In many ways the most important part of
each student's program is the major, for it is in this intensive study of one more or less limited field of knowledge that the individual begins to find a niche in the world of intellectual endeavor. The major may be drawn from the offerings of a single department or it may bring together related concerns of two or more departments. In either case the student should work out a program of study which has a definite design and aims at some overall goal. Guidelines are published by each major department or inter-departmental committee to assist the student in ascertaining goals and to provide a framework within which to develop a program of study. Additional assistance in the form of personal counseling is available in the Liberal Arts Advising Center and from designated faculty advisors in each major department or area.

II. University Requirements

The Liberal Arts major may also be combined with one or more minors, which must be recorded on the student's transcript. Distribution requirements for Liberal Arts majors must be completed at least 12 credit hours at UTK in each major awarded on this transcript. To meet University second-degree requirements each student must complete at least 12 credit hours at UTK in each major awarded on this transcript without regard to course topic. Majors are available in most departments or programs in which majors are offered and also in Biochemistry, Physical Sciences, Portuguese, and Women's Studies. Minors are available in most courses developed in other colleges or schools of the University, but must be approved by the department head in which the minor is proposed and by the Associate Dean for Student Academic Affairs in Liberal Arts. Additional courses may be taken in the major and may also be used to satisfy basic skills or distribution requirements where listed. A minimum grade of C must be earned in each course counted as part of a major, and students transferring from other institutions must complete at least 60 credit hours taken in the major.

In lieu of a major, students may develop an Individualized Program (described below). Majors available in the Basic Program for a B.A. or B.S. include: Anthropology, Art History, Audiology, Botany, Chemistry, Classics, Computer Science, Cultural Studies, Economics, English, French, Geography, Geology, German, History, Human Services, Italian, Mathematics, Microbiology, Music, Philosophy, Physics, Political Science, Psychology, Religious Studies, Russian, Sociology, Spanish, Speech Pathology, Speech and Theatre, Statistics, and Zoology.

II. Individualized Program

The Basic Program described above will meet the educational needs of most of the students enrolling in the college. Some, however, come with particular strengths in their preparation or with special interests which do not coincide with the departmental or interdepartmental majors specified in the Basic Program. For these students the Individualized Program has been established as a means of achieving a closer correlation between student needs and academic programs.

Students in the Individualized Program will satisfy the all Basic Skills and Distribution requirements, just as do those in the Basic Program. The greatest degree of individualization takes place, however, in the area of concentration. Although the quantitative aspect of the area of concentration is the same as for the major course overlap among minors and majors or among minors and Basic Skills and Distribution requirements.

The minimum requirement for a minor is 24 credit hours in courses numbered 2000 or above in one of the health professions. Some of the choices which the student may make include:

Pre-Health Professional Programs

- Pre-Medical
- Pre-Dental
- Pre-Dental Hygiene
- Pre-Nursing
- Pre-Optometry
- Pre-Pharmacy
- Pre-Physical Therapy
- Pre-Veterinary Medicine
- Other Health Professions

Further information and applications may be obtained from the Liberal Arts Advising Center.

III. College Scholars Program

A limited number of freshmen, entering transfer students with less than 60 credit hours, and resident students with less than 90 credit hours are invited each year to enter this distinguished honors curriculum. Selection is based on previous academic record, test scores, recommendations, a written essay, and a personal interview. Admission is provisional for two quarters; continuation depends upon maintenance of a satisfactory record (normally 3.25 or above) and evidence of ongoing motivation and interest.

The College Scholars Program affords the highest degree of freedom to the student in developing a meaningful curriculum. Each program is worked out individually with a special advisor (tutor) who under ordinary circumstances continues to advise the student throughout the college career. Together they determine what kinds of course work and/or other learning experiences will best fulfill the student's objectives, while at the same time achieving the kind of liberal education the college believes is important for every student. In the final two years of the program students will be heavily involved in independent study or research, required of all College Scholars. When College Scholars fulfill departmental requirements for additional majors or minors, these will be recorded on the Scholars' transcripts. Scholars will not be required to meet Basic Skills or Distribution requirements, either as general requirements or in order to have such majors or minors officially recognized.

Further information and applications may be obtained from the Liberal Arts Advising Center.
required for the Bachelor of Arts or Science degree in the College of Liberal Arts at The University of Tennessee, Knoxville. The two-year pre-medical program prepares students to undertake professional training during the third year of study at UT-Memphis. The Science Medical Technology Program prepares students to undertake professional training during the fourth year of study at the University of Tennessee Memorial Research Center and Hospital. Other pre-health professional programs—dental hygiene, medical record administration, cytology, nursing, and physical therapy—are offered for those students who are planning to pursue professional training in health professional areas which lead to an undergraduate degree from UT-Memphis but not to a degree from UTK.

Admission to any program at UT-Memphis or Knoxville is at the discretion of that program's admission committee. Admission to the University of Tennessee and completion of requirements may be obtained from the College of Liberal Arts. Admission to any professional training program.

Because the competition for admission to most programs in the health professions is keen, pre-health professional students are encouraged to work towards the completion of a degree program in a major which will enable the individual to adapt to an alternative program in the event admission to the desired program is not achieved. The preparatory courses necessary for professional study can be incorporated into the chosen major program.

Students in a pre-health professional program should consult with a health professions advisor in the Liberal Arts Advising Center (220 Ayres Hall) for more information about the programs outlined below. Specific requirements often change in the health professions programs. Bulletins describing the various pre-health professional programs, including a detailed statement on requirements, may be obtained from the Health Professions Office, 220 Ayres Hall.

PRE-DENTAL PROGRAM

The college offers both a three-year program leading to a Bachelor of Arts degree and a four-year program leading to a Bachelor of Arts or Science degree for students preparing for the study of dentistry. Both programs are based upon the curriculum of the College of Liberal Arts and the B.A. degree is granted upon satisfactory completion of the first year of study at UT-Memphis. In the four-year program the degree is granted upon completion of 190 or more credit hours while enrolled in the college, and the B.A. degree is awarded to those students who complete all requirements for the degree before enrolling in the College of Dentistry.

Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
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<tbody>
<tr>
<td>English 1010 or 1011; 1020-31-32-33</td>
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<tr>
<td>Chemistry 1110-20-30</td>
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<tr>
<td>Mathematics</td>
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<tr>
<td>Basic Skills B. Foreign Language (Intermediate Level Sequence)</td>
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Sophomore

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Chemistry 3211-21-31 and 3219-29-39</td>
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<tr>
<td>Physics 2510-20-30</td>
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<tr>
<td>Divisional Distribution (A) Non-U.S. History</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Divisional Distribution Humanities (D) Part 1</td>
<td>8-9</td>
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<tr>
<td>Electives*</td>
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Junior

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<tr>
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<tr>
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<tr>
<td>Divisional Distribution (D) Humanities Part 2</td>
<td>6-8</td>
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<tr>
<td>Upper Level Distribution (A) U.S. Studies (B) Foreign Studies or (C) Capstone Experience</td>
<td>12-16</td>
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<tr>
<td>Electives</td>
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Senior

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Completion of major program and B.A./B.S. requirements or completion of one year at UT-Memphis</td>
<td>190</td>
<td></td>
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</table>

Total Minimum Required: 143-151 hours

PRESIDENTIAL PROGRAM

A Bachelor of Science in Dental Hygiene is granted by UT-Memphis upon completion of a program which includes 96 hours of prescribed courses in the College of Liberal Arts and six quarters of study at UT-Memphis. Students interested in the pre-dental hygiene program are encouraged to consult with a health professions advisor in the Liberal Arts Advising Center for more information. Bulletins describing the pre-dental hygiene program and requirements in detail may be obtained from the Health Professions Office, 220 Ayres Hall.

PRE-DENTAL PROGRAM

The college offers a three-year program leading to a B.A. degree and a four-year program leading to a Bachelor of Arts or Science degree for students preparing for the study of medicine. Both programs are based upon the curriculum of the College of Medicine, most students accepted into the study of medicine have the baccalaureate degree before admission. Therefore, pre-dental students are encouraged to work towards the completion of requirements for the B.A. degree before enrolling in the College of Dentistry.

Freshman

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<tr>
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<td>Electives*</td>
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Sophomore

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<td>143-151</td>
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</table>

Total Minimum Required: 190 hours

PRE-MEDICAL PROGRAM

The college offers the pre-medical program leading to a B.A. degree and a four-year program leading to a Bachelor of Arts or Science degree for students preparing for the study of medicine. Both programs are based upon the curriculum of the College of Medicine. In the four-year program the degree is granted upon completion of 190 or more credit hours while enrolled in the college, including a major of 36 or more hours in addition to the courses outlined below. The requirements for a major are waived for those students who complete the last 45 hours of credit in residence at UT-Memphis. Although the B.A./B.S. degree is not required for admission to the College of Medicine, most students accepted into the study of medicine have the baccalaureate degree before admission. Therefore, pre-medical students are encouraged to work towards the completion of requirements for the degree before enrolling in the College of Medicine.

Freshman

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</table>

Total Minimum Required: 143-151 hours

**Notes:**

1. Students wishing to prepare for professional training at institutions other than UT-Memphis should consult the catalogs of those institutions to determine the specific preparation required for admission.

2. Math placement depends on high school courses and grades, ACT scores, and B.A./B.S. requirements. A math placement handout is available in the Liberal Arts Advising Center, 220 Ayres Hall. Math 1400-50, 1560-60 or 1941-51 are prerequisites to Physics. All students must complete the Math Basic Skills requirements as outlined in the Liberal Arts curriculum.

3. This requirement assumes a student has had enough language background in high school to begin an intermediate language sequence at UTK.

4. Students must satisfy two of the three options. B.S. students must satisfy one of the three options. Consult with major departments for required Capstone courses.

5. Recommended courses in biology and zoology are genetics, cell biology, and comparative vertebrate anatomy.

**Pre-Dental Hygiene Program**

A Bachelor of Science in Dental Hygiene is granted by UT-Memphis upon completion of a program which includes 96 hours of prescribed courses in the College of Liberal Arts and six quarters of study at UT-Memphis. Students interested in the pre-dental hygiene program are encouraged to consult with a health professions advisor in the Liberal Arts Advising Center for more information. Bulletins describing the pre-dental hygiene program and requirements in detail may be obtained from the Health Professions Office, 220 Ayres Hall.

1. Or equivalent honors courses.

2. Math placement depends on high school courses and grades, ACT scores, and B.A./B.S. requirements. A math placement handout is available in the Liberal Arts Advising Center, 220 Ayres Hall. Math 1400-50, 1560-60 or 1941-51 are prerequisites to Physics. All students must complete the Math Basic Skills requirements as outlined in the Liberal Arts curriculum.

3. This requirement assumes a student has had enough language background in high school to begin an intermediate language sequence at UTK.

4. The College of Medicine at E.T.S.U. requires two quarters of literature.
PRE-MEDICAL RECORD ADMINISTRATION PROGRAM

Admission to the medical record administration program at UT-Memphis, leading to a Bachelor of Science in Medical Record Administration, requires completion of 135 hours of prescribed courses. Classes are admitted in September; applications must be filed by April 15. The selection process usually includes interviews with members of the faculty.

Students interested in the pre-medical record administration program are encouraged to consult with a health professions advisor in the Liberal Arts Advising Center for more information. Bulletins describing the medical records administration requirements and program in detail may be obtained from the Health Professions Office, 220 Ayres Hall.

PRE-MEDICAL TECHNOLOGY PROGRAMS

The college offers two programs leading to the study of medical technology:

1. The Science-Medical Technology Curriculum leading to a Bachelor of Arts degree with a major in medical technology from the University of Tennessee, Knoxville. (1) Technical-Science Curriculum leading to a Bachelor of Science degree in medical technology from UT-Memphis.

2. The Pre-Medical Technology Program leading to a degree of Bachelor of Science in medical technology from UT-Memphis.

SCIENCE-MEDICAL TECHNOLOGY CURRICULUM

The Science-Medical Technology Curriculum is a three-year program consisting of a minimum of 140 credit hours in college. Students who complete this curriculum satisfactorily may apply for admission to the course of study in medical technology at The University of Tennessee Memorial Research Center and Hospital in Knoxville (UTMRCH). Successful completion of this course, which results in the granting of 50 credit hours, makes the student eligible for examination by the Board of Registry of the American Society of Clinical Pathologists in order to be certified as registered medical technologists.

Freshman

Hours Credit

1English 1010 or 1011; 1020; 1031 or 1032 or 1033. 9

2Biology 1210-20-30 or Zoology 1118-28-38. 9

3Chemistry 1110-20-30. 12

4Basic Skills (B) Foreign Language (Intermediate Level Sequence). 9

5Mathematics (Elective). 4

Sophomore

Hours Credit

1English 2010 or 1011; 1020; 1031 or 1032 or 1033. 9

2Chemistry 2200. 4

3Zoology 2210. 3

4Biological Science 3310-20. 8

5Divisional Distribution (C) Social Science. 8

6Microbiology 3200 and 3519. 4

7Divisional Distribution (D) Humanities Part 1. 8

8Divisional Distribution (A) Non-U.S. History. 8

9-50

JUNIOR

Hours Credit

1Microbiology 4320-29. 5

2Chemistry 2140-49 and 4910-20-30, Zoology 3505 and 3600. 12

3Microbiology 4270. 3

4Divisional Distribution (C) Social Science. 7

5Divisional Distribution (D) Humanities Part 2. 8

6Upper Level Distribution (A) U.S. Studies. 6

7(B) Foreign Studies or (C) Capstone Experience. 12

8Total: Minimum 140-148 hours

Senior

Medical technology course of study at UTMRC.... 50

Total Minimum Required: 190 hours

PRE-MEDICAL TECHNOLOGY PROGRAM

Students planning to seek admission to the medical technology course of study at UT-Memphis must complete 90 credit hours of prescribed courses while enrolled in the College of Liberal Arts. The program at Memphis is 7 quarters in length and leads to the degree of Bachelor of Science in Medical Technology from UT-Memphis. Classes are admitted in September and application must be made one year in advance.

Students interested in the pre-medical technology program of study at UT-Memphis are encouraged to consult with a health professions advisor in the Liberal Arts Advising Center for the specific requirements for admission.

Bulletins describing both pre-medical technology programs and requirements in detail may be obtained from the Health Professions Office, 220 Ayres Hall.

PRE-NURSING PROGRAM

The minimum requirements for admission to the College of Nursing at UT-Memphis is 90 hours of prescribed courses in the College of Liberal Arts. The program at Memphis is 7 quarters in length and leads to the degree of Bachelor of Science in Medical Technology from UT-Memphis, is two years in length.

Registered nurses who wish to work for a degree of Bachelor of Science in Nursing must complete 54 hours of prescribed courses to qualify for admission on the advanced standing track.

Students interested in the pre-nursing programs are encouraged to consult with a health professions advisor in the Liberal Arts Advising Center for more information. Bulletins describing the pre-nursing programs may be obtained in the Health Professions Office, 220 Ayres Hall.

Note: A degree program in nursing is also available at the University of Tennessee, Knoxville. Information may be obtained from the dean of the College of Nursing.

PRE-PHARMACY PROGRAMS

The college offers three programs preparing students for the study of pharmacy at UT-Memphis. The Doctor of Pharmacy (Pharm.D.) degree is conferred by UT-Memphis upon completion of four years of professional study at Memphis following any of the three programs. Bulletins describing the three pre-pharmacy programs in detail may be obtained from the Health Professions Office, 220 Ayres Hall.

The two-year program prepares students to be admitted to the College of Pharmacy upon completion of 90 hours of a prescribed course of study in the College of Liberal Arts. Further information may be obtained from the Health Professions Office, 220 Ayres Hall.

The three-year program leading to a B.A. degree and the four-year program leading to either a B.A. or B.S. degree from The University of Tennessee, Knoxville, as well as to the professional degree in pharmacy from UT-Memphis, are based upon the program outlined below. In the three-year program, the student must complete at least 134 credit hours while enrolled in the College of Liberal Arts, and the B.A. degree is granted upon satisfactory completion of the first year of study at Memphis. In the four-year program the B.A. or B.S. degree is granted upon completion of 190 or more credit hours while enrolled in the college, including a major of 36 or more hours in addition to the courses outlined below. The requirement for a major is waived for those taking their fourth year at UT-Memphis. Students in either the three- or four-year program must complete the last 45 hours of credit in residence at The University of Tennessee, Knoxville, before enrolling in the College of Pharmacy.

Freshman

Hours Credit

1English 1010 or 1011; 1020; 1031 or 1032 or 1033 or equivalent. 9

2Chemistry 1110-20-30. 12

3Mathematics (Elective). 12

4Basic Skills Foreign Language (Intermediate Level Sequence). 9

5Divisional Distribution (A) Non-U.S. History. 8

6Total: Minimum 142 hours

Sophomore

Hours Credit

1Biology 1210-20-30 or Zoology 1118-28-38. 12

2Chemistry 3211-21-31 & 3219-29. 29

3Psychology 2500. 4

4Divisional Distribution (C) Social Sciences. 5

5Divisional Distribution (D) Humanities Part 1. 8

6Psychology 2500. 4

7Total: Minimum 142 hours

Junior

Hours Credit

1Accounting 2110. 3

2Physics 2210-20-30. 12

3Divisional Distribution (C) Social Sciences. 5

4Divisional Distribution (D) Humanities Part 2. 8

5Upper Level Distribution (A) U.S. Studies. 6

6Electives. 6

7Total: Minimum 142 hours

Senior

Completion of major program and B.A./B.S. requirements or completion of one year at the UT Center for the Health Sciences.

Total Minimum Required: 190 hours

* Or equivalent honors courses.
PRE-PHYSICAL THERAPY PROGRAM
Admission to the physical therapy program at UT-Memphis, leading to the degree of Bachelor of Science in Physical Therapy from UT-Memphis, requires completion of 90 hours of prescribed courses while enrolled in the College of Liberal Arts. The program in Memphis is 2 years in length.

Students interested in the pre-physical therapy program are encouraged to consult with a Health Professions advisor in the Liberal Arts Advising Center for more information. Bulletins describing the physical therapy program in detail may be obtained from the Health Professions Office, 220 Ayres Hall.

PRE-VETERINARY MEDICINE PROGRAM
The following program is designed for students who wish to pursue a Liberal Arts degree while preparing for the study of Veterinary Medicine. Students in this program must complete at least 153 credit hours while enrolled in the College of Liberal Arts, must satisfy the Basic Skills and Distribution requirements, and must complete the last 45 hours in residence at UTK before enrolling in the College of Veterinary Medicine. A departmental major is not required. Upon successful completion of the first year (three quarters) of the professional veterinary medicine curriculum, the Bachelor of Arts degree will be conferred by the College of Liberal Arts.

Note: Admission to the College of Veterinary Medicine is at the discretion of the admissions committee of that college; admission to and successful completion of this program does not assure admission to the College of Veterinary Medicine.

Bachelor of Fine Arts
Two majors in the B.F.A. degree are available: B.F.A. in Studio Arts and B.F.A. in Graphic Design/Illustration. Both majors require a similar prerequisite introductory art core. Majors must pass a portfolio review, usually at the end of the sophomore year, in order to be admitted into upper-division courses and concentrations. All studio courses require 3 hours per week attendance for each credit hour earned. Completing the B.F.A. program may take more than 12 quarters. Students are urged to seek departmental advisement each quarter to ensure proper scheduling.

Transfer students are advised that a minimum of 28 hours in studio courses, and eight upper-division hours in art history must be earned at UTK. No grade below C in art courses may be applied to the B.F.A. major. A minimum of 60 credit hours, 3000-level or above, must be earned prior to graduation.

STUDIO ART MAJOR
The B.F.A. in Studio Art is a professionally oriented degree especially intended for those students planning careers or graduate study in the visual arts.

Students may be accepted into advanced media concentration in (1) Ceramics, (2) Drawing, (3) Painting, (4) Printmaking, (5) Sculpture, (6) Web/Computer, (7) approved Inter-Area combinations, after passing the appropriate portfolio course.

CORE CURRICULUM
The Studio Art Core is required of all B.F.A. candidates. It is designed to give a broad art background, in both studio and art history, at the earliest possible time. This background, during the freshman and sophomore years, gives a foundation upon which students may build, and provides them an opportunity to become acquainted with the various artistic disciplines. This gives each student the understanding to plan a better program during the remaining two years. Unless otherwise stated the art core courses are non-sequential.

I. ART CORE

Hours Credit
A. Art 1000.......... 2
B. Art History
   1. Art 1815, 1825, 1850.... 15
      2. Additional hours........ 12
   C. Studio
      1. Art Fundamentals 1115, 1125, 1135... 11
      2. 2117 Intermediate Design & Color.... 3
      3. 2105 Drawing; 2205 Painting or 2206 Watercolor; (2405 or 2406 or 2408 or 2409 or 2450); Fine Art; 2905 Ceramics; 2935 Film Design; 2950 Ceramics... 12
      4. 12 hours from the following:
         Fiber-Fabric (2260 or 2265 or 2270 or 2275 or 2280 or 2286); 2416 Life Modeling; 2636 Metal Detect; 2905 Ceramics; 2935 Film Design; 2950 Ceramics... 12
   Subtotal: 59 hours

II. CONCENTRATION

Additional hours in studio course electives to be completed in the Art Department or at our affiliated facility, Arrowmont School of Arts and Crafts. Students may also apply a maximum of 12 credit hours of approved studio courses from Architecture, Art Education, Broadcast Journalism, Computer Science, Vocational-Technical Education, Interior Design or Theatre.

   A. Approved Concentration Electives (maximum credit hours in parenthesis): Ceramics: (Art 2115 6), 2415 3, 2905 3, 2906 3, 3405 4, 3415 4, 4964 4, 4965 6, Drawing: Art 2106 4 or 2106 4/4566 4/4568 2, 2205 2 or 2205 2 NOT taken as core requirement (3), 2215 3, 2315 3, 2316 3, 2316 3, 2905 3, 2906 3.

   Subtotal: 59 hours

III. INTER-AREA ELECTIVES

Additional hours in studio course electives to be completed in the Art Department or at our affiliated facility, Arrowmont School of Arts and Crafts. Students may also apply a maximum of 12 credit hours of approved studio courses from Architecture, Art Education, Broadcast Journalism, Computer Science, Vocational-Technical Education, Interior Design or Theatre.

   A. Approved Inter-Area Electives

   Subtotal: 49 hours

Total: 190 hours

**Note:** Approved Concentration Electives (maximum credit hours in parenthesis): Ceramics: (Art 2115 6), 2415 3, 2905 3, 2906 3, 3405 4, 3415 4, 4964 4, 4965 6, Drawing: Art 2106 4 or 2106 4/4566 4/4568 2, 2205 2 or 2205 2 NOT taken as core requirement (3), 2215 3, 2315 3, 2316 3, 2316 3, 2905 3, 2906 3.

**GRAPHIC DESIGN/ILLUSTRATION MAJOR**

The Graphic Design/Illustration major is specifically designed to provide the basic
visual education for those persons who wish to pursue careers in the commercial application of art in fields such as advertising, art direction, package design, publications, television, etc.

A minimum of 190 credit hours are required for graduation. Two options are available: graphic design or illustration. Students are advised that courses in Graphic Design/Illustration must be taken in sequence, and that successful completion of Art 3500 (Portfolio Review, S/NC) is required for admittance to all upper-division courses.

### III. Design Electives

Art 2506, 3516, 3517, 3525, 4506

Subtotal: 70 hours

### IV. General Curriculum

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Subtotal: 34 hours

### Core Enrichment Courses

25 hours in the following Liberal Arts areas are required for all students enrolled in the B.M. degree program.

I. 8 hours from:
   - Non-U.S. History
   - Social Science
   - Natural Science (can be sequential)

II. 8 hours from:
   - Humanities-Arts (non-music)
   - Literature
   - Philosophical Perspectives (can be sequential)

III. 9 hours Foreign Language

Distribution of Core Enrichment credit hours are designated in the course listing for each concentration.

### MUSIC THEORY

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Continuation is subject to periodic review by the faculty. Students qualified for honors courses will enroll in course numbers which most closely parallel their present level, i.e., sophomores in 2008, juniors in 3008, seniors in 4008. Each course number may be repeated for a maximum of 24 hours credit.

### Bachelor of Music

The Department of Music offers the degree of Bachelor of Music with concentrations in music theory, composition, electronic music, music history and literature, and applied music (voice; piano; organ; church music—organ or piano; church music—voice; piano—literature; strings; woodwind, brass, and percussion instruments; multiple keyboard instruments; multiple woodwind instruments; studio music and jazz; String pedagogy). The study is designed to prepare students for graduate study or for positions in music for which a professional degree is required.
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**Music Concentrations/College of Liberal Arts**

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**Multiple Keyboard Instruments**

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**Bachelor of Science in Chemistry/College of Liberal Arts**

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<td>Core Enrichment II</td>
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**ELECTRONIC MUSIC**

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**SUZUKI STRING PEDAGOGY**

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</table>

**Bachelor of Science in Chemistry**

Students who desire to major in chemistry may select from among three courses of study: Bachelor of Science/Concentration A, Bachelor of Science/Concentration B, or Bachelor of Science in Chemistry. The last program is approved by the Committee on Professional Training of the American Chemical Society and is designed to train students to go directly into positions in the chemical industry or to enter graduate study leading to positions in research and college teaching. A student in the B.S. in Chemistry or cooperative program should, at the earliest opportunity, ask the Liberal Arts Advising Center for assignment of a faculty advisor in the Chemistry Department. For further information, contact the head of the Chemistry Department, 575 Buehler Hall.

A minimum average of 2.5 must be made in each chemistry course applied to the Bachelor of Science in Chemistry degree.

**COOPERATIVE PROGRAM IN CHEMISTRY**

A cooperative program is available to students in the B.S. in Chemistry curriculum. After the freshman year the student alternates a quarter in school with a quarter in a job in a chemical industry. The program normally requires five years and involves a total of seven work quarters and twelve school quarters. Students are required to have at least a 2.5 average to enter and remain in the program. Some opportunity exists for students to enter the program later than the end of the freshman year. Students interested should make application to the head of the department at least one quarter in advance of the beginning of the first work period. Further information will be supplied on request.

**CURRICULUM REQUIREMENTS**

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<th>Hours Credit</th>
<th>Bachelor of Science in Chemistry/College of Liberal Arts</th>
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<td>Chemistry 1325-35</td>
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**Note:** The curricula in strings; woodwinds, brass, and percussion; multiple woodwinds; and voice allow 12 hours of ensemble credit to apply toward electives. This is in addition to the hours in ensemble listed in the tabular resumes.
Preparation for Other Professions

Law
Students who plan to study law should consult the statement regarding admission to the College of Law in the Graduate Catalog and discuss their programs with advisors in the Liberal Arts Advising Center.

Library Science
Certain courses in the Graduate School of Library and Information Science are open to students in the College of Liberal Arts interested in beginning positions in a library or in preparation for future graduate study in professional librarianship. For further information, see page 52 or consult the Director of the Graduate School of Library and Information Science.

Planning
Students who wish to consider a career in city and regional planning or a related field will find a brief description of the program of the Graduate School of Planning on page 52. Students are accepted into planning from a broad variety of undergraduate backgrounds. Detailed information on the planning professions, admission requirements, and the program of study may be obtained from the Graduate School of Planning.

Public Administration
Students majoring in political science who wish to prepare for an administrative career in the public service may select courses to fit that objective. The concentration appearing below is suggested for students with public service career interests. The degree to be awarded is a Bachelor of Arts with a major in political science, augmented by supportive work in related disciplines.

Freshmen
Hours Credit
Political Science 2510-20, 2530 (choose 8 hours) 8
Economics 2510-20 8
Political Science 2545-46 or 3801-02-03-04 8
Economics 3340 2
Accounting 2110-20-30 9
Speech and Hearing Center 1210 3
Political Science 4610-20 8
Political Science 4410 2
Economics 3410 2
Accounting 3510 3
Economics 4750-50 6

In addition, students must take sufficient additional political science courses to meet the total hours and distribution requirements for a major in political science.

Further information may be obtained in the Department of Political Science.

Social Work
Students who wish to prepare for graduate professional training in social work will find a brief description of the program of the College of Social Work on page 214. Detailed information about courses and curricula, as well as requirements for admission, will be found in the catalog of the College of Social Work.

Teaching
Students in the College of Liberal Arts who wish to be certified for secondary school teaching must satisfy state certification requirements as well as all degree requirements of the College of Liberal Arts and must be recommended for certification by the College of Education. The College of Education is approved by the National Council for Accreditation of Teacher Education (NCATE); recommendation for certification by the college, therefore, in effect certifies the student in 30 states.

Application for admission to the Teacher Education Program should be made during the second or third quarter of the sophomore year in the office of the dean of the College of Education, 212 Claxton Education Building. Criteria for admission are: (1) a 2.2 cumulative grade point average; (2) satisfactory ratings in a speech and hearing exam as determined by tests administered by the Speech and Hearing Center; (3) a personality inventory; (4) satisfactory student conduct records; (5) successful field experience.

One quarter during the senior year must be reserved for student teaching (Education C & I 4710-20). Application for student teaching must be filed not later than January 1 of the year preceding the academic year in which the student teaching will be undertaken. Those planning to student teach during the 1996-97 academic year must apply by January 1, 1996.

For additional information contact Teacher Certification Office, Room 212 Claxton Education Building.

Teology
Students planning to study theology should follow one of the Bachelor of Arts curricula. Any liberal arts major is acceptable for admission to most theological schools; strong preparation in literature, philosophy, history, religious studies, and social science is desirable. Students may wish to consult with faculty members in the Department of Religious Studies in planning their programs.

General Information
Association with the College
For information regarding association with the College of Liberal Arts, see page 16.

Course Load
The average course load in the college for any quarter is 14-16 credit hours. The University defines full-time undergraduate students as those who register for a minimum of 12 hours. The maximum number of hours which may be taken by liberal arts students is 18, exclusive of elective work in ensemble music and physical education. Exceptions to this rule will require approval by the Associate Dean for Student Academic Affairs (220 Ayres Hall).

Lower Division—Upper Division
Courses numbered at the 1000 and 2000 levels are considered lower division and are normally taken by students in the freshman and sophomore years. Courses numbered 3000 and above are upper division and are designed for students at the junior and senior levels.

Satisfactory/No Credit Courses
A few courses in the college are offered only on a Satisfactory/No Credit (S/NC) basis and students may elect to take others on this basis, except in areas where the option is specifically prohibited. Such courses, if successfully completed, will count as hours for graduation although neither S nor NC grades will be calculated in the student's grade point average. Satisfactory is defined as C or better work on the traditional grading scale and No Credit is defined as less than C. The following regulations apply:

1) S/NC courses, except those offered only on this basis, may not count for Basic Skills or Distribution requirements or major and minor requirements unless specifically permitted by petition. This restriction applies also to major or minor prerequisites or corequisites.

2) The maximum number of S/NC elective hours which may be counted toward graduation is 30, exclusive of courses offered only S/NC, physical education courses, and/or satisfactory hours earned by examination, laboratory service, etc.

3) A student who desires to take a course S/NC should indicate that intention at the time of registration. A change from S/NC grading to regular grading from S/NC will not be permitted beyond the add deadline in each quarter. (Exception: Students who register for a course S/NC in a restricted area will be required to change to regular grading when the error is discovered.)

4) A transfer student who has more than 30 S/NC or equivalent hours earned prior to admission to The University of Tennessee, Knoxville, may count all of these toward graduation but may not elect additional S/NC hours.

5) A transfer student with S/NC or equivalent credit evaluated for admission to The University of Tennessee, Knoxville, in a course which satisfies Basic Skills or Distribution requirement may count it for that purpose. In the case of a course which satisfies a major or minor requirement, statement (1) applies.

The option of taking courses on a S/NC basis is provided to encourage the able student to venture beyond the limits of those courses in which he demonstrates ability and motivated by intellectual curiosity, to explore
subject matter in which performance may be somewhat less outstanding than work in preferred subject fields.

Note: Students planning to seek admission to graduate or professional schools (especially in the health sciences) should discuss with their advisors possible limitations on exercise of the S/NC option before registering for courses on this basis.

Off-Campus Study
Recognizing that learning is not restricted to formal classroom situations, the college provides for students to earn credit toward graduation for approved off-campus study. Such study may be undertaken only with prior approval of the faculty member and the department concerned. It may include certain kinds of work experiences, community involvements, working in political campaigns, etc. Credit per quarter will vary from 1-16 hours. Up to 24 hours of credit earned in this way may be applied toward a degree in the college, although individual departments may limit the number of hours which may be applied toward a specific major.

Independent Study
Certain educational goals may best be met through independent study done by an individual under the direction of a faculty member. Students who wish to do such independent work should obtain the approval of the faculty member and the departments concerned prior to embarking upon their study. Credit per quarter will vary from 1-16 hours. Up to 24 hours of credit earned in this way may be applied toward a degree in the college, although individual departments may limit the number of hours which may be applied toward a specific major.

Study Abroad and Foreign Study Courses
Several opportunities for study abroad are available to students in the college. One avenue is through group programs arranged and supervised by departments of the college on a full-quarter or summer term basis. A second is through group programs conducted abroad by other academic institutions to which UTK students with approval may enroll for credit. Assistance in identification of and registration in such programs may be obtained through the Overseas Study Information Service located in the University’s Division of International Education. A third opportunity is through individualized programs under the foreign study number 4101. The nature of this work as well as credit for it should be negotiated by students prior to departure with the appropriate liberal arts departments. Credit will be awarded only after completion of all agreed upon requirements, and may vary from 1–16 hours in any one department. Up to 24 hours of such credit, exclusive of that earned in group programs offered by departments, could apply toward a degree in the college. Departments may in any of the above forms, however, limit the hours of credit which can be applied toward a given major.

Liberal Arts Advising Center
Academic advising for students of the college is offered through the Liberal Arts Advising Center, 220 Ayres Hall, as well as through the several major departments. The Advising Center is staffed on a regularly scheduled basis by members of the college faculty, each of whom has been trained for this specialized work. Students in their first quarter of residence are assigned to the Advising Center where they may relate themselves to a particular advisor of their choice or consult the person on duty at the time they need assistance. Most students continue in this relationship to the Advising Center until they have determined their major, normally by the beginning of the junior year, at which time they may be transferred for advising to a faculty member in the major department.

Office of African and Afro-American Studies
The Office of African and Afro-American Studies, 802 Volunteer Blvd., Suite 416, cooperates with the various departments and colleges of the University with respect to the development of curricular changes and innovations which incorporate the Black experience into academic and extracurricular programs of the institutions. It supplies information on financial assistance for Black students, and serves as the focal point for the coordination and development of an improved and expanded African and Afro-American Studies Program at the University.

Bureau of Public Administration
The University has established in the college a Bureau of Public Administration for the purpose of promoting sound governmental administration through research, publication, and consultation. Offices and staff are maintained in both Knoxville and Nashville. The head of the Department of Political Science serves as director of the Bureau of Public Administration.

Psychological Clinic
The Psychological Clinic is an outpatient psychodiagnostic and treatment center established by the University within the Department of Psychology. It provides advanced graduate training for students in clinical psychology and also serves as a training facility for graduate students in the School of Social Work. Referrals for treatment come from many sources, including self-referrals and referrals by relatives and friends and by various social and mental health agencies. Treatment services are available to anyone regardless of residence, sex, age, race, or citizenship.

University Theatres
The Department of Speech and Theatre offers a full schedule of dramatic presentations in three different theatres. The Clarence Brown Theatre has outstanding facilities for proscenium and open staging and for film productions, and, in a separate Studio Theatre, for laboratory productions.Carousel Theatre is designed for arena staging and can be converted for open-air performances in the summer.

Instructional Facilities
The college carries out its varied teaching and research activities in more than two dozen principal buildings in two areas of the campus, as well as in a number of converted residences which provide office, studio, or clinical space. The older of the two clusters of buildings is on "The Hill," and includes Ayres Hall (mathematics and computer science), Austin Peay (psychology), Hasler (botany), Walters Life Science (biochemistry, biology, microbiology, and zoology). The Nielsen Physics Building (physics and astronomy), Geology-Geography (geology and geography), and South Stadium Hall (audiology and speech pathology and anthropology). West of "The Hill." is a recently built group of buildings for the humanities, social sciences, and fine arts: McClung Tower and the Humanities-Social Sciences classroom building (classics, English, foreign languages, history, philosophy, political science, religious studies, sociology, and speech and theatre), the Music Building (music), and the Hearing and Speech Center (audiology and speech pathology), Alumni Hall (human services) and the Art and Architecture Building (art). In this area also are the McClung Museum and the Clarence Brown and Carousel Theatres, as well as the Undergraduate Library.

College Offices
The College Administrative Office is in 226 Ayres Hall. The Liberal Arts Advising Center is in 220 Ayres Hall.

Departments of Instruction

Afro-American Studies
See Cultural Studies.

American Studies
See Cultural Studies.

Ancient Mediterranean Civilizations
See Cultural Studies.

Anthropology (122)

Professors:
W. M. Bass (Head), Ph.D. Pennsylvania;
C. H. Feukeler, Ph.D. Indiana; R. L. Jantz, Ph.D. Kansas; P. W. Parmaele, Ph.D. Texas A & M;
M. C. Wheeler, Ph.D. Yale.

Associate Professors:

Assistant Professors:
B. J. Howell, Ph.D. Kentucky; J. F. Simek, Ph.D. SUNY-Binghamton; P. S. Willey, Ph.D. Tennessee.

Research Assistant Professor:
J. Chapman, Ph.D. North Carolina

1Alumni Distinguished Service Professor.
Religious Studies 3440
Relationship between language and culture. Prereq: 3420 Linguistic Anthropology (3) Basic linguistic concepts and objectives in study of culture. Range of cultural aspects of language. May be repeated. Maximum credit 9 hours.
3450 Community Studies in Complex Culture (3) Review of cross-cultural comparative urban and village communities and methodologies used in community studies. 2530 recommended.
3460 Alcohol, Health and Culture (3) Socio-cultural perspectives and consequences of alcohol use/abuse in various cultural groups.
3500 African Religions (4) (Same as Religious Studies 3460 and Afro-American Studies 3490.)
3530 Peoples and Cultures of Africa (3) Ethnographic survey of aboriginal cultures of sub-Saharan Africa. Cultural diversity and human ecology in a real perspective. 2530 recommended. (Same as Afro-American Studies 3530.)
3540 North American Indians (3) Ethnographic survey of cultures of Arctic, Southwest, Plains, and Eastern areas. Emphasis on cultural differences of peoples occupying these areas during pre-colonial period. 2530 recommended.
3555 Cherokee Ethnology (3) Survey of sociopolitical aspects and culture traits of Eastern Creeks and external relationships from the first European contact to present. Emphasis on 18th and 19th centuries.
3575 Afro-American Anthropology (3) Anthropological perspective. Focus on the Black in New World: examination of Afro-American via anthropological theories and methodology. (Same as Afro-American Studies 3575.)
3580 Peoples and Cultures of Mesoamerica (3) Ethnographic survey of aboriginal peoples and post-conquest changes in Indian cultures. Emphasis upon analysis of small rural communities using modern village studies as source material. Recommended prereq: 2530. (Same as Latin American Studies 3580.)
3610 Archaeology of United States and Canada I (3) Survey of prehistoric peoples north of Mexico from initial occupation to European contact. 2520 recommended.
3611 Archaeology of United States and Canada II (3) Historic archaeology of Euro-American, Afro-American, and Asian American cultures in the United States and Canada from the 15th to the 20th centuries.
3630 European Prehistory I (3) Cultural developments during Paleolithic, Mesolithic, and Neolithic periods. 2520 recommended.
3630 European Prehistory II (3) Cultural developments during Metal Ages. From close of Neolithic through Iron Age. 2520 recommended. 3620 and 3630 should be taken in sequence.
3660 Prehistory of Tennessee (3) History of archaeological research in Tennessee and survey of prehistoric American Indian cultures identified through research.
3670 Principles of Archaeology (3) Research strategies in archaeological excavation, interpretation, and explanation. Prereq: 2520 or consent of instructor.
3690 Culture and Society (3) Introduction to anthropological study of folklore.
3811 Introduction to Mesoology (3) (Same as Art 3811.)
3900 Human Osteology (4) Intensive examination of the human skeleton. Prereq: 2510 or consent of instructor. 3 hrs. and 1 lab.
4101 Foreign Study (1-16) See page 181.
4102 Off-Campus Study (1-16) See page 181.
4103 Independent Study (1-16) See page 181.
4111 Non-Western Education: Anthropological Approaches (3) Analysis of traditional educational practices among non-Western peoples and problems encountered from application of western models of education among those peoples. Particular attention is paid to American Indians, African tribal groups, and Asian cultures. (Same as Education C & 4111.)
4240 Applied Cultural Anthropology (3) Applications of anthropological theory to the analysis and examination of planned change in applied programs. Intensive analysis of selected case studies. Prereq: 2530.
4250 Medical Anthropology: Lecture (3) Survey of medical anthropology. Historical and current medical anthropology. Emphasis on pre-colonial cultures of health, disease, treatment, death, and related concepts. Focus on analyses and descriptions of anthropological fieldwork.
4300 Readings in Anthropology (1-8) Intensive reading, problem oriented. For anthropology majors with senior standing. Others by consent of instructor. May be repeated to a maximum of 9 credit hours.
4304 Field Work in Anthropology (3) Practicum work, including surveying, excavation, processing, and analyzing data; intensive reading. Prereq: 2510-20-30 and consent of instructor. May be repeated to a maximum of 9 credit hours.
4400 Cultural Ecology (3) Survey of concepts and methods in studying dynamic interaction between cultures and their environments. Topics include ecological theory, methods of analysis, and application from selected case studies. Prereq: Anthropology 2520 or 2530, or 3410, or consent of instructor.
4410 Dynamics of Culture (3) Culture change: innovation, diffusion, and acculturation; cultural continuity and stability. Prereq: 2530 or consent of instructor.
4440 Urban Anthropology (3) Survey of theoretical and methodological issues anthropologists encounter researching urban culture and its environments. Focus is on anthropological perspective and urban problems and planning. Prereq: 3450 or consent of instructor. (Same as Urban Studies 4440.)
4480 Current Trends in Anthropology (3) Analytical integrative review in symposium of current debates, research directions, theories, fieldwork methods, and general assumptions of the four subfields of anthropology: archaeology, physical anthropology, linguistics, and cultural anthropology. Required of anthropology majors in senior year. Prereq: Senior standing.
4500 Indians of the Southeastern United States (3) Survey of Southeastern Indian cultures; emphasis on aboriginal adjustment to environment; lifeways of Southeastern American Indian groups prior to Euro-American contact. Prereq: 2530, 3540, or consent of instructor.
4506 Cherokee Ethnology (3) Intensive survey of ideas, materials, and techniques of Cherokee culture existing at time of first European contact.
4600 Method and Theory in American Archaeology (3) Historical development of New World archaeology with emphasis on theory and field techniques. Prereq: 2530 or consent of instructor.
4610 African Prehistory (3) Survey of cultural history in Africa, south of the Sahara, from earliest evidence of human activity to time of European contact. Prereq: 2520 or consent of instructor. (Same as Afro-American Studies 4610.)
4640 Zooarchaeology (3) Basic osteological studies of vertebrate classes; emphasis on aboriginal man's utilization of native animals in his subsistence and culture. Identification, analysis, and interpretation of archaeologically derived molluscan and vertebrate remains.
4650 Archaeology of Southeastern United States (3) Intensive study of prehistoric American Indian. Special emphasis on Tennessee prehistory. Prereq: 3610 or consent of instructor.
4720 American Folklore (3) Anthropological perspectives on folklore of geographical regions and ethnic groups of the United States. Prereq: 3700 or consent of instructor.
4740 Southern Appalachian Folk Culture (3) A survey of the settlement history and economic development
of southern Appalachia in relation to its traditional culture: technology and economics, social organization, beliefs and values, oral traditions, and customs.

Consent of instructor.

4741 Research in Southern Appalachian Folk Culture (3) Research oriented course dealing with a wide range of traditional culture in southern Appalachia: settlement patterns, folk housing, economy, clothing, beliefs, speech, art, song, dance, and oral traditions and customs. Prereq: 4740. May be repeated. Maximum 5 hrs.

4750 Italian Folklore (3) (Same as Romance Languages 4760).

4930 Physical Growth and Constitution (3) Comparative growth patterns throughout the life cycle of man; skeletal and dental maturation; sex differences in growth; human constitutional types. Prereq: 2510 or consent of instructor. Biology 2110 strongly recommended.

4940 Biology of Native Americans (3) American Indian origins and evolution from standpoint of skeletal remains and morphology and genetics of living populations. Emphasis on North American Indians. Prereq: 2510 or consent of instructor.

4950 Primate Studies (3) Survey of field and laboratory investigations of comparative anatomy and non-human primate behavior. Prereq: 2510 or consent of instructor.

4960 Primate Paleontology (3) Survey of fossil primate forms; origin and evolution of major primate lineages, emphasizing the earliest Hominid and related forms. Prereq: 2510. Recommended: Zoology 4380.

8115 Life Drawing (3) General requirements for the master's and doctoral degrees, as well as the course description, are given in the Graduate Catalog. See Cultural Studies.

Art (140)


Instructor: D. Wilson, M.F.A. California (San Diego).

The Department of Art serves the University both generally and specifically: exhibitions are initiated within the Art and Architecture Building and across campus; students from the various colleges enroll in art courses for personal enrichment and to fulfill requirements; and the Department offers undergraduate and graduate majors in the visual arts.

Art has two aspects: the history of art and the practice of art. Knowledge of the practice of art is required of art history majors, knowledge of art history is required of studio majors.

Studio courses within the Department of Art require 3 hours of class time for each credit hour earned. The Department reserves the right to acquire student studio work.

UNDERGRADUATE

B.F.A. Majors: see page 155.

B.A. Major: Art History: Prerequisites Art 1815, 1825, and 1835 (12 hrs.); art history courses 2000 and above, which may include Greek and Roman art and archaeology (26 hrs.); studio courses 2000 and above (9 hrs.); Philosophy 3910 (4 hrs.); Museology 3811 and 3821 (8 hrs.). Undergraduate work in art history is enhanced by knowledge of at least one foreign language and by studio art experience. Graduate work normally requires reading knowledge of at least two foreign languages, usually German, French, and any other language appropriate to an area of specialization.

Students anticipating possible careers in the museum or gallery field are advised that elective hours in Art 4811 Museum Internship should be considered.

B.A. Minor: Art History—Consists of 24 hours in art history: courses numbered 2000 and above. Art 1815 and 1825 are prerequisites to the minor.

B.A. Major: Art (Concentration in Studio)—Art 1000, 1115, 1125, 1135, 1850, and eight additional hours of art history are prerequisites to a major of 36 hours of courses numbered 2000 and above, including a minimum of 21 hours in upper-division courses.

B. A. Minor: Art (Concentration in Studio) —Art 1115, 1125, 1135, and 1815, 1825, 1850 are prerequisite to a minor of 24 hours which includes a minimum of 8 additional upper-division hours. Concentration may be in Ceramics, Drawing, Fiber-Fabric, Painting-Watercolor, Printmaking, Sculpture or a combination from these areas.

1000 The Visual Artist (2) Lecture course with guest artists for art majors and non-art majors. Role of visual artist. Language of art and design. Materials and processes of art disciplines (painting, sculpture, graphic, craft, photography, and architecture). Major issues and concerns in visual arts and career opportunities. Must be taken freshman year.

1015 Introduction to Studio Art: Various Media (3) Introduction to individual studio media. Individual sections for various artistic disciplines. For non-majors and non-art education majors.

1105 Introduction to Studio Art: Various Media (3) Introduction to individual studio media. Individual sections for various artistic disciplines. For non-majors and non-art education majors. Course may be repeated; medium may not be repeated. Maximum 12 hrs.

1115 Studio Fundamentals (2) Development of observational skills and perception of reality. Fundamental aspects of drawing—line, tone, space, form, and composition. Primarily for art, architecture, interior design, and art education majors.

1125 Studio Fundamentals (2) Surface composition and color. Primarily for art, architecture, interior design, and art education majors.

1135 Studio Fundamentals (2) Real space and volume. Primarily of art, architecture, art education, and interior design and housing majors.

1501 Orientation to Graphic Design/Illustration (2) Lecture/discussion of the field, history, social impact and economics. Prereq: 1115, 1125.

1706 Exploring Art (4) Form and meaning in visual arts. Lecture/discussion. Especially for non-majors.

1815 Western Art I (4) Survey of major monuments in Western art with an emphasis on the art of Europe from prehistory through the Middle Ages.

1825 Western Art II (4) Survey of major monuments in Western art with an emphasis on Europe and American from 1400 to the early 20th century.

1835 Asian Art (4) Art of Central and Southeast Asia, India, China, Korea and Japan from prehistory through the present. Course may be repeated; medium may not be repeated. Maximum 12 credit hours.


2006 Special Topics (2-4) Student or instructor initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 credit hours.

2105 Survey of Drawing (3) Further exploration and refinement of fundamentals of drawing with more emphasis on composition and techniques. Prereq: 1115.

2106 Special Topics in Drawing (3) Student or instructor initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 credit hours.

2115 Life Drawing (3) Further development of drawing and observational skills with special emphasis on structure and human form and the human figure and of the environment. Prereq: 2105. May be repeated. Maximum 6 credit hours.


2205 Introduction to Painting (3) Capacities of oil and acrylic painting on canvas. Prereq: 1115, 1125, 1135 for art majors; none for non-art majors.

2206 Special Topics in Painting (3) Student or instructor initiated course offered at convenience of department to enhance and expand the painting curriculum. Does not substitute for basic program. Hours to be determined by department. May be repeated. Maximum 12 credit hours.

2215 Painting II (3) Techniques of expression in oil and/or acrylic. May be repeated. Maximum credit 8 hours. Prereq: 2205 for art majors, none for non-art majors.

2256 Special Topics in Fiber and Fabrics (3) Student or instructor initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 credit hours.

2260 Fabric; Painting and Dyeing (3) Survey of painting and dyeing processes in the development of surface design on fabric. Includes block, direct painting, and/or other related approaches.

2265 Fiber: Three-Dimensional Non-woven Structures (3) Development of three-dimensional structures through non-woven fiber techniques. Crochet, half-stitch knotting, and/or coiling.


2275 Fiber: Woven Structures (3) The woven structure as a two-dimensional pictorial surface. Tapestry, knotted pile, wrapped weave techniques in the development of imagery, color structures and textual surface.


2285 Fabric: Woven Wall Works (3) Fabrication of woven forms on vertical forms with emphasis on experimental use of fiber media in the development of architecturally scaled wall works.

2295 Introduction to Watercolor (3) Capacities of transparent watercolor. Prereq: 1115, 1125, 1135 for art majors, none for non-art majors.
2617 Screen Printing (3) Creative explorations of a variety of screen printing techniques. May be repeated. Maximum 6 credit hours.

2640 Papermaking Workshop (3) Exploration of papermaking as a medium for two and three-dimensional art. Includes pulp forming, paper casting, pulp dyeing, pulp bleaching, embossing, pulp dyeing, inlaying, casting and other related techniques. Emphasis upon development of a personal style. Prereq: 2640. May be repeated. Maximum 6 credit hours.

2655 Introduction to Metal Design (3) Basic techniques of jewelry and metalsworking. Prereq: 1115, 1125, 1135 for art majors, none for non-art majors. May be repeated. Maximum 6 credit hours.

2665 Metal Design II: Jewelry (3) Additional jewelry and metalsworking techniques including casting, stone-setting, and forming. Prereq: 2665. May be repeated. Maximum 6 credit hours.

2675 Metal Design II: Enameling (3) Exploration of vitreous enamel as individual art form and in combination with other materials. Prereq: 2665. May be repeated. Maximum 6 credit hours.

2706 Special Topics in Art History (4) Student or instructor initiated course offered at convenience of department. Prereq: determined by department. May be repeated. Maximum 12 credit hours.

2725 Black Art (4) Black art history in America. 15th century to contemporary trends. (Same as Afro-American Studies 2725.)

2905 Introduction to Photography (3) Introduction to the art of black and white photography. Field and studio shooting; black and white photography, basic developing and enlarging techniques.

2906 Special Topics in Photography (3) Student or instructor initiated course offered at convenience of department. Prereq: determined by department. May be repeated. Maximum 12 credit hours.

2935 Film Design (3) Introductory theory and practice of film making. Emphasis on graphic elements through use of motion picture camera.

2950 Introduction to Ceramics (3) Exploration of ceramics, Designing and constructing pottery forms using pinch, coil, slab, and wheel techniques. Prereq: 1115-25-35 for art majors, none for non-art majors.

2955 Special Topics in Ceramics (3) Student or instructor initiated course to be offered at convenience of department. Prereq: determined by department. May be repeated. Maximum 12 credit hours.

2970 Ceramics II: Wheel Techniques (3) Prereq: 2950.

3000 Inter-Area Portfolio Review (1) A review of prior work in graphic design and illustration. Successful completion required prior to registration for junior and senior courses. Prereq: consent of department. S/NC only.

3100 Drawing Portfolio Review (1) A review of prior work in drawing. Successful completion required prior to registration for junior and senior courses. Prereq: consent of department. S/NC only.

3115 Drawing III (4) Development of personal drawing techniques and concepts through class problems. May be repeated. Maximum credit 12 hours. Prereq: 2115.

3200 Painting Portfolio Review (1) A review of prior work in painting. Successful completion required prior to registration for junior and senior courses. Prereq: consent of department. S/NC only.

3215 Painting III (4) Individual expression with varied media on canvas. May be repeated. Maximum credit 12 hours. Prereq: 8 hours of credit in 2215 for art majors; consent of instructor for non-art majors.

3270 Fabric: Individual Class Projects (4) Prereq: 8 hours from 3270 or equivalent. Consent of instructor. May be repeated. Maximum 12 hrs.

3300 Watercolor Portfolio Review (1) A review of prior work in watercolor. Successful completion required prior to registration for junior and senior courses. Prereq: consent of department. S/NC only.

3315 Watercolor III (4) Individual expression with varied water-based media on paper. May be repeated. Maximum credit 12 hours. Prereq: 6 hours in 3315 for art majors; consent of instructor for non-art majors.

3400 Sculpture Portfolio Review (1) A review of prior work in sculpture. Successful completion required prior to registration for junior and senior courses. Prereq: consent of instructor. S/NC only.

3405 Sculpture: Intermediate Clay Modeling (4) Further problems in clay and wax modeling and casting. Prereq: 2405 or consent of instructor.

3407 Sculpture: Intermediate Mixed Media (4) Further problems in the sculptural use of two or more distinctive materials. Prereq: 2407 or consent of instructor.

3409 Sculpture: Intermediate Welding and Metal Fabrication (4) Further exploration of casting methods for bronze and aluminum. Prereq: 2409 or consent of instructor.

3415 Advanced Sculpture III (4) Individual projects through discussion with instructor, designed to widen previous experience. Prereq: consent of instructor. May be repeated. Maximum 12 hours.

3416 Sculpture: Advanced Life Modeling (3-4) Advanced modeling techniques in clay and wax, working from figure. Four credit hours includes casting a minimum of one piece. Prereq: 2416 or consent of instructor. May be repeated. Maximum 8 credit hours.

3500 Graphic Design/ Illustration Portfolio Review (1) A review of prior work in graphic design illustration. Successful completion required prior to registration for junior and senior courses. Prereq: 2526 or consent of instructor. S/NC only.

3509 Line Illustration (4) Study of black and white media and techniques as applied to product and editorial illustration. Prereq: 2526.


3517 Airbrush (4) Technique of airbrush. Emphasis on skill and creative applications. May be repeated once for credit. For art majors only.

3519 Half-tone Illustration (4) Continuous tone and limited-color media and techniques as applied to product and editorial illustration. Prereq: 2525.

3525 Visual Communications Concepts (4) Advanced pictorial perception; a broad range of concepts, methods, and techniques for designer/illustrator. Prereq: 3500.

3529 Full Color Illustration (4) Process color media and techniques as applied to product and editorial illustration. Prereq: 2519.

3535 Package Design (4) Study of contemporary concepts and techniques applied to all types of package design and production. Prereq: 3515.

3545 Corporate Design (4) Concepts of corporate graphics. Problems include all areas of graphic design and illustration. Prereq: 3535.

3555 Visual Communications Seminar (2) Political, social, economic, and ethical problems of contemporary designer. Sessions with outside guest speakers and field trips are employed. For Graphic Design/ Illustration majors only. S/NC.

3600 Printmaking Portfolio Review (1) A review of prior work in printmaking. Successful completion required prior to registration for junior and senior courses. Prereq: consent of department. S/NC only.

3615 Intaglio III (4) Color intaglio printing from zinc or cardboard plates. Extra techniques—mezotint, sandpaper, etc. May be repeated. Maximum credit 12 hours.

3616 Lithography III (4) Color lithography from stone or plates. Extra techniques—stone engraving, acid etching, etc.
and resident accommodations. The Arrowmont Gallery presents changing juried, invitational, theme or media oriented exhibitions. The Gallery and Library are open to the public Monday-Saturday, 8:30-4:30 p.m. Arrowmont receives financial support from chapters of the Pi Beta Phi Fraternity, alumni clubs, and individual members. The following courses are continued periodically ONLY at the Pi Beta Phi Arrowmont School of Arts and Crafts, Gatlinburg, Tennessee. Content varies with faculty. Students should check specific course content as printed in the Arrowmont timetable published each spring.

2004 Special Topics (1-4) Student or instructor initiated course offered at convenience of Department. May be repeated.

2104 Drawing (1-4) Beginning to intermediate. May be repeated.

2204 Painting (1-4) Beginning to intermediate. May be repeated.

2254 Ceramic (1-4) Intermediate to advanced. May be repeated.

2904 Special Topics (1-4) Student or instructor initiated course offered at convenience of Department. May be repeated. Maximum 16 credit hours.

3952, 3955. May be repeated. Maximum 16 credit hours.

3960, 3965. May be repeated. Maximum 18 credit hours.

2960 Honors Ceramics IV: Advanced Projects (4-6) Prereq: 2950. May be repeated. Maximum 18 credit hours.

2975 History of Ceramics Seminar (4) A survey of historical and contemporary ceramics, dealing with clay sculpture, architecture, and pottery. Oriental, Ancient Greek, Pre-Columbian, and American ceramics. Will not apply to art history requirements. Prereq: 2950, 2960, and 2970.

PI BETA PHI ARROWMONT SCHOOL OF ARTS AND CRAFTS

Director: S. J. Blain, M.F.A. Wisconsin.

Lecturers, spring/summer 1984:

R. Adams; D. Bailey; P. Baldwin, J. Bassier; W. Bates; E. Bjorklund; B. Bobick; K. Borgeson; T. Carson; N. Crow; R. Dehnert; P. Dufour; E. Eagle; H. Easterwood; D. Ellsworth; C. Evans; F. Fenster; W. Florini; M. Ford; J. Francis; R. George; M. Goldenstein; L. Goldsmith; P. Grayson; J. Hall; S. Hogbin; W. Hylec; E. Iverson; F. Jacobs; E. Kalke; E. Kochansky; L. Koscianski; M. Kotlarz; G. Kraft; S. Kristoferson; C. Kumska; E. Lambert; T. Lang; R. Laskin; R. Law; B. Lee; M. Lenderman; J. & D. Liles; M. Lloyd; R. Lockhart; S. Ludden, T. Malone; P. Maloni; T. & G. Marsh; R. Matsvey; T. & C. McCollery; D. Millard; M. Monroe; J. Myers; D. Nelson; D. Nish; W. Nottingham; J. Osgood; R. Osolnik; J. Oris; N. Putnam; N. Quagliata, Sr.; R. Revor; T. Riesing; B. Roberson; H. Sadow; R. Smiler; D. Smith; S. Stephenson; E. Streetman; J. Troy; F. Woel; K. Woel; C. Yarborough.

Arrowmont, located 40 miles from the UTK campus, is a visual arts complex which functions as a regional and national cultural center. In 1954, Pi Beta Phi Fraternity established an affiliation with The University of Tennessee and with the Department of Art in 1978. The program currently includes spring and summer one and two week media workshops, special weekend conferences, and community classes. Media offerings include: clay, fiber, fabric, metal, wood, stained glass, leather, papemaking, drawing, painting, graphics and photography. Students may receive audit, undergraduate or graduate credit for spring and summer classes through The University of Tennessee, Department of Art. Facilities include well equipped studios, on campus book and supply store, a large auditorium, art library, illustration, painting, printmaking, sculpture, watercolor and inter-area. In addition to meeting the requirements of the Graduate School, applicants must have an undergraduate major in art or outstanding proficiency. Examples of work will be requested. For additional information regarding these programs, write to the head of the department.

The department reserves the right to acquire student studio work.

Consult the Graduate Catalog for listing of graduate level courses.

Asian Studies
See Cultural Studies.

Astronomy
See Physics and Astronomy.

Audiology and Speech Pathology (160)

Professors:
H. L. Luper (Head), Ph.D. Ohio State; S. Adler, Ph.D. Ohio State; C. W. Asp, Ph.D. Ohio State; P. J. Carney, Ph.D. Iowa; D. M. Lipscomb, Ph.D. Washington; I. V. Nabelek, Ph.D. Czech Technical (Prague); H. A. Peterson, Ph.D. Illinois; B. Silverstein, Ph.D. Purdue.

Associate Professors:
S. B. Burchfield, Ph.D. Michigan State; C. G. Maisel, M.Ed. Texas.

Assistant Professors:

Instructors:

UNDERGRADUATE

General Information. The Department of Audiology and Speech Pathology offers course work in the scientific study of human communication sciences and disorders. The two undergraduate majors (audiology and speech pathology) are pre-professional; that is, they are preparatory to graduate work and to professional certification in some aspect of speech, language, and hearing disorders. The master's degree is required for most professional certificates and employment positions. Information about the audiology and speech pathology programs may be obtained from the departmental office, 457 So. Stadium Hall, and students are strongly encouraged to consult with the undergraduate advisors in the department as early as possible in their programs. Suggested electives for non-departmental majors include 3010, 3040, 3050, 3200, 3710, 4070, and 4720.

A B.A. major in speech pathology consists
of Audiology and Speech Pathology 3010, 3040, 3050, 3065, 3200, 3310, 3710, 4040, 4320, 4330, 4450, 4720 plus not less than 9 nor more than 15 hours from the following: 4070, 4310, 4340, 4400, 4610, 4930, 4940. Additional recommended courses for speech pathology majors are: Audiology and Speech Pathology 4520, 4450, 4460, 4470, Audiology 4310; Curriculum and Instruction 3010; Educational Psychology 3100; Psychology 2500, 2520, 2530, 3150, 3550, Special Education 3333, 4030, 4341, 4342, 4610 and Child and Family Studies 4119.

A B.A. major in audiology consists of Audiology and Speech Pathology 3010, 3040, 3050, 3065, 3200, 3310, 3710, 4040, 4320, 4330, 4450, 4720, 4930 plus not less than 6 nor more than 12 hours from the following: 4340, 4460, 4470, 4610, 4650, 4940. Additional recommended courses for audiology majors are: Psychology 2500, 2520, 2540, 3150 and Special Education 3333, 4260, 4281, 4290.

1261 English Pronunciation for Foreign Students (3) (Same as English 1261) F, S.

3010 Basic Acoustics in Speech and Hearing (3) Fundamental aspects of acoustics in speech and hearing including physics of sound. Prereq: Consent of instructor. W, S.

3040 Introduction to Speech Pathology and Audiology (3) Nature, etiology, incidence of speech, hearing, and language disorders. F, S.

3050 Speech Science I: Phonetics (3) Basic phonetics including recognition and production of spoken English sounds with analysis of their formation; acoustic characteristics of speech and speech perception. F, W.

3065 Speech Science II (4) Anatomy and physiology of speech production mechanism. Prereq: 3050. W, S.

3200 Speech and Language Development (4) Speech and language development in the normal child including development of distinctive features and implications of this process for diagnosis of speech and language development. Prereq: Psychology 3850 or Educational Psychology 2430 recommended. F, W.

3310 Articulation Disorders (4) Etiology, diagnosis, and treatment of articulatory defects. Prereq: 3040, 3065, or consent of instructor. (Same as Special Education 3310) F, W.

3710 Audiology I (3) Fundamental aspects of auditory anatomy and physiology. Introduction to disorders of hearing and their remediation. (Same as Special Education 3710) F, W.

4040 Appraisal of Speech and Language Disorders (4) Diagnostic procedures for children and adults with speech and language problems including observation and practice with diagnostic tests. Prereq: 3200, 4343, or consent of instructor. (Same as Special Education 4040) F, S.

4070 Free Association (4) Oral and written free association as process for diagnosing and treating communication disorders. Includes didactic self analysis. W, SU.

4190 Speech Development of the Hearing Impaired (3) Prereq: 3050. (Same as Special Education 4190.)

4200 Practicum in Speech Development of the Hearing Impaired (3) (Same as Special Education 4200.)

4210 Language Development of the Hearing Impaired I (3) (Same as Special Education 4210.)

4220 Language Development of the Hearing Impaired II (3) (Same as Special Education 4220.)

4250 Introduction to the Psychology and Education of the Hearing Impaired (3) (Same as Special Education 4250.)

4310 Stuttering (3) Nature and treatment. Review and integration of various theories. Prereq: 3049 or consent of instructor. (Same as Special Education 4310.) F, SU.

4320 Introduction to Clinical Practice in Speech Pathology (3) Prereq: 3040, 3050, 3310, and consent of instructor. S/NC. (Same as Special Education 4320) E.

4330 Clinical Practice in Speech Pathology (1-9) Prereq: 4320 and consent of instructor. For letter grade only. (Same as Special Education 4330.) E.

4340 Clinical Practice in Speech Pathology (1-9) Prereq: 4330 and consent of instructor. May be repeated for credit. For letter grade only. (Same as Special Education 4340.) E.

4460 Topics in Language Retardation and Its Habilitation (3) Lectures on selected topics by representatives of diverse disciplines in education, early childhood education, educational psychology, genetics, and psychology. Prereq: 4610 or consent of instructor. SU.

4720 Audiology II (4) Basic principles of clinical audiology, pure-tone, speech, masking, and overview of special auditory tests. Prereq 3710. (Same as Special Education 4720.) F, W.

4930 Aural Rehabilitation: Speechreading and Auditory Training (3) Discussion of rehabilitation of acoustically impaired by maximizing use of residual hearing and utilization of speechreading as a receptive communicative process. Prereq: 4720. (Same as Special Education 4930.) F, W, SU.

4940 Introduction to the Verbo-Tonal System (4) Prereq: 3710, 4930 and 3050 recommended. (Same as Special Education 4940.) F, W, SU.

GRADUATE
Consult the Graduate Catalog for listing of graduate level courses.

Bacteriology
See Microbiology.

Biochemistry (188)

Professors: W. D. Wicks, Ph.D. Harvard (Head); J. E. Churchich, Ph.D. Sheffield (England); J. G. Joshi, Ph.D. Poona (India); K. J. Monty, Ph.D. Rochester.

Associate Professors: L. Huang, Chancellor's Research Scholar, Ph.D. Michigan State.

Assistant Professors: F. Fairfield, Ph.D. Stony Brook; R. H. Feinberg, Ph.D. California (Berkeley); E. Freire, Ph.D. Virginia; J. Koonitz, Ph.D. Kentucky.

UNDERGRADUATE
A B.S. major in biochemistry consists of Biology 3110-20, Chemistry 3211-21-31, 3219-29-39, Physics 2210-20-30, Biochemistry 4110-20-30, 4119-29, 4210-20-30, and four hours chosen from: Biochemistry 4500; Botany 3210; Microbiology 3519, 3700, 4140, 4270; Zoology 3050, 3060, 3080, 4210, 4279. Prerequisites to this major are Biology 1210-20-30, Chemistry 1110-20-30, Math 1540-50-60, and Computer Science 1510.

For the Bachelor of Arts degree with a minor in biochemistry, the following courses are required: Chemistry 2140-49, 3211-21-31, 3219-29-33, and Biochemistry 4110-20 and 4119. Additional credits from Biochemistry 4210-20-30 and/or 4500 are desirable.

3110 Introduction to Biochemistry (4) Biochemical principles underlying physiological events in animal tissues. Metabolism of carbohydrate, lipid, protein, and nucleic acids. Biochemistry of body fluids. Action of drugs and hormones. Prereq: Chemistry 1110-20-30 or 1510-20-30 and at least 2 quarters of college level biology sciences. Not available for credit if credit has been previously received for 4110, 4120 or 4130.

4110-20 Cellular and Comparative Biochemistry (4,4) Electrolyte behavior; chemistry and structure of proteins; enzyme behavior and biological function; catabolism and energy capture; synthetic metabolism; nucleic acid function, protein synthesis, and biochemical genetics; regulation of biological processes. Must be taken in sequence. Prereq: Chemistry 3211-21-31, 3219-29-39, and one course from Biology 1210-20-30 or Botany 1110-20. Three lectures and discussion.

4119 Cellular and Comparative Biochemistry Laboratory
2120-20 Introduction to Physical Chemistry (3,3)
4210—Introduction to thermodynamics; phase stability and phase change; chemical potential; osmotic pressure; activity and the Debye-Hückel model; electrophoresis; membrane permeability. 4220—Elementary Statistics; electronic, diffusion, collision theory; chemical kinetics; and transition state theory; higher order kinetics; specialized kinetics of enzymatic processes; some biocatalyst considerations. Prereq: Mathematics 1840-50-60, Chemistry 3211-21-31 and 3219-29-39, and an introductory course in biology.

4320 Introduction to Physical Chemistry (2,2)
Physical characterization of macromolecules; polarized light, absorption and fluorescence, sedimentation and transport hydrodynamics, electrophoretic mobility, light scattering, and structural x-ray crystallography of proteins and nucleic acids. Prereq: 4220 or Chemistry 3430, or equivalent.

4500 Independent Research in Biochemistry (1-6)
Special experimental problems under direction of staff member. Limited to undergraduates and by consent only. May be repeated for credit. Prereq or coreq: 4110-20, 4119.

GRADUATE

Master's and doctoral degree requirements, as well as course listings, are found in the Graduate Catalog. Master's degree candidates usually should offer an undergraduate major in biochemistry, biology, or chemistry. A B.A. degree must present an undergraduate major in biochemistry, biology or chemistry.

Botany (198)
Chairperson of Botany Consortium Board: W. D. Wicks
Co-chairperson: R. W. Holton

A B.A. degree in biology may be obtained by completing one of the three following concentrations:

A. Concentration in Cell Biology. Consists of Biology 3110-20-30, Chemistry 3211-21-31, 3219-29-39, Biochemistry 4110-20, and 12 hours of upper-division courses from: Biochemistry 4119, 4500; Botany, any 3000 or 4000-level courses (except 3050, 3070, 3090); Microbiology 3200, 3700, 3519, 4110-10-20-30, 4270-29, 4420, 4090; Zoology 3050, 3060, 3080, 3150, 3320, 4010, 4050, 4110-20-30, 4250, 4280, 4368, 4380, 4450. In meeting upper-division minimum requirement, not more than 8 hours may be credited for any one biological science department, and not more than 4 hours of research courses may be credited. Prerequisites to this concentration are Biology 1210-20-30 or Botany 1110-20-20, or 1118-28 or Zoology 1118-28 and Chemistry 1110-20-30. Corequisites are a year sequence in Physics (except 1220-30-20), Chemistry 2140-49, and a 3-quarter Math package consisting of Math 1115-15-15-20-20-20-20-20 or 1150-20-20-20-20-20-20-20, plus one of the following: Computer Science 1510, 1610; Math 1600, 3050, 3060, 3861; Plant & Soil Science 3610; or Psychology 3150.

B. Concentration in Organismal and Systems Biology. Consists of Biology 3110, 3120, 3130, Chemistry 3211-21-31, 3219-29-39, and 18 hours of upper-division courses from: Biochemistry 3110, 4110-20, 4119, 4500; Botany, any 3000- or 4000-level courses; Microbiology, any 3000- or 4000-level courses; Zoology, any 3000- or 4000-level courses except 3010-20-30 and 3090. In meeting upper-division minimum requirement, not more than 12 hours may be credited from any one biological science department, and not more than 4 hours of research courses may be credited. Prerequisites to this emphasis are Biology 1210-20-30 or Botany 1110-20 or 1118-28 or Zoology 1118-28-38. 1210-F, W, SU; 1220-W, S, SU; 1230-S, SU.

1225-35 General Botany (5,5) A special version of 1220-30 augmented by guest lecturers, field trips, etc. Enrollment by invitation based on superior performance in The General Botany sequence. In all situations calling for study in General Botany, 1225 may be substituted for 1220 and 1225 for 1230.

3110 General Genetics (4) Classical and modern principles of heredity. Prereq: 1210-20-30 or Botany 1110-20 or equivalent of 2 years of high school biology and satisfactory ACT scores; Chemistry 1110-20-30. 3 hours and an additional class meeting may be taken in any sequence or combination with 3120 and 3130. E.

3120 Cell Biology (4) Organization and function of the cell. Prereq: Same as 3110. 3 hours and 1 additional class meeting may be taken in any sequence or combination with 3110 and 3130. E.

3130 General Ecology (4) Relations between organisms and their environment, including human environmental problems. 3 hours and an additional class meeting. Prereq: Same as 3110. May be taken in any sequence or combination with 3110 and 3120. E.

Encouraged to inquire about access to those invitational courses.

1210-20-30 General Biology (4,4,4) 1210—Biology of cells: chemical basis of life, cell structure and function, energy metabolism, cell division, DNA, RNA, protein synthesis, monera, protista, and fungi. 1220—Biology of plants and animals; survey of plant kingdom, vertebrate and invertebrate animal systems: Biology of plants and animals; survey of plant kingdom, vertebrate and invertebrate animal systems.

1225-35 General Botany (5,5) A special version of 1220-30 augmented by guest lecturers, field trips, etc. Enrollment by invitation based on superior performance in The General Botany sequence. In all situations calling for study in General Botany, 1225 may be substituted for 1220 and 1225 for 1230.

1225-35 General Botany (5,5) A special version of 1220-30 augmented by guest lecturers, field trips, etc. Enrollment by invitation based on superior performance in The General Botany sequence. In all situations calling for study in General Botany, 1225 may be substituted for 1220 and 1225 for 1230.

1225-35 General Botany (5,5) A special version of 1220-30 augmented by guest lecturers, field trips, etc. Enrollment by invitation based on superior performance in The General Botany sequence. In all situations calling for study in General Botany, 1225 may be substituted for 1220 and 1225 for 1230.
to furnish necessary experience in academic and practical skills to prepare graduates for immediate employment in the job market or for continuing graduate education in pure or applied biological sciences.

A B.A. major consists of Biology 3110-20-30; Botany 3010-20-30, 3210, 1 hour from Botany 5110-20-30 or Botany 4000 or 4410-20-30, 4 additional hours of upper-division Botany (not more than 3 hours allowed from Botany 3050-70-90) and 4 hours of upper-division courses from related biological sciences (zoology, microbiology, biochemistry, entomology and plant pathology, forestry, ornamental horticulture and landscape design, plant and soil science, or other with approval of undergraduate coordinator and department head).

Prerequisite: Prerequisites to this major are Botany 1110-20-30 or 1118-28-38 or Biology 1210-20-30 and Chemistry 1110-20-30.

Corequisites: Math 1550-60, 1840-50 or 1841-51; Chemistry 3211-21-31, 3219-29-39; and Physics 1210-20 (or 2210-20), or Geology 1410-20. (See Note.)

Options for Concentrations consists of Organismal Botany, Cellular and Molecular Botany. Concentration requirements will be individualized and must be approved in writing by the undergraduate coordinator. Consult the departmental lists of recommended courses for areas of concentration.

A. Organismal Botany—At least 8 hours beyond the major of 3000-level or above from Botany or related Biological Sciences.

B. Cellular and Molecular Botany—At least 8 hours beyond the major of 3000-level of above from Botany or related Biological Sciences. (Biochemistry 4110-20 is recommended to complete this requirement.)

A minor consists of Biology 3110-20-30, 10 hours of upper-division in Botany (not more than 3 hours from 3050, 3070, 3090) and 4 hours of upper-division courses in related biological sciences (as described under the major). Prerequisites to the minor are Botany 1110-20-30 or 1118-28-38 or Biology 1210-20-30.

Note: Students who anticipate continuing beyond the Bachelor's level into graduate studies in Botany or related sciences should consult a Botany advisor for direction and design of coursework.

1110-20-30 Fundamentals of Botany (4,4,4) Nature and development of plants, including processes, structure, life histories, inheritance, ecology, and importance to man. Enrollment in sequence is desirable. Two 1-hour discussions and approximately 3 hours audio-tutorial laboratory per week. Students may not receive credit for both Botany 1110-20-30 and Biology 1210-20-30. 1110-F, SU; 1120-W, SU; 1130-S.

1118-28-38 Honors: Fundamentals of Botany (4,4,4) Honors course designed for superior students in beginning two-year college. Open for areas of a score of 27 or better on natural science section of ACT; and sophomores who have a cumulative GPA of 3.25 (or 3.5 in the sciences) or who are approved through interview with a member of botany faculty. Students receiving a grade of C or D in 1118 must transfer to 1120. Three 2-hour lecture-lab-discussion periods per week. Must be taken in sequence. Students may not receive credit for both Botany 1118-28-38 and Biology 1210-20-30. F, W, S.

1119-29 Laboratory in Fundamentals of Botany (0,0) A

1119 Laboratory in Selected Topics in General Botany (0) Students must also register for 1130.

3010-20 Plants in Evolution (4,4) Monera to angio-

3011 Plants and People (2) Botany of domesticated food plants from prehistorical times to the present with consideration of their origin, spread and relationship to development of human culture; emphasis on plant problems of hunger. Not open to botany majors.

3030 Field Botany (4) Study of plants in natural environments including plant identification, collection, preservation, and basic ecological concepts. Prereq: 6 hours in botany graduate credit. Not for botany graduate credit. S, SU.

3031-32 Field Botany (4,4) Emphasis on fall and winter flora, respectively. Prereq: 3050. Need not be taken in sequence. F, W.

3050 Socio-Economic Impact of Plants (3) Significance of plants in origin and development of human culture, evolution of cultivated plants, and role of plants in present civilizations. Occasional field trips. Not for botany graduate credit. S, SU.

3070 Genetics and Society (3) An introduction to genetics, anthropology, and evolution with emphasis on their implications for human society. Not for botany graduate credit. (Same as Anthropology 3070). W, A.

3090 Biology and Human Affairs (3) Basic biological principles involved in deterioration and preservation of an environment which humans and their cultures may survive. Not for botany graduate credit. (Same as Zoology 3090). F.

310 Introductory Plant Pathology (4) (Same as Entomology and Plant Pathology 3130.)

3120 Introductory Plant Physiology (4) Organismal physiology of plants: water relations, mineral nutrition, morphogenesis, elements of metabolic processes, effects of age, light, natural rhythms, temperature, and other environmental factors. Lecture and lab. Not for botany graduate credit. Recommended: One year general chemistry and one year biological science. F, S, SU.

3300 Biological Oceanography (3) Distribution of abiotic factors in the sea and their effect on plankton growth; composition of zooplankton and processes affecting each; food webs in the sea; role of hyperproductive regions (estuaries, upwellings). Prereq: Chemistry 1110-20-30 and either Biology 1210-20-30 or Botany 1110-20-30 or Geology 2710. S.

3710-20-30 Junior Seminar (1,1,1) At least 1 hr. is required for a Botany major. Prereq: Junior standing.

4000 Tutorial in Botany (1-3) Individual, independent study under the supervision of staff. By application only. May be repeated with consent of department. Maximum credit 6 hours. E.

4017 Field Mycology (3) Field experience on identification of higher fungi. Frequent field trips emphasizing field recognition of species and habitats. Laboratory sessions for discussion and practice with techniques and literature for accurate identification. Prereq: 6 hours of botany. Recommended: Botany 3010-20. SU, A.

4021 Field Bryology (3) Field experience on identification of mosses and liverworts. Frequent field trips emphasizing field recognition of species and habitats. Laboratory sessions for discussion and practice with techniques and literature for accurate identification. Prereq: 6 hours of botany. Recommended: Botany 3010-20. SU, A.

4045 Aquatic Vascular Plants (3) Field experience on identification of aquatic vascular plants. Frequent field trips emphasizing field recognition of species and habitats. Laboratory sessions for discussion and practice with techniques and literature for accurate identification. Prereq: 6 hours of botany. Recommended: Botany 3010-20.

4050 Synanthropology (3) Field experience on identification of composite. Frequent field trips emphasizing field recognition of species and habitats. Laboratory sessions for discussion and practice with techniques and literature for accurate identification. Prereq: 6 hours of botany. Recommended: Botany 3010-20.


4075 Botanical Photography (3) Emphasis on photograph of natural history subjects and achievement of technical and aesthetic skills and knowledge to produce illustrations for class, seminar, or public lecture. Landscape, habitat, close-up, and small object photography, in color, using 35 mm format exclusively. Limited shared equipment available. Student encouraged to own equipment. Film and processing costs paid by student. Photos processed and critiqued in class. Prereq: 6 hours of botany. Recommended: Botany 3010-20.

4080 Field Pteridology (3) Field experience on identification of ferns and fern allies. Frequent field trips emphasizing field recognition of species and habitats. Laboratory sessions for discussion and practice with techniques and literature for accurate identification. Prereq: 6 hours of botany. Recommended: Botany 3010-20.

4120 Plant Anatomy (4) Comparative structure of vascular plants. Prereq: 3110-20. S.

4240 Paleobotany (4) (Same as Geology 4240.)

4310 Plant Ecology (4) Interactions between individuals, species, communities and their environments. Circulation of energy and matter in ecosystems. Weekly field trips or laboratory periods, and at least two weekend field trips. Prereq: 3030 or equivalent. S.

4410-20-30 Undergraduate Research Participation (2,2,2) Experience in active research projects under supervision of staff members. Prereq: junior or senior standing, minimum grade average 3.0, consent of instructor. E.

4510 Plant Tissue Culture (4) Methods for the culture of cells, tissues, and organs in vitro. Media preparation and maintenance of cultures. Lecture and lab. Prereq: Botany 1110-20 or Biology 1210-20-30 or equivalent. Recommended: Botany 3010-20, 3210, and 4120; Microbiology 3200 or 3700 and 3519; Ornamental Hort. and Landscape Design 3030, and Plant and Soil Science 3120.

4830 Field Measurements in Plant Ecology (3) Practice in the use of field and laboratory instruments for the measurement of environmental factors, plant function and physiological parameters. Data collection will be followed by analysis and interpretation of data. Visits to highly instrumented field sites will be included. Prereq: 3030 or equivalent; 1 year of physics and chemistry recommended. F.
GRADUATE
Consult the Graduate Catalog for listing of graduate level courses.

Chemistry (235)

Professors:
G. Mamantov (Head), Ph.D. Louisiana State; J. E. Bloor, Ph.D. Manchester (England); N. S. Bowman (Emeritus), Ph.D. Princeton; C. A. C. Buehler, Professor of Chemistry, Ohio State; W. E. Bell, Ph.D. Illinois; J. Q. Chambers, Ph.D. Kansas; J. A. Dean (Emeritus), Ph.D. Michigan; F. J. F. Easton, Ph.D. California (Berkeley); W. H. Fletcher (Emeritus), Ph.D. Minnesota; G. W. Kabalka, Ph.D. Purdue; D. C. Kleinleiter, Ph.D. Princeton; M. H. Listzke, Ph.D. Wisconsin; R. M. Magid, Ph.D. Yale; R. M. Pagni, Ph.D. Wisconsin; J. R. Peterson, Ph.D. California (Berkeley); G. K. Schweitzer*1, Ph.D. Illinois; D. A. Shirley (Emeritus), Ph.D. Iowa State; W. T. Smith (Emeritus), Ph.D. Ohio State; W. A. Van Hook, Ph.D. Johns Hopkins; E. L. Werey, Ph.D. Purdue; T. F. Williams*, Ph.D. London (England); J. H. Wood (Emeritus), Ph.D. North Carolina.

Associate Professors:
J. L. Adock, Ph.D. Texas; F. A. Grimm, Ph.D. Cornell; J. M. Harris, Ph.D. Texas (Austin); J. D. Kovac, Ph.D. Yale; C. A. Lane, Ph.D. California (Berkeley); L. J. Magid, Ph.D. Tennessee; F. M. Schell, Ph.D. Indiana; C. Woods, III, Ph.D. North Carolina State.

Assistant Professors:
S. D. Alexandratos, Ph.D. California (Berkeley); C. E. Barnes, Ph.D. Stanford; J. E. Bartmess, Ph.D. Northwestern; K. D. Cook, Ph.D. Wisconsin; C. S. Feigenson, Ph.D. Colorado; M. J. Sepaniak, Ph.D. Iowa State.

*1Alumni Distinguished Service Professor.

UNDERGRADUATE
For information regarding the Bachelor of Science in Chemistry degree and the cooperative program in chemistry, see page 159.

For students wishing to major in chemistry and desiring a more flexible course of study than the B.S. in Chemistry, there are two programs: the B.S./Concentration A and the B.S./Concentration B. These two concentrations are designed for students with different career objectives; this course of study is not appropriate for students intending to become professional chemists. Because of the more flexible requirements in the B.S./Concentration B degree, a student in one of the Chemistry programs will commonly combine it with a second major in one of the biological sciences.

Prerequisites to the major are Chemistry 1110-20-30 and (preferably) 1310-20-30. Chemistry 1325-35, and Mathematics 1840-50. Corequisite to the major are Mathematics 2400-50-60. Corequisite to the major are Chemistry 2140, 2149, 3211-21-31, 3212-29-39, 3410-20-30, 3429, either 4210-19 or 4220-29, 4811-21-31, and 6 hours of additional upper-division work in chemistry (no more than 4 hours of Chemistry 4710 may be applied to this requirement). At least one of these courses must be taken during the 6th hour of upper-division work to be applied to the 6-hour requirement: Biochemistry 4110, 4210-20-30, Geology 4610, Chemical Engineering 3610-20, Metallurgical Engineering 4510, Polymer Engineering 4910-20-30. Appropriate honors courses may be substituted for the specified courses in the major. Although not required, certain courses are highly recommended for students planning careers as chemists:

Mathematics 2860, Computer Science 3150, Chemistry 4310 and 4420, and various offerings by the Department of Chemical, Metallurgical, and Polymer Engineering. Because professional chemists need a reading knowledge of a second foreign language, intermediate level competence should be acquired in German, French, or Russian. The B.S./Concentration B is intended for students who have career objectives in fields other than the above-mentioned careers; this course of study is not appropriate for students intending to become professional chemists. Because of the more flexible requirements in the B.S./Concentration B degree, a student in one of the Chemistry programs will commonly combine it with a second major in one of the biological sciences.

Prerequisites to the major are Chemistry 1110-20-30 or (preferably) 1310-20-30, Chemistry 1325-35, and Mathematics 1840-50 or 1841-51, Mathematics 1860 or 3861 or Computer Science 1510 or 1610. Corequisite to the major are Physics 2210-20-30. The major consists of Chemistry 2140, 2149, 3211-21-31, 3212-29-39, 3410-20-30 and 10 hours of additional upper-division work in chemistry including at least one of the following courses: Chemistry 4210, 4220, 4310, 4510, 4550. (Up to 6 hours of Biochemistry 4110-20-30 may be applied to the 10-hour requirement.)

A minor in chemistry shall consist of the successful completion of 24 hours of chemistry courses numbered 2000 and above including Chemistry 2140-49 (4 hours) and at least one of the following sequences: Chemistry 3211-21-31, 3219-29-39 (12 hours) or Chemistry 3410-20-30 (9 hours) or Chemistry 4910-20-30. Placement in Freshman Sequences: The sequences which meet all requirements of a year of general chemistry and which serve as prerequisite for upper-division courses are 1110-20-30 and 1310-20-30; chemistry majors are strongly encouraged to take the latter sequence and are required to elect 1325-35. The 1510-20-30 sequence has more limited applications; it emphasizes organic and biochemical chemistry and may be used as prerequisite only for 2230 and 3810.

It is possible to move from one sequence to another if permission for substitution is obtained. More flexible, less demanding coursework is intended for the student who finds a need to complete the 1110 series after having completed 1510 may substitute 1510 for 1110 with approval of the chemistry department and may then take 1120 followed by 1130. However, no single quarter of the 1500 sequence may be substituted for 1120 or 1130. Credit may be received for only one of the courses 1110, 1310, or 1510.

In any chemistry course above the freshman level which has Chemistry 1110-20-30 as a prerequisite, 1510-20-30 may be used as a prerequisite with approval of the chemistry department.

Chemistry 1118-28-38 is an honors course designed for the student who has already made considerable progress in science. Class size may be limited to promote faculty-student interaction. Selection is based on ACT scores, high school chemistry grade, and if necessary, performance on a placement examination to be given during the first class meeting. A student receiving a passing grade below B in 1118 will complete the year's work by taking 1120-30 or 1310-20. A student receiving a failing grade below D in 1528 will not be eligible for 1138 and must take 1130 or 1330 to get the full 12 hours of credit.

Beginning students who have had high school chemistry and who have had additional experience (e.g. summer institute study, special research projects, home laboratory) are invited to apply during the summer to the head of the department for permission to take a proficiency examination in one or more quarters of freshman chemistry. If a satisfactory grade is made on the examination, credit will be allowed for the course(s) or course for which the exam was taken.

1110-20-30 General Chemistry (4,4,4) General courses of theoretical and descriptive chemistry. 1110—Modern atomic theory, chemical bonding, stoichiometry, and quantitative treatment of gas laws. 1120—Quantitative aspects of solution chemistry, kinetics, chemical equilibria, and thermochemistry. 1130—Descriptive chemistry of metals, salts, and non-metals; electrochemistry, and introduction to organic and biochemical chemistry. Must be taken in sequence. 3 hours and 1 lab. E.

1118-28-38 Honors: General Chemistry (4,4,4) (See The above) 3 hours and 1 lab. 1118-F; 1128-W; 1138-S.

1310-20-30 General Chemistry (4,4,4) A general chemistry course for chemistry majors. Subject matter similar to Chemistry 1110-20-30. Must be taken in sequence. 3 hours and 1 lab. 1310-F; 1320-W; 1330-S.

1325-35 Chemical Programming (1,1) A course in which the computer is utilized in solving problems encountered in general chemistry. Required of and limited to chemistry majors. 1325-30 or 1330 for 1325; 1130, 1138, or 1330 or 1335.

1410 Chemistry for Nurses (4) Inorganic, organic, and biochemical. 3 hours and 1 lab. F.

1420 Chemistry for Nurses (4) Aromatic compounds and biochemical. Prereq: 1410. 3 hours and 1 lab. W.

1510-20-30 Introductory General, Organic and Biochemistry (4,4,4) Introductory course with emphasis on topics relating to living systems. 1510—Bonding and molecular structure, gas laws, liquid and solid state, solutions, complex ions, electrochemistry, oxidation and reduction, kinetics and equilibria. Introduction to organic chemistry, alkaloids, unsaturated and aromatic hydrocarbons. 1520—Structure and reactions of various organic functional groups. Introductory bio-
chemistry—amino acids and proteins, carbohydrate, lipids, nucleic acids. Must be taken in sequence. 3 hours and 1 lab. F, S.

2140 Analytical Chemistry (3) Principles and practice of quantitative measurements in chemical systems. Acid-base equilibria, oxidation reduction systems, complexometric and spectrophotometric methods. Corresponding lecture (3211-21-31) is coreq for students not having credit for the lecture. 3211-21-F, W, S; 3231-E.

2230 Elements of Organic Chemistry (4) Brief treatment of fundamentals of organic chemistry and associated chemical techniques. Not for credit by chemistry or physics majors or minors. Prereq: Radioactive decay, detection apparatus and techniques, tracer procedures, and safety precautions in appropriate laboratory. May be repeated. Maximum credit 6 hours.

2510 Introduction to Chemical Research (1) Participation in an active research program in analytical, inorganic, organic, or physical chemistry. Students work with researchers to acquire expertise in planning experiments, interpreting results, and formulating hypotheses. Credits may not be applied toward a major or minor in chemistry. Not a substitute or prerequisite for 4710. Coreq or prereq: 2000 or higher level laboratory course in chemistry and permission of instructor. May be repeated. Maximum credit 8 hours.

3211-21-31 Organic Chemistry (3.3,3) Compounds of carbon and their reactions, reaction mechanisms, spectroscopic and other physical properties. Must be taken in sequence. 3211-21-F, 21-30. Corresponding laboratory (3219-29-39) is coreq for students not having credit for the laboratory. 3211-21-F, W, S; 3231-E.

3219-29-39 Organic Chemistry Laboratory (1,1,1) Experiments in organic chemistry. Corresponding lecture (3211-21-31) is coreq for students not having credit for the lecture. 3219-29-F, W, S; 3239-E.

3310 Molecular Basis of Polymers (3) Molecular features of polymers as opposed to small molecules, polymerization reactions, polymer structures, and molecular characterization of polymers. Not for credit by chemistry majors or minors. Prereq: 3221-29-A.


3429-39 Physical Chemistry Laboratory (2.2) Gases, liquids, chemical equilibria, solutions, phase equilibria, reaction kinetics, and electrochemistry. Prereq or coreq: Corresponding courses (3420 and 3430). 1 lab. 3429-W, S; 3439-F, S.

3511-21-31 Principles of Organic Chemistry (3.3,3) Structure and reactivity of aliphatic and aromatic compounds emphasizing reactions of synthetic utility. Use of spectroscopic and physical techniques to elucidate reaction mechanisms. Recommended for chemistry majors and students planning careers in physical or biological sciences. Must be taken in sequence. Prereq: 1110-20-30. Corresponding laboratory: 3219-29-39 or 3219, 3259-39 is a coreq; latter is recommended. 3511-F, W; 3531-S.

3529-39 Organic Chemistry Laboratory (1,1) Experiments on topics discussed in 3211-31. Similar to 3229-39 except designed for students who have need for operating knowledge of various spectroscopic and chemical techniques. Corresponding lecture (3521-31 or 3221-31) is coreq for students not having credit for the lecture. 3529-W, 3539-S.

3810 Radioactivity and Its Applications (3) Radioactive materials in tracer and therapeutic applications. Radioactive decay, detection apparatus and techniques, tracer procedures, and safety precautions in appropriate laboratory. May be repeated. Maximum credit for credit by chemistry or physics majors or minors. Prereq: Math 1550 or equivalent, 1 year of general chemistry.

4000 Topics in the Development of Chemistry (3) The historical development of topics such as: the atomic theory; the chemical industry; the interrelationship of population, energy, and food. Subject matter may vary from year to year. Recommended for advanced undergraduates. Also includes readings from the older original literature (Dalton, Faraday, Kekule) as well as from current journals. Prereq: 3221-39 or 3231-35; advanced approval will include the usual and misuse of evidence, the impact of chemistry on society, how scientists reach conclusions, and the nature of scientific controversy. Written reports will be required. Prereq: senior standing in chemistry.

4110 Physical Chemistry (3) Theoretical aspects of chemical kinetics. Quantum mechanics of atomic and molecular systems. Molecular symmetry, crystal structure, and solid state. Statistical thermodynamics. Prereq: 3430, F, W.

4119 Physical Chemistry Laboratory (2) Solutions, phase equilibria, reaction kinetics and spectroscopy. Coreq: 4110, F, W.

4160-70 Intermediate Physical Chemistry (3,3) Designed for entering graduate students who have had molecular structure to bulk properties of polymers. 4170—Gases and kinetic theory, chemical kinetics, elementary quantum chemistry; and introduction to chemical statistics. 4160-F; 4170-W.

4210 Advanced Analytical Chemistry (3) Chemical separations including chromatography, ion exchange, and solvent extraction; spectrophotometric techniques. Prereq: 2140-49. W.

4219 Advanced Analytical Chemistry Laboratory (2) Experiments on topics discussed in 4210. Coreq: 4210. W.

4220 Advanced Analytical Chemistry (3) Electroanalytical methods of analyses (including potentiometry, coulometry, polarography, and voltammetry); magnetic resonance methods; mass spectrometry; x-ray absorption and fluorescence techniques. Prereq: 2140-49; 3420 or 4920 recommended. S.

4229 Advanced Analytical Chemistry Laboratory (2) Experiments on topics discussed in 4220. Coreq: 4220. S.

4310 Introductory Polymer Chemistry (3) Fundamental principles, stressing the role of chemistry in the interdisciplinary field of polymer science; relations of molecular structure to bulk properties of polymers. Prereq: 3211; Coreq: or Coreq: 4220 or 3420. S.

4420 Physical Inorganic Chemistry (3) Theoretical concepts leading to an understanding of inorganic chemistry; quantum theory of the atom, principles of molecular structure, and elementary nuclear chemistry. Prereq: 3410-20-30. W.

4430 Intermediate Inorganic Chemistry (3) Application of theoretical concepts to inorganic elements, their chemical states, and their reactions. Prereq: 4420. S.

4510 Organic Qualitative Analysis (3) Identification of compounds and mixtures using advanced instrumental techniques as well as classical chemical approaches. Prereq: 3211-39; 3 labs. (Not open to students who have completed 4610.) F.


4610 Advanced Chemical Experimentation (2) Laboratory course in application of modern experimental techniques to solution of chemical problems. Synthesis and characterization of organic and inorganic compounds with emphasis on independent student study using advanced instrumentation. Prereq: 3219-39 or 3231-35; 3430-49; 4220. Students who receive credit for 4510 may not also receive credit for 4510. W.

4840 Chemical Instrumentation (4) Principles of chemical instrumentation; practice in the design and construction of laboratory instruments. 2 hours and 2 labs. Prereq: 2140-49.

4710 Research in Chemistry (2) Open to senior majors with approval of department head. Written report must be submitted to research director at termination of project. May be repeated. Maximum credit 6 hours.

4811-21 Senior Seminar (1,1) Discussion by faculty and students of current research and topics from the recent literature which illustrate the role of chemists and the impact of chemistry in confronting present technological challenges (e.g., energy, environment, medical, and military concerns, etc.) Oral and written reports required. All chemistry majors are encouraged to attend. Prereq: Senior standing in chemistry.

4910-30-35 Biophysical Chemistry (3,3,3) Physicochemical principles with applications to biological systems. Must be taken in sequence. Not open to students having 3410-20-30. 4910—Gases, laws; first, second, and third laws of thermodynamics; equilibrium. 4920—Solution chemistry; electrochemistry; kinetics; nuclear chemistry. 4930—Elementary quantum chemistry; optical and magnetic spectroscopy; light scattering; macromolecular properties. Prereq: 3231-39, Math 1550-60 or equivalent. 4910-F; 4920-W; 4930-S.

4929 Biophysical Chemistry Laboratory (2) Experiments in the physical chemistry of biologically important systems. Coreq. 4920. Not open to students in 3410-20-29-39. S.

GRADUATE

Students majoring in chemistry for the M.S. or Ph.D. degree are required to present as a prerequisite one year each of general, analytical, organic, and physical chemistry with a satisfactory record. Students lacking any of these prerequisites may be admitted with appropriate deficiencies which must be removed without graduate credit.

For students minoring in chemistry, the prerequisite is two years of chemistry including quantitative analysis.

The master's and doctoral degree requirements, as well as course listings, are found in the Graduate Catalog. The department offers specialization in nine areas for the Ph.D.: analytical, energy, environmental, inorganic, organic, physical, theoretical, chemical physics, and polymer science.

Chinese

See Cultural Studies (Asian Studies).

Classics (257)

Professors: H. C. Rutteridge (Head), Ph.D. Ohio State; J. C. Gasell, Ph.D. North Carolina ( Chapel Hill).

Associate Professor: J. E. Shelton, Ph.D. Vanderbilt.

Assistant Professors: C. P. Craig, Ph.D. North Carolina (Chapel Hill); S. D. Martin, Ph.D. Michigan; D. W. Tandy, Ph.D. Yale.

The Classics major consists of two tracks: Greek and Latin. The Classics major concentrating in Greek may take a minor concentration in Latin. The Classics major concentrating in Latin may take a minor concentration in Greek.

Greek

UNDERGRADUATE

A B.A. major concentration in Greek consists of 39 hours distributed as follows: 30 hours of Greek language courses numbered above 2000, and including 6 hours of Classics 4220 (senior seminar): 9 hours
chosen from Classics 2210-20-30, 3310, 3340, 3350, 4101 (maximum of 6 hours with approval of department, History 3121. The student majoring in Classics is strongly encouraged to have as background History 3121 before taking the senior seminar. The student concentrating in Classics is encouraged to begin (or take some advanced work in) Latin.

The Greek minor consists of 24 hours distributed as follows: (a) 18 hours of Greek language courses courses numbered above 2000; (b) 6 hours chosen from Classics 2210-20-30, 3310, 3340, 3350, History 3121. The student minoring in Classics is encouraged to take 3 hours of Classics 4220 (senior seminar).

**1210-20-30 Beginning Greek (3,3,3)** Must be taken in sequence. F, W, S.

**2610 Intermediate Greek: Grammar Review and Selected Readings (3) F.**

**2620 Intermediate Greek: Homer (3) W.**

**2630 Homer: Iliad (4) **

**2640 Intermediate Greek: New Testament (3) Prereq: 2610 or consent of instructor. S.**

**2650 Readings in Hellenistic Greek (4) Reading and discussion in religious and secular literatures of Hellenistic Greek (koine). Prereq: Classics 1210-20-30. May be repeated. Maximum credit 6 hours. (Same as Religious Studies 2650.) A.**

**3010 Plato (3) A.**

**3200 Herodotus (3) A.**

**4020 Aeschylus, Sophocles (3A) **

**4040 Aristophanes (3) A.**

**4050-60-70 Directed Readings in Greek (3,3,3) F, W, S.**

### Latin

**UNDERGRADUATE**

A B. A. major concentration in Latin consists of 38 hours distributed as follows: 30 hours of Latin language courses numbered above 2000, and including 6 hours of Classics 4220 (senior seminar) 9 hours chosen from Classics 2210-20-30, 3310, 3340, 3350, 4101 (maximum of 6 hours with approval of the department). History 3121. The student majoring in Classics is strongly encouraged to have as background History 3121 before taking the senior seminar. The student concentrating in Latin is encouraged to begin the study of Greek.

The Latin minor consists of 24 hours distributed as follows: a) 18 hours of Latin language courses courses numbered above 2000; b) 6 hours chosen from Classics 2210-20-30, 3310, 3340, 3350, History 3121. The student minoring in Classics is encouraged to take 3 hours of Classics 4220 (senior seminar).

**Placement Examination:** Students who transfer to UTK from other colleges and students who enter with high school units in Latin should register for the courses in which they would normally be placed on the basis of such credits. During the first week of the quarter a placement test will be given, and students will be advised if a change in registration is indicated by the results.

**Proficiency Examinations:** Students who have acquired a knowledge of Latin through private study or tutoring should request a proficiency test. A student who earns a grade of B or better in this examination is eligible for credit toward graduation. A student who omits any course in a sequence may receive credit for it by passing the appropriate proficiency examination.

**Certification for Teaching Latin in Tennessee:** Consult Certification Clerk, Room 212, Clayton Education Building.

**1110-20-30 Beginning Latin (3,3,3) Must be taken in sequence.** 1110-F, W, 1120-W, S; 1130-S.

**2511 Intermediate Latin: Grammar Review and Prose Reading (3) Prereq: Students who have had at least two years of high school Latin, or equivalent. F.**

**2515 Intermediate Latin: Prose Readings (3) Prereq: Classics 2511 or demonstration of proficiency at that level. W.**

**2521 Intermediate Latin: Vergil's Aeneid (3) Prereq: Three years of high school Latin (without Vergil) or Classics 2515 (or demonstration of proficiency at that level.) S.**

**3140 Cicero (3) Prereq: 3 or 4 years of high school Latin or 2521. F.**

**3150 Plautus and Terence (3) Prereq: 3 or 4 years of high school Latin or 2521. S.**

**3160 Catullus and Horace (3) **

**1120 Horace, Satires and Epistles (3) A.**

**1410 Cicero and Techniques of Latin Prose Composition (4) Recommended for Latin majors and minors, especially those intending to teach or pursue graduate work. Works of Cicero studied as models for prose composition. A.**

**4100 Selected Readings from Latin Literature (3) A.**

**4230-30 Selected Readings from Latin Literature (3,3) May be repeated for credit. A.**

**4540 Horace, Odes (3) A.**

**4550 Tacitus (3) A.**

**4560 Lucretius (3) A.**

**4570 Readings in Medieval Latin (3) A.**

**GRADUATE**

Consult the Graduate Catalog for a listing of graduate level courses.

### GENERAL COURSES

**2210 Early Greek Mythology (3)** Comprehensive study of Greek myths with an emphasis on how they reflect the ancient Greek vision of the universe and man's place in it. Origins and development of Greek myths with an emphasis on how they reflect the ancient Greek vision of the universe and man's place in it. May be repeated for credit. A.

**2220 Greek Mythology in the Classical Period (3)** The use of myth in literature, history, religion, philosophy and art of Greece from about 500 B.C. to the death of Alexander the Great, with emphasis on new myths and new uses for old myths that reflect the proud confidence of the Classical Greeks.

**2230 Roman Mythology (3) Myths created by the Romans; the gods of the state and the gods of the home. Contributions of Rome in the first century B.C. to the Roman perception of man's relationship to divinity. Mays of Roman gods, and the concurrent rise of organized religion. The symbolic use in later cultures of Greek myth figures and events will be a persistent emphasis. In time the course goes from Bronze Age to about 500 B.C.**

**2250 Greek Mythology in the Classical Period (3)** The use of myth in literature, history, religion, philosophy, and art of Greece from about 500 B.C. to the death of Alexander the Great, with emphasis on new myths and new uses for old myths that reflect the proud confidence of the Classical Greeks.

**2260 Greek Mythology in the Classical Period (3)** The use of myth in literature, history, religion, philosophy, and art of Greece from about 500 B.C. to the death of Alexander the Great, with emphasis on new myths and new uses for old myths that reflect the proud confidence of the Classical Greeks.

**2270 Greek Mythology in the Classical Period (3)** The use of myth in literature, history, religion, philosophy, and art of Greece from about 500 B.C. to the death of Alexander the Great, with emphasis on new myths and new uses for old myths that reflect the proud confidence of the Classical Greeks.

**4101 Foreign Study (1-16) See page 159. E.**

**4230 Seminar in Classical Studies (3) Intended to conclude the Classics major, the course surveys the field of Classical studies today. Recent achievements in the areas of both philology and archaeology; the impact of the decipherment of Linear B: new understandings of the culture and politics of the "golden age" of Pericles and Augustus; Classical studies and the academic profession on both the high school and college levels. May be repeated. Maximum 6 hours. A.**

**4410 Special Topics in Classical Civilization (1-3) Topics of special interest not included in regular courses. May be repeated up to three times with consent of department.**

**4510 Selected Readings in Latin Literature in Translation (3) Content varies; may be repeated for credit with consent of department. A.**

**4610 Studies in Classical Archaeology (3) Variable content course offering subject matter not taught in an existing course, or concentrating on one aspect of the major. May be repeated for credit for a maximum of 9 hours. Prerequisites according to topic. A.**

**4620 Roman Law (3) Development of Roman law by the jurists; relationship of Roman law to Roman economic and social history of Roman law to American jurisprudence. Case-book format.**
etal alternatives. This must be done as soon as the student and wish to progress to the major or minor department. Students who have completed lower-division courses specified by the department will be given warning. If after one more quarter's grades have been received the student's computer science average has not risen to 2.5, the student will not be allowed to graduate with a major in Computer Science. A student who desires to be readmitted to the major after being withdrawn as described above must attain an average in computer science courses (computed as described above) of at least 2.7.

The policy applies to all computer science courses taken during or after Winter Quarter, 1982. This policy will be enforced by the Department of Computer Science. This policy will not change a present method of recording grades and grade point averages on the student's permanent academic record maintained in the records office.

Introductory and Service Courses

1410 Introduction to Business Oriented Programming (3) Computer science courses as tools in the business environment with emphasis on learning FORTRAN programming. Not for Computer Science majors; students may not receive credit for both 1410 and 1510. Intended primarily for students in College of Business Administration.

1510 Introduction to Programming—FORTRAN (3) The computer as a tool of varied uses in modern world: emphasis on basic programming in FORTRAN. Problem-solving process; organization and characteristics of digital computers.

Survey of applications of computers in various disciplines. Students may not receive credit for both 1410 and 1510.


2215 Discrete Structures I (3) Introduction to discrete structures useful in computer science. Sets, set logic, Relations, functions. Proof techniques, induction, logic. Graphical representations and algorithms. Prereq: 1620 and Math 1850. (Same as Math 2215.)

2510 Programming Techniques (3) Problem formulation and solution. External devices and direct access input and output. For students who have programming background in a higher level language. Prereq: 1610-20.

2710 Machine Organization (3) Elementary computer architecture. Introduction to machine assembly language programming, representation of data, microprogramming. Prereq: one course in computer programming.

3025 Computers and Society (3) History of computing and computer systems; capabilities of a computer: applications in artificial intelligence, humanities, social sciences, sciences and engineering; computing in foreign countries; office automation; future advances in computing; careers in computing. Prereq: Consent of instructor. (Same as Sociology 3025.)

3150 Introduction to Numerical Algorithms and Programming (3) Roots of equations, systems of linear equations, least-squares data fitting, numerical integration, numerical methods for ordinary differential equations. Introduction to programming in FORTRAN. 3150 and 3155 may not both be taken for credit; students with a knowledge of FORTRAN should take 3155. Prereq or coreq: Math 2860. (Same as Math 3150.)

3410 Computer Programming—COBOL (3) Computer programming in business-oriented language COBOL. Prereq: one course in computer programming.

3910 Commercial Computer Concepts and Control (3) Elements, operation and control of computer in a business environment. Topics include input, storage, data manipulation, output, flowcharting, and error control. Prereq: 3410 and Accounting 3210.

4310 Statistical Data Processing (3) FORTRAN language for organization and analysis of scientific data. Statistical analysis such as frequency distributions, percentiles, data reduction correlation and regression, analysis of variance. Not for credit for computer science majors. Prereq: Statistics 2101 or equivalent.

4330 Independent Study in Computer Science (1-3) Special project in area of student's primary interest. To be directed by computer science faculty, perhaps jointly with a faculty advisor. Prereq: Consent of instructor. May be repeated. Maximum credit hours.

Intermediate and Advanced Courses

3155 Introduction to Numerical Algorithms (3) Roots of equations, systems of linear equations, least-squares data fitting, numerical integration, numerical methods for ordinary differential equations. 3150 and 3155 may not both be taken for credit; students with no knowledge of FORTRAN should take 3150. Prereq: 1510 or 1610 or consent of instructor. Prereq or coreq: Math 2860. (Same as Math 3155.)

3180 Logic Design of Digital Systems (3) Introduction to Boolean algebra and design of combinational circuits. Presents gate and flipflop characteristics. Design of clocked sequential circuits and other systems containing memory. Introduction to minicomputer architecture and system components to include basic structure and languages and application. Students may not receive credit for both 3180 and 3185.

3215 Discrete Structures II (3) Continuation of CS/M 2215. Partially ordered sets, lattices, Boolean algebra, Propositional and predicate calculus. Trees and operators on trees. Prereq or coreq: Math 2215 or any 3000 level math course. Prereq: 2215. (Same as Math 3215.)


4233 Numerical Solution to Equations and Numerical Approximations (3) (Same as Math 4225.)

4235 Numerical Methods for Ordinary Differential Equations (3) (Same as Math 4235.)

4245 Numerical Linear Algebra (3) (Same as Math 4245.)

4470 Programming Languages (4) Comparison and analysis of programming languages, design, fea-
Graduate recommendation of Comp. Sci. staff.

4910 Analysis and Management of Computer Installation
4980 Special Topics in Computer Science (1-4) Maximum credit 9 hours with consent of department. Prereq: 3520 or equivalent.

4950 Systems Programming (3) Advanced practice in systems programming. Topics include multitasking, overlays, VM, V O, virtual machine, and design of devices. Prereq: 4980 or consent of the instructor. Prereq: 4510.

5200 Computer Architecture (3) Development of computer architecture; design of computer systems; implementation, justification, personnel in systems; perspective on systems. Prereq: 3520 or equivalent.

5800 Special Topics in Computer Science (1-4) Maximum credit 9 hours with consent of department. Prereq: 4510 or consent of Comp. Sci. staff.

Consult the Graduate Catalog for listing of graduate level courses.

Cultural Studies

Director: Dr. Charles O. Jackson

Basic Faculty:

P. Barrette, Ph.D. Romance Languages
L. J. Champion, Ph.D. Special Problems; R. Copeland, Ph.D. Special Problems; B. D. English; D. M. Fene, Ph.D. Russian; C. Fleming, Ph.D. Special Problems; H. W. Gwynne, Ph.D. Special Problems; J. H. Hodges, Ph.D. Special Problems; W. L. Humphreys, Ph.D. Religious Studies; C. O. Jackson, Ph.D. History; I. Levy, Ph.D. Special Problems; C. J. Maland, Ph.D. English; D. M. Morrow, M.A. Special Problems; M. L. Osborne, Ph.D. Philosophy; M. E. Peck, M.A. Special Problems; H. C. Rutledge, Ph.D. Classics; S. E. Wallace, Ph.D. Sociology.

The ideal curriculum encourages not only proficiency in a given field of knowledge but also the comprehension of similarity and complementarity between areas of intellectual endeavor. One answer to the need for fusion and integration of knowledge is the interdisciplinary program. The college has joined the resources of several departments to offer a cultural studies major with concentrations in Afro-American Studies, American studies, Ancient Mediterranean Civilizations, Asian studies, comparative literature, Latin American studies, linguistics, Medieval studies, Russian and East European studies, and urban studies. Minors are provided in Afro-American Studies, Asian studies, comparative literature, Latin American studies, linguistics, Medieval studies, urban studies, and women's studies.

Afro-American Studies (022)

The Afro-American Studies Program (AAS) offers both a concentration and a minor under the general Cultural Studies Program of which AAS is a part. Courses in the Program are located in several colleges and numerous departments as well as those offered by the AAS Program. The requirements are: Concentration: Afro-American Studies 2010-2020 plus 4103 and 4105 are required courses for B.A. majors. In addition to courses offered by AAS Program, courses from at least two other departments must be included in the 36 hours required for a major, 24 of which must represent upper-division hours.

Minor: Afro-American Studies 2010-2020 are required courses, with 16 additional hours at the upper-division level needed to complete the requirements for a minor. The 24 hours must be selected from the AAS Program and at least two other departments.

For further information consult the chairperson of the Afro-American Studies Committee, Mr. Marvin Peek.

Afro-American Studies (022)

1510-20 Elementary Swahili (4,4) Taped language program. Must be taken in sequence.

2725 Black Art (Art 2725)

2930 The Biology of Human Races (3) Same as Anthropology 2930.

3140-50-60 Directed Readings in Afro-American Studies (1,1,1) Designed for students who are interested in doing intensive reading in some area of Black studies which is defined by the student and the instructor. Prereq: 2010 (or 2020) and consent of instructor.

3330 Prejudice and Racism in the United States (4) (Same as Sociology 3330)

3340 Sociology of Poverty and Inequality (4) (Same as Sociology 3340)

3490 African Religions (4) (Same as Religious Studies and Anthropology 3490)

3530 Peoples and Cultures of Africa (3) (Same as Anthropology 3530)

3550 Religion and Racism in America (4) (Same as Religious Studies 3550)

3555 Minority Group Politics in the United States (4) (Same as Political Science 3555)

3560 Afro-American Anthropology (3) (Same as Anthropology 3575)

3565 Afro-American Psychology (3) (Same as Anthropology 3575)

3575 Afro-American Anthropology (3) (Same as Anthropology 3575)

3615-16 Black Africa: The Politics of Change and Stability (4,4) (Same as Political Science 3640)

3640 Contemporary Issues in Afro-American Education (4) Issues in Afro-American Education from 1954 to the present. (Same as Educ. C&I 3640)

3710 The Black Male in America (4) This course will look at the Black male with regards to historical images, myths and stereotypes; and the impact of Black feminism, violence, crime, masculinity, the family, the white male and female, homosexuality, nationalism, and athletics will be discussed.

3760 Studies in Afro-American Art (4,4) Same as Art 3760.

3830 Geography of Africa (4) (Same as Geography 3830)

3950 African History Since 1940 (3) (Same as History 3950)

3951 African History Since 1940 (3) (Same as History 3951)

4101 Foreign Study (1-16) See page 161.

4102 Off-Campus Study (1-16) See page 161.

4103 Independent Study (1-16) See page 161.


4292 History and Philosophy of Afro-American Education (4) Examines the attempt by Afro-Americans to secure an education for themselves and their children from the era of slavery to the Supreme Court decision of 1954. Focuses on Black perceptions of the importance of education and the special obstacles confronting blacks who tried to get an education. (Same as Educ. C&I 4292 and History 4292)

4310 Research in Afro-American Studies (4) Deals with Black experience and research process.

4500 Current Issues and Topics in Afro-American Studies (3-4) Problems, topics, and issues in area of Black Studies. Consent and credit determined by instructor. May be repeated. Maximum credit 12 hours.

4610 African Prehistory (3) (Same as Anthropology 4610)

4810 Afro-American Families (3) (Same as Child and Family Studies 4810)

4830 Afro-American Women in American Society (4) Historical and contemporary socio-economic-political factors in American society as they relate to the Black woman. History 1950-60 recommended. Prereq: Consent of instructor. (Same as Women's Studies 4830)

4880 Afro-American Psychology (3) (Same as Psychology 4880)
Approved Area Courses

Anthropology 3350 Peoples and Cultures of Africa (3)
Anthropology 3930 Biology of the Races of Man (3)
Art 2725 Black Art (4)

CFS 4310 The Afro-American Family (3)

English 2540 The Literature of Black America (4)
English 4610-20-30 Black Literature (3,3,3)

Geography 3830 Geography of Africa (3)

History 1950-60 Afro-American History; An Introduction (4,4)

History 2950 Introduction to Afro-American History (3)

Music 3350 Introduction to Afro-American Music (4)

Music 4370 Evolution of Jazz (3)

Political Science 3615-16 Black Africa: The Politics of Change and Stability (4,4)

Political Science 3555 Minority Group Politics in the U.S. (4)

Psychology 4880 Afro-American Psychology (4)

Religious Studies 3550 Religion and Racism in America (4)

Religious Studies 3550 Black Religion in America (4)

Sociology 3330 Race, Class, and Power (4)

Sociology 3340 Sociology of Poverty and Inequality (4)

Sociology 4820 American Minority Ethnic Groups (4) Recommendations for the concentration and the minor:
(a) Those with a concentration in Afro-American Studies are encouraged to take a second major, with which an individually designed program in Afro-American Studies can be correlated.
(b) Students should seek academic advising from the Chairperson of Afro-American Studies program for courses for the concentration or the minor which relate to career plans, preparation for graduate study, and relationship to the second major.
(c) Those with a concentration and a minor are strongly encouraged to combine classroom and experiential learning through a careful selection of courses, e.g. Afro-American Families 4810 and/or Afro-American Studies 4102.

American Studies (145)

The American Studies concentration consists of 40 credit hours from the upper-division courses of Asian Studies and approved departmental offerings. 20 of the hours must be taken from courses listed within one of the four geographical-cultural areas (Islamic World; South Asia; China; Japan), and no more than 12 of those 20 hours can come from one sub-division. Sub-division A includes: Art, Asian Cultures, Literature, Music, Philosophy, and Religious Studies; Sub-division B includes: Anthropology, Economics, Geography, History, Political Science, and Sociology. Two of the Asian Studies culture courses (Asian Studies 3310-20-30-40) must be taken as part of the concentration. Prerequisite to the concentration is Asian Studies 2510-20. Corequisite to the concentration is competence in a major Asian language of the area of concentration (at the level attained by successful completion of the intermediate level sequence of that language or by demonstration of the equivalent competence.)

The American Studies minor consists of Asian Studies 2510-20 and 16 credit hours taken from courses listed within one of the four geographical-cultural areas.

For further information consult the chairperson of the American Studies Committee, Dr. Charleste Jackson.

3010 Introduction to American Culture (3) Explores dynamics and nature of contemporary American culture.

3233-34 Forms of Popular Literature and Culture (3,3) (Same as English 3233-34).

3445 Film and American Culture (3) Examines American film as both works of art and social documents. By placing a sequence of films in their historical context and analyzing the explicit or implicit cultural values, students explore the relationship between the medium of film and American culture in the twentieth century. (Same as English 3445.)

4010 Topics in American Culture (3) Content varies. May be repeated once.

Asian Studies (145)

The Asian Studies concentration consists of 40 credit hours from the upper-division courses of Asian Studies and approved departmental offerings. 20 of the hours must be taken from courses listed within one of the four geographical-cultural areas (Islamic World; South Asia; China; Japan), and no more than 12 of those 20 hours can come from one sub-division. Sub-division A includes: Art, Asian Cultures, Literature, Music, Philosophy, and Religious Studies; Sub-division B includes: Anthropology, Economics, Geography, History, Political Science, and Sociology. Two of the Asian Studies culture courses (Asian Studies 3310-20-30-40) must be taken as part of the concentration. Prerequisite to the concentration is Asian Studies 2510-20. Corequisite to the concentration is competence in a major Asian language of the area of concentration (at the level attained by successful completion of the intermediate level sequence of that language or by demonstration of the equivalent competence.)

The Asian Studies minor consists of Asian Studies 2510-20 and 16 credit hours taken from courses listed within one of the four geographical-cultural areas.

For further information consult the chairperson of the Asian Studies Committee, Dr. Yen-ping Hao.

2431-32-33 Elementary Modern Standard Arabic I, II, III (5,5,5) Five class meetings a week and 2 hours of lab exercises per week. Prereq: 2431-32-33 or equivalent or consent of instructor. Must be taken in sequence.

3340 Islamic Culture (4)

3431-32-33 Intermediate Modern Standard Arabic I, II, III (5,5,5) Five class meetings a week and 2 hours of lab exercises per week. Prereq: 2431-32-33 or equivalent or consent of instructor. Must be taken in sequence.

3531-32-33 Intermediate Chinese (5,5,5) Five class meetings a week. Prereq: 2531-32-33 or equivalent or consent of instructor. Must be taken in sequence.

3560-60 Chinese Literature in Translation (4,4) A two-quarter introduction to the major genres of Chinese literature. 3550 presents masterpiece of classical prose and poetry (approx. 1200 A.D.); 3560 concentrates vernacular fiction and drama literature of dynasties and includes an introduction to twentieth century Chinese literature.

3610 The Literatures of India in English Translation (4) A survey of some of the major genres and masterpieces of Indian literature—epic poetry, drama, court poetry, modern novel. Major concentration is on the ancient and classical periods of Indian literary history.

3631-32-33 Intermediate Japanese (5,5,5) Five class meetings a week and 2 hours of lab exercises per week. Prereq: 2631-32-33 or equivalent or consent of instructor. Must be taken in sequence.

3650-55-60 Japanese Literature in English Translation (4,4) Five quarter introduction to the major genres of Japanese literature, based on chronological development, that present the masterpieces of classical and modern literature of Japan from the early court and military aristocracies (approx. 400 A.D. to 1300 A.D.), the masterpieces of traditional literature of Japan of the feudal ages (approx. 1300 A.D. to 1900 A.D.), and the masterpieces of modern Japanese literature of the twentieth century.

3670 Islamic Literature in English Translation (4) Survey from origins to modern period of Major Islamic literatures, especially Arabic, Persian, and Turkish. Prereq: 2431-32-33 or consent of instructor. Must be taken in sequence.

3731-32-33 Intermediate Persian (4,4,4) Taped language program. Prereq: 2731-32-33 or equivalent or consent of instructor. Must be taken in sequence.

3831-32-33 Intermediate Modern Hebrew (4,4,4) Taped language program. Prereq: 2831-32-33 or equivalent or consent of instructor. Must be taken in sequence.

4000 Common Seminar (4) Interdisciplinary seminar conducted by members of the Asian Studies Committee for students in the concentration. Relationship of Asian values to Western scholarship.

4010-20-30 Readings in Asian Literature (4,4,4) Prereq: Elementary intermediate Modern Standard Arabic, Modern Chinese, Modern Japanese, or consent of instructor.

4012 Selected Topics in Asian Studies (4) Content varies. May be repeated. Maximum credit 12 hours.


4434-35 Spoken Lebanese/Palestinian Arabic I, II (4,4) Aural-oral introduction to a central dialect of the Arabic-speaking world. Prereq: Asian Studies 2431-32-33 or consent of instructor.

4543-44 Advanced Arabic I (4,4) Class will include conversation, drill, and composition practice with native speaker. Must be taken in sequence. Prereq: 3631-32-33 or equivalent.

Asian Language and Literature

ARABIC (127)

4131-32 Spoken Arabic I, II (4,4)

2431-32-33 Elementary Modern Standard Arabic (4,4,4)
Asian Studies

Art, Asian Cultures, Literature, and Music

Religious Studies

SANSKRIT (895)

PERSIAN (744)

taken in sequence. Prereq: Asian Studies (iii, 5,5,5) Must be taken in sequence.

Asian Studies

II, III (5,5,5) Prereq: Intermediate Modern Hebrew (ii, III (4,4,4) Taped language program. Must be taken in sequence.

HEBREW (458)

Intermediate Modern Hebrew (ii, III (4,4,4) Taped language program. Must be taken in sequence.

Asian Studies

Intermediate Modern Hebrew (ii, III (4,4,4) Taped language program. Prereq: 2531-32-33 or equivalent or consent of instructor. Must be taken in sequence.

JAPANESE (589)

Asian Studies

Intermediate Japanese I, II, III (5,5,5) Must be taken in sequence.

Asian Studies

Intermediate Japanese I, II, III (5,5,5) Prereq: 2531-32-33 or equivalent or consent of instructor. Must be taken in sequence.

Intermediate Modern Hebrew II, III (4,4,4) Taped language program. Prereq: 2731-32-33 or equivalent or consent of instructor. Must be taken in sequence.

PERSIAN (744)

Asian Studies

Intermediate Persian II, III (4,4,4) Taped language program. Must be taken in sequence.

Asian Studies

Intermediate Persian II, III (4,4,4) Taped language program. Prereq: 2731-32-33 or equivalent or consent of instructor. Must be taken in sequence.

SANSKRIT (895)

4740-50-60 Elementary Sanskrit (4,4,4) (Same as Religious Studies 4940-50-60).

4770-80-90 Intermediate Sanskrit (4,4,4) (Same as Religious Studies 4770-80-90).

Approved Area Courses

(a) Art, Asian Cultures, Literature, and Music

Art 3775 Art of Indian Asia (4)
Art 3776 Chinese Art (4)
Art 3777 Japanese Art (4)

Asian Studies

3310 Indian Culture (4)
3320 Chinese Culture (4)
3330 Japanese Culture (4)
3340 Islamic Culture (4)
3550-60 Chinese Literature in Translation (4,4)
3610 The Literature of India in English Translation (4)

Asian Studies

3650-55-60 Japanese Literature in English Translation (4,4,4)
3670 Islamic Literature in English Translation (4)

Asian Studies

4010-20-30 Readings in Asian Literature (4,4,4)

Music 4260 Introduction to Ethnomusicology (3)

Geography 3870 Geography of Asia (4)

History 3780-90 History of the Middle East (3,3)
History 3795 Contemporary Middle East (4)

History 3800 North Africa since 1830 (3)
History 3810-20-30 History of East Asia (3,3,3)

History 4791 Modernization of the Middle East (3)
History 4792 Historical Writers in Islamic History (3)

History 4811-21 History of Japan (4,4)

History 4870 Cultural History of China (3)

History 4880 History of Modern China (3)

History 4890 History of Contemporary China (3)

Political Science 3621 Contemporary China and Japan (4,4)

Political Science 3641 Government and Politics of Middle East and North Africa (4)

Political Science 3795 Contemporary Middle East (4)

Anthropology, Philosophy, Religious Studies, and Sociology

Philosophy 3650 Philosophy and Religion in India (4)

Philosophy 3660 Buddhist Philosophy and Religion (4)

Philosophy 3671 Religion and Philosophy in China (4)

Religious Studies 3650 Philosophy and Religion in India (4)

Religious Studies 3660 Buddhist Philosophy and Religion (4)

Religious Studies 3671 Religion and Philosophy in India (4)

Religious Studies 3672 Religion and Society in Japan (4)

Religious Studies 3680 Islam (4)

Religious Studies 3750 Eastern Religions and Western Thought (3)

Religious Studies 3770 Zen Buddhism (3)

Religious Studies 4670 Topics in Eastern Religions (4)

Religious Studies 4960 Traditions, Change and Modernity in Asia (4)

Sociology 3672 Religion and Society in Japan (4)

Cinema Studies

Minor: Consists of English 2690 and Art 2935 plus sixteen additional hours of approved area courses. It is strongly recommended that English 2690 and Art 2935 be taken before selection of electives provided for in the minor.

For further information consult the chairperson of the Cinema Studies Committee, Dr. Charles Maland, English Department. Other related courses in such departments as history, philosophy or sociology may be approved through consultation with Dr. Maland and petition.

Approved Area Courses

Art 3935 Film Design (4)

Broadcasting 3670 TV Film News (3)

Broadcasting 4030-40 Television Production (3,3)

Comparative Literature 4032 Topics in Film and Literature (3)

English 3440 Literature and Film (3)

English 3445 Film and American Culture (3)

English 4090 Topics in Film Study (3)

Comparative Literature (260)

A concentration in comparative literature consists of 39 hours including Comparative Literature 4010, 4012-22-32, 9 hours of literature in a foreign language in courses numbered 3000 and above, and Classics 4510. The remaining 12 hours should include literature courses, either in English or in a foreign language, numbered 3000 and above, from at least two of the following departments: English, Germanic and Slavic Languages, Religious Studies, Romance Languages (certain courses in Philosophy and Speech and Theatre may be substituted with the approval of the chairperson of the Comparative Literature Program). Students concentrating in comparative literature are strongly encouraged to acquire a working knowledge of a second foreign language, especially if they hope to pursue comparative literature on the graduate level.

A minor in comparative literature consists of 24 hours including Comparative Literature 4010, two courses from Comparative Literature 4012-22-32, 6 hours of literature in a foreign language in courses numbered 3000 and above, and 9 hours of literature courses numbered 3000 and above, either in English or in a foreign language, from at least two of the following departments: Classics (4510), English, Germanic and Slavic Languages, Religious Studies, and Romance Languages (certain courses in Philosophy or Speech and Theatre may be substituted with the approval of the chairperson of the Comparative Literature Program). Minors in comparative literature are strongly encouraged to continue their study of a foreign language beyond the minimum requirement.

For further information, consult the chairperson of the Comparative Literature Committee, Dr. Harry C. Rutledge.

2010 Introduction to Comparative Literature (4) Basic knowledge, techniques, and sources necessary to compare literatures of various cultures, ages, and nations.

2010 Computer Techniques for Literary Study (3) Introduces students to the growing field of computer research in literary study. Students will learn to write programs in BASIC which have literary research applications. Students will study the components of a literature study for which a computer is a useful tool. Projects include the following: indexing and bibliography, concordances, syntactic analysis, content analysis, authorship attribution, textual editing, and stylistic analysis. No previous computer knowledge or background is assumed or required.

3236-37 Special Themes in Literature (3,3) (Same as English 3236-37).
5012 Comparative Theories of Literature (3)
Research and writing of comparative literary studies. Major project will be preparation of seminar paper in comparative literature. Prereq: 2010 and one course from 4012-23-32 Special Topics in Comparative Literature (3,3,3). Content varies; may be repeated for credit.

5012 Comparative Theories of Literature (3)

5022 Approaches in Comparative Literature (3)

5032 Studies in Comparative Literature (3)

Approved Area Courses
Classics 2210-20-30 Greek and Roman Mythology (3,3,3)
Classics 4510 Selected Reading in Latin Literature in Translation (3)
English 3411-12-20-30 Modern Drama (3,3,3,3)
English 3716 Literature of the English Bible (3)
English 2910-20-30-40 Comparative Literature (3,3,3,3)
English 4720 Folklore (3)
English 4730 Popular Ballad (3)
English 4950 Approaches to Literature (3)
English 5860 Introduction to Literary Research (3)
German 2210-20-30 Masterpieces of German Literature in English Translation (3,3,3)
German 4030 German Drama in English Translation (3)
German 4040 The Modern German Novel in English Translation (3)
German 4050 The Faust Legend (3)
Russian 2210-20-30 Survey of Russian Literature in English Translation (3,3,3)
Romance Languages 4610 Masterpieces of French Literature in English Translation (3)
Romance Languages 4620 Masterpieces of French Drama in English Translation (3)
Romance Languages 4030 Masterpieces of Spanish Literature in English Translation (3)
Romance Languages 4040 Masterpieces of Spanish Drama in English Translation (3)
Romance Languages 4050-60-70 Dante and Medieval Culture (3,3,3)

Ancient Mediterranean Civilizations
The concentration in Ancient Mediterranean Civilizations consists of Classics 3810, Classics 3820, Religious Studies 2611, and 28 additional hours from the following list, distributed in such a way that no more than 20 hours are in any one of the three divisions:
(a) Ancient Near Eastern Cultures: History 3751, 3752; Religious Studies 3110, 3120, 4210;
(b) Greek Culture: Classics 2210, 2220, 3310, 2320, 3340, 3350, 4010, 4220 (where applicable), 4230 (where applicable); History 3760; Philosophy 3111, 4410, 4420; Political Science 3801.
(c) Roman Culture: Classics 2230, 2330, 3340, 4220 (where applicable), 4510; History 3770; Religious Studies 3311-12, 3330, 4310, 4640.
Courses of variable content, topics courses, reading and research, off-campus, or foreign study in the Departments of Art, Classics, History, Philosophy, or Religious Studies can be applied to the three divisions as appropriate. Students are encouraged to satisfy the Foreign Language requirement with Greek, Latin, or Hebrew.

Latin American Studies (600)
Concentration consists of 36 hours including Spanish 3110-20-30 or Portuguese 3510-20, History 3870-80, Political Science 3625-26, and Geography 3390 or 3790 and 9-10 hours of acceptable elective courses in any of the participating departments or in the Latin American studies sequence 2510-20 (4,4) or Independent Research 4010, or Senior Seminar 4970.

For further information, consult Dr. H. C. Rutledge (Classics) or Dr. W. L. Humphreys (Religious Studies).

Linguistics/College of Liberal Arts

4001 Cultural Plurality in Latin America (3) Introduc-
tion to various systems and behavioral patterns based on Spanish—Mediterranean, Luso—Mediterranean, indigenous Indian and African heritage existing today in Latin America.

4002 Institutional Changes in Latin America (3) intro-
duction to government, political parties, the role of the military, the Church, educational institutions, democracy and dictatorship, nationalism, and the family. Course focus will be on the evolution of the institutions in Luso and Hispanic area. Credit to vary according to the scope and length of the project.

4231 The Political Economy of Latin America (3) Description, analysis, and comparison of major eco-
nomic problems and policies of various Latin American countries. (Same as Economics 4231.)

4310-20-30 Directed Readings in Brazilian and Por-
tuguese Literature (3,3,3) May be repeated with consent of instructor. (Same as Romance Languages Portu-
guese 4315-20-30.)

4420-30 Latin American Civilization (3,3) Prereq:
2130, 2520, or equivalent. (Same as Romance Lan-
guages Spanish 4420-30.)

4461 Quantitative Analysis of Language (3) (Same as English 4461.)

4727 Politics of Inter-American Relations (4) Analy-
sis of selected theoretical and policy issues concerning international relations in the Americas with emphasis upon imperialism, intervention, and the Cuban revo-
lution, nationalism, foreign assistance, trade, or economic integration. (Same as Political Science 4727.)

4810-20-30 Topical Survey of Spanish American Lit-
erature (3,3,3) 4810—Prose fiction: major examples of the short story and novel. 4820—Poetry: landmark figures of past and present. 4830—Drama and essay. (Same as Romance Languages 4810-20-30.)

4840 History of Mexico (3) (Same as History 4840.)

4850 History of the Caribbean (3) Caribbean region from discovery and colonization to contemporary times. (Same as History 4850.)

4970 Latin American Studies Seminar (2-4) Selected topics in Latin American studies. May repeated. Max-
imum 8 credit hours.

Linguistics (623)
This concentration offers a broad exposure to the various fields of linguistics (including historical, descriptive, and theoretical linguistics) along with an opportunity to study areas where linguistics overlaps with other disciplines such as psycholinguistics, sociolinguistics, speech pathology, and the like. It is designed to prepare a student for graduate work in linguistics or related areas, or to serve as a general survey of language and linguistics. It provides the additional pos-
sibility of emphasizing the teaching of English as a second language for the student interested in employment at the B.A. level. The requirements of this concentration are:

Corequisites
(a) A 3000-level sequence or its equivalent of a foreign language. (The following lan-
guages offer sequences appropriate for this requirement: French, German, Italian, Portu-
guese, Russian, and Spanish.)
(b) Two quarters of a non-Indo-European
4260 Introduction to Historical and Comparative Linguistics (3) (Same as French, German, Russian, and Spanish 4260.)

4270 Introduction to Romanic Linguistics (3) (Same as French and Spanich 4270.)

4271 Introduction to Slavic Linguistics (3) (Same as Russian 4271.)

4440 Sociolinguistics (3) (Same as English 4440.)

4460 Special Topics in English Linguistics (3) (Same as English 4460.)

4461 Quantitative Analysis of Language (3) (Same as English 4461.)

4471-81 English as a Second or Foreign Language (3,3) (Same as English 4471-81.)

**Medieval Studies (674)**

A concentration in Medieval Studies focuses upon culture and society from the collapse of the Roman Empire to the 16th century. Such a concentration offers the opportunity to deepen one's self-awareness and broaden one's view of the range of human possibilities by studying a wide range of works from the medieval period. Focuses on classical works from the medieval period. Focuses on the conditions of life, social and political institutions, values and ideals, and modes of perception and expression.

A concentration in Medieval Studies consists of Medieval Studies 2010 and 4010 and 26 hours of upper-division courses concerned primarily with the Medieval experience, divided among the following three categories: (1) history, philosophy, political science and religious studies; (2) language and literature; (3) the arts—history of art, architecture, music, and speech and theatre. Courses should not be selected at random but should either form a related pattern (for example, courses in the literature and history of Medieval England or Italy, etc.) or should revolve around a particular discipline, or two closely related disciplines (for example, courses in the history of art and architecture). A minor in Medieval Studies consists of Medieval Studies 2010 and 4011 and 26 hours of upper-division courses distributed among the categories listed above for the major. Each student's program, major or minor, must be approved in advance by the Medieval Studies Coordinating Committee, chairperson Dr. Paul Barrette.

Latin is the most appropriate language for students in the Medieval Studies concentration and is essential for those who plan to continue their studies in graduate school. In addition, students planning to go on to graduate school are strongly advised to supplement their Medieval Studies concentration with extensive work in one of the traditional disciplines.

2010 Medieval Civilization (4) Introduction to basic themes in medieval experience, approached from interdisciplinary points of view and including philosophy and religion, art and architecture, language and literature, social and political history.

2601 Literature of the Dark Ages (5th-10th Centuries) (3-4) Critical analysis and interpretation of selected classical works from the medieval period. Focuses on texts representing the major genres of the early Middle Ages (e.g., religion, rhetorical, lyric-epical, biographical). Readings include St. Gregory's Life of St. Benedict, Augustine's Confessions, the life of Charlemagne, etc. Students registering for four credit hours will be assigned additional work to satisfy the fourth credit hour.

2602 Literature of the Later Middle Ages (3-4) Critical
Italian 4000-60-70 Dante and Medieval Culture (3,3,3) (readings in English or Italian)

Italian 4330 History of Italian Language (3) (readings in Italian)

Category #3 The Arts

Architecture 4130 Seminar in Medieval Architecture (4)

Art 3704 History of Medieval Art (4)

Art 3705 Northern European Painting, 1350-1600 (4)

Art 3715 Early Italian Renaissance Art, 1300-1500 (4)

Music 4200 Independent Study in Music History and Literature (1-3) (when subject is part of medieval culture and society)

Music 4280 The Mass to 1600 (3)

Music 4290 Gregorian Chant (3)

Theatre 2325 History of the Theatre (4)

Russian and East European Studies (887)

Prerequisites to the major are the completion of Russian 2110-20-30 and Russian 3710-20. The major consists of 42 hours distributed as follows: Geography 3880; six hours from History 3470-80-90; Philosophy 3550; Political Science 3631 and four additional hours from Political Science 3632, 3796, 4815, and 3570; Russian 3110-20-30; Russian 4010 (Selected Topics in Russian and East European Studies); and any eight additional hours in courses numbered 3000 or above from the list ‘Approved Area Courses’ which can be obtained from the chairman of the Russian and East European Studies Committee, Dr. Donald Finie.

4010 Selected Topics in Russian and East European Studies (3) An interdisciplinary seminar on a selected topic using a comparative approach.

Urban Studies (985)

A concentration in urban studies consists of 40 quarter hours, including Urban Studies 2500 and 3000, at least 4 hours of Urban Studies 4000, and 28 hours from the urban studies curriculum provided below. The urban studies minor consists of 24 quarter hours, including Urban Studies 2500 and 3000 plus 16 hours from the urban studies curriculum provided below. For further information consult the chairperson of the Urban Studies Committee, Dr. Samuel E. Wallace.

2000 Human-Environment Systems (4) (Same as Interior Design 2000)

2500 Interdisciplinary Urban Studies (4) Fundamental perspectives of various disciplines toward the city, urbanism as a way of life, and urbanization as an ongoing process. Stresses the multidimensional nature of urban studies.

3000 Selected Topics in Urban Studies (4) May be repeated with consent of the committee. Maximum credit 12 hours.

3420 Urban Problems (4) (Same as Sociology 3420)

3750 The Urban Polity (4) (Same as Political Science 3750)

3760 Urban Policy Process (4) (Same as Political Science 3760)

3800 Introduction to Real Estate (3) (Same as Business Administration 3800)

4000 Directed Field Work (1-16) Participant observation and other directed field research in selected sites and organizations. May be done in a concentrated manner, such as a summer, or over the course of an academic year. Minimum of four credits required for a concentration in urban studies. May be repeated. Maximum credit 18 hours.

4100 Survey of Planning (3) (Same as Planning 4100)

4330 Urban Ecology (4) (Same as Sociology 4330)

4440 Urban Anthropology (3) (Same as Anthropology 4440)

4510 Passenger Transportation (3) (Same as Transportation 4510)

4670 Cities and Urbanization in American History (4) (Same as History 4670)

4830 Problems of Urban Development (3) (Same as Finance 4830)

Urban Studies Curriculum:

For the concentration and minor, courses may be selected to fill the respective requirements from the following:

Anthropology:

3450 Community Studies in Complex Culture (3)

4440 Urban Anthropology (3)

Geography:

3000 Man, Location, and Behavior (4)

3430 Urban Geography (4)

History:

4670 Cities and Urbanization in American History (4)

4740 The City in Europe (3)

Planning:

4100 Survey of Planning (3)

Political Science:

3750 The Urban Polity (4)

3760 Urban Policy Process (4)

Sociology:

3410 Urban Environment (4)

3420 Urban Problems (4)

4330 Urban Ecology (4) (Same as Sociology 4330)

4530 Community Organization (4)

Women's Studies (944)

The Cultural Studies major with a concentration in Women's Studies has eight hours of prerequisites: one of the Images of Women in Literature courses (either 2010 or 2015), Women in Society (2020), and an additional 16 hours of upper-division Women's Studies courses. For further information contact the chairperson of the Women's Studies Committee, Dr. Marther Lee Osborne, at the Women's Studies Office, 2012 Lake Avenue, 974-2409, or in the Philosophy Department, 807 McChung Tower, 974-7212 or 974-3255.


2015 Images of Women in Literature: Fiction, Poetry, Drama (4) An introduction to the study of women through the roles and stereotypes portrayed in a variety of literary genres (fiction, poetry, and drama), including from diverse historical periods and cultures.

2020 Women in Society (4) An examination of the role played by women in various societies during different historical periods, a study of the factors which have limited women's participation in society, and an assessment of social scientists' assumptions about women.

2120 Sex Roles and Marriages (3) (Same as Child and Family Studies 2120)

3010 Emergence of the Modern American Woman (3) An examination of the role of women in the development of American civilization and values. Major topics include women's legal and political status, the emergence and development of feminism, women and the creative arts, and women's roles in industrial and post-industrial American society.

3095 Women in Music (3) (Same as Music 3095).

3150 Gender in Society (4) (Same as Sociology 3150).

3240 Women in French Culture (4) (Same as French 3240).

3310 Women Writers in England and America (3) (Same as English 3310).

3311 Women in American Literature (3) (Same as English 3311).

3430 The Concept of Woman (4) (Same as Philosophy 3430).

3435 Philosophy of Feminism (4) (Same as Philosophy 3435).

3830 Women in the Greek and Roman World (3) (Same as Classics 3830).

4000 Topics in Women's Studies (4) Content varies. May be repeated.

4103 Independent Study (1-16) Registration by consent of the Women's Studies Committee Chair.

4110 Psychology of Sex Role Development (3) (Same as Psychology 4115 and Educational Counseling and Psychology 4110).

4280 Women in European History (4) (Same as History 4280).

4290 Women in American History (4) (Same as History 4290).

4430 Women's Health (3) (Same as Health 4430).

4560 Rhetoric of the Women's Rights Movement (4) (Same as Speech 4560).

4830 Afro-American Women in American Society (4) (Same as Afro-American Studies 4830).

4870 Contemporary Research in the Behavior of Women (4) (Same as Psychology 4870).

Cultural Studies (270)

1000 Selected Topics (2-4) May be repeated. Maximum credit 8 hours.

4000 Selected Interdisciplinary Cultural Topics (1-12) Acceptable for credit in any cultural studies course.
cent direction or minor with the consent of the director of cultural studies and the respective chairperson. May be repeated for credit up to maximum of 12 hours.

**Economics (283)**

See faculty list, page 82.

**UNDERGRADUATE**

The program in economics combines a broad liberal education with the rigorous study of current issues of the day such as employment, inflation, poverty, wealth, and the benefits and costs of economic growth.

Courses offered in the Department of Economics consist of: (1) Economics 2510, 2520, or 2530; (2) Economics 3110 (or 3111 and 3112) and 3120 are required as economics courses. Economics 3110 (or 3111) is a corequisite for any of the three economics courses presented to fulfill this corequisite, Economics 3111 and 3112 are required as part of the upper-division work and should be taken as early in the upper-division program as possible. A minor consists of (1) Economics 2510, 2520; and (2) 15 additional hours in economics at the upper-division level.

In addition, certification to teach economics in secondary schools is available. Students with such an interest should consult the Certification Clerk, Room 212, Clijton Education Building as early in their program as possible to determine the appropriate requirements.

**GRADUATE**

See page 81 in the College of Business Administration. The department offers the following degree programs: M.A. and Ph.D. Also, the MBA degree with a concentration in economics is offered.
specific course descriptions below and departmental advisors.

B.A. Majors: A minimum of 36 quarter hours is required in 3000-4000 level courses as indicated for the concentrations below.

Concentration in Literature: Thirteen English courses at the 3000-4000 level including:
(1) English 3042; (2) at least five courses in periods or major figures before 1900, including at least three before 1800; (3) at least two courses concerned with approaches other than literary, such as literary forms or modes, theories of criticism, or other unifying approaches or ideas; (4) a total of three courses in writing or the English language may be counted towards the literature concentration but may not be substituted for requirements 1, 2, or 3 above.

Concentration in Creative Writing: Thirteen English courses at the 3000-4000 level including:
(1) two-course sequence in expository, creative, or technical writing; (2) four other courses in creative writing at either the 3000 or 4000 level; (3) four courses in literature; (4) three additional English courses selected in consultation with the advisor.

Concentration in the English Language: Twelve English courses at the 3000-4000 level including:
(1) English 3330, English 3331; (2) four courses in linguistics and the English language selected from among those offered by the English department and, with English advisor approval, one of the following: Anthropology 3420, Psychology 4660, or Linguistics 4000; (3) two additional courses in language, literature, or writing; (4) four courses in literature.

Individualized Program: The Director of Undergraduate Studies is empowered to approve individualized programs developed by students in consultation with their English advisors. These programs need not necessarily fulfill all of the requirements listed above.

Honors Program: For students who qualify for this program, the English department offers individualized study in the senior year culminating in a senior thesis and a comprehensive examination based on the MA Reading List. If the thesis and examination both receive grades of B or better, the student will be graduated with Honors in English. Interested students should consult their advisors or the Director of Undergraduate Studies.

Internship in Technical Writing and Editing: A limited number of part-time positions in University offices may be available on a competitive basis for senior English majors who have completed the appropriate writing courses. Details are available through the Director of Undergraduate Studies.

Minor: An English minor consists of 24 hours at the 3000-4000 level, including at least 18 at the 3000-4000 level. Certification for Teaching: Students planning to teach English in the public schools should consult the Certification Clerk, Room 212, Claxton Education Building.

Departmental Course Information: In the English Office, 316 McClung Tower, students can obtain a booklet describing current English courses in detail and listing the courses to be offered each quarter throughout the academic year. The booklet is available in advance of University timetables.

1010 English Composition (3) Expository writing recommended for students with ACT English scores at or above cutoff value set by the English Department. Emphasis on invention, organization, style, and revision; intensive study of essays for meaning and ways of expressing meaning; conference on individual writing problems. A, B, C, I, NC, W grading. Students may not receive credit for both 1010 and 1111. F, W, S.

1011 English Composition (4) Expository writing recommended for students who lack the ACT English score needed for 1010 or who have previously failed to pass that course. Includes the material of 1010 and development of critical techniques. F, W, S.

1019 Writing Workshop (1) Self-paced laboratory course only for students remediated to it at the beginning of the quarter. Individual instruction on writing problems. Individual conference in grammar, mechanics, sentence patterns, reading comprehension, summary writing, and paragraphing. Prerequisite: 1011. A, B, C, I, NC, W grading.

1020 English Composition (3) Analytical writing based on study of great themes in literature; practice in documentation; individual conferences. Prerequisite: 1010. Students receiving a grade of A in 1010 may elect to complete a year's work in English composition with any 3000-level writing course, A, B, C, I, NC, W grading. F, W, S.

1031-32-33 English Composition (3,3,3) Application of writing skills to areas of special interest. Study and practice of research writing; individual conferences. Prerequisite: 1010-20; any 1020-level course completes a year's work in English composition; no more than one may be taken for credit. 1031—Writing about modern literature; 1032—Practice and typical writing assignments encoun-
tered in the workplace; 1033—Writing and language: how we are influenced by verbal manipulation in education, politics, and mass media. A, B, C, I, NC, W grading. F, W, S.

1018-28-38 Honors: English Composition (3,3,3) Open only to those students selected on the basis of placement scores and high school record. Grading scale and work are the same as regular sequence. 1018—Expository writing based on study of non-fiction prose. Introduction to research writing. 1028—Analytical and research courses on 1018 level. Students receiving a grade below B in 1018 will complete a year's work in English composition by taking 1028 and one course in the 1030 level; students receiving a grade of A or B also receive credit and a grade of no less than B for 1028 and may continue into 1038; all students with A's and those with B's and consent of department have additional option of completing a year's work in English composition with any 3000-level writing course. A, B, C, I, NC, W grading. 1018-F; 1038-W.

1221 Written and Oral English for Foreign Students (3) Emphasis on the more advanced structures of English grammar and on paragraph writing. Required during the first quarter of residence of foreign students who on the English Proficiency Examination demonstrate need for work in English structure, but not at the intensive level of English 1211. Required also of foreign students who complete 1211 A, B, C, I, F, W grading. Students required to take English 1211 are permitted to register for only two other courses. E.

1261 English Pronunciation for Foreign Students (3) Sounds and intonation patterns of American English and relation of spelling to sound. Designed to improve student's ability to speak and understand English. May be repeated. Maximum credit 6 hours. S/NC. (Same as Audiology and Speech Pathology 1261.) E.

1431 English Composition for Foreign Students (3) Composition and reading for students whose native language is not English. Emphasis on paragraph and composition organization based on grammar and mechanics. English 1431 replaces English 1010 for undergraduate foreign students. Prerequisite: 1221 or recommendation based on English Proficiency Examination. A, B, C, I, NC, W grading. F, W, S.

1441 English Composition for Foreign Students (3) For students whose native language is not English, writing based on reading and discussion with attention to the four skills of communication. Practice and typical writing assignments encountered by college students. English 1441 replaces English 1028 for undergraduate foreign students. Prerequisite: 1431. A, B, C, I, NC, W grading. F, W, S.


2120 British Masterpieces (4) 2510—To the 18th century. 2520—Since the mid-18th century. F, W, S.

2531-32-33 American Masterpieces (4,4,4) Focusing on major texts. 2531 examines the development of American literature from the beginnings to 1865; 2532 covers the literature from 1865 to the present; 2533 examines Black American literature exclusively, as a distinct literary movement.

2560-70-80 Literature of the Western World (4,4,4) 2560—Ancient and medieval. 2570—Renaissance through the 18th century. 2580—19th and 20th centuries. 2560-F, W, S; 2570-W; 2580-S.

2660 Introduction to Drama (4) Study of selected plays to provide critical techniques necessary for understanding of drama. F, W, S.

2670 Introduction to Poetry (4) Study of selected poems to provide critical techniques necessary for reading of different types of poetry. F, W, S.

2680 Introduction to the Novel (4) Study of selected novels to provide critical tools necessary for judging longer works of fiction. F, W, S.

2690 Introduction to Film Studies (4) Selected world cinema feature films are studied to provide critical techniques and a basic framework for analysis of narrative cinema. Emphasizes basic elements of film expression and contours of film history. Writing assignments.

3042 Colloquium in Literature (3) Introduction to methods and objectives of literary study; conferences to plan student's program in major.

3045 Introduction to Literary Criticism (3)

3050-51 English Culture (3,3) English literature in the context of parallel developments in art, architecture, music, and social and intellectual history. 3050—Before 1865. 3051—From 1865 to the present.

3070 Modern British Poetry (3) From Housman to Thomas and more recent poets.

3080 Modern American Poetry (3) From Robinson to Stevens and more recent poets.

3110-20-30 Romantic Poetry and Prose (3,3,3) 3110—Emphasis on Wordsworth and Coleridge. 3120—Em-
3445 Film and American Culture (3) Examines American film as both works of art and social documents. By placing a range of films in their historical context and analyzing them through the lens of explicit cultural values, students explore the relationship between the medium of film and American culture in the twentieth century. (Same as American Studies 3445.)

3450 Writing Fiction (3) Introduction to writing novels and short stories.

3470 Writing Poetry (3) Introduction to writing poetry.

3480 Writing Drama (3) Introduction to writing both one-act and full length plays.

3510 Sixteenth-Century Prose and Poetry (3) More and Wyatt to Spenser.

3520 Elizabethan Drama (3) Marlowe, Jonson, and others.

3610 Restoration and Eighteenth-Century Poetry (3) Emphasis upon Dryden and Pope.

3620 Restoration and Eighteenth-Century Drama (3) Dryden through Sheridan.

3630 Restoration and Eighteenth-Century Prose (3) Defoe, Addison, Steele, Swift, and others.

3670 Age of Johnson (3)

3710 Literature of the English Bible (3) Types of Old Testament literature, excluding Wisdom literature. (Same as Religious Studies 3710.)

3711 Literature of the English Bible (3) Old Testament literature and types of New Testament literature. (Same as Religious Studies 3711.)

3721 Introduction to Folklore (3) Essential terms and concepts in modern folklore-folkslore studies. Emphasis is on North American materials: folklore, folksong, myth, legend, proverb, riddles, superstitions, dance, games, and architecture.

3840 Advanced Writing (3) Strategies of writing on personal and academic subjects. Discussion of student and professional writing. Conferences on individual student's goals and problems. Open to sophomores with instructor's consent. F, W, S.

3850 Persuasive Writing (3) Exploration of persuasive techniques through essays written by students and professionals. Examination of strategic rhetorical stances and effective logical and emotional appeals. Conferences on individual student's goals and problems. Open to sophomores with consent of instructor.

3860 Special Topics in Writing (3) Original writing integrated with reading, usually taught by professional author. Topics vary. May be repeated. Maximum credit 9 hours.

3870 Writing the Screenplay and the Television Play (3) Advanced, specialized course in dramatic writing. Completion of English 3450-60-70 is desirable, but students with active interest in the medium are invited to seek consent to enroll.

3910 Comparative Literature (3) 3910—Ancient, 3920—Medieval and Renaissance. 3930—Modern.

3920 Comparative European Literature (3) Selected medieval and Renaissance masterpieces, in translation, by such authors as Dante, Machiavelli, and their influence on English literature. English 3910 is not a prerequisite.

3930 Comparative European Literature (3) Selected masterpieces of Continental literature, in translation, and British literature from the Enlightenment to the present, with emphasis on the interdependence of national literatures and ideas. English 3910, 3920 are not prerequisites.

3940 Novel of the Contemporary Western World (3) Proust, Joyce, Mann, and others.

4010-20 Shakespeare (3,3,3) 4010—Early plays, c. 1590-1601, including I Henry IV, Twelfth Night, and Hamlet. 4020—Later plays, 1601-1613, with emphasis upon tragedies and dramatic romances.

4042-43 Topics in Mode and Genre (3,3) Content varies. Special topics in principal forms and modes of British and American literature, e.g., comedy, tragedy, epic, lyric, satire, etc. May be repeated with consent of department. Maximum credit 6 hours each.

4045 Topics in Literary Theory and Criticism (3) Content varies. Special topics in theoretical and practical approaches to British and American literature. May be repeated with consent of department. Maximum credit 6 hours.

4047 Special Topics in Literature: Major Authors (3) Content varies. Studies in major British and American Writers. May be repeated once with consent of department.

4050-60-70 American Novel (3,3,3) 4050—From earliest sentimental novels by Jackson, Cooper, and Kennedy, and major figures to 1875, 4060—Henry James and Mark Twain through early works of Faulkner and Hemingway. 4070—Early_twentieth to present.

4090 Topics in Film Study (3) Content varies. Indoctrinal study of particular director, film genres, national cinema movements, or other topics. May be repeated with consent of department. Maximum credit 6 hours.

4101 Foreign Study (1-16) See page 161.

4102 Off-Campus Study (3-12) See page 161.

4103 Independent Study (1-12) See page 161.

4118-28-38 Honors: Senior (3,3,3) Admission by consent of department.

4120-30 Foundations of Linguistics Science, Development of Methodology, Contemporary Theory (3,3) Historical and methodological foundations of linguistics science. Changes wrought about by Saussure's Course and the growing impact of other disciplines on linguistics science. (Same as Linguistics 4120-30.)

4140 Advanced Technical Writing (3) For students planning careers in business, industry, education, and government who will need technical writing skills after they graduate. The writing of definitions, process descriptions, sets of instructions, descriptions of mechanisms, recommendation reports, abstracts, proposals, and technical reports. Open to sophomores with student's major or consent of instructor. F, W, S.

4150 Professional Writing (3) The writing of articles, theses, and dissertations in which data are marshaled and analyzed. The writing of abstracts, varieties of documentation styles, proper use of visuals, guidelines and procedures for manuscript submission, and the process of editorial review. Prereq: 4140 or consent of instructor.

4160 Technical Editing (3) Primary emphasis is on the techniques and language skills necessary for technical editing. Formats, graphics, layout methods, and mechanics of publishing production are also discussed. Prereq: Successful completion of either 4140 or 4150, or permission of instructor.

4250 Advanced Fiction-Writing (3) Further development of skills acquired in basic writing fiction course. Prereq: 3450 and consent of instructor.

4254 Writing the Detective and Mystery Story (3) Instruction and writing cover entire crime field—suspense, police procedural, private eye, spy, and adventure fiction. Prereq: 3450-60-70 or consent of instructor.

4256 Writing Science Fiction and Fantasy (3) Survey of general development and basic texts of science fiction, speculative fiction, and fantasy. Exercises in writing, conferences, in accordance with techniques learned in basic fiction writing course.

4270 Advanced Poetry Writing (3) Further development of skills acquired in basic poetry writing course. Prereq: 3470 or consent of instructor.

4310-30-40 The British Novel (3,3,3) 4310—Defoe to Jane Austen. 4320—Scott to Thackeray. 4330—George Eliot to Galsworthy. 4340—James Joyce to present.

4440 Sociolinguistics (3) The study of language in relation to society. Empirical and theoretical study. Emphasis both on individuals and on large-scale social units such as tribes, nations, and social classes. Prereq: 3330 or Linguistics 2000 or consent of instructor. (Same as Linguistics 4440.)
4450 Dialectology (3) Theories and methodologies of dialect research, fieldwork, and analysis. Prereq: 3340 or consent of instructor. (Same as Linguistics 4450.)

4455 American Dialects (3) Characteristics of the major social and regional dialects of American English. Their origins and functions. Implications for cultural pluralism. 3330 or Linguistics 2000 or consent of instructor. (Same as Linguistics 4461.)

4460 Special Topics in English Linguistics (3) May be repeated for credit with consent of department. (Same as Linguistics 4460.)

4461 Quantitative Analysis of Language (3) Introduction to statistical techniques in the study of variation in language both in spoken language and in written texts, including literature. Emphasis on identifying questions, collecting, analyzing, and interpreting data. Implications for linguistic and literary theory. Prereq: English/Linguistics 3330 or Linguistics 2000 or consent of instructor. (Same as Linguistics 4461.)

4471-81 English as a Second or Foreign Language (3.3) 4471—Applied linguistics in teaching and learning of English as second or foreign language. Phonological and grammatical structure of present-day English. Analysis of differences (phonological, grammatical, and lexical) between English and another language. Prereq: Second year of a foreign language. 4472—Materials and methods of language teaching, with emphasis on preparation of materials and structured teaching situations. Theory of testing language competence and performance, with emphasis on construction of tests. Team teaching with an experienced member of the staff. Prereq: 4471. (Same as Linguistics 4471-81.)

4610-20 Black Literature (3.3) Trends and developments.

4640 Black American Literature and Aesthetics (3) Evaluation of major texts in Black American Literature and Aesthetics since 1899, with emphasis on the major contributors.

4651 Southern Literature through the Nineteenth Century (3) Southern writing from colonial period to end of 19th century, including frontier humorists and local color writers.

4652 Southern Literature in the Twentieth Century (3) Modern Southern literary renaissance, Fugitives and Agrarians, Faulkner, and more recent writers such as Welty, O'Connor, and Porter.

4660 Emerson and Thoreau (3)

4680 American Humor through Mark Twain (3) 4721-31-41 Ballad and Folktales (3.3) 4721—Study of traditional English and Scottish popular ballads and their North American variants; 4731-Study of Native American ballads and folktales—The folk narrative: functions, categories, and patterns of storytelling. Prereq: English 3271 or consent of instructor.

4850 Milton (3) Emphasis on major poems.

4860 Seventeenth-Century Prose and Poetry (3) Bacon and Donne to Marvell.

4930-40 Chaucer (3.3) 4930—The Canterbury Tales 4940—Trotlus and Criseyde and early poems.

GRADUATE Consult the Graduate Catalog for listing of graduate level courses.

French
See Romance Languages.

Geography (415)

Professors: S. R. Jumper (Head), Ph.D. Tennessee; C. S. Aiken, Ph.D. Georgia; T. L. Bell, Ph.D. Iowa; E. H. Ham mond, Ph.D. California (Berkeley); R. G. Long (Emeritus), Ph.D. Northwestern; C. W. Minkel (Vice Provost and Dean for Graduate Studies), Ph.D. Syracuse; C. T. Paludan, Ph.D. Colorado; T. H. Schimdtke, Ph.D. Wisconsin; T. J. Wilbanks (adjunct), Ph.D. Syracuse.

Associate Professors: L. W. Brinkman, Jr., Ph.D. Wisconsin; J. R. Carter (Associate Professor of Cultural Geography, Ph.D. Georgia; B. A. Raislon, Ph.D. Northwestern; J. B. Rehrer, Ph.D. Louisiana State.

Assistant Professors: T. J. Blasing (Adjunct), Ph.D. Wisconsin; R. A. Forresta, Ph.D. Rutgers; L. M. Pulsipher, Ph.D. Southern Illinois.

UNDERGRADUATE

B.A. Major: A minimum of eight hours at the 1000 or 2000 level is required as an introduction to a major. Geography 3700, 4100, 4210, and 4990 are also required, along with an additional 28 hours selected from courses at the 3000 and 4000 levels. At least one course must be selected from each of groups A, B, C, D, and E below:

a. Physical Geography: 3510, 3520, 3530, 4550;

b. Economic Geography: 3410, 3430, 3490, 4075;

c. Cultural Geography: 3000, 3450, 3600, 3610, 3660, 4240;

d. Regional Geography of the United States: 3610, 3920, 3930, 3940;

e. Regional Geography of Foreign Areas: 3790, 3800, 3830, 3840, 3870, 3880. Students in the 3/2 program are encouraged to take 12 of their 28 upper-division credit hours from Group B.

For those pursuing a program leading to professional employment or graduate study in geography, 4210 and/or a senior project under 4103 are/is strongly recommended.

Minor: Eight hours in courses numbered at the 1000 or 2000 levels are recommended as an introduction to the minor which consists of 24 hours selected from courses at the 3000 and 4000 levels.

Students wishing to major or minor in geography are strongly urged to consult with a departmental undergraduate advisor. Through choices available within the structure of the major and by appropriate selection of electives outside the department, each student may develop a coherent program in accordance with specific interests and needs. Such programs might emphasize basic geography, geography itself or might develop interdisciplinary themes such as natural and environmental resources, urban and rural planning, or the culture, history, or economy of a particular area. A useful technical or vocational specialty program is available which emphasizes cartography and remote sensing.

1610-20 Introduction to Geography (4.4) Selected problems or situations of contemporary interest are studied in depth, illustrating geographical points of view and techniques. Need not be taken in sequence. 1610-E; 1620-W, S.

1810-20-30 Geography of the Natural Environment (4.4.4) Characteristics and processes of earth's surface and lower atmosphere; their interaction to produce world pattern of distinctive environments significant to man. Must be taken in sequence. 3 hr. lecture and 2 hrs. of lab per week. 1810-F, W; 1820-W, S.

1910 Introductory Cultural Geography (4) Basic concepts of cultural landscapes and distributions of cultural phenomena including geography of languages, religions, cultural regions, population, settlements, and forms of economy.

2110-20-30 Economic Geography (4.4.4) The significance of location, pattern, and environment in economic activities. Emphasizes: 2110—agriculture; 2120—energy, minerals, and manufacturing; 2130—transportation and trade. Need not be taken in sequence. 2110-E; 2120-30-W, S.

3000 Man, Location, and Behavior (4) Types of human spatial behavior, such as shopping patterns, commuting, residential mobility, trade, and regional consciousness, as they relate to distance, natural environment, and culture. Order and regularity in pattern of human use of earth's surface.

3410 Intermediate Economic Geography (4) Concepts, theories, and applications in location planning. Locational patterns in agriculture, manufacturing, and service activities.

3430 Urban Geography (4) Concepts and theories concerning development and significance of systems of cities and internal morphology of cities.

3450 Rural Geography (4) Geographical appraisal of rural areas of the United States, including small towns and urban fringes. Problems and potentials of rural America.

3490 Geography of Resources (4) Study of factors related to variations in resource availability from time to time and from place to place, with particular emphasis upon energy and metallic resources.

3510 Meteorology (4) Introduction to dynamic atmosphere and resulting weather events. Nature of interrelationships between earth's general circulation, and analysis over time and space.

3520 Climatology (4) Overview of general circulation system leading to world pattern of climates. Climatic change and modification, and interrelationships of climate and human activity.

3530 The Land-Surface System and Man (4) Nature and regional variations in relationships among surface form, water, vegetation, and surface materials. Man as evaluator and agent of change.

3600 Geography of Population (4) World population patterns; regional socio-economic characteristics and demographic trends; relationship to resource base.

3610 Political Geography (4) Importance of geographic factors for understanding political relationships within and among nations; spatial implications of political decision-making processes; geography of administrative units.

3660 Cultural Geography (4) Basic concepts of culture; methods and background of cultural geography; world patterns of cultural phenomena.

3790 Maps and Aerial Photographs (4) Introduction to sales sources, and production of maps, aerial photos, and other forms of spatial images.

3790 Geography of the Middle East (4) Covers Mexico, Central America, and the West Indies. (Same as Latin American Studies 3790.)

3800 Geography of South America (4) (Same as Latin American Studies 3800.)

3830 Geography of Africa (4) Survey of major physical, and economic characteristics of Africa with particular emphasis on the area to the south of the Sahara. (Same as Afro-American Studies 3830.)

3840 Geography of Australia and Oceania (4) Survey of major physical, economic, and social characteristics of Australia and New Zealand, and of impact of western civilization on selected island groups of Southwest Pacific.

3870 Geography of Asia (4) A survey of the physical, cultural, and economic characteristics of the countries of Asia, excluding the Soviet Union.

3880 Geography of the Soviet Union (4)

3910 Regional Geography of United States and Canada (4) Physical, economic, and social distributions as they interrelate to give distinctive character to regions of United States and Canada.

3920 Geography of the American South (4) Geographical appraisal of the south, tern United States, including physical environment and human resources.
**Geological Sciences**

**Professors:**

**Associate Professors:**

The Department of Geological Sciences provides training for (1) those who plan careers as professional geologists in industry, federal and state surveys, education, or other fields which utilize earth scientists; and (2) those who seek a general knowledge of geology and its relationship to the other sciences, engineering, business, law, and other disciplines.

The requirements set forth below are designed to provide geology majors with a broad base from which qualified students may proceed into advanced study in one or more of the branches of geology or related minor fields. Because a wide range of elective courses is available, it is essential that each student be guided in planning the program by a departmental advisor. A list of advisors is available in the departmental office.

**Undergraduate**

**B.S. Major:** Prerequisites: Geology 1010, 1020, 1030. Students who have less than one year of high school biology must take Biology 1210, 1220; it is recommended that a student who has had one or more years of high school Biology should take any two of the following courses: Biology 1230; Botany 1110, 1120; Zoology 1118, 1128; Biology 3130. Chemistry 1110-20; Physics 1310-20; Mathematics 3000 or equivalent. See page 161.

**Geology of Soils** (4)
- Soils as physical systems and their relationship to environments. Investigation of specific cases of role of soil in management of natural systems. Emphasis upon changing population patterns, development of agricultural regions, and patterns of urban development.

**Independent Study** (1-16)
- Prereq: Written consent of instructor required prior to registration. See page 161.

**Foreign Study** (4)
- Prereq: Consent of instructor required prior to registration. See page 161.

**Proseminar in Geography** (4)
- Interrelation of physical, economic, and social patterns to give distinct character to the region and its parts, especially southern Appalachian, Appalachia in perspective in the current American scene.

**Geography of Transportation** (4)
- Geographic examination of transportation systems, emphasizing transport of population on highways and by public facilities. Relationship of these systems to changing geography of cities and urban hinterlands.

**4100 Quantitative Methods in Geography** (4)
- Geographic applications of statistical techniques, point pattern analysis, and analysis of areal units. Prereq: Mathematics 3000 or consent of instructor.

**4101 Foreign Study** (1-16)
- Prereq: Written consent of instructor required prior to registration. See page 161.

**4102 Off-Campus Study** (1-16)
- Prereq: Written consent of instructor required prior to registration. See page 161.

**4103 Independent Study** (1-16)
- Prereq: Written consent of instructor required prior to registration. See page 161.

**4210 Problems in Geographical Method** (4)
- Examples of problems and approach in geographic analysis and synthesis. Emphasis on character of geographic data, area sampling, generalization, classification, regionalization, and questions of scale.

**4240 Historical Geography of the United States** (4)
- Survey of changing human geography of United States during four centuries of settlement and development. Emphasis upon changing population patterns, development of agricultural regions, and patterns of urban development.

**4510 Principles of Geomorphology** (4)
- Same as Geology 4510.

**4550 Geography of Soils** (4)
- Soils as physical systems and their relationship to environments. Investigation of specific cases of role of soil in management of environmental systems.

**4710 Cartographic Design and Production** (4)
- Introduction to principles and practice of design, construction, and reproduction of maps. 3700 recommended, 2 hours and 2 labs.

**4720 Data Mapping** (4)
- Automated techniques of representing surfaces, using geographic information systems. 3700 knowledge of a computer language recommended.

**4730 Advanced Cartography** (4)
- Map production from design through colorproofs. Prereq: 3700, 4710, and 4720 or consent of instructor.

**4740 Remote Sensing** (4)
- Types and Applications. 4740 includes principles of optical photography and other remote sensing techniques. Emphasis upon use of various types of imagery for geographic interpretation and simple mapping. Prereq: Consent of instructor.

**4760 Interactive Computer Graphics** (3)
- Same as Computer Science 4750 and Electrical Engineering 4750.

**4799 Practicum in Cartography/Remote Sensing** (2-6)
- Supervised practice in design and production of maps and other graphic products in Department of Geography's Cartographic Services Laboratory or a similar organization. Prereq: Written consent of instructor prior to registration.

**4990 Proseminar in Geography** (4)
- Overview of major themes in geography, especially trends over past 20 years. Designed for undergraduate majors and minors; open to graduate students. Prereq: Completion of at least 12 hours of major or minor requirements for geography.

**Graduate**

The general requirements for the master's and doctoral degrees as well as course descriptions are in the Graduate Catalog.
330 Regional Geology of the United States (3) Evolution of various geologic provinces within the U.S. with emphasis on the integration of several types of geologic data. Prereq: completion of core courses in the major or equivalent.

331 Quaternary Geology of North America (4) Quaternary geology, stratigraphy, sedimentology, and geomorphology of glaciated and unglaciated North America and oceans. Prereq: 1010 or consent of instructor. Two 2-hour lectures.

332 Quaternary Paleoclimatology (4) Study of pollen and plant macrofossils of character and climate change during Quaternary. Prereq: Consent of instructor. Two 2-hour lectures.

333 Quaternary Field and Lab Techniques (4) Techniques for environmental characterization and reconstructions, including pollen and plant macrofossil identification, description of site stratigraphy, and sedimentology. Prereq: 1010 or consent of instructor. Two 2-hour lectures.

370 Tectonic Styles (4) The tectonic evolution of structures and their associations with metamorphism, plate motions, and structural assemblages as determined by systematic study of field and outcrop data. 3 lectures and 1 seminar or lab. Prereq: 3370 or consent of instructor.

440 Field Geology (5) Field camp course, first term summer quarter. Advanced undergraduates only. Prerequisites include field study and interpretation of depositional environments. Recommended: 1020 and 3180. 3 hours and 1 lab period.

4110 Principles of Economic Geology (4) Ore-forming processes, classification of mineral deposits, survey of different types of mineral deposits with emphasis on their genesis and their distribution. Prereq: 12 hours of geology. 3 lectures and 1 lab. Coreq: 3190.

4130 Sedimentary Geology (4) Introduction to physical processes of sedimentation: transport of sediments and formation of sedimentary structures, river, flood, waves, tides, and ocean circulation. Prereq: 3310. 3 lectures and 1 lab.

4230 Paleoclimatology (4) Principles of environmental analysis as applied to fossil assemblages and associated lithologies. Prereq: 3260 or consent of instructor. 3 hours and 1 lab.

4240 Paleobotany (4) Survey of fossil record of plants and particular emphasis on (1) comparative morphological and evolutionary trends in major plant groups and (2) chronological succession and geographic distribution of past floras on earth. Prereq: 1420 or 2210; Botany 3010-20 or consent of instructor. 2 lectures and 1 lab or field period. (Same as Botany 4240.)

4250 Evolution of Higher Taxa (4) Discussion of current evolutionary theory in context of palaeontological patterns of evolution in fossil organisms at family level or higher. Prereq: 3260. 3210-20 also recommended. 2 lectures, one 2-hour seminar.

4260 Biostratigraphy (3) Principles of application of paleontologic data to stratigraphic study, codification of stratigraphic nomenclature, and recommended practical exercises. Prereq: 3260 and 3380. 1 lecture plus one 2-hour seminar.

4270 Micropaleontology (4) A survey of geologically important microorganisms and their biological association if known. Special emphasis is given fossil foraminifera, protists, and palynomorphs. Prereq: 3260 or consent of instructor.


4310 Geologic Mapping (4) Interpretation of maps and methods of geologic mapping. 3 lectures and 1 lab or field period. Prereq: 12 hours of geology.

4320 Introductory Environmental Geology (4) APPLICATIONS of the geological sciences toward a comprehension of the effects of geologic processes on humans and the effects of human activities on the earth environment. Prereq: 1010-20-30. 3 lectures and one 2 hr. lab or field period.

4330 Regional Geology of the United States (3) Evolution of various geologic provinces within the U.S. with emphasis on the integration of several types of geologic data. Prereq: completion of core courses in the major or equivalent.

4331 Quaternary Geology of North America (4) Quaternary geology, stratigraphy, sedimentology, and geomorphology of glaciated and unglaciated North America and oceans. Prereq: 1010 or consent of instructor. Two 2-hour lectures.

4332 Quaternary Paleoclimatology (4) Study of pollen and plant macrofossils of character and climate change during Quaternary. Prereq: Consent of instructor. Two 2-hour lectures.

4333 Quaternary Field and Lab Techniques (4) Techniques for environmental characterization and reconstructions, including pollen and plant macrofossil identification, description of site stratigraphy, and sedimentology. Prereq: 1010 or consent of instructor. Two 2-hour lectures.

470 Petrophysics (3) Fluid, heat, electric current, and ionic flow through rock masses in a potential field. Stress-strain behavior of rock as a function of temperature and pressure. 3 lectures per week. Prereq: 3310, Math 1830, Physics 1330. Recommended: Math 2610 and 2820.

4810 Special Problems in Geology (1-4) Prereq: Consent of instructor. May be repeated. Maximum credit 4 hours.

GERMANIC AND SLAVIC LANGUAGES

Professors: H. Kratz (Head), Ph.D. Ohio State; J. E. Falen, Ph.D. Pennsylvania: H. W. Fuller (Emeritus), Ph.D. Wisconsin; L. R. Hiller (Emeritus), Ph.D. Cornell; J. C. Osborne, Ph.D. Northwestern; M. P. Rice, Ph.D. Vanderbilt.

Associate Professors: D. M. Fene, Ph.D. Indiana; N. A. Lauchner, Ph.D. Washington; D. E. Lee, Ph.D. Stanford; C. J. Mellor, Ph.D. Chicago; U. C. Ritzenhoff, Ph.D. Connecticut.

Assistant Professor: C. Hodges, Ph.D. Chicago; J. Kolodziej, Ph.D. Indiana.

Instructors: M. H. Harris, M.A. Illinois; A. Rashkovsky, M.A. Tartu.

UNDERGRADUATE

Placement Examination: Students who have had previous work in German or Russian either in high school or in another college should register for the course in which they would normally be placed. After the first week of the quarter a placement test will be given, and students will be advised if a change in registration is indicated.

Proficiency Examinations: Students who have acquired a knowledge of German or Russian through private study, tutoring, residence in foreign countries, or the like, should request a proficiency test. A student earning a grade of C or better on such a test will receive credit for the limited number of hours in courses. Superior students are encouraged to proceed as rapidly as their achievement permits. Students who omit any course in a sequence may receive credit for it by passing a proficiency examination.

Foreign Study: Students are encouraged to study abroad. The department is prepared to recommend summer study programs and junior year abroad programs for students who are interested in foreign study. Credits from recognized foreign study programs can readily be transferred to UTK. For qualified students, the department also offers German 4101 Foreign Study and can be pursued. Foreign Study. See page 161. Students should consult the department before registering for the foreign study course.

B.A. Major: Majors in German should carefully prepare their programs in consultation with a departmental faculty advisor. German 2110-20-30 or its equivalent is a prerequisite to the major. The major shall consist of at least 36 hours of German courses numbered above 3000 (excluding courses in English translation), and usually including German 3110-20-30. It is recommended that German majors also take History 1510-20 or 3710-20-30 and 8 hours of sophomore English. Majors are also strongly urged to consider a minor in some other area of the humanities.

German 2110-20-30 or its equivalent is a prerequisite to the minor. The minor shall consist of at least 24 hours of German courses numbered above 3000, which normally include German 3110-20-30 (or 3410-20-30), and 15 additional hours of courses numbered above 3000, excluding 3010-20-30 and courses in English translation.

B.A. Major: Russian majors should carefully prepare their programs in consultation with a departmental faculty advisor. The
major in Russian shall consist of at least 45 hours of Russian courses, including Russian 3110-20-30; 3610-20-30; 9 hours from Russian 2210-20-30, 2270, 3220, 3221, 3240, 3250, 3260, 3280, 3281, or 3710-20; and 9 hours of courses numbered above 4000. It is recommended that majors also take History 3470/3460-30-30 Survey of Russian literature. Writing emphasis courses. No foreign language credit. The three-package course fulfills the Divisional Requirement in Humanities, Part 1 (for any two quarters fulfills the two-package requirement of Part 2 for students who choose philosophical perspectives for Part 1).

2270 Russian Philosophical and Theological Thought (3) Survey of the development of philosophical and theological thought in Russia from the Middle Ages to the Revolution. Special emphasis on the expression of this thought in Russian literature and literary criticism. A writing emphasis course; no knowledge of Russian required.

3110-20-30 Russian Composition and Conversation (3,3) Practice in writing and speaking; grammar review and vocabulary building. Prereq: Completion of 2110-20-30.

3610-20-30 Introduction to Russian Literature (3,3,3) 3610-Russian poetry. 3620-Russian short stories. 3630-Russian novellas. Prereq: 2130 or equivalent. Need not be taken in sequence.

ADVANCED UNDERGRADUATE AND GRADUATE

4101 Foreign Study (1-16) See page 161.

4102 Off-Campus Study (1-16) See page 161.

4103 Independent Study (1-16) See page 161.

4110-20-30 Russian Studies in Classical and Modern Writers (3,3,3) Required for credit with consent of department. Prereq: 9 hours of 3000 courses (exclusive of 3010-20-30, or courses in English translation) or equivalent.

4140-50 Selected Topics in German Literature from 1750 to the Present (3,3) Prereq: 9 hours of 3000 courses (exclusive of 3010-20-30, or courses in English translation) or equivalent.

4170 Theatrical German (1-3) Performance in one or more German plays. May be repeated for credit with consent of department, Prereq: 2130 or equivalent or consent of instructor.

4210-20-30 Studies in German Literary Types (3,3,3) 4210—Lyric poetry. 4220—Drama. 4230—Narrative prose. Prereq: 9 hours of 3000 courses (exclusive of 3010-20-30, 3210-20-30, 3310) or equivalent.

4250 Introduction to Descriptive Linguistics (3) (Same as Russian, French, Spanish, and Linguistics 4250.)

4260 Introduction to Historical and Comparative Linguistics (3) Linguistic change, proto-languages, Phonological and morphological change, Cultural, historical, sociological influences upon the development of language. Semantic change. Lexicography. All topics copiously illustrated by selected examples from Indo-European languages. Prereq: 9 hours of upper-division courses in a modern or ancient language (exclusive of German and French 3010-20-30, courses in literature in translation, and general courses in Latin and Greek requiring no knowledge of these languages), or consent of department. (Same as Russian, French, Spanish, and Linguistics 4260.)

4270 Introduction to Germanic Linguistics (3) The phonetics and phonemics of German. German grammar and the German vocabulary from a descriptive point of view. An introduction to the study of the other Germanic languages.

4310-20 History of the German Language (3,3) 4810-20-30 Advanced Conversation and Composition (3,3,3) Prereq: 3810-20-30 or equivalent or consent of department.

4850 Business German (3) Survey of German used in fields of business and economics, intended primarily for students majoring in business or economics. Prereq: 3110-20-30.

3260 German Drama in English Translation (3) From Lessing to present. No foreign language credit.

3270 Modern German Novel in English Translation (3) From 1900 to present: Remarque, Hesse, Mann, Kafka, Frisch, Boll, Grass. No foreign language credit.

3310 Dramas of Bertolt Brecht (3-4) Chronological survey of Brecht's dramatic works and theoretical writings in English translation. No foreign language credit.

3340 Special Topics in German Literature in English Translation (1-4) Topics and credit hours vary and are announced in advance. Student suggestions for topics are welcome. No foreign language credit. May be repeated for credit.

GRADUATE

The Department of Germanic and Slavic Languages offers two advanced degrees. They are Master of Arts (M.A.) in German and Doctor of Philosophy (Ph.D.) in German Languages and Literatures. May be repeated for credit. Requirements for these degrees as well as course descriptions are in the Graduate Catalog.
History (462)

Professors: J. H. Morrow, Jr. (Head), Ph.D. Pennsylvania; P. H. Bergeron, Ph.D. Vanderbilt; E. V. Chmielewski Ph.D. Harvard; R. E. Duncan, Ph.D. California (Berkeley); V. Pratt (Emeritus), Ph.D. Harvard; Y. P. Hao, Ph.D. Harvard; A. G. Haas, Ph.D. Chica- go; R. W. Haskins (Emeritus), Ph.D. California (Berkeley); J. E. Janco (Assoc. Dean, Liberal Arts College), Ph.D. Emory; M. M. Klein (Emeri- tus), Ph.D. Columbia.


Instructor: D. B. Morrow, M.A. Tennessee.

Honors Program: The Department of History offers honors sections of the Western Civilization and United States history survey course. Students entering freshman year are invited to participate; other interested students may apply. These survey courses are open to non-majors. An honors major requires successful completion of three special courses and the junior-senior honors thesis (4018-4028). To join the Junior-Senior Honors Program, students interested in honors work should consult the department's honors coordinator.

Departmental Course Information: Students can obtain additional information about the content and availability of history courses in the departmental office, 1101 McClung Tower, or from any member of the history department. The department also prepares a course description brochure for each quarter.

American Studies. See Cultural Studies.
Asian Studies. See Cultural Studies.
Latin American Studies. See Cultural Studies.

Russian and East European Studies. See Cultural Studies.

1510-20 Development of Western Civilization (4,4) 1510—Ancient World to 1715. 1520—1715 to present.

1518-28 Honors: Development of Western Civilization (4,4) Consent of department required. 1518—F, 1528—W.

1610-20 A History of World Civilization since 1450 (4,4) Interaction of Western World and non-Western peoples since the 15th century. 1610—ca. 1450. 1620—1800. 1620—1800 to present. 1610—F, 1820—W.

1950-60 Afro-American History: An Introduction (4,4) 1950—Survey of the Afro-American experience to 1890. Traditional African societies from which Afro-Americans emerged; evolution of prejudice and racism in America; the institution of slavery; free Negroes; Civil War and Reconstruction. 1980—The Afro-American experience from 1850. The Afro-American struggle for political, social, and civil equality; leaders of the struggle; their philosophies and programs, responses of Black community leaders to these challenges of the 20th Century; the rise of city ghettos; the Civil Rights and Black Power movements.

2020 The City in Europe, ca. 1200-1900 (3) Survey of European urban growth, with comparative analysis of major periods of urbanization of 13th and 19th centuries. Emphasis on relationship between demographic, social, cultural, and economic factors of cities and political and cultural development.

2015 Historical Issues (3) Introduction to broad, the- matic issues in historical perspective. Emphasis varies to reflect major historical developments. A lecture-discussion course in which the content will change from quarter to quarter. Especially suitable for non-majors; also open to majors. May be repeated. Maximum credit 9 hours.

2350 U.S. and World Crisis, 1899 to Present (4) Prereq: consent of department. 2350—1950. May not be taken 1 hour elective. Will not be offered during summer sessions. F, W, S.

2515-25 United States History for International Students (4-5) 2515-Settlement to 1865. 2525—1865 to present. F, W.

2518-28 Honors: History of the United States (4,4) Consent of department required. 2518—F; 2528—W.

3008 Honors: Introduction to Historical Analysis and Interpretation (3) Required of students working for honors in history.

3038 Honors: Philosophy and Methods (3) Principles and techniques of research and study of comparative or speculative philosophy of history. Required of students working for honors in history. Admission with consent of department.

3048 Honors: Readings (3) Required of and open only to students working for honors in history.

3050 The West and the Third World Since 1870 (3) Examination of the relationships between the West and Africa, Asia, and Latin America since 1870 across a broad spectrum of critical issues. Includes economic interdependence and underdevelopment, ideologies in conflict with non-Western world views, and the search for individual identity in circumstances of cultural disruption.

3051 Revolutions in Historical Perspective (3) Comparative history of major revolutions which in- formed political, social, and economic structures and values, such as those in France, Russia, China, Mexico, and Iran. Contrasts and common patterns in their causes, phases, and outcomes. Relations between leaders and masses. Major theories of revolution.

3060-70-80 History of Western Religious Thought and Institutions (3,3,3) Same as Religious Studies 3060-70-80.

3121 Ancient History to 500 A.D. (3) The culture of the ancient Mediterranean. Considered such topics as the rise of the Greek polis, classical Greek culture, thought, and the Hellenistic era, the rise and fall of the Roman Empire, the origins of Judaism and Christianity.

3122 Medieval Europe, 500-1450 (3) The emergence of a distinctive western European civilization from classical, Christian, and Germanic roots. Considers such topics as the barbarian migrations, feudalism, state-making in England and France, the social and spiritual power of the church, the rise of cities, the Black Death and its challenges. 1450—Reformation and its impact on Europe.

3123 Early Modern Europe, 1450-1750 (3) The tran- sition from medieval to modern society. Considers such topics as the Renaissance, Reformation, religion, and civil wars. 1750—The spread of European contacts with the non-European world, population fluctuation, preindustrial economic growth, the rise of modern states, the Scientific Rev- olution, witchcraft.

3124 Modern Europe, 1750-1900 (3) The political, industrial and intellectual revolutions against tradi- tions. Considers such topics as the modern population explosion, urbanization, the political emergence of the middle class and the masses, nationalism, imperialism, rationalism and Romanticism in social thought and politics.

3125 Contemporary Europe, 1900-Present (3) The transformation from industrial to post-industrial soci- ety and the decline of the European nation-state. Considers such topics as war and depression and consequent political and social instability; the Rus- sian Revolution; Naziism, decolonization; the impact of Freud and Einstein; welfare states; European monetarism.

3140-59-60 History of England (3,3,3) 3140—To 1688. 3150—1688 through Reform Bill of 1832. 3180— 1832 to present. Medieval state, church and society; origins of Anglo-American law, the monarchy and parliaments; the Reform Bill, the 17th Century revolutions, commercial, agricultural and industrial rev- olutions; class conflict, empire, the welfare state, world wars, economic crisis.
3201 American Issues: Individualism and Commu-
nity (3) Emphasis on social, cultural, economic, and political impact of both spectator and participatory sports in 20th century.

3240 Law in American History (3) The law and economic development, law and slavery, law and civil liberties, the role of law in the Revolution and the Civil War, and the rise and development of the legal profession. Not for graduate credit.

3311-21 History of Tennessee (3,3) 3311-18th century to Civil War Era. 3321-1865 to 1890. Recommended for seniors. History 3008-3038 (Junior Honors) may substitute.

3321-22 Early Modern Europe (3,3) 3421-17th century Europe. 3422-18th century Europe.

3421-32 Nineteenth Century Europe (3,3) 3431- French and industrial revolution to 1848. The milieu of ferment for conflicting economic, social and political ideas, culminating in a massive revolutionary upheaval. 3432—Maturity and Challenge (1848-1890). Industrial and capitalist maturity in an era of intense national rivalry; triumph of the bourgeoisie, the intellectual climate of realism, scientism, and materialism.

3445-46 History of France (4,4) 3445—Emergence of Modern France (1715-1879). Social, intellectual and economic problems in the Ancien Régime; era of experimentation as revolutionary and traditional France confront one another. 3446—Since 1871.

3470-80 History of Russia (3,3,3) 3470-To 1801. 3480—19th century. 3490—20th century.

3510-26 The American Colonies and the American Revolution (3,3) Emphasis is on major themes rather than chronological coverage of the years 1607-1789. Changing historical interpretations of European colonialization, African society, economy, religion, culture and politics, the causes, character, and consequences of the American Revolution; and the nature of the Federal Constitution of 1787.


3701-30 History of Germany (3,3,3) 3710—Germany to 1700. The First Reich’s fortune and fall. The development of the German empire from medieval greatness to baroque age weakness, disastrous dynastic and religious struggles, rise of powerful princes, economic and cultural decline and political fragmentation, and the final decline. 3720—Germany 1700-1800: The Quest for Nationality. The Austrian-Frussian rivalry in the times of Frederick the Great, and Bismarck; the effects of absolutism, the Enlightenment, romanticism, revolution, reaction, and industrial economics (3) On Gorbachev and the Soviet Union. 3800—1980: The Catastrophic Century. From empires, world wars and Third Reich to defeat and partition, the role of military conflict, impact of economic crises, Hitler and Nazism, and the interplay of extremism, socialism and democracy.

3751 Ancient Near Eastern Civilization (3) Bronze and Iron Ages.

3760-70 The Ancient World (3,3) 3760—Greece 3770— Rome.

3780-90 History of the Middle East (3,3) 3780—Rise and spread of Islamic civilization to the 16th century. 3790—The impact of the West on the Middle East from the 16th century to World War I.

3795 Contemporary Middle Eastern (4) Background of current problems in area, from World War I to present. (Same as Political Science 3795.)

3800 North Africa since 1830 (3) Morocco, Algeria, Tunisia, and Libya in the 19th and 20th centuries.

3810-20 History of East Asia (3,3) 3810—East Asia: History and Culture to 1600. Introductory survey. Chiefly China and Japan; Korea and Vietnam also included. Confucianism, Buddhism, social structure, political tradition, and Japanese feudalism. Comparison and contrast with Western history and culture. 3820—Modern East Asia since 1800. Introductory survey. China, Japan, Korea, and Vietnam. Critical moments and transformations: Western impact, cultural transformation, communist movement, and Japan’s militarism and post-war economic success.

3870-80 History of Latin America (3,3,3) 3870—Colonialism, Independence, 1530-1825. 3880—19th century National Development, 1825 to present. (Same as Latin American Studies 3870-90.)


3921 The United States, 1914-1945 (4) American experience during World War I, the Great Depression, the New Deal, and World War II. Emphasizes domestic history but includes military and foreign policy.

3931 The United States History, 1945 to the Present (3) Demobilization and Cold War after World War II followed by wars in Korea and Vietnam; attempts to find labor peace, national prosperity, and full equality for minorities. From Truman’s administration to the present.

3950 African History to 1940 (3) Focuses on the ethnic groups of the southern and western regions of sub-Saharan Africa and the conflict and occidentalization there from the era of the slave trade through the period of European colonial rule. (Same as Afro-American Studies 3950.)

3961 African History Since 1940 (3) Examines the dynamics of African independence: the achievement of independence by west African nations and the failure of Africans in the south to achieve that goal. Also includes issues of urbanization, industrialization, and formation of a national identity within the twentieth century African context. (Same as Afro-American Studies 3951)

4000 Reflections on History (3) Comprehensive approach to the study of history, focusing on implications and “uses” of history. Emphasis on such topics as values and history; the interaction of historians and their times, the grand models of history, and the relationship between the study of history and patterns of modern thought and behavior. Recommended for seniors. History 3006-3038 (Junior Honors) may substitute for History 4000, fulfilling the Capstone Experience requirements. Recommended but not required that History 4000 and 4010 be taken in sequence.

4010 Colloquium in History (3) Examination of a historical theme or problem; emphasis on questions and skills in special reference to historical writing, including critical analysis of both primary and secondary sources. Recommended for seniors. Recommended but not required that History 4000 and 4010 be taken in sequence.

4015 Studies in History (3-4) Variable content course affording opportunity to cover subject matter not covered in an existing course. May be repeated for credit.

4018-28 Honors: Senior Paper (0-6) Required of students working for honors in history.

4040 History Behind the News (4) The contemporary analysis and the historical background of selected newsworthy events in North and South America, Europe, and the non-Western world are studied to enhance a fuller understanding of their significance. May satisfy history major requirements (except those of geographical distribution). Non-majors may repeat once for credit.

4019 Foreign Study (1-6) See page 161.

4022 Off-Campus Study (1-16) See page 161.

4031 Independent Study (1-6) See page 161.

4130 History of Colonialism and Imperialism (3) 19th century to the present.

4250-60-70 European Intellectual and Cultural History (3,3,3) 4250—From Reformation to Scientific Revolution (1500-1700). 4260—From Enlightenment to Age of Realism (1700-1870). 4270—From Subjectivism to Relativism (1870-present.)

4280 Women in European History (4) Comparative analysis of role and image of women in Medieval, Renaissance, and Enlightenment society. Women’s contribution is shown to parallel changes in structure of family as well as relationship between Western culture and women’s protest movements. (Same as Women’s Studies 4280.)

4290 Women in American History (4) Approaches of 1920 applied to American society. (Same as Women’s Studies 4290.)

4292 History and Philosophy of Afro-American Education (4) (Same as Afro-American Studies 4292 and Educ. C&J 4292.)


4360 The American Experience in World War II (4) A team-taught course. Diplomacy and warfare in Europe and Asia and the impact of the war on American society.

4370 U.S. Military History, 1754 to the Present (4) Examination of nation’s broad strategic aims and means used to attain them, shifting strategy, tactics, and weaponry involved in our wars, and relationship between military and political decision making.

4380 Civilian-Military Relationships in the Modern Western World (3) Civilian—military affairs from about 1900 to 1960 in Western Europe, Russia, and America; emphasis on Western Europe: e.g. Dreyfus Affair, after World War II, and Truman-MacArthur controversy.

4410-20-30 Europe in the Twentieth Century (3,3,3) 4410—1899 to 1919. 4420—1919 to 1939. 4430—1939 to present.

4470 Poland and Its Neighbors (3) A survey of Polish history from its beginnings to present with some emphasis on the Polish question within context of modern international affairs.

4480 Russian Intellectual History (3) Russian intellectual history from 18th century to present, emphasizing problems of Westernization, nationalism, and revolutionary tradition.

4490 Soviet Foreign Policy (3)

4500 History of Medieval England (3) A survey from the Anglo-Saxons to the coming of the Tudors with emphasis on the relationship between legal and institutional developments and the structure of society.

4510-20 Tudor-Stuart England (3,3) 4510—Emphasis on such topics as the Renaissance and Reformation in England. Authors include Thomas More, Elizabeth I, and Mary, Queen of Scots. 4520—
Emphasis on such topics as Puritanism, the English Civil War, the Restoration, the Glorious Revolution and the French Revolution, and on such figures as the Stuart kings, Oliver Cromwell, Milton, Hobbes, and Locke.

4551 Great Britain from Burke to Bright (1780-1848) (3)

4570 Twentieth-Century Britain (3) The emergence of the Welfare State, the political impact of the Labour movement, World War and Depression, chronic economic crisis, the persistence of class.

4610-20-30 The American Frontier and Westward Movement I, II, III (3.3.3) Settlement and development of the "FronTier" throughout American history. 4910—From the Atlantic to the Mississippi. 4620-30—The Trans-Mississippi West.

4641-51 America: Mind, Mood and Society (3,3) Surveys social and cultural history and thought from mythology behind colonization to the major beliefs and values which form the foundation of present-day life in the United States. 4641-Colonial period to 1655, 4651—1850 to present.

4661 Studies in American Social and Cultural History and Thought (3) An intensive examination of specific themes, problems, or ideas.

4670 Cities and Urbanization in American History (4) Origins, growth, and influence of American cities in development of the nation, from colonial era to present. (Same as Urban Studies 4670).

4680 History of Knoxville (3) Knoxville, Tennessee as a historical case study to analyze the interplay of tradition and change in urban America in general and urban South in particular. Economic growth and development, population changes, and political, social, and cultural conflicts over issues connected with change and modernization.

4710-20 Medieval History (3,3) 4710—Age of Heroes, 500-1000. The pattern of early medieval heroism, its social and intellectual assumptions, the individuals who exemplify it, and the continuing harsh environment of the early Middle Ages. 4720—Age of Chivalry: 1000-1300. The emergence of chivalry—from the heroes of the feudal epics of the 11th century to the questing knights of the 12th century. 4741 Italian City-States, 1250-1500 (3) Evolution of urban civilization in northern and central Italy in medieval and Renaissance periods. Architectural and townscapes forms studied in socioeconomic as well as cultural contexts. Florence is primary focus, but other major city-states are also included.

4770 Austria to 1850: Habsburgs and the Heartland (3) German and Catholic Austria's growth from a frontier state to a major power, and its imperial missions, its relation to the Holy Roman Empire, and its neighbors and assertive nationalities. Also includes Maria Theresia, Metternich, unity versus diversity, and Vienna's cultural contributions.

4780 Austria Since 1848: Trials and Transformations (3) The search for identity during the drastic changes from a great multinational empire to a truncated republic, to an exploited Third Reich province, to an Allied occupation zone, and finally, to a free neutral nation at the crossroads of Europe.

4811-21 History of Japan (4,4)

4840 History of Mexico (3) (Same as Latin American Studies 4840).

4850 History of the Caribbean (3) Caribbean region from discovery and colonization to contemporary times. (Same as Latin American Studies 4850).


4940 Local and Regional History (3) Investigates the history of the concept of regionalism, the applicability of regionalism, and an analysis and study of United States regional models. May not be taken for graduate credit. May not receive credit for both 4940 and 5940.

4950 The Afro-American Experience to 1865 (3) Examines the acculturation of blacks in early America, the legal, social, and cultural implications of slavery before the Civil War, and the related plight of free blacks in the context of the slave trade, the American Revolution, westward migration, and the genesis of sectionalism. (Same as Afro-American Studies 4950).

4960 The Afro-American Experience Since 1865 (3) Black attempts to realize the freedom and equality promised to them at the end of the Civil War are examined in the context of Reconstruction, the Harlem Renaissance, the Great Depression, two world wars, and the Civil Rights Movement. (Same as Afro-American Studies 4960). 

GRADUATE

A student who enrolls in the Graduate School with intention of obtaining an advanced degree in history shall have completed an undergraduate major in history or its equivalent. 

General requirements for the Master of Arts and doctoral degrees as well as course descriptions are found in the Graduate Catalog.

Non-Departmental

Director: Dr. Harry Jacobson

The following courses are restricted to students who have been selected to participate. 1118-28-38 are for first-year students invited on the basis of test scores, high school averages, and where appropriate, on University of Virginia placement in the 2000-, 3000-, and 4000-level courses is based on cumulative averages. At present students with an average of 3.25 or greater are eligible.

Honors (509)

3018-28-38 College Scholars Seminar (1,1,1) Sequence (in any order) limited to and required of all College Scholars each year. 301B—humanities, 302B—sciences, and 303B—behavioral and social sciences. May be repeated. Maximum 12 hrs. S/NC grading only.

4101 Honors: Foreign Study (1-16) See page 54 and Director of Special Programs. Primarily for College Scholar Students.

4102 Honors: Off-Campus Study (1-16) See page 54 and director of Special Programs. Primarily for College Scholar Students.

4103 Honors: Independent Study (1-16) See page 54 and Director of Special Programs. Primarily for College Scholar Students.

4996 Honors: College Scholars Studies (2-16) Designed for College Scholars working on their senior thesis, project, or performance. May be repeated for a total of 24 credit hours.

Human Services

Professor: R. F. Kronick (Head), Ph.D. Tennessee.

Associate Professor: P. A. McClain, Ph.D. South Carolina: M. R. Woodside, Ed.D. V.P.I. & S.U.

Assistant Professors: T. McClain, Ph.D. South Carolina: J. D. McLean, Ph.D. Chicago.

Human Services (532)

The Program in Human Services was established in 1971 for the purpose of providing education, training, and experience at the undergraduate level, for individuals interested in working to enhance and increase the well-being of our society. The course of study provided by the faculty is also appropriate for individuals who wish primarily to improve their understanding of themselves and of the society in which they live.

Graduates of the program are employed in a wide variety of settings, including child and family service agencies, community centers, school systems, mental health centers, hospitals, court systems, family planning clinics, extended care facilities, and state human service departments. Many of our graduates enter graduate study to pursue the masters degree in education, social work, and vocational rehabilitation. The program is approved by the Council for Standards in Human Service Education (CSHSE).

The curriculum of the program includes required courses, elective courses, advising, and supervised experiences in human service agencies or organizations. A B.A. major in human services may be obtained by completing the following: H.C. 2690, 3110, 3300, 3900, 4220, 4221, 4400, 4401, and one course from each of the four lists of courses:

1. Psychology 3650 (4)
2. Sociology 3565 (4), Political Science 3566 (4), or Sociology 4560 (4).
3. Psychology 3120 (4) or Sociology 3130.

Total Credit Hours .......................... 55-56

2690 Introduction to Human Services (4) General field of human services with focus on related societal values; contemporary issues in human services. E.

3200 Peoples and Problems of Appalachia (4) Course designed to provide better understanding of Appalachian peoples, by exploring their life style and institutions from contemporary human services point of view. Special emphasis placed on political and economic structures of region. Recommended: Anthropology 4740.

3300 Thinking about People (4) Intended to facilitate development of the insightful, informed, and empathetic attitudes toward human beings—their providing service as well as those receiving service. F, W.

3900 Information Assessment and Interpretation (4) The knowledge and skills of information gathering and assessment for human services are examined in depth to relate to human services practice. Emphasis is placed on formulating questions, identifying relevant data, using related resources, interpreting information and applying this information in a practical setting. F, S.

4101 Foreign Study (1-16) Foreign Study Application filed no later than last week of the quarter prior to the quarter of enrollment. For additional information, see page 161.

4102 Off-Campus Study (1-16) Application filed no later than last week of the quarter prior to the quarter of enrollment. For additional information, see page 161.
later than the first week of the quarter prior to the quarter of enrollment. For additional information, see page 161.

4103 Independent Study (1-16) Independent Study (1-16) Application filed no later than the first week of the quarter prior to the quarter of enrollment. For additional information, see page 161.

4220 Human Services Methodologies (4) Introduction to some specific helping techniques essential to the administration and delivery of human services. F, W.

4221 Human Service Methodologies II (4) A continuation of HS 4220 with emphasis on general helping skills essential to the administration and delivery of human services. Precore: senior standing.

4229 Special Topics in Human Services (4) Examination of specific issues, methods, values, and trends which have implications for helping practitioners, e.g., art therapy, behavior modification, counseling skills, self-awareness training. Content varies; topic to be determined by instructor. May be repeated up to 12 credit hours.

4300 Working Within the System (6) A survey of the context within which the need for human services arises and an analysis of the process by means of which such services are provided. Precore: senior standing.

4400 Human Services Field Work (8) Practical field experiences in appropriately organized and directed human service settings. Designed to offer the student the opportunity to learn and develop specific helping skills and to become exposed and involved in the roles and function of social services; to provide some direct services in a supervised learning situation. For majors only. Must be taken for 8 hours Fall and Spring Quarters. S/N. Coreq: 4220, 4221. FS.

4401 Human Services Field Work II (8) Practical field experiences in appropriately organized and directed human services settings. Designed to offer the student the opportunity to learn and develop specific helping skills and to become exposed to and involved in the roles and functions of social services; to provide some direct services in a supervised learning situation. For majors only. Must be taken for 8 hours Winter and Summer Quarters. S/N. Coreq: 4220, 4221, 4400. W, SU.

Italian
See Romance Languages.

Japanese
See Cultural Studies (Asian Studies).

Latin
See Classics.

Latin American Studies
See Cultural Studies.

Linguistics
See Cultural Studies.

Mathematics (641)

Professors:
J. S. Bradley (Head), Ph.D. Iowa; G. E. Albert (Emeritus), Ph.D. Wisconsin; J. H. Carnuth, Ph.D. Louisiana State; C. C. Clark, Ph.D. Louisiana; R. E. Cline, Ph.D. Purdue; R. J. Daverman, Ph.D. Wisconsin; D. J. DesSart, Ph.D. Maryland; D. E. Dobbs, Ph.D. Cornell; E. D. Fine (Emeritus), Ph.D. Texas; H. Franko, Ph.D. Illinois; J. A. George, Ph.D. Stanford; T. G. Hallam, Ph.D. Missouri; B. S. Hinton, Ph.D. Tennessee; A. S. Householder (Emeritus), Ph.D. Chicago; L. Husch, Ph.D. Florida State; G. S. Jordan, Ph.D. Human; K. C. Koch, Ph.D. Illinois; R. M. McConnell, Ph.D. Duke; D. D. Miller (Emeritus), Ph.D. Michigan; B. Rajput, Ph.D. Illinois; K. C. Reddy, Ph.D. Petroleum Technology; P. W. Schafer, Ph.D. Maryland; S. M. Serbin, Ph.D. Cornell; K. Soni, Ph.D. Oregon State; F. W. Stallman, Ph.D. Georgia Institute; E. Weisbrod, Ph.D. Rensselaer Polytechnic Institute; W. R. Wade, Ph.D. California (Riverside); C. G. Wagner, Ph.D. Duke; J. J. Walsh, Ph.D. SUNY (Binghamton).

Associate Professors:
V. Alexides, Ph.D. Delaware; N. Aliokhos, Ph.D. Brown; D. F. Anderson, Ph.D. Chicago; V. A. Dougall, Ph.D. Harvard; J. Dyda, Ph.D. Warsaw (Poland); S. I. Harlan, Ph.D. Carnegie-Mellon; K. R. Kimble, Ph.D. Ohio State; Y. Kuo, Ph.D. Cincinnati; B. A. Kuperschmidt, Ph.D. Massachusetts Institute Technology; J. Rosinski, Ph.D. Wroclaw University; W. H. Row, Jr., Ph.D. Wisconsin; R. J. Rowlett, Ph.D. Virginia; J. Smith, Ph.D. California (Berkeley); G. A. Sod, Ph.D. California (Berkeley); R. P. Soni, Ph.D. Oregon State; H. Simpson, Ph.D. California Institute of Technology; K. R. Stephenson, Ph.D. Wisconsin; C. Sundberg, Ph.D. Wisconsin.

Assistant Professors:
L. Beale, Ph.D. Cornell; L. Barker, Ph.D. Florida State; S. Elner, Ph.D. Cornell; L. J. Gross, Ph.D. Cornell; O. Karakashian, Ph.D. Harvard; S. Lenhart, Ph.D. Kent; N. M. Morgan, Ph.D. State; M. Mullay, Ph.D. Purdue; B. K. Soni, Ph.D. Texas; R. Sivsry, Ph.D. John Hopkins.

Instructors:
C. G. Doss, M.A. Tennessee.

1Space Institute, Tulahoma.

UNDERGRADUATE Removal of Entrance Deficiencies: Entrance deficiencies in mathematics can be removed by taking courses in the evening, or by correspondence. Additional fees are required. For details, contact the Evening School or, for correspondence courses, The Center for Extended Learning.

The appropriate courses are as follows:

Deficiency
Evening Correspondence Courses

Algebra I
Math 1000
Math 1H-2H

Algebra II
Math 1000-20
Math 3000-4H

Geometry
Math 1030-40
Math 5H-6H

Trigonometry
Math 1050

Placement Information for Freshman Courses: In selecting their first mathematics courses, students should bear the following points in mind:

1. Entrance deficiencies must be removed before any of the courses carrying college credit can be taken. (It is acceptable to take 0150 at the same time a 1700 or 1840, but it is preferable to take trigonometry in high school.)

2. The department reserves the right to exclude or remove from its courses students who do not meet the prerequisites listed.

3. Fewer than half of the students presenting mathematics ACT scores below 16 are able to complete Math 1540 successfully. Such students should take 0120 (in the Evening School) before attempting Math 1700 or Math 1840. No student who fails to complete Math 1540 successfully may subsequently receive credit for Math 1540 or 1700. No student who has earned a grade of C or better in 1540 may subsequently receive credit for Math 1540 or 1700. No student who has earned a grade of C or better in 1550 may subsequently receive credit for Math 1550 or 1600. No student who has earned a grade of C or better in 1550 may subsequently receive credit for Math 1550.

4. Due to crowded conditions in most freshman-level courses, it is usually not possible to change courses after the start of the quarter. Therefore, courses should be chosen carefully, with attention to degree requirements, prerequisites, and ACT scores.

5. Math 1550-60 does not substitute for 1840-50-60 in curricula requiring the latter, nor is it an appropriate preparation for 1540 and 1700. Students who need to take a course preparatory to 1840 should take 1700 (preceded by 1540 if necessary). Placement of Well-Prepared Students: Students in curricula requiring 1540-50-60 should skip 1540 and begin with 1550 if they have a mathematics ACT score of 24 or above and grades of A or B in high school Algebra II.

Students in curricula requiring 1840-50-60 are urged to consider taking the Honors sequence 1848-58-68 if they have mathematics ACT scores of 32 or higher, and a high school average of 3.0 or above.

Students who took calculus in high school may qualify for entrance into the 1840 sequence, and should consult an advisor in the Mathematics Department. Basic Skill Requirement for Liberal Arts Students: Many students are exempt from this requirement; see page 161 for a complete description. Either 1140 or 1700 can be taken to satisfy the requirement. Students who plan to take 1840 (or 1841 or 1842), and who must satisfy the requirement, need to take 1700, not 1140. Note that 1540 does not satisfy the requirement. Credit Restrictions: No student who has earned a grade of C or better in any course numbered 1550 or higher may subsequently receive credit for 1140. No student who has earned a grade of C or better in 1840 may subsequently receive credit for 1841 or 1842.

Due Date: No student who has earned a grade of C or better in 1840-50-60 should skip 1540 and begin with 1550 if they have a mathematics ACT score of 24 or above and grades of A or B in high school Algebra II.

Initials
Instructors:

C. G. Doss, M.A. Tennessee.
credit on the basis of the Advanced Placement (AP) exams offered in some high schools. For the calculus sequence, students scoring 3 or 4 are awarded credit for Math 1840-50; those scoring 4 are awarded credit for Math 1848-58. For the calculus BC exam, students scoring 3 or 4 are awarded credit for Math 1840-50. Students scoring 5 are awarded credit for Math 1848-58-68.

Advanced Mathematics Courses: Include 3090 and all courses numbered 3140 or above, except 3220, 3510, and 3861.

B.S. Major: Before beginning a mathematics major, a B.S. candidate must complete 1840-50-60 (or honors versions) and have programming skill sufficient to take 1315. The major requirements are:

1. 2840-50-60 (or honors version) and 3155.
2. 3550-60. Students who complete 2848-58-68 may substitute six hours of advanced mathematics courses (as defined above) for this requirement.
4. Four additional hours of advanced mathematics courses as defined above. In satisfying this requirement a student may substitute not more than six hours of courses from the following list, for advanced mathematics: Computer Science 4510, 4710; Educational Curriculum 3751, 3752; Physics 3210-20, 4110-20. Statistics 3460.
5. 4910 and 4940. (These two courses constitute a capstone experience for mathematics majors.)

Honors Program:

Mathematics majors who fulfill the preceding five requirements may qualify for an honors degree if their program includes at least 27 hours of 4000-level mathematics courses (except 4710), at least 6 hours of which are honors courses (course numbers with final digit is 8). The grade point average, computed on the aforementioned 27 hours, will determine the honors category as follows: G.P.A. at least 3.4—Honors; G.P.A. at least 3.6—High Honors; G.P.A. at least 3.8—High Honors. Honors in Mathematics, respectively.

In exceptional cases, other courses of similar level may replace the six hours of honors courses.

Courses for an honors degree must apply to the Chair of the Departmental Honors Committee the quarter before they expect to graduate (in the spring, if graduation is to be in December). Their applications should list the courses comprising the required 27 hours, including the required honors courses, or proposed substitutes. Students with credit for more than 27 hours of qualifying courses may select 27 hours to be used in completing the G.P.A., which determines the honors category for which they qualify. A note of successful completion of honors program will be entered in the transcript.

Minor: Consists of 2840-50-60 (or 2848-58-68) and at least 12 hours of advanced mathematics courses, as defined under the heading, Advanced Mathematics Courses: Program Planning for Majors.

Mathematics majors have considerable freedom in determining how they will meet the requirements of the major. This is necessary, since mathematics majors may select courses that lead to a variety of careers. In order to meet this diversity of needs, the mathematics faculty has designed a variety of sample programs which majors may wish to follow. Programs are available to prepare students for:

a. for employment in business or industry, whether in numerical mathematics and computer science, operations research, probability and statistics, business and applied mathematics, biology and related sciences, economics, and philosophy.
b. for graduate work, in pure mathematics, applied mathematics, computer science, operations research, or statistics;
c. for teaching, at the school or college level;
d. for careers in business, law, medicine, or any other areas requiring training in mathematics.

These programs, along with other useful information for majors, are published in a Program Planning Guide, which is available on request at the department office, room 121, Ayres Hall. Prospective students are invited to write for copies.

1015 Trigonometry (0) Plane trigonometry with emphasis on identities and other analytic aspects used in calculus. For students with deficiencies in high school trigonometry. 3 hours per week. No college credit.

1140 Basic Mathematical Skills (4) Sets, elementary deductive logic, problem solving, elementary probability and statistics. Satisfies the Basic Skills Requirement in Mathematics for B.A./B.S. candidates in the College of Liberal Arts. No student who has taken the University with a grade of C or better in any Mathematics course numbered 1550 or higher, may receive credit for 1140. Association requirements in mathematics must be removed before taking 1140.

1540 College Algebra (4) Sets, real and complex number systems, exponents and radicals, fundamental algebraic operations, theory of equations, polynomial inequalities, relations, functions, graphs. No student who has earned a grade of C or better in 1540 may subsequently receive credit for Math 1560. Prereq: Two years of high school algebra or one year of algebra and one year of geometry.

1550-60 Introductory Calculus—General Mathematics (4,4) 1550—Equations of straight lines, conics, derivatives of algebraic functions, applications of derivatives, mean value theorem, area under the graph of a function. Satisfies the Integration of algebraic functions, applications of integration. Prereq: 1540 or equivalent. 1560—Determinants, systems of linear equations and inequalities, Cramer’s Rule, linear programming, trigonometric functions, applications, arithmetic and geometric sequences, simple and compound interest, annuities, exponential and logarithmic functions, law of growth, applications. Prereq: 1550 or equivalent.

Note: No student who has received a grade of C or better in Mathematics 1550 may subsequently receive credit for Mathematics 1550.

Note: Students with an adequate high school background in algebra are advised to begin the 1540-50-60 sequence with 1550.

1700 Precalculus Mathematics (4) Function concept and use of functional notation. Properties of functions and their graphs. Polynomial, exponential, logarithmic, and trigonometric functions. No student who has received credit for Math 1840 with a grade of C or better may subsequently receive credit for Math 1700. Prereq: Two years of high school algebra and the equivalent of one-half year of trigonometry or taking Mathematics 0150 concurrently.

1840-50-60 Single Variable Calculus (4,4,4) Functions, graphs, slope of a curve, definition of a derivative, limits, derivatives of algebraic functions, implicit differentiation, related rates, differentials, applications of derivatives, maxima and minima. Indefinite inte-
ability theory; random variables and their distribu-
tions; applications. Prereq: 1550-60 or equivalent. Does not satisfy the requirements of a major or minor in mathematics.

3060 Elementary Statistical Analysis (3) Elementary probability distributions; sampling theory; confidence intervals; regression and correlation; least squares and linear regression. Prereq: 3050 or consent of instructor. Does not satisfy the requirements of a major or minor in mathematics.

3090 Polynomials and Rings (3) An introduction to algebra beginning with study of integers fol-
lowed by the more general notions of rings, integral domains, and fields. Emphasis is given to certain ring theoretic properties shared by integers and poly-
nomial rings over fields. Prereq or coreq: Math 3100 or consent of instructor.

3100 Logic and Sets (3) Elements of mathematical logic; elementary algebra of sets. Primarily for stu-
dents in the College of Education. Prereq: 1 year of college mathematics. Does not satisfy the require-
ments of a major or minor in mathematics.

3110 Real Number System (3) Laws of arithmetic; rational and irrational numbers; fields. Primarily for stu-
dents in the College of Education. Prereq: 1 year of college mathematics. Does not satisfy the require-
ments of a major or minor in mathematics.

3150 Introduction to Numerical Algorithms and Programming (3) (Same as Computer Science 3150.)

3155 Introduction to Numerical Algorithms (3) (Same as Computer Science 3155.)

3215 Discrete Structures II (3) (Same as Computer Science 3215.)

3220 History of Mathematics (3) Survey of develop-
ment of mathematics, from ancient to modern times. Not acceptable for satisfying requirements for a major or minor in mathematics. Prereq: Math 1860 or 2550 or equivalent.

3310 Advanced Euclidean Geometry (3) Triangles and circles, constructions, modern concepts. Prereq: 1 year of college mathematics.

3320 Non-Euclidean Geometry (3) Foundations of geometry. Elliptic and hyperbolic plane geometry. Prereq: Math 1860 or 2550 or equivalent.

3330 Transformational Geometry (3) Fundamental transformations in Euclidean geometry. Classification of isometries and similarities; symmetries of a poly-
gon; inversions. Prereq: One year of college mathematics.

3510 Intermediate Analysis for Teachers (3) Primar-
ily for students in secondary mathematics education. Course covers elementary calculus from an advanced view point with emphasis on the roots of basic theo-
rems. Topics covered include limits of sequences and functions, continuous functions, derivatives, definite integral, and fundamental theorem of integral calcu-
lus. Prereq: 1550-60 or 1860. Does not satisfy the requirements for a major or minor in mathematics.

3550-60 Intermediate Analysis (3,3) Real number system, functions, sequences, limits, continuity, uni-
form continuity, differentials, and Riemann integration. Must be taken in sequence. Prereq: 2840-50-60.


3780-90 Introduction to Combinatorial Theory (3,3) Introduction to problems of arrangement and se-
lection within discrete systems. Enumerations by recurrence relations and generating functions, graph theory, finite geometries and finite fields, partitions, block designs. Prereq: Math 2860 or consent of instructor.

3810 How to Prove It (3) Course is designed to improve understanding of nature and methods of mathemati-
cal proofs in an informal and non-technical approach in seminar setting. Variable content will include certain standard topics such as elementary set theory, relations and functions, and mathematical induction. Coreq: 2850 or 2560.

3861 Mathematical Models in the Life Sciences (3) Introduction to difference equations and differential equations. Mathematical modeling techniques applied to biological phenomena. Prereq: Math 1841-51 or consent of instructor. Does not satisfy the require-
ments of a major or minor in mathematics.

3920-30 Topology of Euclidean Spaces (3,3) Topics will include topology of line and plane, separation properties, compactness, connectedness, complete-
ness, continuous functions, homeomorphisms, connected, and topological invariants. Must be taken in sequence. Prereq: 3810 or 2868 or consent of instructor.

3990 Studies in Mathematics (1-4) Credit deter-
mmed at registration. May be repeated for credit with consent of department; maximum credit 9 hours. Prereq: Consent of instructor.

4000 Mathematics and Microcomputers for Teachers (3) Primarily for students in secondary mathematics education. Use of microcomputers for concepts and problems in mathematics. Emphasis on algorithms, problem solving and mathematics fundamental to com-
puter science. Does not satisfy the major requirements for a B.S. or M.S. degree in mathematics. Prereq: Two junior/senior level mathematics courses and pro-
gramming experience.

4050-60-70 Matrix Algebra and Applications (3,3,3) Vector spaces, linear transformations, eigenvalues and eigenvectors, similarity and unitary transforma-
tions, unbounded operators, least squares problem, vector and matrix norms. Jordan canonical forms, evolution of discrete and continuous systems, quadratic forms, real analysis, real topics. Must be taken in sequence. Prereq: 2860.

4102 Off-Campus Study (1-16) See page 161.

4120 Linear Algebra (3) Abstract vector spaces, linear transformations and their matrices, systems of linear equations and determinants, inner products, and diag-
onalization of symmetric matrices. Prereq: 2860 or 4050.

4150-60 Abstract Algebra (3,3) Equivalence rela-
tions and partitions, properties of integers, elementary theory of groups and rings, polynomial rings, integral domains, divisibility, unique factorization domains, fields. Must be taken in sequence. Prereq: 2860.

4225 Numerical Solution to Equations and Numeri-
cal Approximations (3) Introduction to computation, instabilities, rounding errors. Solution of a single non-
linear equation, graph drawing. Methods for solving linear and nonlinear systems. Polynomial equations; power and inverse power methods for eigenvalues. Approximation of functions; numerical methods for poly-
nomials, trigonometric and rational functions. Prereq: 3150 or 3155. (Same as Computer Science 4225.)

4225 Numerical Methods for Ordinary Differential Equations (3) Introduction by polynomials and piece-
wise polynomials, quadrature, singularity, and multipstep methods for differential equations. Stability, consist-
ency, and convergence. Current algorithms, variable step and order, stiff systems. Boundary value prob-
lems. Prereq: 3150 or 3155 and 4610 or 4425. (Same as Computer Science 4239.)

4245 Numerical Linear Algebra (3) Review of vec-
tor and matrix algebra; linear systems of equations; iterative methods for large, sparse prob-
lems. Orthogonal decompositions, least squares, and matrix norms. Jordan canonical form, eigenvalues and eigenvectors, numerical linear algebra, and matrix decom-
position. Must be taken in sequence. Prereq: 2860; one 4000-level mathematics course recommended.

4310 Computer Geometry (3) Two or three dimen-
sions; surficial geometry in Euclidean and Non-
Euclidean spaces. Mathematical modeling of states and motion. Implementation of representation of motions with microcomputers. Prereq: Math 2860 and pro-
gramming experience.

4510-20-30 Introduction to Analysis (3,3,3) Real number system, fuctions, sequences, limits, continuity, uni-
form continuity, differentiation, integration, functions of several variables, implicit function theory, multiple integration, definite sums and integrals, improper inte-
grations, uniform convergence, Taylor series. Should be taken in sequence. NOTE: Credit will not be given for both 4510 and 4710.

4540 Finite Sets and Functions of Various Varia-
bles (3) General theory, power series and Taylor’s formula, uniform convergence. Partial differentiation and maxima and minima for functions of several vari-
able. Lagrange multipliers. Prereq: 2860.

4550 Partial Differential Equations (3) Fourier series; orthogonal functions; the vibrating string; solution by series; heat flow, Bessel functions. Prereq: 2860; 4510 or 4710 recommended.

4560-70-80 Introduction to Mathematical Statistics (3,3,3) Introduction to probability; discrete and con-
tinuous distributions, sampling theory; confidence in-
tervals; significance and statistical independence; foundations of sampling theory; significance tests. Must be taken in sequence. Prereq: 2860.

4710 Vector Analysis (3) Fundamental operations, basis vectors, dot and cross products, directional deriva-
atives, divergence and curl of vector fields, line and surface integral divergence, theorem of Gauss, Stokes theorem. NOTE: Credit will not be given for both 4530 and 4710.

4750-60-70 Introductory Probability Theory (3,3,3) 4750—Elementary combinatorial analysis, probabili-
ties in discrete sample spaces, conditional probability and stochastic independence, binomial, Poisson, hyper-
geometric, and normal distributions. 4760— Expectation, conditional expectation, and character-
istic function of random variables, infinite sequences of random variables, the weak and strong laws of large numbers, and the central limit theorem. 4770— Markov processes: limiting probabilities, Markov chains, stationary distributions; Stochastic processes; Pois-
sion, birth and death processes; Kolmogorov equations. Prereq: Math 2840-50-60.

4810 Elementary Number Theory (3) Divisibility; con-
gruences; theorems of Fermat and Wilson, primitive roots; indices, quadratic reciprocity. Prereq: 2860 or consent of instructor.

4910 Senior Topics (3) Topics vary. Assignments will include library research and oral and written reports. May be repeated once for credit. Prereq: 2860-50, senior standing, and consent of instructor.

4940 Mathematical Modeling (3) Survey of construc-
tion and development of mathematical models used in science and industry. Models studied may draw upon Markov chains, linear optimization, graph theory, or differential and integral equations. Mathematics developed contribute to understanding of the model and associated scientific problem that it approxi-

4980 Readings in Mathematics (1-3) Open to superior students with consent of department head. Indepen-
dent study with faculty guidance. May be repeated. Maximum credit 9 hours. Prereq: Math 2860-50.

4990 Studies in Mathematics (1-4) Credit deter-
mmed at registration. May be repeated for credit with consent of department; maximum credit 9 hours. Prereq: Readings in Mathematics or instructor consent of mathematics profes-
sorial staff and consent of department.
GRADUATE

The Department of Mathematics offers four advanced degrees. In order to become a candidate for any one of these the student must first be admitted to the Graduate School. The Master of Arts and Master of Science degree programs presuppose a bachelor's or student's degree in mathematics. The Master of Mathematics degree is intended primarily for teachers of high school mathematics. Applicants for admission to this program must take the Graduate Record Examination and must have either (a) at least 36 semester hours in mathematics, or (b) a grade of B or better in any of the following courses: Mathematics 1841-51 or 1540-50-60. Students do not receive credit for 2919 if 2911 has been taken. Prereq or coreq: 2910.

2910 General Microbiology (3) General properties of bacteria, rickettsia, and fungi, with an emphasis on principles and clinical correlation. Formal lecture designating accompany 4270 and 4279 Advanced Immunology Laboratory (2) Laboratory exercises designed to accompany 4270. Prereq: Consent of instructor. Students do not receive credit for 2919 if 2911 has been taken. Prereq or coreq: 2910.

2911 Microbes in Action (1) Discussions, demonstrations, and films relating to the subject matter of 2910. Students do not receive credit for 2911 if 2919 has been taken. Prereq or coreq: 2910.

2919 Laboratory in General Microbiology (2) Laboratory exercises designed to accompany 2910. Open only to students in the College of Nursing, prevetinarian, premedical, food technology, food science, nutrition, or food systems administration. Others by consent of instructor. Students do not receive credit for 2919 if 2911 has been taken. Prereq or coreq: 2910.

3200 Medical Microbiology (3) Disease producing microorganisms including bacteria, viruses, and fungi; basic principles and mechanisms involved in resistance to infection. Prereq: Chemistry 1110-20-30, Biology 3120; coreq: 3519, Biology 3110.

3519 Introductory Microbiology Laboratory (2) Basic techniques for examination, cultivation, and identification of microorganisms. Coreq: 3200 or 3700.


4010 Biology of Soil Microorganisms (4) Same as Entomology and Plant Pathology 4010.

4101 Foreign Study (1-16) See page 161. No more than 3 hours may be applied toward a major or minor in microbiology. May be repeated. Maximum credit: 16 hours.

4102 Off-Campus Study (1-16) See page 161. No more than 3 hours may be applied toward a major or minor in microbiology. May be repeated. Maximum credit: 16 hours.

4110 Physiology of Bacteria (3) Modern concepts of bacterial physiology and metabolism including cell structure and function. Prereq: 3700 and 12 hours of organic chemistry.

4119 Bacterial Physiology Laboratory (2) Prereq: 3519; coreq: 4110.

4120 Bacterial Diversity (3) An exploration of various bacterial groups and the alternative strategies they have evolved with respect to physiology and metabolism. Prereq: One year of Organic Chemistry and Microbiology 3700; or consent of the instructor. Microbiology 4110 recommended.

4140 Molecular Genetics (3) Transmission and expression of genetic information at the molecular level. Emphasis is on bacterial and viral systems, but unique features of eukaryotic genetic systems are included. Prereq: 3700 or consent of instructor.

4149 Techniques in Microbial Genetics (2) Practical experience in basic techniques in experimentation in microbial genetics. Coreq: 4140.

4150 Microbial Ecology (3) Application of ecological principles to study of microbial communities. Emphasis on functional role of microorganisms in natural environments. Prereq: 3700, one year organic chemistry, Biology 3130, or consent of instructor.

4159 Experimental Microbial Ecology (3) Survey of techniques for assessment of microbial flora, functions, activities, and interactions in a variety of habitats. Prereq: 3519; coreq: 4150 or consent of instructor. 1 hour and 3 lab.

4270 Immunology (3) Principles of inflammation and immunity, immunologic structure and theories of formation, complement, hypersensitivities, cell cooperation in immune mechanisms, abnormalities of the immune system. Prereq: Biology 3120. (Same as Zool 4270.)

4279 Advanced Immunology Laboratory (2) Laboratory exercises designed to accompany 4270. Prereq or coreq: 4270.

4320 Pathogenic Bacteriology (3) Disease producing microorganisms, including bacteria, rickettsias, and chlamydias. Prereq: 3200.

4329 Pathogenic Bacteriology Laboratory (2) Techniques for isolation, cultivation, and identification of pathogenic bacteria. Prereq: 3200; coreq: 4320.

4330 Medical Mycology (3) Disease causing fungi; cytology, physiology, pathogenesis, and immunity; emphasis on methodology of isolation and identification. Prereq: 2910.

4339 Medical Mycology Laboratory (2) Prereq: 3519; coreq: 4330.

4420 Molecular Virology (3) Molecular aspects of the replication, assembly, and expression of viruses, with emphasis on bacteriophage. Prereq: 3700.

4430 Medical Virology (3) General virology with emphasis on medical aspects. Prereq: 3200.

4439 Medical Virology Laboratory (2) Laboratory procedures for isolation, handling and culturing of animal viruses. Prereq: 3515; coreq: 4430.

4909 Laboratory Problems in Microbiology (2-6) Involvement in research program of a faculty member through independent study projects. Consent of individual faculty member required. May not be used as credit toward the major in microbiology, S/H/C only. May be repeated. Maximum 12 credit hours.

4910 Seminar in Microbiology (1) May not be applied toward a major in microbiology. Prereq: Senior standing, consent of instructor. S/N/C.

GRADUATE

Consult the Graduate Catalog for listing of graduate level courses.

Medical Technology (669)

Courses in this major are open only to qualified students who have completed the first three years of the Science-Medical Technology Curriculum. For full description see page 154, and have been approved by the Pre-Medical Advisory Committee.

4011-12 Microbiology (6,6) Laboratory work in bacteriology, mycology, and parasitology. Emphasis on pathogenic bacteria and fungi, their sources, methods of culture, techniques of identification, and evaluation of antibiotic sensitivity. Gross and qualitative chemical examination of feces and methods of identification of protozoa and helminth parasites of man.

4021-22 Clinical Chemistry (5,5) Clinical aspects of biochemistry, including overview of principles and instrumentation with emphasis on practical laboratory application of analytical procedures, specimen collection and handling, significance of results, and quality assurance. Includes blood gas analysis, including radioimmunoassay, and analysis of blood and other body fluids for enzymes, hormones, and other substances of clinical interest, utilizing both automated and manual techniques.

4031-32 Hematology and Clinical Microscopy (5,5) Principles, theories, and instrumentation related to the qualitative and quantitative evaluation of cellular elements of blood and other body fluids; factors of hemostasis, quantitative chemical analysis of urine, and renal function studies. Emphasis is placed on microscopic identification of cells and the significance and correlation of laboratory data.

4041-42 Immunohematology (4,4) Theory and practice in the bank, collection, enzyme and antibody methods, and technique in laboratory procedures for the cross-matching of blood components for transfusion. Safety control methods standard to an efficient blood bank.

4043 Clinical Serology and Immunology (2) Performance and interpretation of broad range of clinical serological and immune tests with emphasis on principles and clinical correlation. Formal lecture and laboratory sections included.

4050 Nuclear Medicine (1) Physical characteristics, detection and use of short half-life radioactive materials. Emphasis placed on in vivo diagnostic medical uses and radiation safety.
4060 History (1) Overview of techniques of preparation of tissues for microscopic evaluation and role of histopathology in clinical diagnosis.

4071 Orientation and Basic Techniques (1) Designed to facilitate transfer of students from campus to hospital community and clinical laboratory. Introduction to medical terminology, ethics, and health team concepts. Basic techniques of methods of study include procedures for collection and handling of specimens, principles of operation of many laboratory instruments, review of laboratory methods, and introduction to quality control procedures. Portions of course extend over entire clinical year.

4072 Principles of Supervision and Education in Medical Technology (1) Seminars in basic principles of management, supervision, and education theories and methods. Comprehensive examination covers entire course.

Music (698)

Professors: J. J. Meacham (Head), M.M. Northwestern; G. C. Blitz, M.M.; converse; J. P. Brock, M.M.; Alabama; W. J. Carter (Emeritus), D.M.A. Eastman; J. Coker, M.A. Sam Houston; F. M. Combs, M.A. Missouri; G. F. DeVine (Emeritus), Diploma, Schurz (Chicago); W. J. Dorn, M.A. Columbia; H. W. Fred, Ph.D.; Card (Emeritus), M.M. Northwestern; C. R. Huber, Ph.D. North Carolina; D. M. Pederson, Ph.D. Iowa; W. J. Starr (Emeritus), M.M.; Eastman; D. Van Vactor (Emeritus), M.M. Northwestern.


The Department of Music offers curricula leading to the Bachelor of Music degree, which is designed to prepare students for graduate study and for professional positions, and the Bachelor of Arts degree with a major and minor in Music, designed for those students who have a strong interest in music, but desire a comprehensive liberal studies program. Information regarding requirements for the B.M. degree may be found on page 156.

B.A. Degree/Music Requirements:

Prerequisites: Music Theory 1111-21-31 +15 Minor:

(a) Concentration in Applied Music—consists of 24 hours in courses numbered 2000 and above, distributed as follows: Music 2300, 12 hours in Music and 9 hours in music electives. Prerequisites are Music 1000 or equivalent and three quarters of applied music study at the 1500-1599 levels.

(b) Concentration in Music History and Literature—consists of 24 hours in courses numbered 2000 and above, distributed as follows: Music 2300, 12 hours in Music History and Literature courses and 9 hours in music electives. Prerequisites are Music 1000 or equivalent and three quarters of applied music study at the 1500-1599 levels. The Bachelor of Science in Music Education, designed for preparation for institutional teaching, is administered by the Department of Music Education. See page 99 for requirements.

GENERAL

1000 Fundamentals of Music Theory (3) Theory and practice of basic elements of music.

1010-20-30 Class Piano (1,1,1) Must be taken in sequence. Course may be waived by successful completion of Piano Competency Examination. Waived courses must be substituted with an equivalent number of quarters of study in Music 1580 or above.

1015 Class Voice (1) Development of basic vocal skills. May be repeated for credit.

1025 Class Voice (1) Prereq: Consent of instructor. May be repeated for credit.

1080 Studio Guitar Styles (2) Introductory survey of guitar styles in jazz, rock, country, and blues idiom. Prereq: consent of instructor.

1085-55 Class Guitar (1,1,1) Must be taken in sequence. Prereq: Consent of instructor.

1416 Music Performance (3) An individualized course of study combining participation in a University musical ensemble with collateral study of an instrument or voice. One hour of applied study (Music 1500-1959) and ensemble rehearsals as scheduled. (Music 3600-3699). May be repeated once for credit. Requires payment of Applied Music fee. For non-majors only. Prereq: Performance ability on an instrument or voice.

2000 Solo Class (0)

2010 Introduction to Musical Theatre Technology (3) Stage technology unique to lyric stage.

2015 Fundamentals of Opera Acting (3) Analysis of stage performance and interpretation; program building. Prereq: Consent of instructor.

2020 Vocal Techniques in Popular Music (1) Development of performance techniques in Broadway and other contemporary music styles. Prereq: Consent of instructor. May be repeated for credit.

2040-50-60 Class Piano (1,1,1) Must be taken in sequence. Prereq: 2000-30.

2045 Projects in Opera Theatre (1-3) May be repeated for credit. Prereq: Consent of instructor.

2050-52-54 Brass Literature (2,2) Prereq: Consent of instructor.

2199 Techniques of Sound Recording (3) Theory and applications of tape recording. Topics include room acoustics, microphones, processing, noise reduction, mixing, editing, editing, and recorder maintenance.

2810-20-30 Jazz Piano (1,1,1) Harmonic language of jazz: interpretation of chord symbols, formule for voicing chords, chord progressions, and fundamenta for studying, and improvisation for right hand. Must be taken in sequence. Prereq: 1010-20.

3000 Junior Recital (0)

3014-24 Woodwind Literature (2,2) Prereq: Consent of instructor.

3015 Percussion Literature (1) Prereq: Consent of instructor.

3016 String Literature (2) May be repeated. Maximum credit 6 hrs. Prereq: Consent of instructor.

3018 Introduction to Styles in Jazz Drumming (2) Examination and study of major composers and performers who have contributed significantly to creation of principal styles of jazz drumming.

3052-53 Jazz Improvisation (3,3) Study and application of principles of improvisation, including nomenclature, chord progressions, chord-scales, patterns, melodic development, and free form devices. Prereq: 1141.

3044-54 Brass Literature (2,2) Prereq: Consent of instructor.

3070 Opera Production (1-3) Supervised work on opera productions. May be repeated for credit. Prereq: Consent of instructor.

3071-81-91 Church Service Playing II (1,1,1) Continuation of Music 2071-81-91, which is prereq.

3095 Women in Music (3) The history of women in music from the Middle Ages to present as composers, performers, educators, and patrons. (Same as Women's Studies 3095).


4000 Senior Recital (0)

4002 Suzuki Piano Method (2) Study of the psychologo, procedures, and literature of the Suzuki piano method. Prereq: Consent of instructor.

4009-19-29 Talent Education Program of S. Suzuki (2,2,2) May be repeated. Maximum credit 12 hours. Prereq: Consent of instructor.

4010-20-30 Piano Techniques (1,1,1) Problems of piano playing; development of piano technique; style and interpretation; program building. Prereq: Consent of instructor.

4012-22-32 Principles of Vocal Pedagogy (1,1,1) Examination and evaluation of concepts and approaches to teaching singing (past and present) and related teaching materials. Collaborative laboratory experiences accompany the study. Prereq: Consent of instructor.

4036-37-38 Advanced Piano Literature (2,2,2) Piano music from preclassical period to present. Prereq: Consent of instructor.

4040 Special Topics in Pedagogy (1-3) Prereq: consent of department head. May be repeated. Maximum 6 credit hours.

4041 Styles in Opera Acting (3) Study and practice of styles in opera acting based on historical and national characteristics. Prereq: 3015 or consent of instructor.

4045 Projects in Opera Theatre (1-3) May be repeated for credit. Consent of instructor.

4046-47-48 Song Literature (2,2,2) Study of literature from 1750 to present including performance. Prereq: Consent of instructor.

4050 Advanced Instrumental Conducting (3) Development of knowledge and skills in instrumental conducting; study of various periods and composers and relationship of different styles to the conductor's
4056-57 Elementary and Intermediate Piano Pedagogy (2,2,2) Examination and study of piano methods and materials designed for teaching precollege level students. Prereq: Consent of instructor.

4060 Advanced Choral Conducting I (3) Development of refinement of conducting techniques; including chant and changing meters. Prereq: Music Ed. 4510 or consent of instructor.

4074 Music in Christian Worship (3) History and philosophy of church music; liturgies and liturgical music; music in non-liturgical worship. Prereq: Consent of instructor.

4084 Church Music Methods and Administration (3) Prereq: Consent of instructor.

4085 Harpsichord Techniques (1) Technique, literature, performance practice, continuo playing, and basic tuning and maintenance. Requires a thorough keyboard background. May be repeated. Maximum credit 3 hrs. Prereq: Consent of instructor.

4091 Special Topics in Performance (1-3) Prereq: Consent of department head. May be repeated. Maximum credit 6 hours.

4174 Hymnology (3) A survey of Christian hymns from Biblical times to the present.


4200 Independent Study in Music Theory (1-3) May be repeated for credit. Prereq: Consent of department head.

4201 Foreign Study (1-16) See page 161.

4213 Pedagogy of Music Theory (3) Techniques, methods and materials involved in college-level theory programs. Prereq: Consent of instructor.

4217 Choral Arranging (3) Analysis of scores and writing of arrangements for men's, women's and mixed choruses. Prereq: 3112 or consent of instructor.

4214 Marching Band Arranging (2) Study and application of techniques employed in scoring for marching band. Prereq: 3112 or equivalent.

4213 Concert Band Arranging (3) Study and application of techniques employed in scoring for concert band. Prereq: 3112 or equivalent.

4250 Survey of Music Theory (3) Theory of music with emphasis on harmonic practice of Baroque, Classic, and Romantic periods. Exercises in writing and analysis. Recommended as review course for graduate students. Prereq: Consent of instructor.

4542 Composition for Media (1-3) May be repeated for credit. Maximum 6 credit hours. Prereq: Consent of instructor.

4850 Jazz Composition (2,2) Prereq: Consent of instructor.

4870-75 StageBand Arranging (2,2) Analysis of scores and scoring for the stage band. Prereq: 3112 and 4850 and consent of instructor. Must be taken in sequence.

4900 Advanced Improvisation (2) Emphasis on further development of individual skills and solving individual problems in jazz improvisation. Prereq: Music 3052-53.

MUSIC THEORY AND COMPOSITION

1111-21-31 Theory (3,3,3) Materials of music with emphasis on literature of Baroque, Classic, and Romantic periods. Exercises in writing and analysis. Must be taken in sequence.

1113-23-33 Sightseeing and Ear Training (1,1,1) Should be taken concurrently with 1111-21-31. Must be taken in sequence. 2 hours per week.

1141 Jazz Theory (2) Fundamentals of the jazz language, including terminology, chord symbols, chord spelling, and chord progressions. Prereq: 1111 or consent of instructor.

1400 Analysis of Jazz Styles (2) Individual improvisatory styles through analysis of their transcribed solos. Training and function of ear in music. Transcription of solos from recordings and preparation of analyses. Prereq: Music 1141.

2111-21-31 Theory II (3,3,3) Materials of music with emphasis on literature of Romantic and contemporary periods. Exercises in writing and analysis. Must be taken in sequence. Prereq: 1131 or 1138 or consent of instructor.

2113-23-33 Advanced Ear Training (1,1,1) Should be taken concurrently with 2111-21-31. Must be taken in sequence. 2 hours per week.

3041 Keyboard Harmony (1) Melody harmonization, figured bass realization, and improvisation. Prereq: 1131-33 and keyboard proficiency at the 2000 level.

3062-63 Sight Reading at the Piano (1,1) Prereq: Consent of instructor.

3111 Modal Counterpoint (3) Counterpoint techniques of 16th century emphasis on style of Palestrina. Prereq: 2131.

3112 Instrumentation (3) Basic techniques in scoring for voices, brass, woodwinds, and string choruses; and percussion. Prereq: 2131.

3113 Analysis I (3) Study and practice in analysis of structures of music from smallest structural units to large compound forms. Emphasis on macroanalytic techniques. Prereq: 2131.

3121 Tonal Counterpoint (3) Contrapuntal techniques of 18th century with emphasis on works of J. S. Bach. Prereq: 2131.

3122 Orchestration (3) Advanced techniques in instrumental writing with emphasis on scoring for the concert orchestra. Prereq: 3112 or consent of instructor.

3123 Analysis II (3) Continuation of Analysis I with emphasis on micro and linear analytic techniques. Prereq: 3113.

3131 Fugue (3) Contrapuntal techniques of 18th century with emphasis on the fugal works of J. S. Bach. Prereq: 3121.

4100 Independent Study in Music Theory (1-3) May be repeated for credit. Prereq: Consent of department head.

4101 Foreign Study (1-16) See page 161.

4113 Pedagogy of Music Theory (3) Techniques, methods and materials involved in college-level theory programs. Prereq: Consent of instructor.

4117 Choral Arranging (3) Analysis of scores and writing of arrangements for men's, women's and mixed choruses. Prereq: 3112 or consent of instructor.

4124 Marching Band Arranging (2) Study and application of techniques employed in scoring for marching band. Prereq: 3112 or equivalent.

4113 Concert Band Arranging (3) Study and application of techniques employed in scoring for concert band. Prereq: 3112 or equivalent.

4125 Survey of Music Theory (3) Use of music on music with emphasis on harmonic practice of Baroque, Classic, and Romantic periods. Exercises in writing and analysis. Recommended as review course for graduate students. Prereq: Consent of instructor.

4542 Composition for Media (1-3) May be repeated for credit. Maximum 6 credit hours. Prereq: Consent of instructor.

4850 Jazz Composition (2) Prereq: Consent of instructor.

4870-75 StageBand Arranging (2,2) Analysis of scores and scoring for the stage band. Prereq: 3112 and 4850 and consent of instructor. Must be taken in sequence.

MUSIC HISTORY AND LITERATURE

1210-20 Orientation in Music Appreciation (3,3) 1210—Developing perceptive listening skills through study of materials of music, musical styles, and musical aesthetics. Illustrative examples selected from 4th through the 20th centuries. 1220—Introduction to musical works from 1600 to present. For non-music majors. Prereq: 1210 for 1220 or consent of instructor.

1230 History of Rock (3) Study and appreciation of rock, its origins in blues and rock and roll, and its relationship with other popular musics—country, gospel, jazz, and folk.

2300 Introduction to Music Literature (3) Acquaintanceship with the principal works of music from 1600 to present. Requires musical background. Prereq: Consent of instructor.

3212 Orientation in Music: Music for the Theatre (3) Study of selected, representative music composed for Broadway stage, films, operetta, and opera. Prereq: 1210 or consent of instructor.

3240 The Symphony (2) Survey of symphonic literature from precursors of classical symphony to present.

3271-61 History of Opera (3,3) Dramatic, vocal, and orchestral elements in operas of Italian, French, and German School. 3271—1600-1800. 3281—1800-present.

3340 Oratorio (3) Choral works other than those appropriate for use in church.

3350 Introduction to Afro-American Music (3) History of African music, blues, gospel music, and jazz with emphasis on Black artists and their contributions.

3361-71 Ethnomusicology (3,3) Attitudes and techniques of ethnomusicology. Survey of music cultures throughout the world. Africa, Near East, and Asia. 4271—Africa, Europe, and the Americas. Credit may not be received for both 3361-71 and 3361-71.

3950 Evolution of Jazz (3) Study of origin, development, and styles of jazz music and its exponents.

4003-04-05 The Organ and Its Literature (3,3,3) The development of the organ and organ literature from the Middle Ages to the present: problems of style and interpretation; pedagogical literature and methods; organ design. Prereq: or coreq: 2361-20-30-40 and consent of instructor.

4035 Keyboard Literature Before 1750 (2) A survey of music for harpsichord and other keyboard instruments from the Elizabethan period through J.S. Bach.

4200 Independent Study in Music History and Literature (1-3) May be repeated for credit. Prereq: Consent of department head.

4205 Survey of Music History (3) History of music with emphasis on genres, style changes, and cultural forces. Covers the Western European tradition from 400-1900. Recommended as a review course for graduate students. Prereq: Consent of instructor.

4211-30 Music of the United States (3) U.S. music from colonial times to present. Emphasis on 20th century. Includes both folk and art music traditions. Recommended: Music 1211.


4290 Gregorian Chant (3) Chants of Latin rite. Masses and Offices examined as functional music as well as by

3430-50 Works of Bach (3,3) Detailed examination of sonatas, chamber, keyboard, and orchestral works; cantatas, motets, Passions, and oratorios. 4340—instrumental works; 4350—vocal works.

APPLIED MUSIC

Applied study is classified as Principal or Secondary.

Students studying their principal (major) instrument register for credit appropriate to their program, 2-4 credit hours; students studying a secondary instrument register for 1 hour of credit. Study at the principal level receives one hour of private instruction per week or a one-hour class lesson plus a half-hour private lesson. Determination of the mode of instruction rests with the department. Study at the secondary level receives one-half hour private instruction per week or its equivalent in class instruction. Applied music courses do not permit non-credit registration nor may students elect non-credit registration.

Non-music students will be accepted at the secondary level if they meet audition requirements established by area faculty (piano, voice, violin, etc.) and instruction time is available.
Undergraduate students seeking entrance to applied music courses must be concurrently registered for no less than three credit hours in academic courses. Graduate students must be concurrently registered for no less than six credit hours in academic courses. Exceptions to these requirements may be made with the approval of the department head if applied music registration is necessary to completion of degree requirements.

Advancement in applied music is measured by proficiency (Jury) examination. Students who do not meet proficiency requirements at any level may be required additional study at that level. Course level and credit hours will be determined by the applied faculty.

All students studying applied music at the principal level are required to register for Music 2000 Solo Class. The requirements for this course are to attend scheduled concerts, recitals, master, repertoire, and solo classes, and to perform at least once each quarter as partial fulfillment of applied music credit requirements.

Applied Music Fees: $30 per quarter for half-hour lesson (1 credit hour) $60 per quarter for hour lesson (2-4 credit hours)

Computer registration and applied music fee payment must be verified in the Department of Music office no later than the end of the second day of classes of the fall, winter, and spring quarters and the first day of the summer terms in order to be accepted for applied music study.

Applied music fees are not refundable after lessons have been scheduled.

1500-2500-3500-4500-5500 Flute (1-4) May be repeated for credit.

1505-2505-3505-4505-5505 Oboe (1-4) May be repeated for credit.

1510-2510-3510-4510-5510 Bassoon (1-4) May be repeated for credit.

1515-2515-3515-4515-5515 Clarinet (1-4) May be repeated for credit.

1520-2520-3520-4520-5520 Saxophone (1-4) May be repeated for credit.

1525-2525-3525-4525-5525 Horn (1-4) May be repeated for credit.

1530-2530-3530-4530-5530 Trumpet (1-4) May be repeated for credit.

1535-2535-3535-4535-5535 Trombone (1-4) May be repeated for credit.

1540-2540-3540-4540-5540 Baritone (1-4) May be repeated for credit.

1545-2545-3545-4545-5545 Tuba (1-4) May be repeated for credit.

1550-2550-3550-4550-5550 Percussion (1-4) May be repeated for credit.

1555-2555-3555-4555-5555 Voice (1-4) May be repeated for credit.

1560-2560-3560-4560-5560 Violin (1-4) May be repeated for credit.

1565-2565-3565-4565-5565 Viola (1-4) May be repeated for credit.

1570-2570-3570-4570-5570 Cello (1-4) May be repeated for credit.

1575-2575-3575-4575-5575 String Bass (1-4) May be repeated for credit.

1577-2577-3577-4577 Electric Bass (1-4) May be repeated for credit.

1580-2580-3580-4580-5580 Piano (1-4) May be repeated for credit.

1585-2585-3585-4585-5585 Harpsichord (1-4) May be repeated for credit.

1590-2590-3590-4590-5590 Organ (1-4) May be repeated for credit.

1595-2595-3595-4595-5595 Guitar (1-4) May be repeated for credit.

1599-2599-3599-4599-5599 Composition (1-3,1-3,1-3) May be repeated for credit. Prereq: Consent of instructor.

3597-4597-5597 Composition with Electronic Media (1-3,1-3,1-3) May be repeated for credit. Prereq: 3199 and consent of instructor.

ENSEMBLES

Ensemble participation during each quarter of residence is required of all students studying applied music. String, woodwind, brass, and percussion students must meet the following ensemble requirements: (1) string students must participate in orchestra each quarter; (2) woodwind, brass, and percussion students must acquire a minimum of six credits in any of the following ensembles: marching band, concert band, campus band, symphony orchestra, jazz ensemble; (3) voice students must acquire a minimum of six credits in any of the following ensembles: Concert Choir, Chamber Singers, University Chorus, Women's Chorale. A student's preference for musical organization will be honored whenever possible, but factors considered in making the assignment will include playing ability, specific needs of various organizations, and previous performance experience at the University.

3600-5600 Chamber Music Ensemble (1,1) May be repeated for credit. Maximum 12 credit hours.

3601-5601 Woodwind Choir (1,1) May be repeated for credit.

3602-5602 Brass Choir (1,1) May be repeated for credit.

3603-5603 Small Jazz Ensembles (1,1) May be repeated for credit. Maximum 12 credit hours.

3604-5604 Jazz Ensemble (1,1) May be repeated for credit.

3605 Studio Orchestra (1) May be repeated. Maximum 12 credit hours.

3606-5606 Trombone Choir (1,1) May be repeated for credit.

3607 Tubal Ensemble (1) May be repeated for credit.

3610-5610 Percussion Ensemble (1,1) May be repeated for credit.

3611-5611 Marimba Choir (1) May be repeated for credit.

3612-5612 Baroque Ensemble (1,1) May be repeated for credit.

3620-5620 UT Singers (1,1) May be repeated for credit.

3630-5630 Chamber Singers (1,1) May be repeated for credit.

3632-5632 Collegium (1,1) May be repeated for credit.

3634-5634 Saxophone Choir (1,1) May be repeated for credit.

3640-5640 Opera Theatre (1,1) May be repeated for credit.

3642-5642 Opera Workshop (1) May be repeated for credit.

3650-5650 Concert Band (1,1) May be repeated for credit.

3652-5652 Campus Band (1,1) May be repeated for credit.

3654-5654 Varsity Band (1,1) May be repeated for credit.

3656-5656 Laboratory Band (1,1) May be repeated for credit.

3657-5657 Marching Band (1,1) May be repeated for credit.

3670-5670 Symphony Orchestra (1,1) May be repeated for credit.

3672 Chamber Orchestra (1) Coreq: Registration in University Symphony. May be repeated.

3680-5680 Concert Choir (1,1) May be repeated for credit.

3682-5682 University Chorus (1,1) May be repeated for credit.

3687-5687 Women's Chorale (1,1) May be repeated for credit.

3699-5699 Accompanying (1,1) May be repeated for credit.

GRADUATE

The Department of Music offers the Master of Music degree in performance, composition, music theory, choral conducting, instrumental conducting, string pedagogy, and the Master of Arts degree in musicology and music theory. See the Graduate Catalog for admission and degree requirements, and for graduate course listings.

Organizational Psychology Program

See Graduate School.

Philosophy (745)

Professors:

J. W. Davis (Head), Ph.D., Emory; R. E. Aquila, Ph.D., Northwestern; G. G. Brenkert, Ph.D., Michigan; L. B. Gebik, Ph.D., Nebraska; R. E. Aquila, Ph.D., Michigan; B. C. Postow, Ph.D., Yale; D. Van de Vate, Ph.D., Yale.

Associate Professors:

J. O. Bennett, Ph.D., Tuane; S. M. Cohen, Ph.D., Northwestern; K. A. Emmett, Ph.D., Ohio State; J. E. Noit, Ph.D., Ohio State; M. L. Osborne, Ph.D., Tennessee.

Assistant Professors:

D. R. Cumiskey, Ph.D., Michigan; H. P. Hamlin, Ph.D., Georgia; E. R. Jones III, Ph.D., Chicago; M. Lavin, Ph.D., Stanford.

Philosophy seeks to understand humans, the world, their relations. It involves (1) use of logical and scientific methods, (2) appreciation of all values, (3) history of ideas, (4) philosophical systems. Philosophy is an appropriate major for students wishing a broad education and for those students preparing for careers as writers (whether journalistic or literary), lawyers, ministers, or teachers, or for positions in various types of political and government service or for non-technical positions in business or industry.

A major in philosophy implies a balanced program in the humanities, natural and social sciences. Graduate students should read French or German, preferably both; other ancient or modern languages are useful and necessary for some advanced work.
UNDERGRADUATE

B.A. Major: Majors' programs must include: 1. at least one prerequisite course in logic, normally 1710 or 1810; 2. at least one course in modern philosophy, normally 3131. Majors' programs must include 36 hours in courses numbered 2000 and above. Majors should discuss their programs with a member of the Philosophy faculty.

1. at least three courses in the history of philosophy, including at least one course in ancient philosophy, normally 3111, and at least one course in modern philosophy, normally 3131.

2. 24 hours in courses numbered 2000 and above. It is suggested that minors discuss their programs with a member of the philosophy faculty.

1510 Introduction to Philosophy: Human Nature and Values (4). E.

1511 The Human Condition: Value and Reality (4)
The meaning of life, the existence of God, freedom of the will, human nature and value.

1520 Introduction to Philosophy: Consciousness and Reality (4) May be taken before 1510. E.

1521 The Human Condition: Consciousness and Reality (4)
The place of mind in a material universe and the nature and possibilities of human knowledge. May be taken before 1511.

1600 Topics in Philosophy (4) May be repeated for credit.

1611 Foundations of Western Thought: Antiquity through 1500 (4) Plato, Late Antiquity and the Medieval period.

1621 Foundations of Western Thought: 1500 through Early Twentieth Century (4) Development of Rationalism and Empiricism thought, Nineteenth Century and early Twentieth Century philosophy. May be taken before 1611.

1710 Informal Reasoning (4) Arguments, informal fallacies, uses of language, definitions.

1810 Introduction to Symbolic Logic (4) Formal deductive reasoning; propositions, arguments in natural language, symbolism, truth and validity, propositional logic, predicate logic.

2310 Elementary Ethics (4) Theories of ethical values. E.

2410 Art and Experiences (4) Introduction to various understandings of art.

2510 Elementary Logic (4) Introduction to deductive logic, including truth tables and elementary formal proofs. E.

2520 Elementary Logic (4) Inductive reasoning, elements of scientific method, and statistical inference.

3000 Special Topics (4) May be repeated for credit one time.

3100 Socrates (4) An attempt to delineate the philosophical tenets of the historical Socrates on the basis of the views of the character Socrates depicted in Plato's dialogues, in Xenophon's Socratic works, and in Aristophanes' The Clouds.

3111 Ancient Western Philosophy (4) E.

3121 Medieval Philosophy (4) E.

3131 Seventeenth- and Eighteenth-Century Philosophy (4)

3141 Nineteenth-Century Philosophy (4)

3151 Contemporary Philosophy (4) Survey of recent movements in philosophy.

3270 Russian Philosophical and Theological Thought (4) (Same as Russian 3270 and Religious Studies 3270).

3311-12 American Philosophy (4,4) 3311—Colonial to late 19th century; 3312—Late 19th century to present.

3320 Philosophy of Law (4) Nature, sources, function of law.

3330 Philosophy of History (4) Speculative and critical aspects of philosophy of history.

3410 Philosophical Ideas in Literature (4) Philosophic assumptions and implications in major literary works.

3420 Philosophy of Literature (4) Study of the nature, functions, value, and epistemic principles of literary arts.

3430 The Concept of Woman (4) An inquiry into the nature of woman as it has been conceived by major western philosophers from Plato to Simone de Beauvoir. (Same as Women's Studies 3430.)

3435 Philosophy of Feminism (4) An examination of various feminist theories and their application to social issues of concern to women today. (Same as Women's Studies 3435.)

3440 Ethics and Society (4) Moral issues of U.S. social policy, abortion, euthanasia, death penalty, reverse discrimination.

3510 Existentialism (4)

3550 Marxism as Philosophy (4)

3570 Philosophical Foundations of Democratic Society (4) Philosophical problems relating to nature and justification of the central values, principles, and concepts of democratic society.

3580 War and Morality (4) The moral justification for war; legal and moral constraints in war.

3590 Business Ethics (4) Ethical problems as they confront both business as a social institution and individuals in business.

3605-06 Professional Responsibility (4,4) Critical analysis of selected classic texts from philosophy, religious studies, and social sciences dealing with the nature of responsibility, the nature of professionalism, and the application of concepts of responsibility to professional activity. Illustrations will be drawn from a variety of professional fields of practice. 3606—Application of the theoretical principles an analytic skills developed in 3605 to selected case studies and other detailed descriptions of professional practice from the following professional fields: engineering/architecture, business/accounting, and at least one of (a) Law/policy (b) Helping professions (social work, human services, religious ministry), (c) teaching. (Same as Religious Studies 3605-06.)

3611 Medical Ethics (4) Explores ethical issues in medicine such as abortion, euthanasia, human experimentation, fairness in health care delivery and the doctor-patient relationship. (Same as Religious Studies 3611.)

3650 Philosophy and Religion in India (4) (Same as Religious Studies 3650.)

3660 Buddhist Philosophy and Religion (4) (Same as Religious Studies 3660.)

3671 Religion and Philosophy in China (4) (Same as Religious Studies 3671.)

3690 Philosophy of Religion (4) Analysis of basic issues of religion. (Same as Religious Studies 3690.)


3740-50 Conceptual History of Science (4,4) 3740—The Scientific Revolution: historical evolution of thought in astronomy, mechanics, and philosophy of nature up to Newton. 3750—The development and decline of Newtonian science: historical evolution of thought on the nature of matter and of light, and on that of life. Prereq: 8 hours of physical science or consent of instructor.

3770 Introduction to Philosophy of Science (4) Standard topics in philosophy of science: scientific method, the nature of laws and theories, problem of induction, explanation, measurement. No background in logic is presupposed.

3810 Symbolic Logic (4) Techniques for formal analysis of deductive reasoning (propositional logic and quantification theory). Prereq: 1610 or 2510 or consent of instructor.

3910 Contemporary Aesthetics (4) Philosophical discussion of contemporary art.

4000 Special Topics (4) A student- or instructor-initiated course to be offered at convenience of department. Subject matter to be determined by mutual consent of students and instructor with approval of department. Prerequisites to be determined by department. May be repeated for credit.

4101 Foreign Study (1-16) See page 161.

4102 Off-Campus Study (1-16) See page 161.

4103 Independent Study (1-16) See page 161.

4111-21 Modern Religious Philosophies (4,4) (Same as Religious Studies 4111-21.)

4200 Classical Indian Systems of Philosophy: The Moksha Tradition (4) (Same as Religious Studies 4200.)

4310 Intermediate Ethics (4) Topics in meta-ethics or ethics.

4370 Theoretical Issues in Medical Ethics (4) 4370—Prereq: 2310 or 3611 or consent of instructor. (Same as Religious Studies 4370.)

4410 Plato (4) Prereq: 8 hours of philosophy or consent of instructor.

4420 Aristotle (4) Prereq: 8 hours of philosophy or consent of instructor.

4450 Continental Rationalism (4) Prereq: 8 hours of philosophy or consent of instructor.

4460 British Empiricism (4) Prereq: 8 hours of philosophy or consent of instructor.

4470 Kant (4) Prereq: 8 hours of philosophy or consent of instructor.

4511 Advanced Topics in Existentialism and Phenomenology (4) Prereq: 8 hours of philosophy or consent of instructor.

4511 Advanced Topics in Logic (4) Prereq: Consent of instructor. May be repeated for credit.

4620 Philosophy of Mind (4) Problems of mind and body in relation to consciousness and personal identity. Prereq: 8 hours of philosophy or consent of instructor.

4630 Philosophy of Language (4) Prereq: 8 hours of philosophy or consent of instructor.

4710 Philosophy of Natural Science (4) Consideration of standard topics pertinent to natural science including reduction of theories and teleological explanation. Familiarity with symbolic logic is recommended. Prereq: 3770 or two years of natural science.

4720 Philosophy of Social Science (4) Examination of methods of inquiry and modes of explanation of social sciences. Prereq: 3770 or two years of social science.

4810 Contemporary Metaphysics and Epistemology (4) Prereq: 8 hours of philosophy or consent of instructor.

GRADUATE
Consult the Graduate Catalog for listing of graduate level courses.

Physical Sciences

Major: None offered.

Minor: Consists of the following courses:


*Math 2840 is a prerequisite for these courses.*
Astronomy (150)

1510-20-30 Introductory Astronomy (4,4,4) Introductory survey of composition, structure and dynamics of the universe. Members and components of solar system are introduced and discussed, incorporating results from explorations of the planets. Stellar evolution is treated as a chain of events. Characteristics of galaxies are examined and evolution of universe is viewed in light of modern astrophysics. May be taken in sequence unless instructor consents otherwise. 4 hrs, lecture/demonstration. Only one of three sequences Astronomy 1510-20-30, 1610-20-30, 2118-28-38 may be taken for credit.

1610-20-30 Introductory Astronomy with Laboratory (4,4,4) Introductory course, with accompanying laboratory, to study structure and dynamics of universe. Members and components of solar system are introduced and discussed, incorporating results from interplanetary exploration. Stellar evolution is treated as chain of events. Characteristics of galaxies and evolution of the universe are examined. Prerequisites by which one interprets astronomical observations are reinforced by lab experience. Must be taken in sequence, 3 hrs, lecture, 2 hrs, lab. Only one of three sequences Astronomy 1510-20-30, 1610-20-30, 2118-28-38 may be taken for credit.

2118-28-38 Honors: Introductory Astronomy (4,4,4) Introduction to astronomy and astrophysics. Components of solar system are described from viewpoint of interplanetary exploration. Evolution and properties of stars are studied. Galactic structure is examined and models of universe are discussed. Observational techniques and theoretical and computational techniques of astrophysics are emphasized in accompanying lab. 3 hrs, lecture, 2 hrs, lab. Coreq: Math 1840 or 1550 or equivalent. Only one of three sequences Astronomy 1510-20-30, 1610-20-30, 2118-28-38 may be taken for credit.

4110-20-30 Astrophysics (3.5,3.5) Physics of stars and interstellar matter, planets and interplanetary matter; atmospheres, interiors, and evolution; nebulae, quasars, pulsars, etc. Observational data and their determination. Current developments. Approach will be interdisciplinary. Acceptable for major credit in physics. Prereq: Physics 2330 and consent of instructor.

Physics (773)

UNDERGRADUATE

B.S. Major: The B.S. major in physics is designed to give the student a broad background in the fundamental principles of classical and modern physics and in the application of these principles to physical world. It is also preparation for graduate study in the research fields of modern physics. A major in engineering physics, shown in tabular form on page 122 and described on page 128, is also offered.

Physics 1318-28-38 and Math 1840-50-60 are prerequisite to the major in Physics. The major includes the following courses: Math 2840-50-60, Physics 2318-28-38, 3110-20 (Mechanics), 3230 (Thermodynamics), 4310-20 (Electricity and Magnetism), 4110-20-30 (Quantum Mechanics), at least six hours of physics electives from 3130, 4330, 4140, 4230, 4340-50, 4560, 4660-70, and at least six hours of physics lab electives from 3610-20-30, 4230-40, 4510-20, 4540-50. Physics 4010-20 may be taken to satisfy the major. The minor in physics shall consist of Physics 2310-20 or 2318-28-39 and 15 hours from physics and astronomy courses numbered 3000 and above. Substitution provisions in the major statement also apply to the minor.

1210-20-30 Introductory Physics (4,4,4) A general course for students whose major is not in the physical sciences. Concepts of physics are developed by observation of phenomena and logic, using a minimum of mathematical formalism. Properties of matter and motion, effect of forces on mechanical systems, use of conservation laws to solve physical problems. This course is designed especially for students in modern society. 1220—Electricity and magnetism, wave phenomena including sound and light, with applications to current technologies. 1230—Nuclear and the Twentieth Century: microscopic systems including atoms, molecules, nuclei and applications such as lasers and energy technologies; also physics of particles moving at extremely high speeds. Should be taken in sequence. 4 hrs lecture and demonstration.

1310-20-30 Fundamentals of Physics: Mechanics and Heat (4,4,4) First course in physics for engineers and liberal arts majors in mathematics and the physical sciences. Basic Engineering 1310-20-30 is equivalent for graduation purposes. Must be taken in sequence. Coreq: Math 1540-50, 60. 3 hours of lecture, 2 hours of lab.

1328-38 Honors: Fundamentals of Physics: Mechanics and Heat (4,4,4) Honors course designed for physics and engineering physics majors and for qualified students from other disciplines. Coreq: Math 1640-50-60. 3 hours of lecture, 2 hours of lab.

1410-30 Nature of the Physical World (4,4,4) Introductory course in concepts and principles of physical sciences which enables a student to establish a unified picture of the physical universe. In the first two terms the principles of mechanics, electricity, and wave motion are developed and applied to such varied fields as solar systems, atomic and molecular behavior, radiation, dynamic changes in the atmosphere and in the earth's crust, and to stellar and galactic phenomena. In the third term these principles are applied in more detail to such topics as nuclear energy, cosmology, atmospheric and oceanic phenomena, drifting continents, and science and society. May be taken out of sequence only after consent of instructor. 4 hours including demonstration lab.

1450 Physics of Athletic Activity (4) Principles of physics, particularly mechanics and heat, are introduced. Discussion of these ideas will emphasize their role in physical activities, particularly sports-related. Course topics include statics, equilibrium, linear and angular momentum, force, work, and energy. 4 hours lecture and demonstration.

1610 Physics of Music (4) Production, transmission, and reception of sound, pitch and timbre. Basic physics of instruments and voice. 4 hours lecture and demonstration.

2210-30 Elements of Physics (4,4,4) 2210—Mechanics, properties of matter, heat, electricity and magnetism, sound waves. 2230—Optics, atomic and nuclear physics, radiation protection. Basic physical principles and applications required in pre-medical, pre-dental, pre-pharmacy, and pre-veterinary programs. Must be taken in sequence. Prereq: Math 1500-50 or Math 1840-50 (or equivalent honors courses). 3 hours of lecture and 3 hours of lab.

2240-50-60 Elements of Physics for Architects (4,4,4) Basic physical principles with emphasis on architectural applications. 2240—Statics, dynamics, principles of mechanics, coreq: Math 1840 or 1560, 2250—Properties of fluids, heat and thermodynamics, wave and acoustic phenomena, optics, coreq: Math 1840 or 1560, 2260—Interstellar space, galaxies, star formation, stellar evolution, stellar structure, and radiation, alternative energy topics. Should be taken in sequence. 3 hrs, lecture, 3 hrs. lab.

2310-30-30 Fundamentals of Physics: Electricity, Waves and Optics (4,4,4) Sequence of courses designed especially for all engineering students. 2310—Electricity. 2320—Waves and Optics. 2330—Modern Physics. Must be taken in sequence. 2310 Fundamentals of Physics 1310-20-30, Basic Engineering 2510 Fundamentals of Physics 1310-20-30, or Physics 2510, coreq: Math 2840-50. 3 hours lecture, 2 hrs. laboratory and recitation per week.

2510 Mechanics (5) Statics, kinematics, Newton's laws, momentum, energy, rotation. 4 hour of lecture-recitation, 3 hours of laboratory-problem sessions. Prereq: Math 1840-50 or equivalent. 2510 satisfies prereq for Physics 2310, although physics major should also take Physics 1330 as a prereq to the major.


3230 Heat and Thermodynamics (3) Concepts of temperature and heat; laws of thermodynamics; applications of laws to simple physical and chemical problems. Prereq: 2320 or 2330 and calculus; 3110-20 or instructor's consent.

3610 Electronics (3,3) Electronic components and circuits of interest to physicists. Prereq: 2316-20-30 or 2210-20-30 and calculus. 3 labs.

3630 Nuclear Electronics Laboratory (3) Elementary circuit theory, nuclear instrumentation are designed and built, and their characteristics are tested as a function of various parameters. Prereq: 3610-20.


3990 Junior Seminar (1-3) Topic of current interest. May be repeated for credit with consent of department.

4010 Background of Physics (3) Survey of historical development and philosophical foundations of natural science. Classical theories of gravitation, electromagnetism, and relativity. Unifying mathematical principles underlying physical applications. Assignments will include readings from important original papers, thought-provoking problems and order-of-magnitude calculations comparing different fields of classical physics, and written report on some independent study. Prereq: Senior standing in physics or consent of instructor.

4020 Forefront of Physics (3) Survey of modern developments in physics, including various forms of quantum mechanics, quantum field theory, and recent theories of particles, fields and their interactions. Discussions of unsolved questions in physics, experiments of current interest, recent literature, and applications in other fields, with final oral report and term paper. Prereq: 4010 or consent of instructor.

4050 Foundations of Physics (3) Selected topics from history and philosophy of classical and modern physics. Prereq: One year of general physics and consent of instructor. NOTE: No student who has received a grade of C or better in Physics 4010-20 may subsequently receive credit for Physics 4050.


4140 Elementary Nuclear Physics (3) General properties of nuclei, two-nucleon systems, nuclear forces, nuclear models, nuclear reactions, nuclear disintegration, and beta-decay; nuclear spin and magnetism. Prereq: 3730 or 4120.

4160 Physical Acoustics (4) Considerations fundamental to detailed investigation of any branch of acoustics; propagation of acoustic waves in the infrasonic, the audible, the ultrasonic, and the hypersonic ranges of frequencies. 3 hours and 1 lab. Prereq: 3110-20, 3330.

4220-40 Modern Optics (4,4) 4220—Geometrical optics: reflection, transmission and refraction of light at a dielectric interface; paraxial theory of interfaces, lenses, and mirrors; thick lenses, lens systems, ray tracing; polarization; imagery; laser optics. 4240—Physical optics: matter, mechanics of wave motion, superposition of waves; interference; Fraunhofer and Fresnel diffraction; Fourier optics, holography. Prereq: 3310 or consent of instructor. 3 hours of lecture and 3 hours of lab.

4310-20-30 Electricity and Magnetism (3,3,3) 4310—Electrostatics in vacuum and medical material. 4320—Magnetism, coupled electric and magnetic fields. 4330—Maxwell's equations, electromagnetic waves. Must be taken in sequence. Prereq: 2320 and Math 2860.

4510-20-30 Atomic Physics Laboratory (3,3,3) Experiments in fundamental particle properties, photoelectricity, conduction of electricity through gases, atomic and molecular spectroscopy, X-ray. Prereq or coreq: 3710-20-30. 3 labs.

4540-50 Experimental Nuclear and Radiation Physics (4,4) Interaction of charged particles and electromagnetic radiation with matter; theory and characteristics of various detectors; statistics of counting, nuclear properties. Experiments illustrate recent techniques for investigating the nucleus and nuclear radiation. 1 hour of lecture, 6 hours of lab. Prereq: 2330.

4580 Principles of Non-Destructive Testing (3) Detection and characterization of discontinuities in materials by non-destructive physical measurements. Ultrasonic, electromagnetic, holographic, and penetrating radiation techniques. Prereq: 2310-20-30 or consent of instructor. (Same as Engineering Science and Mechanics 4580.)

4590 Magnetic Induction Phenomena (3) Theory and application of magnetic induction phenomena. Includes non-destructive testing with eddy currents, induction heating, magnetic levitation, forming, pumping, and flow measurement. Includes lab. Prereq: 3320 or equivalent. (Same as Eng. Sci. and Mech. 4590.)

4640 Kinetic Theory (3) Emphasis is placed on transport properties. Includes discussion of scattering theory and the classical distribution functions. Prereq: 3230 or equivalent.

4650 Statistical Mechanics (3) Elementary methods of statistical mechanics are applied to model systems to derive the thermodynamic relations. Classical and quantum distribution functions are discussed. It is recommended that 4640 and 4650 be taken in sequence. Prereq: 3510.

4660-70 Solid State Physics (3,3) 4660—Symmetry and crystal structure, lattice dynamic specific heat. 4670—Electron band theory, transport properties, optical properties. Must be taken in sequence. Prereq: 3230 or equivalent.

4710-20-30 Introduction to Health Physics (3,3,3) Radioactivity, interaction of electromagnetic radiation with matter, radiation quantities and units, point kernel and extended sources, X-rays and gamma rays, neutron activation, interaction of charged particles with matter, stopping power, range-energy relations, counting statistics, shielding, dosimetry, waste disposal, critically moderated reactor, radiation biology, and ecology. Prereq: 3730.

4918-28-38 48-58 68-78-88-98 Honors: Research and Independent Study (1 hour each) Designed for excellent undergraduate majors. Provides opportunities for research and independent study with faculty guidance. Special consent of department required. Maximum credit 5 hours.

4990 Senior Seminar (1-3) Topic of current interest. May be repeated for credit with consent of department.

GRADUATE General requirements for the master's degree and doctoral program as well as course descriptions are found in the Graduate Catalog.

Associate Professors:

Assistant Professors:
W. Fierman, Ph.D. Harvard; J. M. Scheb, Ph.D. Florida.

Research Associate:
S. Rechichar, M.P.A. Tennessee.

UNDERGRADUATE A.A. major consists of 40 hours that must be distributed as follows:
(1) Eight hours at the 2000 level in political science.
(2) Thirty-two hours in political science courses numbered 3000 and above. These 32 hours must include at least one course in each of four areas of the discipline: United States Government and Politics/Public Administration; Comparative Government and Politics; International Relations; and Political Theory and Methodology. A minor consists of 24 hours that must be distributed as follows:
(1) Eight hours at the 2000-level in political science or in political science courses not used for divisional distribution credit but included on the Social Science list.
(2) Sixteen hours in political science courses numbered at 3000 and above. Upper-division courses on the distribution list may be included.

Honors in Political Science: The Honors concentration encourages highly motivated students to obtain a superior liberal education and more rigorous preparation in the discipline. Admission is selective. The Honors concentration is usually a two-year program and consists of 56 hours, including:
1. Eight hours at the 2000 level in political science.
2. Forty-eight additional hours in political science courses including: (a) Political Science 3918-28-38 (b) Political Science 4918-28-38 (c) 24 additional hours numbered 3000 and above. These 48 hours
must include at least one course in each of four areas of the discipline: United States Government and Politics/Public Administration; Comparative Government and Politics; International Relations; and Political Theory and Methodology.

To graduate with Honors in Political Science, the student must have a GPA of at least 3.3 in Political Science, and a cumulative GPA of at least 3.0.

Public Administration. See page 80 and page 160.


2020 Introduction to Political Science (4) A variety of the basic substantive concepts and concerns of political science.

2510-20 United States Government and Politics (4,4) 2510—Foundations: The Constitution, federalism, separation of powers, campaigns and elections, parties, interest groups, the media, public opinion. 2520—Institutions: executive, legislative, judiciary, and bureaucracy at national, state, and local levels.

2518-28 Honors United States Government and Politics (4,4) Honors course designed for students of superior scholarship and interest. Entrance into 2518 requires a B average; selected entering freshmen will be accepted on the basis of placement scores and high school record. A grade of B in 2518 is necessary for entrance into 2528.

2530 Tennessee Government and Politics (4)

2550 Governments in Knox County (4) Analysis of political institutions and processes in Knox County.

United States Government and Politics/Public Administration

3110 Political Community (4) The course examines a variety of value systems and social and political structures related to political community.

3130 Popular Culture and American Politics (4) Popular culture as it relates to American politics and government focusing on the role of film, television, fiction, music, drama, art and sports.

3390 Contemporary Issues in American Public Policy (4) Exposition of selected public policy issues confronting the nation, including the background, nature, and effects of present policies, and options for the future.

3415 Law in American Society (4) Law as a process through which social problems are addressed in the United States. Examples are drawn from case law, legislation, and administrative regulation.

3545 United States Constitutional Laws: Sources of Power and Restraint (4) Analysis of judicial review, constitutional powers of President and Congress, federalism, sources of regulatory authority, and constitutional protection of political rights. 2510-20 desirable as prerequisite and consent of department.

3546 U.S. Constitutional Law: Civil Rights and Liberties (4) Emphasis on judicial interpretation of 1st Amendment, the equal protection clause of the 14th amendment and the right of privacy.

3547 U.S. Constitutional Law: The Criminal Process (4) The rights of the accused, convicted and incarcerated: search and seizure, right to counsel, self-incrimination, trial by jury, right to appeal, prisoners' rights, etc.

3555 Minority Group Politics in the United States (4) Content varies from quarter to quarter. May be repeated up to a maximum credit of 8 hours with consent of department. (Same as Afro-American Studies 3555.)

3565 Introduction to Public Administration Organization and Management (4) Organization and decision-making theory, line and staff services, politics of organization, leadership, personnel and fiscal management, administrative responsibility. 2510-20 desirable as preceding courses.

3566 Public Administration and the Policy-Making Process (4) Public bureaucracies and the policy-making process, their political environments, administrative problemls associated with policy making. 2510-20 desirable as preceding courses.

3710 State Politics (4) Focus on formal and informal setting of state government. State government's role in formulating, enacting, and implementing state policy.


3750 The Urban Polity (4) Analysis of public institutions and processes in metropolitan areas. (Same as Urban Studies 3750.)

3760 Urban Policy Process (4) Analysis of urban problems and policies in metropolitan areas. (Same as Urban Studies 3760.)

3800 American Political Thought (4) Examination of role of selected political ideas, doctrines, and themes in America, emphasizing their development and relationships to diverse political interests.

4110 Law and the Administrative Process (4) Power of, procedures of, controls over administrators.

4535-36 Political Attitudes, Opinions, and Communication (4,4) Nature, development, formation, and distribution of politically relevant attitudes and opinions; role of leadership, persuasion, and communication in opinion-policy process.


4545 The Judicial Process (4) The study of courts as components of political systems, and public policy formulation through judicial decision making. 2510-20 desirable as preceding courses.

4550 Congress (4) Nature, functions, and processes of the U.S. Congress.

4575 Special Topics in United States Government and Politics (4) May be repeated to a maximum credit of 8 hours with consent of department.

4610 Budgetary Process (4) Fiscal planning, budget and expenditure processes in government, their policy and administrative implications.

4620 Public Personnel Administration (4) Development of the merit system in government, career systems, public personnel management functions, organization for personnel management.

4740 Political Parties and Elections (4) Analysis of party systems and electoral process.

4750 Political Campaigns (4) Coverage includes all aspects of campaign process.

Comparative Government and Politics

3605 Political Change in Developing Areas (4) Characteristics and problems of political changes with primary focus on developing areas.

3616-18 Dynamics of Black African Politics (4,4) (Same as Afro-American Studies 3615-16.)

3621 Government and Politics of the People's Republic of China (4) Examination of the Chinese political setting, political structures, participation and selected policy areas.

3625-26 Latin America Government and Politics (4,4) (Same as Latin American Studies 3625-26.)

3631-32 Government and Politics of the Soviet Union (4,4)

3635-36 Politics in Western Democracies (4,4) Political institutions, patterns, and institutions of Western democratic systems.

3641 Government and Politics of Middle East and North Africa (4)

3795 Contemporary Middle East (4) (Same as History 3795.)

4060 Revolution (4) Examination of characteristics, theories, and consequences of revolution, with particular focus on left-wing revolutions and movements.

4655-66 Policy Making in Democracies (4,4) Comparative approach to theory and process of making public policies.

4675 Special Topics in Comparative Government and Politics (4) May be repeated for a maximum credit of 8 hours with consent of department.

International Relations

3701-02 Introduction to International Relations (4,4) 3701—Basic elements on international politics; major conflicts; problems of peace and security. 3702—Impact of population, resources and economic problems on international politics. International law and organizations particularly the U.N.

3712-22 U.S. Foreign Policy Process (4,4) Processes whereby U.S. foreign policies are made and implemented, focusing on interaction within federal bureaucracy and roles of the President, Congress, the press, and public opinion.

3795 Contemporary Diplomatic and Military Problems (4) Analysis of current international events.

3796 Contemporary Problems of Soviet Foreign Policy (4)

4711 International Law (4)

4727 Politics of Inter-American Relations (4) Analysis of selected theoretical and policy issues concerning international relations in the Americas with emphasis upon imperialism, intervention, and the Cuban revolution, nationalism, foreign assistance, trade, and economic integration. (Same as Latin American Studies 4727.)

Political Theory and Methodology

3990 Introduction to Political Analysis (4) Introductions to nature, character, and functions of research design, data collection, and statistical techniques used in study of politics.

3801 Studies in Ancient Political Thought (4) Classical Greek and Roman political thought.

3802 Studies in Medieval Political Thought (4) From Augustine to Luther: Emphasis on problems and theories of religion and politics.

3803 Studies in Early Modern Political Thought (4) Machiavelli through the Enlightenment.

3804 Studies in 19th- and 20th-Century Political Thought (4) Political theories of industrial and technological societies; 19th and 20th century.

4831-32 The Systematic Study of Politics (4,4) Scope, methods, and procedures of analysis in political science; intended primarily for seniors intending to pursue graduate work and entering graduate students who have not had such a course.

Other

3918-28-38 Junior Honors Seminar (4,4,4) Required of honors majors; admission with consent of Department.

4101 Foreign Study (1-16) See page 161.

4102 Off-Campus Study (1-16) See page 161.

4103 Independent Study (1-16) See page 161.

4918-28-38 Senior Honors Thesis and Seminar (0-12) Required of honors majors; admission with consent of Department. Maximum credit 12 hours.

GRADUATE

General requirements for the master's degree and doctoral degree as well as