functions  
3 hrs.

625 Calculus of Variations  
3 hrs.

626 Partial Differential Equations II  
3 hrs.

633 Geometry  
3 hrs.

640 Graph Theory  
3 hrs.

643 Group Theory  
3 hrs.

644 Matrix Theory  
3 hrs.

645 Combinatorial Design  
3 hrs.
646  Combinatorial Algorithms 3 hrs.
652  Advanced Differential Equations 3 hrs.
653  Real Analysis I 3 hrs.
656  Complex Analysis I 3 hrs.
670  Introduction to Functional Analysis 3 hrs.
671  General Topology 3 hrs.
685  Stochastic Processes with Applications I 3 hrs.
686  Stochastic Processes with Applications II 3 hrs.
690  Special Topics in Mathematics 3 hrs.
699  Master’s Thesis 3 hrs.
726  Theory of Partial Differential Equations 3 hrs.
754  Real Analysis II 3 hrs.
756  Complex Analysis II 3 hrs.
785  Advanced Probability Theory 3 hrs.
790  Graduate Seminar 3 hrs.
799  Doctoral Dissertation 3, 6, or 9 hrs.

Statistics (ST)

281  Elements of Statistical Analysis I 3 hrs.
Descriptive statistics, fundamentals of probability theory, fundamentals of statistical inference, including estimation and hypothesis testing, and use of a typical statistical package such as MINITAB. Prerequisite: MA 154 or 151. Student cannot receive credit for more than one of ST 281, MSC 287, or AHS 300. Lab fee: Level 4.

381  Elements of Statistical Analysis II 3 hrs.
Analysis of variance and multiple comparisons, analysis of covariance, multiple regression and correlations, nonparametric methods, and use of a typical statistical package such as MINITAB. Prerequisite: ST 281 or approval of instructor. Lab fee: Level 4.

687  Theory of Statistics I 3 hrs.
690  Special Topics in Statistics 3 hrs.
787  Theory of Statistics II 3 hrs.
Optical Science Program

Professors: Duthie (chair), Sung; Associate Professors: Bartell, Torbert; Assistant Professor: Chipman; Adjunct Professors: Bowden, Caulfield; Adjunct Associate Professor: Fennelly.

Optical Science Major

The B.S. degree in optical sciences is one of only three such undergraduate degrees in the United States. The curriculum consists of a major in optical science and background courses in physics, computer science and engineering. Optical Science majors develop a minor in mathematics. The program is designed to produce professionals who are able to move immediately into government or private industry and work in many areas of optics such as optical system analysis, optical image processing, optical sensors, laser development and holography. Optical Science graduates are also well-prepared for graduate work in optics, physics and related fields.

Optical science majors receive a strong grounding in geometric and physical optics, then move on to study contemporary topics such as electro-optics, lasers and radiometry. An advanced laboratory exposes students to the use of contemporary equipment and techniques. The following tables show the curriculum requirements and a typical program of study.

Curriculum for B.S. Degree Optical Science

1. General Education Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH 101, 102</td>
<td>6 hours of literature</td>
<td>12 hrs</td>
</tr>
<tr>
<td>HY 101, 102</td>
<td></td>
<td>6 hrs</td>
</tr>
<tr>
<td>Social Science (One discipline)</td>
<td>6 hrs</td>
<td></td>
</tr>
<tr>
<td>Fine Arts</td>
<td>6 hrs</td>
<td></td>
</tr>
<tr>
<td>Modern Foreign Language</td>
<td>6-12 hrs</td>
<td></td>
</tr>
<tr>
<td>or Communication Skills (CS 108 or 113; CM 113; EH 301)</td>
<td>9 hrs</td>
<td></td>
</tr>
</tbody>
</table>

NET TOTAL 36-42 hrs.

2. Areas of Concentration

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 111</td>
<td>General Physics w/Calculus I</td>
<td>4 hrs</td>
</tr>
<tr>
<td>PH 112</td>
<td>General Physics w/Calculus II</td>
<td>4 hrs</td>
</tr>
<tr>
<td>PH 113</td>
<td>General Physics w/Calculus II</td>
<td>3 hrs</td>
</tr>
<tr>
<td>PH 351</td>
<td>Quantum Physics</td>
<td>3 hrs</td>
</tr>
<tr>
<td>OPT 342</td>
<td>Geometrical Optics I</td>
<td>3 hrs</td>
</tr>
<tr>
<td>OPT 343</td>
<td>Physical Optics I</td>
<td>3 hrs</td>
</tr>
<tr>
<td>OPT 411</td>
<td>Geometrical Optics Lab</td>
<td>2 hrs</td>
</tr>
<tr>
<td>OPT 412</td>
<td>Physical Optics Lab</td>
<td>2 hrs</td>
</tr>
<tr>
<td>OPT 417</td>
<td>Electro Optics Lab</td>
<td>2 hrs</td>
</tr>
<tr>
<td>PH 431</td>
<td>Intermediate Electricity &amp; Magnetism</td>
<td>3 hrs</td>
</tr>
<tr>
<td>PH 432</td>
<td>Intermediate Electricity &amp; Magnetism</td>
<td>3 hrs</td>
</tr>
<tr>
<td>OPT 441</td>
<td>Intermediate Geometrical Optics</td>
<td>3 hrs</td>
</tr>
<tr>
<td>OPT 442</td>
<td>Intermediate Physical Optics</td>
<td>3 hrs</td>
</tr>
<tr>
<td>OPT 444</td>
<td>Electro Optics</td>
<td>3 hrs</td>
</tr>
<tr>
<td>OPT 445</td>
<td>Introduction to Lasers</td>
<td>3 hrs</td>
</tr>
<tr>
<td>OPT 446</td>
<td>Radiometry</td>
<td>3 hrs</td>
</tr>
</tbody>
</table>

TOTAL 47 hrs.
3. Math Minor
   MA 153 Calculus I ........................................ 3 hrs.
   MA 154 Calculus II .................................... 3 hrs.
   MA 233 Calculus III ................................ 3 hrs.
   MA 244 Introduction to Linear Algebra .......... 3 hrs.
   MA 251 Calculus IV .................................... 3 hrs.
   MA 352 Introduction to Differential Equations 3 hrs.
   MA 530 Introduction to Fourier Analysis .......... 3 hrs.

   TOTAL  21 hrs.

4. Required Technical Courses
   CS 108 Introduction to Computer Science I .......... 3 hrs.
   CS 208 Introduction to Computer Science II .... 3 hrs.
   EG 300 Electrical Circuits I ....................... 3 hrs.
   EG 301 Electronic Instrumentation Lab ............. 1 hr.
   EG 311 Electronic Instrumentation .................. 3 hrs.

   TOTAL 13 hrs.

5. Technical Electives
   Technical elective courses in physics,
   mathematics, computer science or engineering

   TOTAL 5-11 hrs.

   TOTAL REQUIRED: 128-134 hours

Typical Schedule for Full-Time Students
(Does not include General Education Requirements (GER) Courses)

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA 153</td>
<td>(3)</td>
<td>MA 154</td>
<td>(3) MA 233</td>
</tr>
<tr>
<td>CS 108</td>
<td>(3)</td>
<td>PH 111</td>
<td>(4) PH 112</td>
</tr>
<tr>
<td>PH 113</td>
<td>(3)</td>
<td>MA 244</td>
<td>(3) MA 352</td>
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<tr>
<td>Tech. Courses*</td>
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<td>OPT 342</td>
<td>(2) OPT 343</td>
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<tr>
<td>MA 251</td>
<td>(3)</td>
<td>Tech. Courses*</td>
<td>Tech. Courses*</td>
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<tr>
<td>Year 2</td>
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<td></td>
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</tr>
<tr>
<td>PH 451</td>
<td>(3)</td>
<td>PH 431</td>
<td>(3) PH 432</td>
</tr>
<tr>
<td>Tech. Courses*</td>
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<td>MA 530</td>
<td>(3) OPT 441</td>
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<tr>
<td>Year 3</td>
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<tr>
<td>OPT 411</td>
<td>(2)</td>
<td>OPT 412</td>
<td>(2) OPT 445</td>
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<td>Tech. Courses*</td>
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<td>Tech. Courses*</td>
</tr>
<tr>
<td>Year 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPT 442</td>
<td>(3)</td>
<td>OPT 444</td>
<td>(3) OPT 417</td>
</tr>
<tr>
<td>Tech. Courses*</td>
<td></td>
<td>Tech. Courses*</td>
<td></td>
</tr>
</tbody>
</table>

*The following technical courses are required:
CS 208, EE 300, EE 301, EE 311
Additional technical courses (electives) totaling at least 5 hours must be taken from mathematics, computer science, physics or engineering.
Minor
A minimum of 21 semester hours of course work is required for a minor in optical science. A request for the minor should be initiated by the department in which the student is majoring. The courses should include: OPT 342, 343, 411, 412, 417, 441, 442, plus one of the following: OPT 444, 445, or 446.

Optical Science (OPT)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>342</td>
<td>Geometrical Optics I</td>
<td>3 hrs.</td>
<td>Introduction to the concepts and principles of geometrical optics. Rays and wave fronts, Fermat’s principle, Snell’s law, dispersion, systems of plane mirrors and prisms, paraxial rays, paraxial design, thin lenses and thick lenses, introduction to aberrations and ray tracing. Prerequisite: PH 113. F.</td>
</tr>
<tr>
<td>343</td>
<td>Physical Optics I</td>
<td>3 hrs.</td>
<td>Introduction to the concepts and principles of physical optics. Wave propagation, Young’s experiment, interference, scalar diffraction theory, Fraunhofer and Fresnel diffraction, coherence, transfer function theory and introduction to Fourier optics. Prerequisite: OPT 342. W.</td>
</tr>
<tr>
<td>411</td>
<td>Geometrical Optics Laboratory</td>
<td>2 hrs.</td>
<td>Introduction to optical laboratory techniques, focus and alignment with incoherent and coherent sources, the nodal slide, thin lenses, thick lenses, and lens systems, the effects of apertures and stops, reflection, refraction and dispersion, aberrations, elements of radiometry. Prerequisite or parallel: OPT 342. Lab fee: Level 5.</td>
</tr>
<tr>
<td>412</td>
<td>Physical Optics Laboratory</td>
<td>2 hrs.</td>
<td>Introduction to physical optics phenomena, Young’s double slit experiment, Lloyd’s mirror, Fresnel biprism, Newton’s rings, intensity distribution in fringe systems, michelson interferometer, Fabry-Perot interferometer, Fresnel and Fraunhofer diffraction, diffraction by circular, rectangular and multiple openings, diffraction gratings. Prerequisite or parallel: OPT 343. Lab fee: Level 5.</td>
</tr>
<tr>
<td>417</td>
<td>Electro-Optics Laboratory</td>
<td>2 hrs.</td>
<td>Laser optics, fiber optics, electro-optics and accousto-optics effects, Faraday rotation, frequency doubling, photoelectric detectors. Prerequisite or parallel: OPT 444. Lab fee. Level 5.</td>
</tr>
<tr>
<td>441</td>
<td>Intermediate Geometrical Optics</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 calculus, matrix methods, ray tracing, apertures and stops, third order optics and aberrations. Prerequisite: OPT 342.</td>
</tr>
</tbody>
</table>

306
devices, noise, preamplifiers, detector circuits, the electro-optics of lasers. Prerequisite: OPT 343. (Same as PH 546.)

445 Introduction to Lasers 3 hrs.
Introduction to the concepts and principles of lasers. Stimulated emission, light amplification, optical pumping, optical resonator theory, cavity modes, gas lasers, solid state lasers, laser applications, gaussian beams, coherence, holography. Prerequisite: PH 451, PH 432, OPT 442. Same as PH 545.

446 Radiometry 3 hrs.

Physics Department
Professors Anderson, Chan, Duthie (Chair), Emslie, Horwitz, Rosenberger, Smalley, Sung; Research Professors Barr, Torr; Research Professor Emeritus, McKnight; Associate Professors Bartell, Davis, Torbert; Associate Research Professors Comfort, Paciesas, Takahashi; Assistant Professor Chipman; Adjunct Professors Bowden, Caulfield, Stuhlinger, Tandberg-Hanssen, S.T. Wu; Adjunct Associate Professors Fennelly, Guenther; Adjunct Assistant Professor Stone.

Undergraduate Program
The Physics Department offers lectures and laboratory courses necessary for a student to work professionally in physics and/or optics at the B.S. level or to prepare for graduate school.

Physics Major
The basic courses for a B.S. degree with a major in physics include PH 111, 112, 113, 116, 301, 302, 310, 311, 312, 321, 332, 337, 431, 432, 451, 452. Five approved curricula are listed. Other programs may be approved after consultation with student's faculty advisor.

Physics Minor
A minor in physics consists of the basic courses for a B.S. degree in physics as listed above.

Curriculum I
For working professionally at the B.S. level or preparation for graduate school.

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td>36-42</td>
</tr>
<tr>
<td>Physics—PH 111, 112, 113, 116, 301, 302, 310, 311, 312, 321, 322, 337, 431, 432, one senior lab at 400 level, 451, 452</td>
<td>40</td>
</tr>
<tr>
<td>Mathematics—MA 153, 154, 233, 244, 251, 352, 502, 521</td>
<td>24</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126</td>
<td>8</td>
</tr>
<tr>
<td>Electives</td>
<td>14-20</td>
</tr>
</tbody>
</table>
### Curriculum II
For working professionally in optics at the B.S. level.

<table>
<thead>
<tr>
<th>Course Category</th>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td></td>
<td>36-42</td>
</tr>
<tr>
<td>Physics—PH 111, 112, 113, 116, 301, 310, 311, 342, 343, 431, 451, 545</td>
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<td>32</td>
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<tr>
<td>Optical Science—OPT 412, 442, 444</td>
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<td>8</td>
</tr>
<tr>
<td>Mathematics—MA 153, 154, 233, 244, 251, 352, 502, 521, 530</td>
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<td>27</td>
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<tr>
<td>Chemistry—CH 121, 123, 125, 126</td>
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<td>8</td>
</tr>
<tr>
<td>Electives</td>
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<td>11-17</td>
</tr>
</tbody>
</table>

NOTE: For entry into a graduate program in physics, students should include PH 302, 321 in their program of study.

### Curriculum III
Natural science Program of Study with emphasis on physics. This curriculum will satisfy requirements for the premedical program.

<table>
<thead>
<tr>
<th>Course Category</th>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td></td>
<td>36-42</td>
</tr>
<tr>
<td>Physics—PH 106, 107, 111, 112, 113, 116, 301, 310, 311, 312, 431, 451</td>
<td></td>
<td>32</td>
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<tr>
<td>Chemistry—CH 121, 123, 125, 126, 223, 331, 332, 333, 335, 336</td>
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<td>21</td>
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<tr>
<td>Mathematics—MA 153, 154, 233, 244, 251, 352</td>
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<tr>
<td>Biological Sciences—BYS 113-114, 319</td>
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<tr>
<td>Electives</td>
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</tbody>
</table>

NOTE: Students interested in the premedical aspects of this program are advised to consult with a preprofessional adviser.

### Curriculum IV
B.S. degree with a major in physics for students interested in Engineering Physics.

<table>
<thead>
<tr>
<th>Course Category</th>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td></td>
<td>36-42</td>
</tr>
<tr>
<td>Physics—PH 111, 112, 113, 116, 301, 302, 310, 311, 312, 321, 322, 431, 432, 451</td>
<td></td>
<td>36</td>
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<tr>
<td>Mathematics—MA 153, 154, 233, 244, 251, 352</td>
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<td>18</td>
</tr>
<tr>
<td>Chemistry—CH 121, 123, 125, 126</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Engineering Cognate Studies—To be decided with chairman’s and advisor’s concurrence</td>
<td></td>
<td>30</td>
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</tbody>
</table>

NOTE: This curriculum will probably require more than the minimum total of 128 semester hours.

### Curriculum V
B.S. degree with a major in physics. This plan meets requirements for an Alabama Class B High School Teachers Certificate.

<table>
<thead>
<tr>
<th>Course Category</th>
<th>Courses</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER (humanities and social sciences)</td>
<td></td>
<td>36-42</td>
</tr>
<tr>
<td>Physics—PH 111, 112, 113, 116, 301, 302, 310, 311, 312, 321, 322, 431, one senior lab at 400 level, 451, 452</td>
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<td>37</td>
</tr>
<tr>
<td>Mathematics—MA 153, 154, 233, 244, 251, 352, 502, 521</td>
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<td>24</td>
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</tbody>
</table>
NOTES:
1. This curriculum will probably require more than the minimum total of 128 semester hours.
2. Students pursuing this curriculum should consult with the Department of Education early in their program.
3. It is possible for the general education requirements to count toward the second teaching area. Early academic advisement is recommended for students who wish to pursue this option.
4. A general sciences composite major covering the areas of chemistry, biological sciences, environmental science and physical sciences is possible under this curriculum. Interested students should consult the Education Department.

**Typical Four Year Program (128 Credits)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Cr.</th>
<th>Winter Cr.</th>
<th>Spring Cr.</th>
<th>Cr.</th>
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<tr>
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<td>MA 153 3</td>
<td>MA 154 3</td>
<td>MA 233 3</td>
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<td></td>
<td>CH 121 3</td>
<td>CH 123 3</td>
<td>PH 111 4</td>
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<td>CH 25 1</td>
<td>CH 126 1</td>
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<td>GER 3</td>
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<td>Sophomore</td>
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<td>MA 251 3</td>
<td>MA 352 3</td>
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<td>PH 112 4</td>
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<td>Junior</td>
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<td>PH 432 3</td>
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<td></td>
<td>PH 310 1</td>
<td>PH 431 3</td>
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<td>For. Lang 3</td>
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<td>For. Lang 3</td>
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<td>Elective 3</td>
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<tr>
<td>Senior</td>
<td>PH 451 3</td>
<td>MA 521 3</td>
<td>PH 4XX 1</td>
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<td>MA 526/530 3</td>
<td>PH 321 3</td>
<td>PH 322 3</td>
<td>3</td>
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</tbody>
</table>

+ General Education Requirement Courses
*PH 337 is offered during the summer term

Graduate Programs
For graduate courses and programs, refer to the UAH Graduate Catalog.
### Astronomy (AST)

**106 General Astronomy I**  
4 hrs.  
Introduction to astronomy and astrophysics with emphasis on quantitative aspects of physical phenomena occurring in the universe. The solar system, motion of the earth, seasons, sun, the moon and tides. Telescope systems and their uses, positional astronomy and navigation. Laboratory included. AST 106 and 107 satisfy GER laboratory science requirements. Prerequisite: high school algebra and trigonometry. Lab fee: Level 4. F. (Same as PH 106.)

**107 General Astronomy II**  
4 hrs.  
Continuation of AST 106. Stellar structure and evolution. Galactic structure. Dynamics of the universe—cosmology. End product of stellar evolution—white dwarves, neutron stars, black holes. Laboratory included. Prerequisite: AST 106. (Same as PH 107.) Lab fee: Level 4.

### Physics (PH)

Prerequisites for physics courses listed may be waived by instructor or department chairman for auditors or students with equivalent experience.

**101 General Physics**  
4 hrs.  
Introductory course for nonscience student. Phenomenological in nature with emphasis on understanding basic ideas of physics and ability to apply these ideas to specific problems. Newtonian mechanics, conservation laws, electrostatics, and currents. Laboratory included. PH 101 and 102 satisfy laboratory science requirement. Prerequisite: high school algebra. Lab fee: Level 4.

**102 General Physics**  
4 hrs.  

**106 General Astronomy I**  
4 hrs.  
Introduction to astronomy and astrophysics with emphasis on quantitative aspects of physical phenomena occurring in the universe. The solar system, motion of the earth, seasons, the sun, the moon and tides. Telescope systems and their uses, positional astronomy and navigation. Laboratory included. PH 106 and 107 satisfy laboratory science requirements. Prerequisite: high school algebra and trigonometry. (Same as AST 106.) Lab fee: Level 4.

**107 General Astronomy II**  
4 hrs.  

**111 General Physics with Calculus I**  
4 hrs.  
Introductory course 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 and wave motion. Laboratory included. PH 111 and 112 satisfy laboratory science requirements. Prerequisite: MA 153 and MA 154 in parallel. Lab fee: Level 4.
112 **General Physics with Calculus II** 4 hrs.
Continuation of PH 111. Heat and thermodynamics, basic electricity, electric and magnetic fields. Laboratory included. Prerequisite: MA 154. Lab fee: Level 4.

113 **General Physics with Calculus III** 3 hrs.
Continuation of PH 111 and 112. Modern physics part of general physics sequence. Relativity, quantum effects, atomic and nuclear structure, and elementary particles. PH 116 should be taken concurrently for credit as a laboratory science. Prerequisites: PH 112, MA 233.

116 **General Physics III Laboratory** 1 hr.
Laboratory instruction in support of material covered in PH 113. Prerequisite: PH 113 to be taken concurrently. Lab fee: Level 4.

211 **Selected Topics/Physics** 1-4 hrs.

301 **Intermediate Mechanics I** 3 hrs.
Vectors and vector calculus, Newtonian mechanics, linear driven and non-linear oscillations, calculus of variations, Lagrangian and Hamiltonian dynamics, central force motion. Prerequisite: MA 352.

302 **Intermediate Mechanics II** 3 hrs.
Two-particle collisions, special relativity, non-inertial reference frames, rigid bodies, coupled oscillations, vibrating strings, wave equation. Prerequisites: PH 301, MA 392.

310 **Intermediate Laboratory I** 1 hr.

311 **Intermediate Laboratory II** 1 hr.
Electronics instrumentation, electric fields, motion of charged particles. Prerequisite: PH 310. Lab fee: Level 4.

312 **Intermediate Laboratory III** 1 hr.
Electric circuits, acoustics and fluids, optics. Prerequisite: PH 311. Lab fee: Level 4.

321 **Thermal and Statistical Physics I** 3 hrs.
States of model system, entropy and temperature, Boltmann distribution, thermal radiation and Plank distribution, chemical potential and Gibbs distribution, ideal gas, Fermi and Bose gases, heat and work. Prerequisite: PH 113.

322 **Thermal and Statistical Physics II** 3 hrs.
Gibbs free energy and chemical reactions, phase transformations, binary mixtures, cryogenics, semiconductor statistics, kinetic theory, propagation. Prerequisite: PH 321.

337 **Electronics** 4 hrs.
Introductory course for all science students. Basic AC and DC circuits, vacuum-tube circuits, transistor circuits, power supplies, feedback and their use in laboratory instruments. Laboratory included. Prerequisite: PH 112. Lab fee: Level 4.
342 **Geometrical Optics I**

*3 hrs.*
Introduction to the concepts and principles of geometrical optics. Rays and wave fronts, Fermat’s principle, Snell’s law, dispersion, systems of plane mirrors and prisms, paraxial rays, paraxial design, thin lenses and thick lenses, introduction to aberrations and ray tracing. Prerequisite: PH 113. F. (Same as OPT 342.)

343 **Physical Optics I**

*3 hrs.*
Introduction to the concepts and principles of physical optics. Wave propagation, Young’s experiment, interference, scalar diffraction theory, Fraunhofer and Fresnel diffraction, coherence, transfer function theory and introduction to Fourier optics. Prerequisite: OPT 342. W. (Same as OPT 343.)

411 **Geometrical Optics Laboratory**

*2 hr.*
Experiments in optics. Introduction to nodal slide, cardinal points, pupils and stops, illumination, relay lens set-up, matrix method of lens systems and Delano diagram lens system. Prerequisite: PH 342; Parallel: PH 442. Lab fee: Level 5. F.

412 **Physical Optics Laboratory**

*2 hr.*
Experiments in Fraunhofer and Fresnel diffraction, interferometry, holography, polarization, spectroscopy coherence and Fourier optics. Lab fee: Level 5. Prerequisite: PH 343 or parallel.

413 **Nuclear Physics Laboratory**

*1 hr.*
Statistics in counting processes, beta-ray continuum, scintillation spectroscopy. Lab fee: Level 4. F.

414 **Solid State Physics Laboratory**

*1 hr.*
Fundamental solid state experiments including electron paramagnetic resonance, nuclear magnetic resonance, Hall effect, cyclotron resonance, Mossbauer spectroscopy. Lab fee: Level 4. W.

415 **X-Ray Laboratory**

*1 hr.*

416 **Senior Laboratory**

*1 hr.*
Selected experiments from PH 412 - 415. Lab fee: Level 4. Offered upon demand.

420 **Senior Thesis**

*3 hrs.*
Semioriginal work performed under direction of faculty member. Lab fee: Level 5. Offered upon demand.

431 **Intermediate Electricity and Magnetism I**

*3 hrs.*
Basic concepts of electrostatics, electric potential theory, electric fields and currents, field of moving charge including relativistic treatment, magnetic fields, Maxwell’s equation. Prerequisite: MA 251. Prerequisite or parallel: MA 352. W.

432 **Intermediate Electricity and Magnetism II**

*3 hrs.*
Continuation of PH 431. Development of Maxwell’s equations for time-varying fields, basic concepts of AC circuit theory, electric fields in matter, magnetic fields in matter, modern applications. Prerequisite: PH 431. Sp.

451 **Quantum Physics I**

*3 hrs.*
This is course one of a two part sequence. Waves and particles; Bohr’s theory of atomic spectra; Energy levels; The old quantum theory; de Broglie waves;
Uncertainty principle; Basis postulates of quantum mechanics; Schrodinger's wave equation; Simple problems in one and three dimensions; Hydrogen-like systems; Atomic structure and spectra; Simple perturbation problems; Quantum statistics; The electronic structure of solids; Nuclear physics. Prerequisites: PH 301, MA 244.

452 Quantum Physics II 3 hrs.
Continuation of PH 451.

506 Introduction to Astrophysics of Stellar Systems 3 hrs.
Analysis of structure of main sequence stars; radiation theory, color-magnitude diagrams and their interpretation. Dynamics of simple and many-body systems—the restricted 3-body problem, Hamilton-Jacobi methods, Liouville's and Jean's theorems and their application to galactic structure. General relativity and application to cosmology. Prerequisites: PH 302, 321, 432, MA 352.

531 Introduction to Plasma Dynamics 3 hrs.
Plasma kinetic theory including charged-particle and neutral collision, ionization, electronic excitation and recombination, motion of charged particles, macroscopic equations. Transport coefficients, gas discharges, instabilities, sheaths, electromagnetic waves and radiation. Prerequisites: PH 322, 432. F.

541 Optics I 3 hrs.
Geometrical optics review. Physical optics: interference, diffraction, partial coherence, polarization, interaction of radiation with matter. Prerequisite: PH 432 or equivalent. (Same as EE 541.) F.

542 Optics II 3 hrs.
Integral formulation of radiation from apertures and scattering objects; Fourier and Laplace transform theory; impulse response, imaging and transforming; coherence, optical filtering, holography; interference. Prerequisites: PH 541. (Same as EE 542.) W.

544 Radiometry 3 hrs.
The theory and practice of radiometry. Nomenclature, Planck's law, blackbodies and blackbody simulators, the propagation of radiant energy, detectors, normalization, source detector spectral mismatch, attenuation, very low signals and the avoidance of common errors. Prerequisite: PH 342. (Same as OPT 446.)

545 Introduction to Lasers 3 hrs.
Basic physical concepts of spontaneous and simulated radiation. Pumping processes, optical resonators, types of lasers and laser beam properties. Prerequisites: PH 343, 442, 451. (Same as OPT 445.)

546 Electro Optics 3 hrs.
Planck's law, blackbodies and blackbody simulators, propagation of radiant energy, detectors, noise, basic circuits for photoelectric detectors. Prerequisite: PH 342. (Same as OPT 444.)

551 Introductory Quantum Mechanics I 3 hrs.
This is course one of a two course sequence. Wave-particle duality and uncertainty principle; The Schrödinger's wave equation; Simple systems in one, two and three dimensions; Matrix formulation of quantum mechanics; Angular momentum and spin; Addition of angular momentum; Time independent perturbation theory;
Variational method and WKB approximation; Time dependent perturbation theory; Scattering theory; The interaction of electromagnetic radiation with atomic system; Quantum statistics; The band theory of electrons in crystals. Prerequisites: PH 302, 432, 452. (Same as CH 553.) F.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>552</td>
<td>Introductory Quantum Mechanics II</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>560</td>
<td>Introduction to Solid State Physics I</td>
<td>3 hrs.</td>
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<tr>
<td>561</td>
<td>Introduction to Solid State Physics II</td>
<td>3 hrs.</td>
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<tr>
<td>601</td>
<td>Classical Dynamics I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>607</td>
<td>Mathematical Methods I</td>
<td>3 hrs.</td>
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<tr>
<td>609</td>
<td>Mathematical Methods II</td>
<td>3 hrs.</td>
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<tr>
<td>621</td>
<td>Statistical Mechanics and Kinetic Theory I</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>622</td>
<td>Statistical Mechanics and Kinetic Theory II</td>
<td>3 hrs.</td>
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<tr>
<td>631</td>
<td>Electromagnetic Theory I</td>
<td>3 hrs.</td>
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<tr>
<td>636</td>
<td>Introduction to Space Plasma Physics</td>
<td>3 hrs.</td>
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<tr>
<td>639</td>
<td>Experimental Plasma Physics and Instrumentation</td>
<td>3 hrs.</td>
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<tr>
<td>645</td>
<td>Infrared Science</td>
<td>3 hrs.</td>
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<tr>
<td>647</td>
<td>Polarized Light</td>
<td>3 hrs.</td>
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<tr>
<td>672</td>
<td>Optical Surface Characterization</td>
<td>3 hrs.</td>
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<td>673</td>
<td>Fourier Optics</td>
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<tr>
<td>680-689</td>
<td>Selected Topics</td>
<td>3 hrs.</td>
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<tr>
<td>699</td>
<td>Master’s Thesis</td>
<td>3 hrs.</td>
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<tr>
<td>702</td>
<td>Classical Dynamics II</td>
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<td>705</td>
<td>Relativity</td>
<td>3 hrs.</td>
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<tr>
<td>706</td>
<td>Solar Flare Physics</td>
<td>3 hrs.</td>
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<tr>
<td>711</td>
<td>Problems in Physics I</td>
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<tr>
<td>712</td>
<td>Problems in Physics II</td>
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<td>731</td>
<td>Advanced Plasma Theory</td>
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<td>732</td>
<td>Electromagnetic Theory II</td>
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<tr>
<td>745</td>
<td>Quantum Electronics</td>
<td>3 hrs.</td>
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<tr>
<td>746</td>
<td>Non-Linear Optics</td>
<td>3 hrs.</td>
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<tr>
<td>751</td>
<td>Quantum Mechanics I</td>
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<tr>
<td>752</td>
<td>Quantum Mechanics II</td>
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<td>753</td>
<td>Quantum Mechanics III</td>
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<tr>
<td>760</td>
<td>Quantum Theory of Solids I</td>
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<tr>
<td>761</td>
<td>Quantum Theory of Solids II</td>
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<td>773</td>
<td>Fourier Optics II</td>
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<tr>
<td>780-789</td>
<td>Selected Topics</td>
<td>3 hrs.</td>
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<tr>
<td>792</td>
<td>Physics Seminar</td>
<td>No credit</td>
</tr>
<tr>
<td>795</td>
<td>Advanced Physics Project Laboratory</td>
<td>3 hrs.</td>
</tr>
<tr>
<td>799</td>
<td>Doctoral Dissertation</td>
<td>3, 6, 9 hrs.</td>
</tr>
</tbody>
</table>
Library Research for Undergraduates

Director, Delmus E. Williams, B.A., M.S.L.S., Ph.D.

Professor: Perreault

Associate Professors: LaRose, Pollard, Warren

Assistant Professors: Herring, Kendrick, McNamara

Instructor: McCann

Courses in bibliography are offered as electives only, with the exception of Bibliography of Business and Economics (BIB 230) which is a required course for students in the School of Administrative Science. Elective courses neither form nor contribute to a cluster; nor do they contribute to the certification requirements for teacher librarians. No credit is given toward GER.

Bibliography (BIB)

100 Introduction to Library Research 1 hr.
Organization of university libraries and their collections, use of major reference sources, and techniques of successful research.

230 Bibliography of Business and Economics 1 hr.
Library research methods in business and economics; its production, organization and utilization of information; its reference and research materials.

310 Bibliography of British and American Philology 1 hr.
Library research methods in British and American philology; production, organization, and utilization of information; reference and research materials. Alternate years.

316 Bibliography of German Philology 1 hr.
Library research methods in German philology; production, organization, and utilization of information; reference and research materials. Alternate years.

318 Bibliography of Romantic Philology 1 hr.
Library research methods in romantic philology, production, organization, and utilization of information; reference and research materials. Alternate years. 320
320 Bibliography of American History 1 hr.
Library research methods in the subject; production, organization, and utilization of information; reference and research materials.

345 Bibliography of the Health Sciences 1 hr.
Library research methods in health sciences; production, organization, and utilization of information; reference and research materials.

360 Bibliography of Behavioral Science 1 hr.
Origin and terminology of behavioral science; production and utilization of information; reference and research materials.

380 Bibliography of Music 1 hr.
Library research methods in music; production, organization, and utilization of information; reference and research materials. Alternate years.

385 Bibliography of Art 1 hr.
Library research methods in art; production, organization, and utilization of information; reference and research materials. Alternate years.

400 Theory of Bibliographical Order 2 hrs.
General structures of systems of bibliographical order: hierarchical trees, alphabetical files, juxtaposition and syndesis, facet analysis, thesauri. Prerequisite: BIB 100 or admission to an MLS program.
Division of Continuing Education

Director: C. Michael Oliver, B.S., M.S., Ed.D.
Director of Conferences & Marketing: Karen Mack, B.S.B.A., M.A.S.
Director of Personal Development: Joe Manjone, M.A., M.Ed. Ed.D.
Director of Professional Development: Chuck Rumford, B.A., M.A.S.

General Information
The Division of Continuing Education is the academic unit of UAH that responds to the unique educational needs of the nontraditional student. Working closely with the University faculty and research staffs, the Division offers a broad range of professional and personal development programs that supplement the standard offerings of the University.

To accomplish this objective, credit and noncredit programs are administered through four units—Professional Development, Personal Development, Conferences & Marketing, and Special Studies. The following sections describe the services of these units.

Professional Development
The objective of the Professional Development unit is to provide continuing professional development activities to business, industry, and government organizations on a local, regional, and national level. This mission encompasses activities in management, computer applications, and the science & engineering fields. The unit supports the professional development of its clientele by staying abreast of current and future trends in science, engineering, business & management, and computer technology. These trends and information breakthroughs are then translated into high quality seminars and training activities. The unit works closely with the faculty and staff of the University’s Colleges and research centers in the development, marketing, and presentation of nontraditional credit and noncredit professional development activities. Professional Development provides noncredit course offerings ranging from entry level skill development to the study of the most recent breakthroughs in science, technology, and management. The unit has developed several certificate programs that provide students with an in-depth series of courses to meet professional development needs, including a 60-hour Supervisory Development Certificate Program, a 100-hour Microcomputer Applications Certificate Program, and a 48-hour Certified Contract Manager Certificate Program. In addition, the unit has worked with various professional societies in developing certification review courses including Engineer-in-Training, Professional Engineer, Contract Management, and Professional in Human Resources.
Personal Development

The objective of Personal Development is to respond to the needs of individuals for course offerings in the areas of sports & fitness and self-enrichment, by providing credit and noncredit activities that are designed to improve and enhance the quality of life. The unit develops and administers course offerings in such non-technical areas as health and physical education, leisure travel, the arts, humanities, and social studies. This unit also administers the Listener’s License program.

Special Studies

Special Studies, in cooperation with the academic units of the University, offers credit courses to nontraditional students who cannot take advantage of the regularly scheduled courses at UAH.

Graduate and undergraduate courses are offered both on and off campus. Weekend classes and early bird programs are two means used to serve special scheduling needs. Through evening classes, one can earn credit toward a degree including the completion of the Master’s degree in Administrative Science. The early bird courses are offered in the morning prior to the traditional workday.

Other courses and seminars are offered for credit to meet special requirements for professional recertification in the health and teaching fields.

Conferences

The Division of Continuing Education is the vehicle through which the University can provide a wide variety of conference services to assist university departments, businesses, industries, and governmental groups in developing conferences, institutes, workshops, or special training programs.

Depending on what is required, the Division is ready to provide services ranging from hotel accommodations and meeting space to administration of a program. The goal in coordinating each special program is to deliver a comfortable, professional setting for the conference under University auspices, striving to provide an atmosphere in which the participants are free to focus their attention on obtaining the maximum benefit from their experience.

Classrooms and Meeting Space

As the primary location for Professional Development course offerings, the Tom Bevill Center features state-of-the-art classrooms, computer labs, and meeting space to provide an environment conducive to effective professional learning. Overnight accommodations, a restaurant, and a centralized location combine to make the Center a uniquely flexible conference and meeting facility. Offices for the Director and the units of Professional Development, Conferences & Marketing, and Special Studies are located on the second floor of the Bevill Center.

Spragins Hall provides the necessary athletic facilities for Personal Development course offerings in health and physical education, while additional courses in sports & fitness and self-enrichment may be offered at any one of a number convenient locations throughout the community. Offices for the unit of Personal Development are also located in Spragins Hall.

Offerings Available

Some courses are offered on a periodic basis, but many offerings are designed to meet current needs or interests. Consequently, offerings vary considerably with time. Brochures and a quarterly catalog of complete course descriptions are available through the office of the Division of Continuing Education. For more information concerning course offerings or the development of special courses, please call (205) 895-6010, or toll free 1-800-448-4031.
Admission and Credit

Admission to UAH as a regular University student is not necessary in order to register for credit or noncredit courses offered through DCE. However, students who wish to have credit for appropriate Continuing Education classes applied to a degree must be admitted to UAH as a regular degree-seeking student. Where appropriate, registrants in noncredit programs are awarded continuing education units (CEUs.)

The CEU is a nationally recognized standard of measurement for participation in noncredit continuing education programs. The CEU system offers a way of helping people gain recognition for their efforts to update and broaden their knowledge and skills. It also provides a standardized unit and record system helpful in professions where continuing education is mandated. DCE maintains a permanent transcript for all students awarded CEUs.

Fees

Full-term credit courses offered by DCE follow the fee schedule of UAH, and students may include these courses under the maximum fee structure that does not apply to short-term and/or off-campus specially designed credit and noncredit offerings.

Other Services

Listener’s License Program

In cooperation with the academic units of the University, the Division of Continuing Education offers the Listener’s License Program. The objective of this program is to make the resources of the University available to all members of the surrounding community.

People who may benefit from this program include the following:

1) those at or approaching retirement age who desire further education in preparation for changes in their life-styles.
2) those who need to acquire or maintain skills necessary to adjust to the rapid change in the business and professional fields.
3) young people who will soon be choosing a career.
4) people of all ages who seek educational enrichment to enhance the quality of life.

Participants in the Listener’s License Program may attend selected University classes for a fee of $59 per course. They are passive participants and are not required to take tests or meet attendance requirements.

Registration is through the Division of Continuing Education. A record of program participants is maintained by DCE. (No academic or CEU credit is awarded.)

Courses attended under the Listener’s License Program cannot be challenged for credit unless full tuition for the class is paid. Participants must be at least sixteen years of age or high school senior. Students under disciplinary or academic suspension from any college or university are ineligible to register as a listener.
The University of Alabama in Huntsville

The Board of Trustees of the University of Alabama
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C. David Billings, B.S., Ph.D. .................................................. Dean, College of Administrative Science
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Roy L. Meek, B.A., M.A., Ph.D. ................................................... Dean, College of Liberal Arts
Reet L. Henze, B.S.N., M.S.N. .................................................... Interim Dean, College of Nursing
Harold J. Wilson, B.S., M.S., Ph.D. ............................................. Dean, College of Science
Samuel P. McManus, B.S., M.S., Ph.D. ........................................ Dean, School of Graduate Studies
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C. Michael Oliver, B.S., M.S., Ed.D. ........................................... Director, Continuing Education
George E. Turnmeyer, B.S., M.B.A., Major General USA (Ret.) ..................Director, Cooperative Education
Delmus E. Williams, B.A., M.S.L.S., Ph.D. .................................. Director, Library
Faculty

(Date refers to original appointment to the university; asterisk designates Graduate Faculty.)

ABBOTT, LYNNE C., B.A. (Sangamon State University), M.S.S.W. (University of Tennessee), D.S.W. (University of Alabama, Tuscaloosa). Assistant Professor of Psychiatry, 1976.

ABUSHAGUR, MUSTAFA, B.Sc. (Tripoli University), M.Sc., Ph.D. (California Institute of Technology). Assistant Professor of Electrical Engineering, 1984.*

ADAMS, CURTIS H., B.S. (Mississippi State University), M.S.Ed. (Henderson State Teachers College), Ph.D. (Mississippi State University). Professor Emeritus, 1965.


ADHAMI, REZA, B.S.E., M.S.E., Ph.D. (University of Alabama in Huntsville). Assistant Professor of Electrical Engineering, 1984.


AMIN, ASHOK T., B.S. (University of Baroda, India), M.S., (University of Tennessee), Ph.D. (Northwestern University). Associate Professor of Computer Science, 1984.*

ANDERSON, ELMER E., A.B. (Occidental College), M.S. (University of Illinois), Ph.D. (University of Maryland). University Professor of Physics, 1979.*

ANDERSON, GLORIA J., R.N. (Mobile General Hospital School of Nursing), B.S.N. (Indiana University), M.S.N. (University of Alabama, Birmingham). Director of Undergraduate Program and Associate Professor of Nursing, 1972.


ARENDALE, WILLIAM F., B.S. (Middle Tennessee State University), M.S., Ph.D. (University of Tennessee). Professor of Chemistry, 1964.

AUDEH, NADEEM F., B.S. (South Dakota State College), M.S., Ph.D. (Iowa State University). Professor of Electrical Engineering, 1964.*

BAIRD, JAMES K., B.S. (Yale University), M.A., Ph.D. (Harvard University). Chairman and Professor of Chemistry, 1982.*

BARR, THOMAS A., B.S. (University of Chattanooga), M.S., Ph.D. (Vanderbilt University). Research Professor of Physics, 1982.*
BARTELL, FREDERICK O., A.B. (University of California), M.S., Ph.D. (University of Arizona). Associate Professor of Physics, 1983.*

BATCHELDER, WALTER I., B.S. (New Hampshire College); Ph.D. (Virginia Polytechnic Institute). Assistant Professor of Accounting, 1988.

BECK, RICHARD K., NREMT-P (Victory Memorial Hospital Waukegan, Illinois). Clinical Instructor of Emergency Medical Technology and Paramedic Training/Program Director, 1982

BELL, NORMA, B.S. (University of Kansas), M.A. (George Peabody College). Adjunct Assistant Professor of Developmental Learning, 1980.

BENEDICT, SUSAN B., B.S.N. (Villa Maria College, Erie, PA), M.S.N. (University of Alabama, Huntsville), D.S.N. (University of Alabama, Birmingham). Assistant Professor of Nursing, 1984.*

BIGGS, ALBERT W., B.S. (Washington University), M.S. (Stanford University), Ph.D. (University of Washington), P.E. Professor of Electrical Engineering, 1984.*

BILLINGS, C. DAVID, B.S. (Southwest Missouri State University), Ph.D. (University of Missouri at Columbia). Dean of the College of Administrative Science and Professor of Finance, 1981.*

BOND, MARGARET S., L.L.B. (University of Poitiers, France), Ph.D., S.J.D. (University of Paris, France). Professor of Economics, 1964.*

BOSWORTH, EDWARD, B.A. (University of the South), Master of Divinity (Episcopal Divinity School), M.S. (University of Alabama, Huntsville), Ph.D. (Vanderbilt University). Assistant Professor of Computer Science, 1984.*

BOUCHER, PHILIP P., B.A. (University of Hartford), M.A., Ph.D. (University of Connecticut). Associate Professor of History, 1974.*

BOWER, MARK V., B.S.E., M.S.E., Ph.D. (University of Michigan), P.E. Assistant Professor of Mechanical Engineering, 1984.*

BOYER, D. ROYCE, B.M. (Butler University), M.A. (Catholic University of America), D.M.A. (University of Texas at Austin). Professor of Music, 1966.

BRAINERD, JEROME J., B.S., M.S., (University of Notre Dame), Ph.D. (Cornell University), P.E. Associate Professor of Mechanical Engineering, 1965.


BROWN, JESSE C., B.A., M.A. (Jacksonville State University), Ph.D. (Southern Illinois University). Assistant Professor of Political Science, 1981.*

BROWN, ROBERT A., B.S. (U.S. Naval Academy), M.S., Ph.D. (Ohio State University), P.E. Chairman and Professor of Industrial and Systems Engineering, 1967.
BRYAN, THORNTON, B.S. (University of Kentucky), M.D. (University of Louisville), Professor of Family Medicine, 1987.

BRYSON, ROSCOE E., JR., B.B.A. (Memphis State University), M.B.A., Ph.D. (Georgia State University), C.P.A. Assistant Dean of the College of Administrative Science and Associate Professor of Accounting, 1976.*

BURGE, JANET MARIE, R.N. (Hendrick Memorial Hospital School of Nursing), B.S. (Hardin-Simmons University), M.N. (Emory University), Ph.D. (University of Florida). Director of Graduate Program and Professor of Nursing, 1980.*

BURGER, KENNETH J., B.S. (North Dakota State University), M.B.A. (Kent State University), D.B.A. (University of Kentucky). Assistant Professor of Marketing, 1986.*

BUSBIN, JAMES W., B.S.B.A., M.S. (University of Alabama, Tuscaloosa), Ph.D. (University of Tennessee, Knoxville). Assistant Professor of Marketing, 1983.

BUTTS, TED M., B.S. (Mississippi State University), M.A., Ph.D. (University of Alabama, Tuscaloosa). Chairman of Education and Assistant Professor of Education, 1968.*


Campbell, p. samuel, B.S. (Marietta College), M.S. (Ohio University), Ph.D. (Purdue University). Associate Professor of Biological Sciences, 1973.*


Chan, chia hwa, B.S., Ph.D. (London University). Professor of Physics, 1970.*

Chang, mou-hsiung, B.S. (Chung-Hsing University), M.S., Ph.D. (University of Rhode Island). Professor of Mathematical Sciences, 1974.*

Chappell, robert w., Jr., B.A. (University of Alabama at Birmingham), M.D. (University of Alabama School of Medicine). Assistant Professor of Family Medicine, 1987.

Chen, chien p., B.S. (National Taiwan University), M.S., Ph.D. (Michigan State). Assistant Professor of Chemical Engineering, 1986.*

Cheng, hai-yuin, B.S. (College of Chinese Culture), M.S., Ph.D., (Boston College). Assistant Research Professor of Physics, 1986.

Chipman, russell a., B.S. (Massachusetts Institute of Technology), B.S. (California Institute of Technology), M.S., Ph.D. (University of Arizona). Assistant Professor of Physics, 1988.*

Cholewinski, jane e., B.S.N., M.S.N. (University of Alabama, Birmingham). Ph.D. (University of Alabama, Tuscaloosa). Assistant Professor of Nursing, 1979.*


Chung, t.j., Engineering Diploma (Seoul National University), M.S., Ph.D. (Oklahoma State University). Professor of Mechanical Engineering, 1970.*
CLING, ANDREW D., B.A. (University of Missouri), M.A., Ph.D. (Vanderbilt University). Assistant Professor of Philosophy, 1988.

COBLE, HAROLD DWAIN, B.S., (Kearney State College), M.S., Ph.D. (University of Nebraska). Associate Professor of Chemistry, 1966.*

COFFIELD, KENNETH E., A.B. (University of Kansas), M.A. (DePaul University), M.A., Ph.D. (University of Missouri). Associate Professor of Psychology, 1966.*

COLCLOUGH, GLENNA, B.A., M.A. (Kent State University), Ph.D. (University of Georgia). Assistant Professor of Sociology, 1984.*

COMFORT, RICHARD H., A.B. (Harvard University), M.S., Ph.D. (University of Alabama, Huntsville). Associate Research Professor of Physics, 1977.

CONTRERAS, FRANK, B.M. (Millikin University), M.M. (East Carolina University), D.M.A. (West Virginia University). Assistant Professor of Music, 1977.

COOK, F. LEE, B.S., M.S., Ph.D. (Georgia Institute of Technology). Associate Dean, College of Science and Associate Professor of Mathematical Sciences, 1967.*


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.*

CRABB, PAUL R., M.M. (Wichita State University), Ph.D. (Florida State University). Associate Professor of Music, 1983.


CRULL, MICHELLE, B.S. (University of Mississippi), M.S. (University of Mississippi), Ph.D. (Vanderbilt University). Assistant Professor of Civil Engineering, 1988.

CRUMP, WILLIAM J., B.S. (University of Georgia), M.D. (Vanderbilt University School of Medicine). Associate Professor of Family Medicine, 1983.


DAVIS, CARL G., B.A. (Georgia Institute of Technology), M.S., Ph.D. (University of Alabama, Tuscaloosa). Chairman and Professor of Computer Science, 1986.*

DAVIS, JACK H., B.S., M.S., Ph.D. (Clemson University). Associate Professor of Physics, 1966.*


DILLARD, NANCY F., B.A., M.A., (University of South Carolina), Ph.D. (University of Tennessee). Assistant Professor of English, 1972.*

326
DIMOPOLLOS, GEORGE T., B.S., M.S. (Pennsylvania State University), Ph.D. (Michigan State University). Professor of Biological Sciences, 1980.*

DIPLACIDO, JOHN A., B.S. (Spring Hill College, Mobile), M.D. (University of Alabama School of Medicine). Chief of Obstetrics and Gynecologic Programs and Associate Professor of Obstetrics and Gynecology, 1978.

DOSS, DEVA C., B.S. (University of Madras, India), B.Sc., M.Sc., Ph.D. (University of Poona, India). Professor of Mathematical Sciences, 1969.*


DUNAR, ANDREW J., B.A. (Northwestern University), M.A. (University of California, Los Angeles), Ph.D. (University of Southern California). Associate Professor of History, 1984.*

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State University). Assistant Professor of Computer Science, 1987.*

Part-Time Lecturers

ACCARDI, JAMES R., B.S. (University of North Alabama), J.D. (University of Alabama
School of Law). Adjunct Assistant Professor of Criminal Justice, 1979.

ALDRIDGE, DAVID, B.S. (Florida Atlantic University). Lecturer in Mechanical

AMOS, RICHARD W., B.I.E. (Auburn University). Lecturer in Industrial and Systems
Engineering, 1986.

ANDREZIEWSKI, EUGENE, B.S. (University of Alabama, Tuscaloosa), M.B.A. (Athens


AUSTIN, ERNEST RICHARD, B.A. (Frostburg State College), Ph.D. (Pennsylvania State
University). Lecturer in Chemistry, 1986.*

BABCOCK, EDWARD STANLEY, JR., B.S. (U.S. Military Academy, West Point),
M.A.S. (University of Alabama, Huntsville), Ph.D. (Baylor University), Assistant Professor
of History and Philosophy, 1984.


BELL, NORMA, B.S. (University of Kansas), M.A. (George Peabody College). Adjunct Instructor in Developmental Learning, 1980.

BERG, ERNESTINE H., B.S. (Western State University, Bowling Green), M.D. (University of Louisville School of Medicine). Clinical Professor of Surgery — Anesthesiology, 1977.

BISHOP, JAMES, B.A. (University of Alabama, Huntsville). Adjunct Instructor in Art, 1984.

BILL, T.C., A.A. (College of San Mateo), A.B. (Occidental College), M.S. (Troy State University), Adjunct Instructor in Criminal Justice, 1982.

BOWDEN, CHARLES M., B.S. (University of Richmond), M.S. (University of Virginia), Ph.D. (Clemson University). Adjunct Professor of Physics, 1976.


BOYER, LYNN B., B.S. (University of Mississippi), M.D. (University of Mississippi School of Medicine). Clinical Assistant Professor of Internal Medicine - Neurology, 1979.


BUSH, KATHLEEN C., B.S. (Oral Roberts University), M.S.(University of Alabama, Huntsville). Lecturer in Biological Sciences, 1982.


CARTER, DANIEL C., B.S. (University of Oklahoma), M.S. (University of Hawaii), Ph.D. (University of Pittsburgh). Adjunct Assistant Professor of Chemistry, 1986.


CASTELLANO, B. MICHAEL, B.S. (University of South Florida), Ph.D. (Tulane University). Lecturer in Mathematics, 1981.*

CATES, JOHN O., B.A. (University of Alabama, Tuscaloosa), J.D. (Cumberland School of Law, Samford University). Assistant Professor of Business Legal Studies, 1984.

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CHARERNKA VANICH, DUSIT, B.S. (Prasommitr College, Thailand), M.S. (National Institute of Development Administration, Thailand), Ph.D. (University of Georgia). Lecturer in Computer Science, 1981.

CHASTEEN, MELBA M., B.A. (Samford University), M.A. (University of Alabama, Tuscaloosa). Lecturer in English, 1983.


CHRISTIAN, HUGH J., B.S. (University of Alaska), M.S., Ph.D. (Rice University). Adjunct Associate Professor of Atmospheric and Environmental Science, 1986.


DAHAGAM, CHANDRASHEKAR, B.S.E.E. (Osmania University, India), M.S.E. (University of Alabama, Huntsville). Lecturer in Electrical Engineering, 1986.

DANIEL, CHARLES C., B.S.I.E. (University of Alabama, Tuscaloosa), M.S. (University of Alabama, Huntsville), Ph.D. (Oklahoma State University). Associate Professor of Management Science, 1975.

DASARATHY, BELUR V., B.E. (University of Mysore, Bangalore, India), M.E., Ph.D. (Indian Institute of Science, Bangalore, India). Adjunct Professor of Computer Science, 1985.


DORSETT, MICHAEL J., B.S. (University of Georgia), M.S.E., Ph.D. (University of Alabama, Huntsville). Adjunct Associate Professor of Industrial and Systems Engineering, 1980.

DOUTHIT, FLOYD, B.S. (Jacksonville State University), M.A. (University of Texas), Lecturer in H.P.E.R., 1980.

DURHAM, JAMES, B.S. (University of Missouri-Rolla), M.S. (University of Tennessee). Lecturer in Mechanical Engineering, 1989.


ELAHI, ALI, B.S.E.E. (Mississippi State University), M.S.E., Ph.D. (University of Alabama, Huntsville). Lecturer in Electrical Engineering, 1986.


ESSENWANGER, OSKAR, B.S. (Technical University, Danzig), Diploma in Meteorology, (University of Vienna), Sc.D. (University of Wuerzburg). Adjunct Professor of Environmental Science and Lecturer in Civil Engineering, 1971.


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FAN, XIAHONG, B.S. (Harbin Engineering Institute, China), M.S.E., Ph.D. (University of Alabama, Huntsville). Lecturer in Electrical Engineering, 1986.

FENNELLY, ALPHONSEUS J., B.A. (Manhattan College), M.A., Ph.D. (Yeshiva University). Adjunct Associate Professor of Physics, 1980.

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HUGHES, CUTTER, A.B. (Davidson College), J.D. (University of Virginia), LL.M. (University of London). Adjunct Assistant Professor of Communication Arts, 1978.


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KEEBLER, DOROTHY LYNN, B.S. (Fairleigh Dickinson University), M.S. (Upstate Medical Center, New York). Lecturer in Pathology, 1976.


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LAUGHLIN, EDWARD H., B.A. (University of Virginia), M.D. (Duke University School of Medicine). Clinical Professor of Surgery, 1974.

LAVAN, OLGA, B.A. (University of Texas), M.A. (University of Iowa). Lecturer in English, 1978.

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LEHNIGK, SIEGFRIED H., Staatsexamen, Dr. rer.nat. (Technical University of Braunschweig, Germany). Adjunct Professor of Mathematics and Statistics, 1960.*

LEHOCZKY, SANDOR L., B.A. (King College), Ph.D. (University of North Carolina). Lecturer in Chemistry, 1986.*


LILLEY, JAY, B.S., M.S. (Purdue University), Ph.D. (University of Alabama, Huntsville). Lecturer in Mechanical Engineering, 1986.

LINDSAY, TREVOR R., M.B., B.S. (University of the West Indies). Clinical Associate Professor of Psychiatry, 1978.

LITKENHOUS, EDWARD E., JR., B.E., M.D. (Vanderbilt University). Chief of Pathology Programs and Clinical Professor of Pathology, 1974.

LOLLAR, LOUIS F., B.S. (Auburn University), M.S.E. (University of Alabama, Huntsville). Lecturer in Electrical Engineering, 1983.


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PALMER, JAMES, B.A. (University of the South), M.A. (University of Alabama, Huntsville). Instructor in English, 1982.
PAPADOPOLOS, JAMES, G., B.S. (Massachusetts Institute of Technology). M.S. (Southern Methodist University). Lecturer in Mechanical Engineering, 1981.

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POWELL, MICHAEL, B.S. (Auburn University). M.D. (University of Alabama School of Medicine). Clinical Assistant Professor of Pediatrics, 1984.

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REGNER, JOHN L., B.S., M.S., Ph.D. (Ohio State University). Associate Professor of Physics, 1984.


RICE, HORACE W., B.A. (Alabama A&M University), J.D. (University of Toledo College of Law). Adjunct Assistant Professor of Political Science, 1976.

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RITTER, ALFRED, B.S., M.S. (Aerospace Engineering, Georgia Institute of Technology). Adjunct Professor of Aerospace Engineering in Mechanical Engineering Department, 1988.

ROBESON, VERNON, B.S.M.E. (University of Nebraska), 1978.

ROBINSON, JENNESSEE B., B.S. (University of Utah), M.S., Ph.D. (Purdue University). Lecturer Marketing, 1983.


SCHEERER, MARSHALL T., B.I.E. (Georgia Institute of Technology), M.D., M.P.H. (Tulane University Medical School). Clinical Associate Professor of Internal Medicine, 1979.

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SCHUMANN, J. PAUL, B.A., M.A. (University of Mississippi), Ph.D. (University of Oklahoma). Lecturer in Political Science, 1981.

SCHUTZENHOFER, LUKE, B.S.A.E., (St. Louis University), M.S.E. (University of Alabama, Huntsville). Lecturer in Mechanical Engineering, 1972.


SELAH, CHARLES E., B.S. (University of Oklahoma), M.D. (Tulane University School of Medicine). Chief of Surgery Programs and Clinical Professor of Surgery, 1975.


SMITH, FREDERICK W., B.A. (Vanderbilt University), M.D. (Vanderbilt University School of Medicine). Clinical Professor of Surgery, 1984.


SNYDER, ROBERT S., B.S. (Kenyon College), M.S. (University of North Carolina), Ph.D. (University of Virginia). Lecturer in Chemistry, 1985.*


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STEWART, ROBERT E., B.S., M.D. (University of Tennessee). Clinical Professor of Pediatrics, 1975.

STONE, NOBIE H., B.S., M.S. (Florida State University), Ph.D. (University of Alabama, Huntsville), Adjunct Assistant Professor of Physics, 1980.*


STUHLINGER, ERNST, Ph.D. (Tubingen, Germany). Adjunct Professor of Physics and Environmental Science, 1976.

SWANN, ALLIE C., B.S. (Mississippi State University), M.A.S. (University of Alabama, Huntsville). Adjunct Assistant Professor of Accounting, 1979.


TEMPLE, CRISTAL., B.A. (University of Alabama, Huntsville). Instructor in German, 1980.

TEOH, NIHAL S., B.S. (University of Istanbul), M.S. (University of Manitoba), M.S. (Clarkson College of Technology). Lecturer in Mathematics, 1983.


THOMPSON, KENNETH W., B.A. (Capital University), M.A. (University of South Florida). Adjunct Assistant Professor of Management Information Systems, 1984.

THROCKMORTON, DAVID W., B.S. (Ohio State University), M.S. (University of Alabama, Birmingham), M.D. (University of Alabama School of Medicine). Chief of Emergency Medicine Programs and Clinical Associate Professor of Emergency Medicine, 1984.
TIETKE, WILHELM, (Abendgymnasium, Hanover), M.D. (University of Tuebingen). Clinical Associate Professor of Internal Medicine, 1979.


VAUGHAN, WILLIAM W., B.S. and Graduate Study Certificate (USAFIT) (University of Florida), Ph.D. (University of Tennessee). Adjunct Professor of Atmospheric and Environmental Science, 1986.


WALKER, BILLY JAY, B.S.M.E., M.S., Ph.D. (University of Oklahoma). Adjunct Assistant Professor of Mechanical Engineering, 1969.

WALKER, CONRAD, B.S., M.S. (University of Tennessee). Assistant Professor of Economics, 1971.


WELSTEAD, STEPHEN T., B.S. (University of Notre Dame), M.S. (SUNY at Stony Brook), Ph.D. (Purdue University). Adjunct Assistant Professor of Mathematical Sciences, 1987.

WERKHEISER, ARTHUR H., JR., B.S. (Lafayette College), M.S., Ph.D. (University of Tennessee). Lecturer in Physics, 1969.


WHITTEN, ALAN F., B.A., M.Ed. (Harding University) C.P.A. Lecturer in Accounting, 1981.


WILLIAMS, ROBERT H., A.B. (Miami University, Ohio), M.D. (University of Alabama School of Medicine). Clinical Associate Professor of Internal Medicine, 1981.


WORDEN, JAMES B., B.S. (University of Wyoming), M.S. (University of Missouri). Lecturer in Mechanical Engineering, 1982.

WORKMAN, GARY L., B.S. (College of William and Mary), Ph.D. (University of Rochester). Lecturer in Physics, 1975.

**Volunteer Faculty**

AKIN, T. JOE, M.D. (University of Tennessee College of Medicine). Surgery.

ALISON, W. EVANS, M.D. (Tulane University School of Medicine). Clinical Assistant Professor of Obstetrics and Gynecology.

ANDERSON, HENRY L., JR., B.S., M.D. (Tulane University School of Medicine). Internal Medicine.

ARMSTRONG, THOMAS W., B.A., M.D. (University of Tennessee College of Medicine). Emergency Medicine; Clinical Assistant Professor of Family Medicine.


ARRINGTON, THOMAS H., B.S., M.D. (Harvard Medical School). Internal Medicine.

AUST, GILBERT M., B.S., M.D. (University of South Alabama). Clinical Instructor of Surgery.

BAIRD, ROBERT L., M.D. (Louisiana State University School of Medicine). Clinical Assistant Professor of Surgery - Colon and Rectal Surgery.

BAKER, GRADY L., M.D. (University of Louisville School of Medicine). Clinical Assistant Professor of Family Medicine.

BELL, WILLIAM H., III, B.A., M.D. (University of Tennessee College of Medicine). Clinical Associate Professor of Pediatrics.

BOGGESS, JOHN W., B.S., M.D. (University of Alabama School of Medicine). Clinical Assistant Professor of Family Medicine.

BOOHER, PETER C., B.A., M.D. (Emory University School of Medicine). Clinical Assistant Professor of Radiology.

BORDENCA, ANNA, B.A., M.D. (Medical College of Alabama). Clinical Associate Professor of Pediatrics.

BOSHELL, JOANN, B.A., M.D., (University of Tennessee College of Medicine). Clinical Assistant Professor of Pediatrics.


BROWN, MICHAEL W., B.S., M.D. (University of Alabama School of Medicine). Clinical Associate Professor of Internal Medicine.

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CARPENTER, MARK, B.S., M.D. (University of Wisconsin). Clinical Assistant Professor of Surgery.

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CARUSO, P. MICHAEL, B.A., M.D. (University of Alabama School of Medicine). Clinical Assistant Professor of Internal Medicine.

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