American structuralism and introduction to generative-transformational theory. (Same as Linguistics 3532.)
3360 Old and Middle English Literature in Transition from 15th to 16th Century. (Same as English 3360.)
3410-30 Modern Drama (3, 3, 3) 3411—
Continental to 1840. 3412—Continental since 1900. 3420—British. 3430—American.
3440 Literature and Film (4) Aesthetic relationships, emphasized upon media and intertextual aspects of film history. Writing assignments.
3510-30-50 American Literature (3, 3, 3) 3510—John Smith through Poe. 3520—Emerson through Mark Twain. 3530—Henry James to present.
3620 Colloquium in Literature (3) Introduction to methods and objectives of literary study, conferences to plan student's project in major.
3645 Introduction to Literary Criticism (3)
3705 Modern British Poetry (3) From Rovescott to Thomas and more recent poets.
3780 American Modern Poetry (3) From Robinson to Stevens and more recent poets.
3930 Tennyson and His Successors (3) Includes such poetry as that by Pre-Raphaelites, humorists, and local color writers.
3950-60-70 Literature of the Western World (4, 4, 4) 3950—Emphasis on classical, biblical, and local color writers. 3960—Emphasis on medieval, chivalric, and local color writers. 3970—Renaissance and local color writers.
3980-90 Nineteenth Century (3, 3) 3980—19th century to 1900. 3990—19th century to 1835.
3990-1835 English Literature and Culture of the Nineteenth Century (3, 3) Survey of literature dealing with leading movements in politics, science, religion, and the arts. 3990—1820 to 1859. 3990—1859 to 1900.
3990-2000 English Literature and the Culture of the Twentieth Century (3, 3) Survey of literature dealing with leading movements in politics, science, religion, and the arts. 3990—1820 to 1900.
3990-2000 American Literature and Other Fields (3, 3) Content varies. Focus on religious, philosophical, psychoanalytical, and social aspects of literature. May be repeated with consent of department. Maximum credit 6 hrs each.
3990-3334 Forms of Popular Literature and Culture (2, 2) Focus on literature in film, television, video games, and comics. May be repeated with consent of department. Maximum credit 6 hrs each.
3990-3335 Special Themes in Literature (3, 3) Content varies. The city, the frontier, the sea, the American landscape, women, heroes, and the hero,等. May be repeated with consent of department. Maximum credit 3 hrs each. (Same as American Studies 3335-34.)
3990-3336 Women Writers in England and America (3) Emphasis upon the literary consciousness of women in the 18th and 19th centuries. May be repeated with consent of department. Maximum credit 3 hrs each. (Same as Comparative Literature 3336-37.)
3990-3337 Introduction to Study of English Language (4) Grammar, semantics, phonetics, and history of the English language. May be repeated with consent of department. Maximum credit 4 hrs each. (Same as Linguistics 3337.)
3990-3338 Cultural History of the English Language (3) English influence of model and formal processes in development of English pronunciation, vocabulary, and syntax. (Same as Linguistics 3338.)
3990-3339 Modern English Grammar (3) Traditional, prescriptive approach to English grammar, followed by intensive study of descriptive approaches of
and Agrarians, Faulkner, and more recent writers.

2910 Introductory Geology for Engineers (2) Mineral and structure of the earth. For College of Engineering students only, 2 lectures and 1 lab at field period.

2710 Introductory Oceanography (4) Introduction to study of oceans including origin and development of ocean basins and physical and biological processes within ocean basins and their connection to water and sediment masses. 1410 recommended.

3160 Introduction to Earth Materials (4) Study of minerals and rocks. Laboratory includes both hand specimen and analytical methods of identification. Not available for credit majors. Prereq: 1410. 3 lectures and 2 labs.

3180 Mineralogy I (4) Introduction to crystallography and study of minerals. Laboratory includes hand specimen, chemical, and x-ray methods of identification. Prereq: 12 hr of geology and consent of instructor. 3 lectures and 1 lab.

3210 Structural Geology I (4) Systematic review of important metamorphic and sedimentary rock groups. 3350-Perilite to Amphibolite, including minerals, esteroids, bioturbations, and conduits. 3320-Muscovite through lesser Chondrites, including amphibole and schistomica. May be taken separately or in sequence. Prereq: 3250, Biology 1110-20, or consent of instructor. 3 lectures and 1 lab or field period.

3250 Micropaleontology (4) Microscopic remains of animals and plants with special emphasis on stratigraphically important groups. Prereq: 3210 or consent of instructor. 3 lectures and 3 labs.

3260 Paleontology I (4) Introduction to principles and materials of palaeontology as applied to interpretation of earth history. Prereq: 1420. 3 lectures and 1 lab or field period.

3270 Geological History of Land Organisms (4) Geological history and development of terrestrial biota and ecosystem with special emphasis on fossil record of land plants and vertebrates. Prereq: 1420. Not intended for geology majors. 3 lectures and 1 lab.

3280 Introduction to Environmental Geology (4) Principles of environmental geology as applied to fossil assemblages and modern organisms, with an emphasis on the role of environmental factors in controlling the distribution of organisms. 3 lectures and 1 lab.

3310 Principles of Ground Water Geology (3) Geological materials and processes affecting the occurrence and behavior of water. Not open to geology majors. 3 lectures and 1 lab. (Same as Water Resources Development 1610.)

3315 Introductory Environmental Geology (4) Geologic processes involving air, water, and land: their relationship to environmental and resource problems. 3320-3330 and 3325. 3 lectures and 1 lab or field period.

3330 Geology of East Tennessee (4) Lectures and field period. 3510-20, 3520, and 3530. 3 hrs and 1 lab.

3340 Structural Geology II (4) Elements, habitats, and genetic causes of basic styles of tectonic deformation presented on maps, sections, aerial photographs, and fabric diagrams. 3 lectures and 1 lab.

3350 Geologic History of Land Biota (4) Evolution and modern distribution of past floristic and faunistic assemblages. Prereq: 3330. 3 hrs and 1 labor field period. (Same as Botany 3250-30.)

3360 Stratigraphy-Sedimentation (4) Basic principles of sedimentary processes and interpretation of depositional environments. Prereq: 3310. 3 lectures and 1 lab.

3410 Sedimentology (4) Introduction to physical processes of sedimentation, transport of sediments and formation of depositional units and rock units. River flows, tides, and ocean circulation. Prereq: 3310. 3 lectures and 1 lab.

3420 Paleontology II (4) Principles of environmental analysis as applied to fossil assemblages with an emphasis on the role of environmental factors in controlling the distribution of organisms. 3 lectures and 1 lab or field period. (Same as Palaeontology 3540.)

3520 Evolution of Higher Taxa (4) Discussion of current evolutionary theory in context of paleontological patterns of evolution in fossil organisms at family level or higher. Prereq: 3320. 3520 has been discontinued. 2 lectures, 1 hour seminar.

3530 Biostratigraphy (4) Principles of application of paleontological data to stratigraphic study, correlation of geological units, and determination of paleoecological parameters. Prereq: 3520 and 3530. 1 lecture plus one 2-hr seminar.

3540 Geologic Mapping (4) Interpretation of maps and methods of mapping geologic mapping. 3 lecture periods and 1 lab.

3550 Stratigraphy I (4) Elements, habitats, and genetic causes of basic styles of tectonic deformation presented on maps, sections, aerial photographs, and fabric diagrams. 3 lectures and 1 lab.

3590 Geophysics-Seismic Exploration Methods (4) Techniques for environmental characterization and exploration, including gravity and magnetic surveys. 3 lecture periods and 1 lab.

4010 Principles of Economic Geology (4) Formation and classification of rocks and processes of accumulation and distribution of mineral deposits. Prereq: 3180, 3370, or equivalent. 3 lecture periods and 1 seminar.

4030 Principles of Geologic Photography and Photogrammetry (4) Principles of terrestrial and aerial photographic practice, including photographic principles and practice, geometry of terrestrial and aerial photography, and image interpretation. Prereq: 3310 or consent of instructor. 3 lectures and 1 lab.

4050 Optical Micropaleontology (4) Identification of mineral and organic chemical crystallographic parameters by petrographic microscope.
Assistant Professors:
Wisconsin; E.T. Hankamer (Emeritus), Ph.D.
6710 Seminar in Geochemistry (3)
3610 Seminar in Paleontology (3)
3610 Seminar in Structural Geology (3)
3610 Seminar in Mineralogy (3)
3610 Seminar in Petrology (3)
3610 Seminar in Geochemistry (3)

Georgian and Slavic Languages
Professors:
K. Nagy; Ph.D., Ohio State; J. E. FaUen, Ph.D.
Wisconsin; T. Hantken (Emeritus); Ph.D.,
Bonn (Germany); R. L. Hiller, Ph.D., Gottingen;
R. L. Nordmark (Emeritus); Ph.D., Ohio State;
J. O. Osborne, Ph.D., Northwestern.

Associate Professors:
J. R. Elliott, Ph.D., Michigan;
R. A. Laing, Ph.D., Washington;
D. E. Lee;
D. Ph. Stanford; M. R. Pisc; Ph.D., Vanderbilt.

Assistant Professors:
D. M. Fane, Ph.D., Indiana;
C. J. Metter, Ph.D., Chicago;
C. R. Nestor, Ph.D., Connecticut.

Instructor:
M. H. Harris, M.A., Illinois.

UNDERGRADUATE
Place 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. 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.

Proficiency Examinations: Students who have acquired a knowledge of German or Russian in high school or college, who have tutored, 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 a limited number of 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 410 Foreign Study and Russian 410 Foreign Study. See page 181. Students should consult the departmental faculty for registering for the foreign study course.

German:
Major: Majors or minors in German should carefully prepare their programs in consultation with the departmental faculty adviser. German 2110-20-30 or the equivalent is a prerequisite to the major. The major consists of at least 36 hours of German including German 2110-30-30 (or 3410-20), 3810-30-20, 9 hours of German literature in courses numbered above 3000, excluding 3010-30-30, and courses in English translation.

It is recommended that German majors also take History 1510-20 or 3110-30 and 8 hours of sophomore English. Majors are also strongly urged to consider a minor in some other area of the humanities.

German 2110-30-30 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 will normally include German 3110-30-30 (or 3410-20), and 15 additional hours of courses numbered above 3000, excluding 3010-30-30 and courses in English translation.

Major:
Russian majors should carefully prepare their programs in consultation with the departmental faculty adviser. Russian 2110-30-30 is a prerequisite to the major. Russian 2640-50 is a prerequisite to the major. The major consists of 36 hours of Russian courses, including Russian 3110-30-30, 3610-30-30, 9 hours from Russian 3210-21-30-40-50-60, and 11 hours of courses numbered 4000 and above. It is recommended that majors also take History 4370-40-60 and 9 hours of sophomore English.

Major:
American and Russian majors are urged to consider a minor in some other area of the humanities.

Minor: Russian 2110-30-30 is prerequisite to the minor. The minor consists of 27 hours of Russian courses, including 9 hours from Russian 2640-50, 3210-21-30-40-50-60 and 18 hours to be taken from Russian 3110-30-30, 3610-30-30, and courses numbered 4000 and above.

Russian and East European Studies. See College of Liberal Arts.

Certification for Teaching German and Russian in Tennessee.
Consult Certification Clerk, Room 212 Claxton Education Building.

German (433)
1310-20-30 Elementary German (3, 3, 3) Must be taken in sequence.
1510-20-28 Honors Elementary and Intermediate German (3, 3, 3) Honors courses for students of superior ability. fellowships are advertised on the basis of high school average and performance on the American Council of Teachers Competence Test. The second hour in 1510-20 is an hour for students to work in small groups. A grade of C or better is prerequisite to the 1510-20-28 sequence in order to continue with 1510-20. A student obtaining a grade of D or better in 1510-20 may continue with 1520. This sequence is equivalent to 1510-20 and 1510-30 and 1520-30 and it complements the student to enter all 3000-level German courses.
1320 Elementary German through Individualized Instruction [1-8] Same material as in German 1510-20-28. Students may elect to study in one or two of the following areas: history, art, music, and literature. Each hour of study counts as 1 credit.
1510-30 German Civilization (3, 3, 3) May be repeated for credit with consent of instructor.
1528-28-38 Honors Elementary and Intermediate German (3, 3, 3) Honors courses for students of superior ability. Fellowships are advertised on the basis of high school average and performance on the American Council of Teachers Competence Test. The second hour in 1510-20 is an hour for students to work in small groups. A grade of C or better is prerequisite to the 1510-20-28 sequence in order to continue with 1510-20. A student obtaining a grade of D or better in 1510-20 may continue with 1520. This sequence is equivalent to 1510-20 and 1510-30 and 1520-30 and it complements the student to enter all 3000-level German courses.
1530 Elementary German through Individualized Instruction [1-8] Same material as in German 1510-20-28. Students may elect to study in one or two of the following areas: history, art, music, and literature. Each hour of study counts as 1 credit. A grade of C or better is prerequisite to the 1510-20 sequence in order to continue with 1510-20. A student obtaining a grade of D or better in 1510-20 may continue with 1520. This sequence is equivalent to 1510-20 and 1510-30 and 1520-30 and it complements the student to enter all 3000-level German courses.
1530 German Civilization (3, 3, 3) May be repeated for credit with consent of instructor.
3110-20-30 Conversation and Graduate Students (3, 3, 3) Elements of Ger-
5590 Modern German Literature (1945-Present) (3) 
5580 Modern German Literature (1889-1945) (3) 
5560 German Romanticism (3) 
5540 German Classicism (3) 
5520 German Baroque Literature (3) 
5500 Studies in German Literature (3) 

They are Master of Arts (M.A.) in German, 
Works are read in English translation. No foreign 
analysis of Hesse's major novels in English transla-
tion. No foreign language credit. No foreign language 
and interpretation of the work. No foreign language 
credit.

3320 Novels of Hermann Hesse (3-4) Study and 
writings in English translation. No foreign language 
(3-4) Goethe's Faust in English Translation (3) In-
credit.

Kafka, Frisch, Boll, Grass. No foreign language 
(3) From 1900 to present; Remarque, Hesse, Mann, 
and Seniors (3,3,3) with emphasis on language under the Soviets.

2510 The Works of Ivan Turgenev and Anton Chekhov in English Translation (3-4) 
2500 Russian Folklore in English Translation (3-4) 
2510 Philosophical and Theological Thought (A) survey of the development of philo-

sophical and theological thought in Russia from the Middle Ages to the Revolution. 
Special emphasis on the expression of this thought in Russian literature and 

philosophy. May be repeated as a seminar. 
2520 Special Topics in Russian Literature in Eng-
lish Translation (3-4) Topics vary and are announced in advance. 
Students suggest topics for further interest. 

2530 Contemporary Slavic Literature in English Trans-
literation and interpretation of the work. No foreign language credit. 
May be repeated for credit.

2550 The Works of Ivan Turgenev and Anton Chekhov in English Translation (3-4) 
2560 Russian Folklore in English Translation (3-4) 
2570 Russian Philosophical and Theological 

Thought (A) survey of the development of philo-

sophical and theological thought in Russia from the Middle Ages to the Revolution. 
Special emphasis on the expression of this thought in Russian literature and 

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May be repeated for credit.

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Special emphasis on the expression of this thought in Russian literature and 

philosophy. May be repeated as a seminar. 
2580 Special Topics in Russian Literature in Eng-
lish Translation (3-4) Topics vary and are announced in advance. 
Students suggest topics for further interest. 

2590 Contemporary Slavic Literature in English Trans-
literation and interpretation of the work. No foreign language credit. 
May be repeated for credit.
15th century. 1610-ca. 1450-present. above the 2000 level of which at least 8 hours consists of 24 hours of courses numbered appropriate.

4950-60 ;History 4015 when subject matter is appropriate .

4018-28), plus 3008-38-48 . Students interested in undertaking an honors program must be in United States history.

Directed readings in aspects of national past. Only 2511-21 Readings in United States History (1,1) to parallel changes in structure of family as well as European urban growth, with comparative analysis of major periods of urbanization and 19th centuries. Emphasizes on relationship between demographic, economic and social foundations of urban and political and cultural development.

3060-70 History of Western Religious Thought and Institutions (3,3) (Same as Religious Studies 3060-70) .


3751-52 Ancient Near Eastern Civilization (3,3) 3751—Early and Middle Bronze Ages; 3752—Late Bronze and Iron Age.

3790-The impact of the West on the Middle East from the 16th century to World War I .

3795 Contemporary Middle East Geography (4) background current problems in the area, from World War I to present. (Same as Political Science 3736).

3650 Civil War and Reconstruction, 1852-1877.

3640-Jacksonian Era, 1815-1852.

3620-1754-1789 .


3620-1754-1789.3610-Settlements to 1754.

3610-20 The American Colonies and the American Revolution (3,3).3611—Colonial America, 1565-1763.

3770-80 The Ancient World (3,3) 3770—Rome.

4211-12-13 Renaissance and Reformation (3,3,3) 4211—Renaissance, 1348-1517; 4212—Reformation, 1517-1648; 4213—Age of Enlightenment, 1648-1789.

3140-50-60 History of England (3,3,3) 3140-To 1660; 3150-1714; 3160-1837; 3170-1863.

3140-To 1660; 3150-1714; 3160-1837; 3170-1863.

3112-13 Early Historical Period (3,3) 3112—Prehistory; 3113—Early Historical Period, 7000 Bears—3000 Bears BC.

3101-12 World History (4,4) 3101—3500 Bears BC; 3111—3112 Early Historical Period; 3113—Early Historical Period, 7000 Bears—3000 Bears BC.

3100-3500 World History (4,4) 3100—Prehistory; 3110—Early Historical Period; 3120—Early Historical Period, 7000 Bears—3000 Bears BC.

3000-3500 World History (4,4) 3000—Prehistory; 3010—Early Historical Period; 3020—Early Historical Period, 7000 Bears—3000 Bears BC.

3770-Rome.

3760-70 The Ancient World (3,3) 3760—Greece.

3750-60 History of the Middle East (3,3) 3750—Rise of Islam and early empires.

3740—The impact of the West on the Middle East from the 16th century to World War I.
and supervised experience in one or more medicine, and social work.

therapy, hospital administration, law, as diverse as guidance counseling, physical schools, seeking advanced degrees in fields graduates enter graduate and professional child abuse, and discrimination. Many of our problems such as crime, poverty, alcoholism, schools to nursing homes, and are wide variety of settings, ranging from nursery themselves and of the society in which they primarily to improve their understanding of appropriate for individuals who wish of the individuals it comprises. The course of experience, at the undergraduate level, for providing education, training, and increase the well-being of our society and of the individuals it comprises. 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 at work in a wide variety of settings, ranging from nursery schools to nursing homes, and are confronted with the human consequences of problems such as crime, poverty, alcoholism, child abuse, and discrimination. Many of our graduates enter graduate and professional schools, seeking advanced degrees in fields as diverse as guidance counseling, physical therapy, occupational administration, law, medicine, and social work.

The curriculum of the program includes required courses, elective courses, advising, and supervised experience in one or more human service agencies or organizations.

Students pursuing a major in Human Services will take 2690, 3100, 3300, 4220, 4229, and 4400—preferably in the order given—and one course from each of the four lists of courses given below; total hours' credit for the major will vary from 48 to 52, due to differences in the number of hours' credit awarded for different courses on these four lists.

I. Culture and Personality

American Studies 3010, Anthropology 3410, 3800, 3860, 4420, 4430, 4740, Audiologic & Speech Pathology 4250, 4650, Child and Family Studies 3210, 3220, 4810, Educational Psychology 4110, 4800, Geography 3610, Psychology 3120, 3250, 3650, 4110, Sociology 3020, 3030.

II. Complex Organizations

Geography 3610, Political Science 3565, 3865, 4660, Psychology 4530; Religious Studies/Sociology 4340, Sociology 3160, 3620, 4030, 4560.

III. Research and Statistics

Computer Science 3010; Philosophy 3790, 4720; Psychology 3150, Sociology 3910, 3920.

IV. Community and Society

Economics 3210, 3410; Anthropology 3070, 3450; Child and Family Studies 3150, 3520, 4610; Geography 3000, 3430; Home Economics 3110; Human Services 4900, Philosophy 3320, 3440, 3611, Political Science 3710, 3720, 3730, 3780, 4520, 4590, Public Health 3330; Religious Studies 3550, 3620, 3660; Rural Sociology 3420; Sociology 3160, 3220, 3330, 3550, 3430, 3510, 3690, 4330, 4550, 4540, 4590, Special Education 5480, 5620.

Total Credit Hours ..........48-52

2690 Introduction to Human Services (4) General field of human services with focus on related societal values, contemporary issues in human service trends which have implications for helping practice.

3100 Social Welfare as a Social Institution (4) Specific social welfare institutions examined in depth in relation to human needs, structure, program, and service approaches. 2690 recommended.
Honor Courses: The current practice of the department is to offer honor versions (1840-58-68 and 1840-50-60) and 2840-60 in sequence, fall-winter-spring, each year. In addition to these regularly offered honors courses, an honors version of any course in the department whose number has zero as the last digit may be offered in any quarter. In this case, the last digit will be changed to eight and the title will be preceded by the word "Honors." Both in the Timetable and on the student's transcript. These honors courses may be offered upon the initiative of interested faculty, students, or the department head (in all cases subject to the approval of the department head).

Proficiency Examinations: Students who have taken calculus in high school are encouraged to inquire at the Mathematics Department, Ayres Hall, Room 124, about the possibility of taking a proficiency examination for one or more courses from the calculus sequence 1840-50-60. If a satisfactory grade is made on the examination(s), credit will be awarded for the appropriate courses.

Major: In mathematics, a student must complete the Basic Requirements and Advanced Requirements listed below:

1. Basic Requirements:
   a. 2840-50-60, or 2848-58-68, or 2540-50-60, 2610, and 2860.
   b. 3810, preferably taken during the sophomore year. Students who take 2848-58-68 may substitute any 3- or 4-hour mathematics course numbered 3050 or above for 3810.

2. Advanced Requirements:
   a. 21 additional hours in mathematics courses numbered 3050 or above, including a senior seminar (4910 or 4920) and at least 6 hours in the sequences:
      - 3780, 3920-30, 4060-4250, 4250-45, 4250-425, 4510-20, 4550-4250,
      - 4710, 4710-4250, 4710-4500.
   b. Additional hours in mathematics courses from the following list: mathematics courses numbered 3890, 3920-30, 4510-20, 4550-4250, Computer Science 3510, 3751, 3752, 3251, 3252, Physics 3120, 3230, 3250, 4410, 4420, 4430, 4210, 4220, 4250, 4260.

Honors Program:

Program 1: Mathematics majors interested in considering freedom in determining how they will meet the advanced requirements of the major in mathematics, in order to offer some guidance in program planning, the mathematics department has designed several sample programs which majors may wish to follow. A brief description of these programs appears below, more detailed information about these or any additional programs which the department may design in the future is available in Ayres 121.

Comparison of the courses suggested in any of the following programs will meet (and, in some cases exceed) the advanced requirements for a major in mathematics. All students who intend to pursue graduate studies in the mathematical sciences are strongly urged to study French, German, or Russian for at least two years.

Program 1. This program is designed for students who have a general interest in mathematics and do not plan to become professional mathematicians. Supplemented by appropriate non-mathematical electives, such a program might be followed, for example, by students majoring in law, by students planning to teach secondary mathematics, or by those who wish to enter business after graduation. Suggested courses: Mathematics 3150, 3050-60, 3790-90, 3330, 4150-10, 4120, senior seminar, three hours of mathematics electives.

Program 2. This program emphasizes pure mathematics and is designed to prepare students for graduate study in any of the mathematical sciences. Suggested courses: Mathematics 3150, 3050-60, 3790-90, 3330, 4150-10, 4120, senior seminar, three hours of mathematics electives.

Program 3-A. This program emphasizes numerical mathematics and is designed to prepare the student for employment in industry. Suggested courses: Mathematics 3150, 4250-30, 4510, 4610-70, 4250, Computer Science 3410, Mathematics 4990 or Computer Science 4330, senior seminar, six hours of math electives selected from 4540, 4550, 4610, 4640, 4710.

Program 3-B. This program emphasizes pure mathematics and is designed to prepare the student for graduate study in any of the mathematical sciences. Suggested courses: Mathematics 3150, 3050-60, 3790-90, 3710-90, 3230, 4150-10, 4120, senior seminar, three hours of mathematics electives.

Program 3-C. This program emphasizes numerical mathematics and is designed to prepare the student for employment in industry. Suggested courses: Mathematics 3150, 4250-30, 4510, 4610-70, 4250, Computer Science 3410, Mathematics 4990 or Computer Science 4330, senior seminar, six hours of math electives selected from 4540, 4550, 4610, 4640, 4710.

Program 3-D. This program emphasizes pure mathematics and is designed to prepare the student for graduate study in any of the mathematical sciences. Suggested courses: Mathematics 3150, 3050-60, 3790-90, 3710-90, 3230, 4150-10, 4120, senior seminar, three hours of mathematics electives.
Program 4-A. This program emphasizes operations research, probability, and mathematical statistics, and is designed to prepare the student for employment in business or industry. Suggested courses: Mathematics 3150, 4540, 4065-70, 4565-70, 4750-60, Statistics 3450, Industrial Engineering 3510-20, seminar senior, three hours of mathematics electives.

Program 4-B. This program emphasizes operations research, probability, and mathematical statistics, and is designed to prepare the student for graduate work in one or more of these areas. Suggested courses: Mathematics 3150, 4065-70, 4565-70, 4510-20, 4740-70, 4750-60, Industrial Engineering 3510-20, seminar senior.

Program 4-C. Double Major: Mathematics and Statistics. Students completing this following program will graduate with a double major in mathematics and statistics. Supplemented by a minor in an applied business or scientific field, this program provides preparation for graduate programs in business or applied science or for industrial employment. Suggested courses: Math 3150 or 3152; 3780; 3790; 4120, 4170, 4450, 4450, 4520, and senior seminar Statistics 3450, 3460, 4310, 4415, 4410, 4750 and 4820. Computer Science 4310. (Course counts toward both mathematics and statistics for major requirements.)

Program 5. This program emphasizes actuarial science and is designed to prepare students for employment or graduate work in actuarial science. Suggested courses: Math 3150 or 3152; 3410, 3751, 3781, 3790, 4120, 4170, 4450, 4450, 4520, and senior seminar. Students following this program should select electives in actuarial science, particularly C, P, L, M, and F, by selecting electives such as Economics 2110-20-30 or 2118-28-38, Accounting 2110-30, Insurance 3290, 4710-20, Marketing 3110, Statistics 3450; Industrial Engineering 3510-20, Computer Science 3530, 3545, 4550.

1910 Trigonometry (3) Plane trigonometry with emphasis on identities and other analytic aspects used in engineering courses. Credit is not given for both Math 1910 and senior seminar two courses from 4780-60-70, 4800-70. Computer Science 3530 3520, 4550.

1920 Mathematics: A Philosophical Approach (3) Mathematics as a language, as a mathematized game, nature of mathematical truth, strengths and limitations of the axiomatic method, the infinite and the infinitesimal, mathematical creativity, ethical implications of the mathematics of humanity.

1540 College Algebra (4) Sets, real and complex number systems, polynomials, exponents, and radicals, fundamental algebraic operations, theory of equations, partial fractions, factoring, functions, graphs. NOTE: Students may not receive credit for both Math 1540 and Math 1550. Two or more of the last ten courses taken. Math 1840 with a grade of C or better may subsequently receive credit for Math 1540 or 1538. Prereq: Math 1560 or at least one semester of high school algebra or equivalent.

1811-51 Calculus for Biological Sciences (4, 4) Coarse designed to prepare students in the life sciences. Differentiation and integration of functions of one variable, maxima and minima. Indeterminate integral, area, definition of definite integral. Fundamentals of calculus, application of the definite integral, logarithmic, exponential, and trigonometric functions to the life sciences. Must be taken in sequence. NOTE: Students who have received credit for Math 1840 with a grade of C or better may subsequently receive credit for Math 1540 or 1538. Prereq: Math 1540. Two years of high school algebra, one year geometry, and one semester of trigonometry or equivalent.

1840-43 Calculus for Business Students (4, 4, 4) Coarse designed to prepare students in business or science. Differentiation and integration of functions of one variable, maxima and minima, integrals of transcendental functions, methods of integration, plane analytic geometry, polar coordinates. Must be taken in sequence. NOTE: Students who have received credit for Math 1840 with a grade of C or better may subsequently receive credit for Math 1540 or 1538. Prereq: Math 1540. Two years of high school algebra, one year geometry, and one semester of trigonometry or equivalent.

1910-20-30 Structure of the Number System (3, 3, 1) Structure of the number system, numeration systems, place value, order properties, rational numbers, integers, and irrational numbers. Euclidean geometry. Must be taken in sequence. Prereq: 1 year of high school algebra and at least sophomore standing in secondary education. Prereq: Two years of high school algebra or equivalent, or consent of instructor.


9100 Finite Mathematics (4) Logic and sets, combinations and permutations, vectors and matrices, elementary combinatorial optimization and game theory, applications to simple problems in the behavioral and managerial sciences. Prereq: Two years of high school algebra or equivalent, or consent of instructor.

1810 Introduction to Differential Equations (2, 2) This course may be taken by students who have completed 1840 or students who have had a significant introduction to calculus in high school. Definition of a derivative; derivatives of algebraic and transcendental functions; applications to maxima and minima; applications to problems in the life sciences; differential equations. Prereq: Math 1810-51.


2118-28-38, 2110-30 Structure of the Number System (3, 3, 1) Structure of the number system, numeration systems, place value, order properties, rational numbers, integers, and irrational numbers. Euclidean geometry. Must be taken in sequence. Prereq: 1 year of high school algebra and at least sophomore standing in secondary education. Prereq: Two years of high school algebra or equivalent, or consent of instructor.

2410-22 Finite Mathematics (4, 4) Logic and sets, combinations and permutations, vectors and matrices, elementary combinatorial optimization and game theory, applications to simple problems in the behavioral and managerial sciences. Prereq: Two years of high school algebra or equivalent, or consent of instructor.

3220, 4710-20; 4510-20-30; 4310, 4415, 4410, 4750 and 4820. Computer Science 4310. (Course counts toward both mathematics and statistics for major requirements.)

9100 Finite Mathematics (4) Logic and sets, combinations and permutations, vectors and matrices, elementary combinatorial optimization and game theory, applications to simple problems in the behavioral and managerial sciences. Prereq: Two years of high school algebra or equivalent, or consent of instructor.

3450, 3460, 4310, 4415, 4410, 4750 and 4820. Computer Science 4310. (Course counts toward both mathematics and statistics for major requirements.)

1910 Trigonometry (3) Plane trigonometry with emphasis on identities and other analytic aspects used in engineering courses. Credit is not given for both Math 1910 and senior seminar two courses from 4780-60-70, 4800-70. Computer Science 3530 3520, 4550.

1920 Mathematics: A Philosophical Approach (3) Mathematics as a language, as a mathematized game, nature of mathematical truth, strengths and limitations of the axiomatic method, the infinite and the infinitesimal, mathematical creativity, ethical implications of the mathematics of humanity.

1540 College Algebra (4) Sets, real and complex number systems, polynomials, exponents, and radicals, fundamental algebraic operations, theory of equations, partial fractions, factoring, functions, graphs. NOTE: Students may not receive credit for both Math 1540 and Math 1550. Two or more of the last ten courses taken. Math 1840 with a grade of C or better may subsequently receive credit for Math 1540 or 1538. Prereq: Math 1560 or at least one semester of high school algebra or equivalent.

1811-51 Calculus for Biological Sciences (4, 4) Coarse designed to prepare students in the life sciences. Differentiation and integration of functions of one variable, maxima and minima. Indeterminate integral, area, definition of definite integral. Fundamentals of calculus, application of the definite integral, logarithmic, exponential, and trigonometric functions to the life sciences. Must be taken in sequence. NOTE: Students who have received credit for Math 1840 with a grade of C or better may subsequently receive credit for Math 1540 or 1538. Prereq: Math 1540. Two years of high school algebra, one year geometry, and one semester of trigonometry or equivalent.

1840-43 Calculus for Business Students (4, 4, 4) Coarse designed to prepare students in business or science. Differentiation and integration of functions of one variable, maxima and minima, integrals of transcendental functions, methods of integration, plane analytic geometry, polar coordinates. Must be taken in sequence. NOTE: Students who have received credit for Math 1840 with a grade of C or better may subsequently receive credit for Math 1540 or 1538. Prereq: Math 1540. Two years of high school algebra, one year geometry, and one semester of trigonometry or equivalent.

1858-59 Honors: Single Variable Calculus (4, 4) Honors course designed to satisfy the needs of the better student. Special emphasis on the theory of calculus and its relationship to other disciplines. Special lectures and projects. Computer use may be emphasized. Prereq: Two years of high school algebra, one year geometry, and one semester of trigonometry or equivalent.

1860-59 Honors: Multivariable Calculus and Matrices (4, 4, 4) Coarse designed to satisfy the needs of the better student. Special emphasis on the theory of calculus and its relationship to other disciplines. Special lectures and projects. Computer use may be emphasized. Prereq: Two years of high school algebra, one year geometry, and one semester of trigonometry or equivalent.

statistics without calculus. Course cannot be used as a prerequisite to majors or minors in mathemat-
ic. nor is it available for credit to students in College of Business Administration.

3000 The Ideas of Calculus (4) Study of basic ideas and theory behind differential and integral calculus designed for students whose course of studies does not include courses in calculus. May be accepted as a calculus prerequisite only by departmental permission. Prereq: One year of high school algebra. May not be taken for credit by any student who has previously received credit for any college-level calculus course.

3535 Elementary Probability and Statistical Analysis (3) Combustion problems; sample spaces, sets, and events; statistical independence; average probability theory; random variables and their distributions; simple random processes. Prereq: 1550-60 or equivalent.

3600 Elementary Statistical Analysis (3) Elemen-
tary probability theory and statistical inference; con-
tidence intervals and statistical tests of hypotheses; linear correlation and regression. Prereq: 3535. Cons-
istent instructor.

4090 Polynomials and Rings (3) Introduction to abstract algebra, beginning with study of integers. Followed by more general notion of rings, integral domains, and fields. Emphasis is given to certain ring theoretic properties shared by integers and polynomial rings over certain fields. Prereq: Math 290 or consent of instructor.

3100 Logic and Sets (2) Elements of mathematical logic; elementary algebra of sets. Prerequisite for stu-
dents in the College of Education. Prereq: 1 year of college 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.

3140 Mathematical Modeling (3) Survey of con-
temporary development of mathematical models used in science and industry. Models studied may include types of phenomena in economics, computer science, graph theory, and differential and integral equa-
tions. Emphasis on understanding the strengths and weaknesses of standing of the models and associated scientific problems. (Same as Computer Science 2840). Prereq: 2840-50-60.

3150 Non-Euclidean Geometry (3) Foundations of geometry. Euclidean and hyperbolic plane geometry. Prereq: 3110. Consistent instructor.

3300 Transformational Geometry (3) Fundamental ideas in the transformational approach to the classifica-
tion of isometries and similarities, symmetries of a polygon, inversion. Prereq: One year of college mathematics.

3310 Intermediate Algebra (3) Primarily for stu-
dents in secondary mathematics education. Course is designed as an acceptable substitute for satisfying requirements for a major or minor in mathematics. Prereq: Math 290 or equivalent.

3315 Advanced Euclidean Geometry (3) Triangles and circles, constructions, modern concepts. Prereq: 1 year of college mathematics.

3320 Non-Euclidean Geometry (3) Foundations of geometry. Euclidean and hyperbolic plane geometry. Prereq: 3110. Consistent instructor.

3330 Transformational Geometry (3) Fundamental ideas in the transformational approach to the classifica-
tion of isometries and similarities, symmetries of a polygon, inversion. Prereq: One year of college mathematics.

3360 Intermediate Algebra (3) Primarily for stu-
dents in secondary mathematics education. Course is designed as an acceptable substitute for satisfying requirements for a major or minor in mathematics. Prereq: Math 290 or equivalent.

3390 College of Business Administration. Emphasis on the designed for students whose course of studies does

3410 History of Mathematics (3) Survey of develop-
ment of mathematics from ancient times to modern times. Not acceptable for satisfying requirements for a major or minor in mathematics. Prereq: 1 year of mathematics, science, or engineering. Prereq: 1 year of college mathematics.

3425 Linear Algebra (3, 3, 3) Introduction to linear algebra. Topics covered include systems of linear equations, matrices, determinants, eigenvalues, eigenvectors, linear transformation, and diagonalization of symmetric matrices. Prereq: 3150 or 3155.

3430 Advanced Abstract Algebra (3) Groups, rings, fields. Must be taken in sequence. Prereq: 3150 or 3155.

3450 Elementary Number Theory (3) Fundamentals of number theory. Topics covered include congruences; theorems of Fermat and Wilson, primitive roots; indices, quadratic reciprocity. Prereq: 2860 or 4050. (Same as Computer Science 4252.)


4225 Numerical Solution to Equations and Numeri-
cal Algorithms and Programming (3) (Same as Computer Science 3715.)

4235 Numerical Linear Algebra (3) Review of vec-


4270 Vector Analysis (3) Fundamental operations, point vectors, dot and cross products, directional derivatives, divergence and curl of vector fields, line and surface integrals, divergence theorem of Gauss, and Stokes theorem. Prereq: 4225. (Same as Computer Science 4235.)

4315 Special Functions of Mathematics (3) Special functions. Prereq: 3150 or 3155. Consistent instructor.

4320 Numerical Methods for Partial Differential Equations (3) Finite difference and finite element solutions of partial differential equations. Prereq: 4225 or 4235. (Same as Computer Science 4245.)

4350 Partial Differential Equations (3) (Same as Computer Science 4245.)

4360 Introduction to Mathematical Statistics (3, 3, 3) Introduction to probability; discrete and continuous distributions, correlation, regression, and statistical independence; foundations of sam-
ing theory; significance tests. Must be taken in sequence. Prereq: 2860.

4370 Advanced Discrete Structures (3) (Same as Computer Science 4235.)

4411 Real and Complex Analysis (3) Introduction to the theory and applications of linear algebra and topology. Prereq: 3150 or 3155. Consistent instructor.

4425 Calculus of Finite Differences (3) Real differ-
ential equations; applications to problems in en-
gineering and physics. Prereq or coreq: 4411.

4450-70 Introduction to Mathematical Statistics (3, 3, 3) Introduction to probability; discrete and continuous distributions, correlation, regression, and statistical independence; foundations of sam-
ing theory; significance tests. Must be taken in sequence. Prereq: 2860.

4510-20-30 Differential Equations (3, 3, 3) 4510—

4540 Infinite Series and Functions of Several Vari-
hables: Series solutions and Legendre polynomials. Regu-
lar singular points, Frobenius method and power series solutions. Systems of linear differential equations and matrix exponential. 4560-30—Sturm-Liouville boundary value problems, Green's functions, and Fourier methods. May be repeated for credit with consent of department. Prereq: 4610 or 4710. (Same as Computer Science 4245.)

4610-20-30 Topological Spaces, General Topology (3, 3, 3) Topo-
logical spaces; continuity; topological properties preserved by homeomorphisms. (Same as Computer Science 4245.)

4610-20-30 Topological Spaces, General Topology (3, 3, 3) Topo-
logical spaces; continuity; topological properties preserved by homeomorphisms. (Same as Computer Science 4245.)

4650-60-70 Introduction to Mathematical Statistics (3, 3, 3) Introduction to probability; discrete and continuous distributions, correlation, regression, and statistical independence; foundations of sam-
ing theory; significance tests. Must be taken in sequence. Prereq: 2860.

4710 Vector Analysis (3) Fundamental operations, point vectors, dot and cross products, directional derivatives, divergence and curl of vector fields, line and surface integrals, divergence theorem of Gauss, and Stokes theorem. Prereq: 4225. (Same as Computer Science 4235.)

4720 Elementary Complex Variables (3) Complex numbers, Cauchy-Riemann equations, elementary functions, Cauchy's theorem and formula, Taylor and Laurent series. Prereq: 3155. Consistent instructor.

4730 Numerical Linear Algebra (3) Linear systems, function approximation, limits, continuity, uniform convergence, differentiation, integra-

4760 Expectation, conditional expectation, and con-
tinuous random variables. Prereq: 4610 or 4610. (Same as Computer Science 4245.)

4770-50-60 Introduction to Mathematical Statistics (3, 3, 3) Introduction to probability; discrete and continuous distributions, correlation, regression, and statistical independence; foundations of sam-
ing theory; significance tests. Must be taken in sequence. Prereq: 2860.

4910 Senior Seminar (1-2) Credit determined at reg-
istration. May be repeated for credit with consent of department. Prereq: 4910 or 4920. (Same as Computer Science 4245.)

4910 Senior Seminar (1-2) Credit determined at reg-
istration. May be repeated for credit with consent of department. Prereq: 4910 or 4920. (Same as Computer Science 4245.)

4940-50-60 Introduction to Mathematical Statistics (3, 3, 3) Introduction to probability; discrete and continuous distributions, correlation, regression, and statistical independence; foundations of sam-
ing theory; significance tests. Must be taken in sequence. Prereq: 2860.

4950-50-60 Introduction to Mathematical Statistics (3, 3, 3) Introduction to probability; discrete and continuous distributions, correlation, regression, and statistical independence; foundations of sam-
ing theory; significance tests. Must be taken in sequence. Prereq: 2860.
must first be admitted to the Graduate School. The Master of Arts and Master of Science degree programs presuppose a bachelor’s degree with a major 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) certification for teaching secondary mathematics, or (b) successful elementary or secondary school teaching experience. The Doctor of Philosophy degree program presupposes a bachelor’s or master’s degree with a strong major in mathematics. This program is intended to train professional mathematicians for a career in teaching and scholarly work in colleges and universities or work in industry. Further details on all of these programs are in the Graduate Catalog.

5000 Thesis
5002 Non-Thesis Graduation Completion (3-15)
5011 Elementary Functions from an Advanced Standpoint for Teachers (3-4)
5012 Differential Geometry for Teachers (3-4)
5013 Geometry for Teachers (3-4)
5014 Analysis for Teachers (3-4)
5015 Probability and Statistical Inference for Teachers (3-4)
5050 60-70 Mathematical Logic (3, 3, 3)
5051 Introductory Business Mathematics (3)
5052 Mathematics for Business Decisions (3)
5115 20-30 Theory of Functions of Complex Variables (3, 3, 3)
5150 60-70 Foundations of Analysis (3, 3, 3)
5210 20-30 Theory of Functions of a Real Variable (3, 3, 3)
5250 40-60 Applied Linear Algebra (3, 3)
5270 Stabiliry Theory and Liepunov’s Direct Method (3)
5310 10-20-30 Introduction to Harmonic Functions (3, 3, 3)
5370 80-90 Mathematical Principles of Fluid Mechanics (3, 3, 3)
5430 Integral Equations (3)
5440 Calculus of Variations (3)
5450 60-70 Introduction to Partial Differential Equations (3, 3, 3)
5455 Finite Difference Methods for Partial Differential Equations (3)
5485 Finite Element Methods (3)
5487 Advanced Topics in Numerical Partial Differential Equations (3, 3, 3)
5489-90 Mathematical Programming (3, 3)
5510 20-30 Introduction to Higher Algebra (3, 3, 3)
5540 Galois Theory (3)
5560 70-90 Theory of Matrices in Numerical Analysis (3, 3, 3)
5569 Theory of Rings (3)
5610 20-30 Mathematical Physics in Physics (3, 3, 3)
5640 Numerical Methods in Physics (3)
5645 65-75 Numerical Mathematics (3, 3, 3)
5710 20-30 Tensor Analysis (3, 3, 3)
5720 60-70 Advanced Mathematical Statistics (3, 3, 3)
5775 Combinatorial Algorithms (3)
5810 20-30 Number Theory (3, 3, 3)
5840 50-60 Mathematical Ecology (3, 3, 3)
5870 60-90 Introduction to Ordinary Differential Equations (3, 3, 3)
5910 30-30 Elementary Topology (3, 3, 3)
5970-80 Mathematical Systems Theory (3, 3)
5990 Graduate Reading in Mathematics (1-3)
5991 Seminar Analysis (1-3)
5992 Seminar Topology (1-3)
5993 Seminar Algebra (1-3)
5994 Seminar Foundations (1-3)
6000 Seminar Applied Mathematics (1-3)
6000 Doctoral Dissertation Research (1-3)
6010 20-30 Functional Analysis (3, 3, 3)
6030 60-70 Theory of Semigroups (3, 3, 3)
6070 Theory of Groups (3)
6070 60-70 Advanced Ordinary Differential Equations (3, 3, 3)
6120 60-70 Probability Theory (Probability (3, 3, 3)
6130 20-30 Topological Algebra (3, 3, 3)
6130 20-30 Modern Topology (3, 3, 3)
6140 80-90 Introduction to Algebraic Topology (3, 3, 3)
6161 Seminar Analysis (1-3)
6162 Seminar Topology (1-3)
6165 Seminar Algebra (1-3)
6166 Seminar Foundations (1-3)
6168 Seminar Applied Mathematics (1-3)
6169 Seminar in Numerical Mathematics (1-3)

Medieval Studies
See Cultural Studies.

Microbiology
Professors: A. Brown (Head), Ph.D. Chicago; R.W. Beck, Ph.D. Washington; J.O. Mundt, Ph.D. Arizona; T.C. Montie, Ph.D. Maryland; J.M. Becker, Ph.D. Cincinnati; D.F. Holtman (Emeritus), Ph.D. Ohio State; and A. Brown.

Assistant Professors: H.A. Varma, Ph.D. Toronto; P.L. Barry, Ph.D. Florida; and D. Gulph (Canada).

Instructor: S.M. Dumas, Ph.D.

Assistant Professor: N.J. Riba, Ph.D. Toronto; and D. Gulph (Canada).

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Instructor: S.M. Dumas, Ph.D.
1015 Class Voice I (1) For music and music education majors only. May be repeated for credit.
1085-95 Class Guitar I (1, 1) Must be taken in sequence. Prereg: Consent of instructor.
2040 Solo Class I (3)
2010 Introduction to Musical Theatre Technology (3) Stage technology unique to lyric stage.
3052-53 Jazz Improvisation (2, 2, 2) Study and application of jazz idioms, performance practice, development of knowledge and skills in instrumental improvisation.
3014-24 Woodwind Literature (2, 2, 2) Prereq: Consent of instructor.
3015 Percussion Literature (1) May be repeated for credit. Prereq: Consent of instructor.
3016 String Literature (2) May be repeated. Prereq: Consent of instructor.
3018 Introduction to Styles in Jazz Drumming (2) Study of jazz idioms, performance practice, development of knowledge and skills in instrumental improvisation.
3022 French and Russian Songs (3) Study of operatic repertoire for both voices and instrumental techniques.
3025-26-27 String Techniques I, II, III (3, 3, 3) Detailed examination of musical compositions by Mahler, Ravel, and Bartók, with emphasis on literature of contemporary composers.
3032 Late German and Contemporary Songs (3) Study of operatic repertoire for both voices and instrumental techniques.
3036-37 Advanced Piano Literature I, II (2, 2) Piano music from preclassical period to present. Prereg: Consent of instructor.
3041 Styles in Opera Acting (2) Practice and study of styles in opera acting based on historical and national characteristics. Prereg: 2075 and consent of instructor.
3070 Opera Production (1-3) Supervised work on opera productions. May be repeated for credit. Prereg: Consent of instructor.
3071-91 Church Service Playing (6, 6, 6) Continuation of Music 3071-91, which is prereq.
3111-21-31 Tonal Counterpoint I, II, III (3, 3, 3) Study of counterpoint in the Renaissance and Baroque periods. Exercises and projects in writing and analysis.
3121 Orchestration (3) Advanced techniques in instrumental composition and the study of orchestration. Prereg: Consent of instructor.
3122 Orchestration (3) Advanced techniques in instrumental composition and the study of orchestration. Prereg: Consent of instructor.
3123 Orchestration II (3) Advanced techniques in instrumental composition and the study of orchestration. Prereg: Consent of instructor.
3125 Orchestration III (3) Advanced techniques in instrumental composition and the study of orchestration. Prereg: Consent of instructor.
3185-86-87 Advanced Piano Literature I, II, III (2, 2, 2) Piano music from preclassical period to present. Prereg: 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 Small Ensemble (1, 1) May be repeated for credit.
3601-5601 Woodwind Choir (1, 1) May be repeated for credit.
3602-5602 Brass Choir (1, 1) May be repeated for credit.
3604-5604 Jazz Ensemble (1, 1) May be repeated for credit.
3607-5607 Trombone Choir (1, 1) May be repeated for credit.
3611 Marimba Choir (1) May be repeated.
3613-5613 Baroque Ensemble (1, 1) May be repeated for credit.
3620-5620 UT Singers (1, 1) May be repeated for credit.
3621-5621 Chamber Singers (1, 1) May be repeated for credit.
3630-5630 Organ Literature Seminar (3) May be repeated for credit.
3640-5640 Opera Theatre (1, 1) May be repeated for credit.
3642-5642 Opera Workshop (1, 1) May be repeated for credit.
3650-5650 Concert Band (1, 1) May be repeated for credit.
3653-5653 Campus Band (1, 1) May be repeated for credit.
3654-5654 Varisty Band (1, 1) May be repeated for credit.
3658-5658 Laboratory Band (1, 1) May be repeated for credit.
3667-5667 Symphony Orchestra (1, 1) May be repeated for credit.
3668-5668 University Chorus (1, 1) May be repeated for credit.

3682-5682 University Chorus (1, 1) May be repeated for credit.
3688-5688 Women's Chorus (1, 1) May be repeated for credit.
3689-5689 Accompanying (1, 1) May be repeated for credit.
5684 Campus Chorus (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, and Suzuki string techniques, and the Master of Arts degree in musicology and music theory. See the Graduate Catalog for more information and degree requirements.

1000 Thesis
5001 Choral Conducting Document (3)
5002 Non-Thesis Graduation Completion (3-18)
5160 Organ Literature Seminar (3)
5162-23-22 Pedagogy of Voice (2, 2, 2)
5200 Piano Literature Seminar (3)
5208 Choral Literature Seminar (3)
5400 Vocal Literature Seminar (3)
5409 Graduate Recital (3)
5501 Opera Performance (3)
5502 Vocal Chamber Music Performance (3)
5503 Choral Conducting Performance (3)
5504 Lecture-Recital (3)
5505-0566 Practical for Instrumental Conductors (1, 1)
5507 Instrumental Conducting Seminar (3)
5509 Seminar in Choral Performance (3)
5509 Special Topics in Performance (1-6)
5510 Independent Study in Music Theory (1-3)
5511 Advanced Harmony (3)
5514 History of Music Theory (3)
5516 Musical Styles (3)
5517 Analytical Techniques (3)
5519 Practicum in Computers and Music Research (3)
5510 Seminar in Music Theory (3)
5520 Independent Study in Music History and Literature (1-3)
5520 Introduction to Music Research (3)
5520 Music Bibliography (3)
5521 Seminar in Musicology (3)
5522 Band Literature (3)
5523 Music in the Middle Ages (3)
5526 Music in the Renaissance (2)
5533 Music in the Baroque Period (3)
5540 Musical Aesthetics (3)
5557 Composition with Electronic Media (1-3)
5561 Marimba Choir (1)

Organizational Psychology Program
See Graduate School.
1310-30-30 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. Coreq: Math 3410-50-60. 3 hrs of lecture, 2 hrs of lab.
1318-28-38 Honors: Fundamentals of Physics: Mechanics and Heat (4, 4, 4) Honors course covers the same material as 1310-30-30 with additional emphasis to prepare students for other disciplines. Must be taken in sequence. Coreq: Math 1440-50-60. 3 hrs of lecture, 2 hrs of lab.
1410-20-30 Honors: Fundamentals of Physics: Mechanics and Heat (4, 4, 4) Honors course covers the same material as 1310-30-30 with additional emphasis to prepare students for other disciplines. Must be taken in sequence. Coreq: Math 1440-50-60. 3 hrs of lecture, 2 hrs of lab.

1450 Physics of Athletic Activity (4) Principles of physics, particularly mechanics and heat, are intro-
duced. Discussion of these ideas will emphasize their role in physical activities, particularly related. Course topics include statics, equilibrium, linear and angular motion, momentum, force, work, and energy. 4 hrs lecture-demonstration.
1510 Physics of Music (5) Production, transmission, and reception of sound waves. Frequency, intensity, time, basic acoustics of instruments and voice. 4 hrs lecture and 1 hr demonstration.
1318-28-38 Elements of Physics (4, 4, 4) 2210—Elements of Physics: Sound and Light (4, 4, 4) The physical properties of fluids, heat, light, and sound. Coreq: Math 3410-50-60. 4 hrs lecture and 1 hr laboratory-recitation per week.
1218-28-38 Elements of Physics: Electricity, Waves, and Optics (4, 4, 4) Modern view of the physical properties of electricity, waves, and light. Coreq: Math 3410-50-60. 4 hrs lecture and 1 hr laboratory-recitation per week.
1310-30-30 Fundamentals of Physics: Electricity, Waves, and Optics (4, 4, 4) Honors course designed for selected students in arts and sciences. Must be taken in sequence. Coreq: Math 3410-50-60. 3 hrs of lecture and 3 hrs of laboratory-recitation per week.
1318-28-38 Honors: Fundamentals of Physics: Electric, Waves, and Optics (4, 4, 4) Honors course designed for selected students in arts and sciences. Must be taken in sequence. Coreq: Math 3410-50-60. 3 hrs of lecture and 3 hrs of laboratory-recitation per week.
1210-30 Introductory Astronomy (4, 4) Surveys astronomical data and trains in telescope operation on the solar system. 2310 introduces stellar astronomy including binary and variable star clusters and nebulae. It is recommended that the course be taken in sequence. 4 hrs including lab.
2400 College of Liberal Arts

recent techniques for investigating the nuclear and radiation reaction, 1-3 hrs of lab. Prereq: 2320.

4500 Principles of Non-Destructive Testing (3) De-
critical phenomena. Radioactivity, interaction of electromagnetic radia-

marginal characterization of discontinuities in materials by non-destructive physical meas-
tions, ultrasonic, electromagnetic, holographic, and generating radiation technique. Prereq.: 2320-30 or consent of instructor. Same as Engineering Science and Mechanics 4806.

4610-30 Geology and Solid States (3, 3, 3) Kinetic

4200-30 Introduction to Health Physics (3, 3, 3) Radioactivity, interaction of electromagnetic radia-
ton, matter, stopping power, range-energy relations, nuclear radiation, special consent of department. Special consent of department required.

4710-30 Introduction to Electromagnetic Theory (3, 3, 3) Radiation, interaction of electromagnetic radia-
tions with matter, stopping power, range-energy relations, nuclear radiation. Special consent of department. Special consent of department required.

4810-30 Advanced Modern Physics (3, 3, 3) Radiant phenomena in matter, radiation, blackbody radiation, photoelectric effect, Compton scattering, Bohr's model of the atom, quantum mechanics. Special consent of department. Special consent of department required.

4910-30 Special Problems (3, 3, 3) Special problems in the area of physics. Special consent of department. Special consent of department required.

4990 Seminar (1) Special problems in the area of physics. Special consent of department. Special consent of department required.

5000 Thesis (3) May be repeated to a maximum of 9 hrs. Thesis. May be repeated to a maximum of 9 hrs. Thesis. May be repeated to a maximum of 9 hrs. Thesis.

5110-30-30 Introduction to Theoretical Physics (3, 3, 3) Introduction to the principles of theoretical physics. Special consent of department. Special consent of department required.

5210-30 Advanced Modern Physics (3, 3, 3) Quantum mechanics, quantum electrodynamics, quantum field theory. Special consent of department. Special consent of department required.

5310-30 Advanced Thermodynamics and Statistical Mechanics (3, 3, 3) Special consent of department. Special consent of department required.

5320 Special Relativity (3) Special consent of department. Special consent of department required.

5410-30-30 Electromagnetic Theory (3, 3, 3) Special consent of department. Special consent of department required.

5510-30 Advanced Thermodynamics and Statistical Mechanics (3, 3, 3) Special consent of department. Special consent of department required.

5610-30 Mathematical Methods in Physics (3, 3, 3) Special consent of department. Special consent of department required.

5640 Numerical Methods in Physics (3) Special consent of department. Special consent of department required.

5710-30-30 Introduction to Polymers (3, 3, 3) Special consent of department. Special consent of department required.

5810-30-30-30 Advanced Advanced Organic Chemistry (3, 3, 3) Special consent of department. Special consent of department required.

5910-30-30 Special Problems (3, 3, 3) Special consent of department. Special consent of department required.

5911-31 Special Problems in Teaching of Physics (1, 1) Special consent of department. Special consent of department required.

5990 Seminar (1) Special consent of department. Special consent of department required.

6050 Doctoral Dissertation Completion (3-15) Special consent of department. Special consent of department required.

6000 Graduate Research Participation (3) Special consent of department. Special consent of department required.

6110-30-30 Quantum Mechanics (3, 3, 3) Special consent of department. Special consent of department required.

6210-30 Nuclear Structure (3, 3, 3) Special consent of department. Special consent of department required.

6310 Electromagnetic Theory of Light (3) Special consent of department. Special consent of department required.

6320 Special Relativity (3) Special consent of department. Special consent of department required.

6330 General Relativity (3) Special consent of department. Special consent of department required.

6420 Advanced Topics in Classical Theory (3) Special consent of department. Special consent of department required.

6430 Advanced Topics in Quantum Theory (3) Special consent of department. Special consent of department required.

6535-39 Electrical Conduction in Gases and Plasma Physics (3, 3) Special consent of department. Special consent of department required.

6610 Interaction of Electrons with Gases (3) Special consent of department. Special consent of department required.

6620 Interaction of Electrons with Solids (3) Special consent of department. Special consent of department required.

6630 Interaction of Radiation with Matter (3) Special consent of department. Special consent of department required.

6710-30-30 Advanced Solid State Physics (3, 3, 3) Special consent of department. Special consent of department required.

6810 Vibrational Phenomena in Molecular Spectra (3) Special consent of department. Special consent of department required.

Political Science (801)

Professors:

T. D. Ure (Dean), Ph.D. Iowa State; D. R. Avery (Emeritus), Ph.D. Northwestern; W. P. Miller (Emeritus), Ph.D. Northwestern; W. M. Worthy (Emeritus), Ph.D. Northwestern; E. D. Blyth (Emeritus), Ph.D. Northwestern; I. M. Neus (Emeritus), Ph.D. Northwestern; J. D. Stephan (Emeritus), Ph.D. Jonnie Hopkins; D. M. Wilcox, Ph.D. Texas.

Associate Professors:

R. B. C. Greselin (Emeritus), Ph.D. Indiana; J. W. Dodd, Ph.D. Indiana; A. E. Bullitt, Ph.D. Columbia; E. P. G. Elsner, Ph. D. Columbia; N. A. Hopkins, Ph.D. Columbia; D. F. Hafemeister, Ph.D. Missouri; D. F. Hopkins, Ph.D. Missouri; E. H. J. R. Robins, Ph.D. Missouri; J. D. Stephan, Ph.D. Jonnie Hopkins; D. M. Wilcox, Ph.D. Texas.

Graduate Assistant:

W. Lyons, Ph.D. Oklahoma.

Graduate Assistants:

M. R. Fitzgerald, Ph.D. Oklahoma; F. E. Freeman, Ph.D. Wisconsin.

Research Associates:


UNDERGRADUATE

A major consists of 40 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 Triad credit but included on the History and Society list.

(2) Six hours at the 3000 level in political science courses numbered at 3000 and above.

(3) Upper-division courses in the Triad list may be included. These 32 hours must include at least one course in each of four areas of the discipline: United States Government and Politics/Political 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) Six hours at the 2000 level in political science or in political science courses not used for Triad credit but included on the History and Society list.

(2) Six hours in political science courses numbered at 3000 and above.

(3) Upper-division courses in the Triad list may be included.

Public Administration. See page 84 and page 180.


Russian and East European Studies. See Cultural Studies.

2020 Introduction to Political Science (3) A variety of topics to develop a broad understanding of political science.

United States Government and Politics/Public Administration (2510-20) United States Government and Politics (2510): The Constitution, federalism, the executive, legislative, judicial, political parties, interest groups, the media, public opinion, political institutions, coercive power, legislation, and bureaucracy and responsibilities, state and local levels.

2518-20 Honors: United States Government and Politics (2510) Honors courses designed for students who have completed at least one course in political science. Prerequisite: a grade of B average; selected entrancing freshmen. Special consent of placement prior to high school and high school record. A grade of B in 2518 is necessary for entry into 2518.

2530 Tennessee Government and Politics (4) 2545 United States Constitutional Law: Sources of Power and Restraint (6) Analysis of judicial review, constitutional powers of President and Congress, federalism, sources of regulatory power, and constitutional protection of political rights. 2518-20 desirable as preceding course.


2550 Minority Group Politics in the United States (4) Content varies from quarter to quarter. May be re-peated up to a maximum credit of 8 hrs with consent of department.

2565 Introduction to Public Administration Organization and Management (4) Organization and decision-making theory, one and staff services, political organization, leadership, personnel and management, administrative responsibility. 2510-20 desirable as preceding course.

2570 State Politics (4) Focus on formal and informal activities of state government in the legislative, executive, and judicial branches. Special consent of department. Special consent of department. Special consent of department. Special consent of department.

2571 State Government and Policy-Making (4) Nature and functions of the institutions of state government: their political environments, and relationships to political institutions. 2510-20 desirable as preceding course.

2574 State Government and Policy-Making (4) Nature and functions of the institutions of state government: their political environments, and relationships to political institutions. 2510-20 desirable as preceding course.

2575 Special Topics in United States Government (4) The study of topics directly relevant to the discipline of political science or in political science courses not used for Triad credit but included on the History and Society list.

2590 Presidents, Congress, and Public Policy (4) The Presidency and Congress within framework of policy-making process.

2645-46 The Judicial Process (4, 4) The study of courts and their role in the American political process. Special consent of department. Special consent of department. Special consent of department. Special consent of department.

4533-36 Political Attitudes, Opinions, and Public Policy (4, 4) The study of political attitudes, opinions, and public policy formulation and execution. Special consent of department. Special consent of department. Special consent of department. Special consent of department.


2549-50 The Presidency and Congress within framework of policy-making process.

4457 Special Topics in United States Government and Politics (4) The study of topics directly relevant to the discipline of political science or in political science courses not used for Triad credit but included on the History and Society list.

4541-50 Academic Planning and the Policy-Making Process (4) The study of topics directly relevant to the discipline of political science or in political science courses not used for Triad credit but included on the History and Society list.

4541-50 Academic Planning and the Policy-Making Process (4) The study of topics directly relevant to the discipline of political science or in political science courses not used for Triad credit but included on the History and Society list.

4541-50 Academic Planning and the Policy-Making Process (4) The study of topics directly relevant to the discipline of political science or in political science courses not used for Triad credit but included on the History and Society list.
Comparative Government and Politics
3610 Political Change in Developing Areas (4) Characteristics and problems of political changes with primary focus on developing areas.
3615-16 Dynamics of Black African Political (4, 4) Examination of factors that affect the political dynamics of black African societies.
3621 Contemporary China and Japan (4) Examination of contemporary political issues in China and Japan.
3622 Contemporary South and Southeast Asian States (4) Analysis of selected states, with emphasis on problems of development.
3625-26 Latin American Government and Politics (4, 4) Analysis of political systems in Latin America.
3631-32 Government and Politics of the Soviet Union (4, 4) Study of the political system of the Soviet Union.
3635-36 Politics in Western Democracies (4, 4) Historical, social, cultural, and institutional factors in Western democracies.
3541 Government and Politics of Middle East and North Africa (4) Political analysis of the Middle East and North Africa.
3796 Contemporary Middle East (4) Same as History 3796.
3802 Studies in Medieval Political Thought (4) 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 in 19th and 20th century.
4810 Contemporary Soviet Marxism-Leninism (4) Soviet political philosophy and the development of Marxist-Leninist political science: intended primarily for seniors intending to pursue graduate work and entering graduate students who have not had such a course.
4875 Special Topics in Political Thought (4) May be repeated up to a maximum of 6 credit hours with consent of department.
Other
4105 Foreign Study (1-16) See page 181.
4200 Off-Campus Study (1-16) See page 181.
4103 Independent Study (1-16) See page 181.
4705 Senior Seminar in World Politics (4, 4) Seminar in Political Science (4) Selected research for seniors, primarily for majors. May be repeated up to a maximum of 8 hours with consent of department.
GRADUATE
General requirements for the master's degree and doctoral degree are found in the Graduate Catalog.
5000 Thesis
5001 Non-Thesis Graduation Completion (3-16) See page 181.
5101 Foreign Study (1-15) See page 181.
5102 Off-Campus Study (1-15) See page 181.
5103 Independent Study (1-15) See page 181.
5110-20 Seminar in World Political Theory (3, 3) Seminar in Political Administration (3) Seminar in Political Administration (3)
5110-20 Seminar in Comparative Government (3) Seminar in International Administration (3)
5200 Seminar in African Politics (3) Seminar in Political Science (3)
5270 Seminar in Politics in Development (3) Seminar in Comparative Government (3)
5310-20 Seminar in Comparative Government (3, 3)
5340-50 Seminar in Latin American Government (3, 3)
5270 Seminar in Soviet Politics and Government (3, 3)
5410-20 Seminar in Public Law (3, 3)
5440-50 Theory and Analysis of U.S. Foreign Policy Processes (4, 4) Seminar in Comparative International Organizations (4, 4)
5480 Seminar in International Organization (4, 4) Seminar in Comparative Public Administration (3)
5500 Seminar in Development in Developing Countries (3)
6000 Public Administration (3)
6050 Research and Methodology in Public Adminis- tration (3)
6110 Seminar in Organization Theory (3, 3) Seminar in Local State Administration (3, 3)
6111-31 Seminar in State-Local Administration (3, 3)
6380 Seminar in Technology and Public Policy (3)
6385-40 Operations Research for Public Administrators (3, 3)
6450-50 Seminar in Metropolitan Areas (3, 3)
5500 Seminar in Contemporary Public Policy (3, 3)
5770 Seminar in Policy Analysis (3, 3)
5710 Seminar in Politics of Development (3, 3)
2518-28 are prerequisite to a major consisting of Psychology 2500 and two courses from 2520-30-40 or concentrating on psychology. Psychology 3150 or 4150, 8 hours of laboratory, field, or practicum courses, and 22 independent study.

Eligibility: Selection of participants is determined by departmental Undergraduate Honors Committee. The interested student should apply to the psychology department. Successful applicants usually have a G.P.A. of at least 3.2. Requirements: Psychology 2500 or 2518 and one other 2000-level course in psychology, 3150, and one quarter of laboratory or field experience. Honors students will complete Psychology 4110 before participating in 4610. Compilation of the Honors Program is dependent upon submission of an acceptable Honors research thesis and passing of a final Honors examination.

2500 General Psychology (4) An introduction to psychology, methods, and contributions of the major's development of grasp of science of psychology. Course encourages independent study.

2310 Biological Foundations of Behavior (4) Survey of theories and research pertaining to the biological foundation of behavior; including neural and psychological mechanisms.

2350 Psychology as a Social Science (4) Introduction to individual behavior and experience in a social context.

4540 Psychology of the Individual (6) Study of individuals, their behavior, and the progressive changes in behavior that occur in normal environments; in structure of personality (development) and abnormal psychology. Recommended: 2350.

2120 Social Psychology (4) General survey of theories, methods, and research findings on individual behavior in a social context.

2130 Social Psychology Laboratory (2) Research and personality processes using methods in behavioral sciences.

3120 Learning and Thinking (4) Study of theories and empirical bases of learning and thinking. General psychology recommended.

3220 Motivation and Emotion (4) Current theories, observations, and application of theories of emotion and motivation.

4240 Psychology of Music (4) Introduction to psychological study of musical sounds and instruments, theories of rhythm, melody, and their relation to the psychology of spoken language. Recommended: prerequisite.

3519 Introduction to Research in Psychology (2) Basic techniques of research in behavioral science, including experimentation and naturalistic observation.

3191 Child Psychology (4) Origin and principles of behavior in infancy and childhood; physical, mental, emotional, and language behavior of the normal child. Recommended: prerequisite.

3595 Laboratory in Child Psychology (2) Field and laboratory studies of child development. Recommended: Psychology 3191.

3616-26 Human Relations (2, 2) Experience and study of human relations in groups and small and large groups. S/N.

4350 Abnormal Psychology (4) Constitutional and environmental factors in abnormal behavior; new approaches to psychological theories. Non-technical discussion of diagnostic and therapeutic methods.

4101 Foreign Study (1-6) See page 181.

4102 Off-Campus Study (1-6) See page 181.

Psychology 4110, 4107, 4109, and 4110 are courses of independent study and research taken by consent of instructor only. Course requirements, meeting times, and grading procedures are established by agreement between the student and a member of the psychology faculty. Each credit hour, a quarter of the total semester credit hours, is a three-hour period for the quarter. No more than 24 credit hours may be earned in courses 4103, 4107, 4110, 4110 combined.

4103 Independent Study (1-6) May be repeated. Maximum credit 18 hrs.

4107 Experience in Individualized Instruction (1-6) May be repeated for credit to maximum of 16 hrs. Prerequisite: Consent of instructor.

4258 Undergraduate Research (1-6) May be repeated for credit to maximum of 16 hrs. Prerequisite: Consent of instructor.

4112 Undergraduate Participation in Community Research (1-6) May be repeated. Maximum credit 12 hrs. Graded by letter grade only. Prerequisite: Consent of instructor.

4371 Research Methods (4) Prerequisite: 3150 or consent of instructor.

4120 Topics in Social Psychology (4) Intensive examination of selected topics. Prerequisite: 3150.

4520 Personality and Social Systems (4) Prerequisite: 4510 or consent of instructor.

5410 Personality Theories (4) Prerequisite: 3595 or consent of instructor.

4530 Personality and Social Systems (4) Prerequisite: 4510 or consent of instructor.

4610 Group Processes (3) Study and experience of theory and techniques of group process and facilitation. Those participating in 4610 are expected to continue into 4620 and 4630. Prerequisite: 3616-26 and consent of instructor.

4620 Seminar in Group Processes (3, 3) Didactic and laboratory experience for those qualified for further training as group facilitators. Prerequisite: 4610 and consent of instructor.

4640 Psychological Tests and Measures (4) Theory and construction of individual and group measures; survey of various methods of assessment of intelligence, personality, special abilities, and educational achievement. Prerequisite: 3519.

4550 Symbolic Processes (4) Logic of signs and symbols; classical and associative thinking; mental and verbal processes; attitudes, use, and development of language. Prerequisite: 3616 or consent of instructor.

4690 The Psychology of Language (4) Theories and descriptions of phonology, syntax, and semantics applied to psychology and related disciplines.

4700 Cognitive Development (4) Theory and research on development of language and thinking in children and adolescents. Prerequisite: 3210 or 3319.

4710 Physiological Psychology (4) Nervous system and physiological correlates of behavior. Prerequisite: One year of biology and zoology. Prerequisite.

4712 Physiological Psychology Laboratory (4) Laboratory studies of nervous system and physiological correlates of behavior. Coreq: 4710.

4728 Comparative Animal Behavior (4) Methods and principles. (Same as Zoology 4728.)

4729 Comparative Animal Behavior Laboratory (4) Laboratory and field work. Coreq: 4728. (Same as Zoology 4728.)

4720 Evolution and Ontogeny of Social Behavior (4) Genetic, evolutionary, ecological, and developmental aspects of social organization and dynamics of vertebrates. Prerequisite: Consent of instructor.

4750 Psychology and Current Issues (4) Research and applied work on current social, political, and personal contemporary issues. 4 class hrs per week. Credit: Consent of instructor.

4830 History and Systems of Psychology (4) Prerequisite: 9 hrs of upper-division psychology.

4850 Learning Theories (4) Historical and theoretical development of learning models. Prerequisite: 3150.

4850/Programmed Learning (4) Some to Educ. C. 4650.)

4870 Contemporary Research in Behavior of Women (4) Study of interaction of biological and social factors in determining the behavior of women, with emphasis on psychological mechanisms.

4880 Afro-American Psychology (4) Review and analysis of psychological literature on Afro-Americans. Prerequisite: Consent of instructor. (Same as Black Studies 4880.)

4920 Aspects of Urban Environment (4) Course in Sociology 4920, Human Services 4990, and Real Estate 4800.)

4910 Senior Seminar in General Psychology (4) In-depth examination of major problems in psychology. Prerequisite: Consent of instructor.

4454-58-59 Honors Research and Research (4, 4, 4) Contact and consent of instructor.

4957-88-89 Honors: Senior Reading and Research (4, 4, 4) Honors candidates only. Graded by letter grade only.

General requirements for the master's degree and doctoral degree are given in the Graduate Catalog.
5690 Psychopharmacology (3)
5680 Neural Basis of Behavior (3)
5670 Forensic Psychology (2)
5610-20 Psychology of Learning (3, 3)
5600 Variance and Psychopathology (2, 2, 2)
5590-92-93 Clinical Psychology 1: Patterns of Adaptation
5589 Psychological Techniques Laboratory (2)
5581-82-83 Clinical Psychology 1: Human Development
5560-70 Seminar in Social Psychology (3, 3)
5540 Probability Models in Psychology (3)
5520 Theory of Mental Measurement (3)
5510 Methods of Research in Applied Psychology (3)
5500 Seminar in College Counseling (2)
5490 Continuing Education in Mental Health (1-4)
5450 Human Problems in Administration (3)
5420-30-40 Advanced Psychological Statistics (3, 3)
5400 Psychophysics and Scaling Methods (3)
5350-60-70 Seminar in Psychology (3, 3, 3)
5340 Group Dynamics (3)
5300 Special Problems in Psychology (2)
5290 Special Problems in Psychology (2)
5280 Special Problems in Psychology (2)
5270 Special Problems in Psychology (2)
5260 Special Problems in Psychology (2)
5250 Special Problems in Psychology (2)
5240 Readings in Psychology (4)
5230 Readings in Psychology (5)
5220 Readings in Psychology (5)
5210 Readings in Psychology (5)
5200 Topics in Developmental Psychology (3)
5190 Seminar in Developmental Psychology (2)
5180 Seminar in Developmental Psychology (2)
5170-80-90 Proseminar in Organizational Psychology (3, 3, 3)
5160-65-66 Practicum in School Psychology I (2, 2, 2)
5170-80-85 Proseminar in Organizational Psychology (3, 3, 3)
5150-53-55 Practicum in Psychology II (2, 2, 2)
5140-45-47 Practicum in Psychology I (2, 2, 2)
5130 Readings in Psychology (5)
5120 Readings in Psychology (5)
5110 Readings in Psychology (5)
5105 Developmental Assessment (3)
5100 Developmental Psychology (3)
5095 Practicum in College Teaching (2)
5090 Practicum in College Teaching (2)
5090 M.S. Program in Psychological Services (3, 3, 3)
5080 M.S. Program in Psychological Services (3, 3, 3)
5070 M.S. Program in Psychological Services (3, 3, 3)
5060 M.S. Program in Psychological Services (3, 3, 3)
5050 M.S. Program in Psychological Services (3, 3, 3)
5040 M.S. Program in Psychological Services (3, 3, 3)
5030 M.S. Program in Psychological Services (3, 3, 3)
5020 M.S. Program in Psychological Services (3, 3, 3)
5010 M.S. Program in Psychological Services (3, 3, 3)
5000 M.S. Program in Psychological Services (3, 3, 3)
4950, 4960. 
4940, 4930, 4920, 4910, 4900, 4890, 4880, 4870, 4860, 4850, 4840, 4830, 4820, 4810, 4800, 4790, 4780, 4770, 4760, 4750, 4740, 4730, 4720, 4710, 4700, 4690, 4680, 4670, 4660, 4650, 4640, 4630, 4620, 4610, 4600, 4590, 4580, 4570, 4560, 4550, 4540, 4530, 4520, 4510, 4500, 4490, 4480, 4470, 4460, 4450, 4440, 4430, 4420, 4410, 4400, 4390, 4380, 4370, 4360, 4350, 4340, 4330, 4320, 4310, 4300, 4290, 4280, 4270, 4260, 4250, 4240, 4230, 4220, 4210, 4200, 4190, 4180, 4170, 4160, 4150, 4140, 4130, 4120, 4110-21, 4100, 4090, 4080, 4070, 4060, 4050, 4040, 4030, 4020, 4010, 4000, 3990, 3980, 3970, 3960, 3950, 3940, 3930, 3920, 3910, 3900, 3890, 3880, 3870, 3860, 3850, 3840, 3830, 3820, 3810, 3800, 3790, 3780, 3770, 3760, 3750, 3740, 3730, 3720, 3710, 3700, 3690, 3680, 3670, 3660, 3650, 3640, 3630, 3620, 3610, 3600, 3590, 3580, 3570, 3560, 3550, 3540, 3530, 3520-35, 3510, 3500-30, 3490, 3480, 3470, 3460, 3450, 3440, 3430, 3420, 3410, 3400, 3390, 3380, 3370, 3360, 3350, 3340, 3330, 3320, 3310, 3300, 3290, 3280, 3270, 3260, 3250, 3240, 3230, 3220, 3210-20-30, 3200, 3190-31, 3180, 3170, 3160, 3150, 3140, 3130, 3120, 3110, 3100, 3090, 3080, 3070, 3060, 3050, 3040, 3030, 3020, 3010, 3000. 
3000. 
2610 Introduction to Religions of the World (4)
2550 History of Science Laboratory (2, 2, 2)
2540 Field Placement in Clinical Psychology Level-4 (1-4)
2530 Field Placement in Clinical Psychology Level-3 (1-4)
2520 Field Placement in Clinical Psychology Level-2 (1-4)
2510 Field Placement in Clinical Psychology Level-1 (1-4)
2490 Field Placement in Clinical Psychology (Level-1)(1-4)
Linguistic and Cultural Studies (3, 3) This sequence is strongly recommended for students intending to take upper-division courses in French. Must be taken in sequence 3 hrs and 2 labs.

1110-20 Elementary French (3, 3) This sequence is required for students intending to take upper-division courses in French. Must be taken in sequence 3 hrs and 2 labs.

1188-28 Honors: Elementary French (3, 3, 3) This sequence is required for students intending to take upper-division courses in French. Must be taken in sequence 3 hrs and 2 labs.

1118-20 Class covers normal elementary French program for those who place by exam. Students expected to spend normal amount of preparation time. Students finding course too difficult may easily transfer to regular class. Potential majors and minors in French are urged to take this course. Students passing with grade of B or higher are eligible for 1128 (6 credits). Students passing 1120 with grade of B or higher are eligible for 1138 (6 credits).

1100-20 Elementary French (4, 4) Must be taken in sequence. 4 class meetings and 2 laboratory periods.

1188-30 Honors: Elementary French (4, 4, 4) Honors course for students of superior ability. French 1188 is offered by permission of the instructor. Students passing with grade of B or higher are eligible for 1198 (6 credits). Students passing 1190 with grade of B or higher are eligible for 1188 (6 credits).
the Renaissance: Life of St. Alexis, Song of Roland, French Literature in English Translation. (3-4, 3-4, 3-4) 3210-20-30 For students who have completed 3210 or equivalent last year and at least 3.0 on all university work. No credit for grade less than B.

3460-50 French Literature of Sixteenth Century (3, 3, 3) Prereq: 3210, 3220, or equivalent.

3000 Thesis
GRADUATE
5110-20 Two-semester Thesis (3, 3, 3) Prereq: 3 hrs. No foreign language credit.
3130-20 Intermediate Composition and Conversation (3, 3, 3) Laboratory work, drills, and exercises. Selected reading and composition. Prereq: Completion of 3 hrs course on 3000 level. (Same as Spanish, German 4250.)
3210-20 French Literature of Seventeenth Century (3, 3, 3) Prereq: 3210 or equivalent.
3420-20 Advanced Grammer (3, 3) Prereq: 3210 or equivalent.
3430 Introduction to Descriptive Linguistics (3) Prereq: 3310 or equivalent. Introduction to phonetics, phonetics and phonemics, morphology and syntax. Application of descriptive linguistics—field linguistics, dialect study, its methodology. Students must present appropriate amount of extra work above that required for 3 hrs.
3450-50 Lyric Poetry of Nineteenth Century (3, 3, 3) Prereq: 3210, 3220, or equivalent.
3500-50 Advanced Syntax and Stylistics (3, 3, 3) Prereq: 3210, 3220, or equivalent.
3610-20 Survey of French Literature (3, 3, 3) Prereq: Completion of 3 hrs course on 3000 level. (Same as Spanish, German 4250.)
3810-20 Advanced Grammar, Composition, and Conversation (3, 3, 3) Laboratory work, drills, and exercises. Selected reading and composition. Prereq: Completion of 3 hrs course on 3000 level. (Same as Spanish, German 4250.)
4010-20 Elementary Italian (4, 4) Must be taken in sequence, 4 class meetings and 2 laboratory periods.
4150-20-30 French Literature of Nineteenth Century (3, 3, 3) Prereq: 3210, 3220, or equivalent.
4610-20 Readings in French Literature (3, 3, 3) Prereq: 3210, 3220, or equivalent.
4616-20 Honors: Readings in French Literature (3, 3) For students who have completed 3210 or equivalent last year and at least 3.0 on all university work. No credit for grade less than B.

5110-20 Two-semester Thesis (3, 3, 3) Prereq: 3 hrs. No foreign language credit.
5210-20 Intermediate Italian (4, 4) Must be taken in sequence, 4 class meetings and 2 laboratory periods.
5310-20 Panorama of Italian Culture (4, 4) Prereq: Survey of Italian culture from roman era through the 17th century. 2510—Survey of Italian culture in the 18th, 19th, 20th centuries.
5310 Italian Literature in English Translation in 324-3-4, 325-3-4: Sicilian School, the Forentine School, D'Annunzio, Stendal, science, Petranco, Boecce, Machiavel, Maituo, Assisio. 3220—From the Bohemian to 18th century, commedia dell'arte, Giasco, Maituo, 3230—19th century. Carocci, Pramandn, Quan- dici, E. Aronster, Ciclo, Writers change in credit hr after add deadline. Option of 4 hrs' credit must present appropriate amount of extra work above that required for 3 hrs.
5350 The Italian Cinema (3) Italian film masterpieces of such directors as Rossellini, DeSSis, Fat- tini, Visconti, literary and socio-political relations; the Italian image in America.
5410-20 Advanced Grammar, Composition, and Conversation (3, 3, 3) Laboratory work, drills, and exercises. Selected reading and composition. Prereq: Completion of 3 hrs course on 3000 level. (Same as Spanish, German 4250.)
5420 Introduction to Historical and Comparative Linguistics (3) Prereq: 3210, 3220, or equivalent.
5450 History of Italian Language (2) Prereq: 3130, 3230, or equivalent.
5460 Introduction to Italian Literature (3-4) Prereq: 3130, 3230, or equivalent.
5480 History of the Literature of the Rinascimento (3-4) Prereq: From Pius to Tasso, the Quattrocento and the Cin- quecento. 3130, 3230, or equivalent.
5490 The Modern Novel (3) Prereq: 3230 or equivalent.
5494 Contemporary Theatre (3) Prereq: 3230 or equivalent.
5496 Contemporary Poetry (3) Prereq: 3230 or equivalent.
5498 Contemporary Prose (3) Prereq: 3230 or equivalent.
5710-20-30 Readings in Italian Literature (3, 3, 3) Prereq: 3210, 3220, or equivalent.
5720 Literary Criticism: Foundations of Romance Criticism (3)

Italian (564)

UNDERGRADUATE
Major: Consists of 36 hours in courses numbered 3110 or above, to include the following (or equivalents, with consent of the department): 3410-30-30 ([advanced grammar, composition, and conversation, 9 hrs]: 3110-20-30 or 3510-30 (aspects of Italian literature, at least 8 hours); 9 hours of course at the literature level of 4000: 10 additional hours selected from courses in literature, language, or civilization; Students may substitute Foreign Study (4160) for certain courses, with students' special interests, such as comparative literature, may make certain substitutions with consent of the department.
Minor: Consists of 24 hours in courses numbered 3110 or above, to include the following: 3410-30-30 (advanced grammar, composition, and conversation, 9 hrs); 3110-20-30 or 3510-30 (aspects of Italian literature, at least 8 hours); 7 additional hours selected from courses in literature, language, or civilization.

Courses in Italian literature in English translation may not be counted toward either a major or a minor.
1510-20 Elementary Italian (4, 4) Must be taken in sequence, 4 class meetings and 2 laboratory periods.
Following sequences:

- Minimum of 8 hours chosen from the numbered
- Foreign Study (4, 4) Must be taken in sequence. 4 class meetings and 2 laboratory periods.
- 3510-20 Intermediate Portuguese (4, 4) Must be taken in sequence. 4 class meetings and 2 laboratory periods.
- 3520-20 Aspects of Portuguese Literature (3, 3, 3) The picaresque novel; Cervantes, the Com-"}

Spanish (924)

Undergraduate

Major: Consists of 36 hours in courses numbered 3310 or above. Students whose primary interest is literature must have a minimum of 8 hours chosen from the following sequences:
- 3310-30-33, 3510-30, or 3610-20 (aspects of Spanish American literature, or aspects of survey of Spanish literature, 8 hours); 3410 (composition and conversation, 3 hours); 4210 (phonetics, 3 hours); sufficient additional hours selected from courses in literature, language, or civilization to fulfill the major requirement.

Students whose primary interest is language must have a minimum of 8 hours chosen from the following sequences:
- 3310-30-33, 3510-30, or 3610-20 (aspects of Spanish American literature, or survey of Spanish literature, 8 hours); 3410 (composition and conversation, 3 hours); 4210 (phonetics, 3 hours); 9 hours selected from courses 3420-30 (composition and conversation), 4260-70 (Advanced Grammar), or 4520-60-70 (linguistics); 3 hours of literature at the 4000 level; 3 hours of civilization; sufficient additional hours selected from courses in literature, language, or civilization to fulfill the major requirement.

Students whose primary interest is civilization must have a minimum of 8 hours chosen from the following sequences:
- 3310-30-33, 3510-30, or 3610-20 (aspects of Spanish American literature, or aspects of survey of Spanish literature, 8 hours); 3410 (composition and conversation, 3 hours); 4210 (phonetics, 3 hours); 9 hours selected from courses 3420-30 (composition and conversation), 4260-70 (Advanced Grammar), or 4520-60-70 (linguistics); 3 hours of literature at the 4000 level; 3 hours of civilization; sufficient additional hours selected from courses in literature, language, or civilization to fulfill the major requirement.
Social Work. Students contemplating entrance into the field of professional social work will have an opportunity to plan their upper-division programs to this end. Suggested course offerings for students planning a social work career can be obtained from the Graduate School of Social Work. The address and general information on the school are given on page 52.

Students who contemplate professional training in social work should discuss their upper-division programs with the Knoxville campus representatives of the School of Social Work. American Studies. See Cultural Studies. American Studies. See Cultural Studies.

5151-61-71 Bibliography and Methods of Research
5250 Problems in Romance Linguistics (3)
5670 The Modern Novel in Spanish America (3)
5633 Spanish American Essay (3)
5631 Spanish American Prose to 1900 (3)
5620-30 The Modern Novel in Spanish America (3)
5610 Spanish American Prose to 1900 (3)
5270-20-30 Seminar in Spanish Literature (3, 3, 3)
5190 Social Psychology of Action (4) Examinations of relations between deviance and social order. Various types of deviance are considered, with focus on their structure, social factors related to process of becoming deviant, and consequences of deviant conduct.

5240 Sociology of Sex Roles (4) Sociological examination of the structure of current American sex roles, with emphasis on the role theory and caregiving, and development and differentiation of gender roles in relation to social institutions and social movements such as feminism are considered.

5160 Sociology of Medicine (4) Introduction to sociological approach to study of health and medicine. Emphasis on relationship of demographic characteristics to prevalence of disease, organization of health care facilities, and staff relationships.

5220 The Family (4) Origin and etymology of the term "family". Consideration of structure and change of family, with special emphasis on the family system as a unit of social interaction.

5230 Sociology of Mass Communication (4) Sociological dimensions of mass communication and media studies, nature of mass communication organizations as bureaucratic structures, and effects of mass communication on social and economic phenomena are examined.

5330 Prejudice and Racism in the United States (4) (Same as Black Studies 3320.)

5340 Sociology of Poverty and Inequality (3) Factors contributing to the experience of being poor. Structure and functioning of poverty.

3410 Urban Environment (4) Introduction to urban sociology as a sociological analysis of the big city. Consideration of the impact of urbanization on the world, the organization of urban society, and the impact of the city on social structure.

4210 Urban Problems (4) Crime and the urban community. Problems of poverty, housing, urban renewal, and neighborhood conserva-
6040 Experimental Research (3)
6000 Doctoral Research and Dissertation (3)
5970 Sociology of Development and Modernization
5960 Demographic Techniques (3)
5920 Seminar in Social Attitudes (3)
5910 Urban and Regional Sociology (3)
5670 Social Organization (3)
5640 Social Structure and Personality (3)
5610-20-30 Seminar in Occupations (3,3,3)
5580 Sociology of Mental Disorders (3)
5550 Seminar on Community Power (3)
5520 Crime, Law, and Social Control (3)
5320-30 Social Statistics (3,3)
5251 Historical Demography (3)
5230 Seminar in Sociology of Medicine (3)
5210, 5420-30 Social Theory (3,3,3)
5200 Seminar in Collective Behavior and Social Movements (3)
5050 Seminar in Political Sociology (3)
5040 Methodological Issues in Social Research (3)
5000 Thesis

GRADUATE

The general requirements for the master's and doctoral degrees are given in the Graduate Catalog.

5000 Thesis
5010 Professional Seminar (1)
5040 Methodological Issues in Social Research (3)
5050 Seminar in Political Sociology (3)
5060-70 Special Social Investigation (3,3)
5200 Seminar in Collective Behavior and Social Movements (3)
5210, 5290-30 Social Theory (3,3,3)
5290 Social Control (3)
5290 Seminar in Sociology of Medicine (3)
5291 Historical Demography (3)
5310 Seminar in Methods of Sociological Research (3)
5320-30 Social Statistics (3,3)
5390 Crime, Law, and Social Control (3)
5350 Seminar in Community (3)
5350 Seminar on Community Power (3)
5850-70 Field Research in Deviance (3,3)
5850 Sociology of Mental Disorders (3)
5890 Social Differentiation and Stratification (3)
5890-80-90 Seminar in Occupations (3,3,3)
5840 Social Structure and Personality (3)
5870 Social Organization (3)
5770 Seminar in Research Problems in Intergroup Relations (3)
5810 Seminar in Race and Culture (3)
5910 Urban and Regional Sociology (3)
5920 Seminar in Social Attitudes (3)
5940 Delinquency and the Social Structure (3)
5950 Epidemiographic Techniques (3)
5970 Sociology of Development and Modernization (3)
6000 Doctoral Research and Dissertation (3)
6040 Experimental Research (3)
6050 Seminar on Methods of Social Research (3)
UNDERGRADUATE

Prerequisites to upper-division courses: Biology 1210-20-30 or Zoology 1118-28 are prerequisites for all upper-division courses with the exception of 3900 and 4900.

Additional prerequisites are included with course descriptions. Courses numbered in the 4000s are no more advanced than those in the 3000s except as may be indicated by prerequisites.

Major: Consists of Biology 3110, 3120, 3130, 18 hours of upper-division zoology courses (except 3100-20-30), and 3 quarters of anatomy or biochemistry at the 2000 level or above. Of the 18 hours of upper-division zoology courses a minimum of 6 hours must be at the 4000 level, and at least one laboratory or field course. Prerequisites to this major are: Biology 1210-20-30 or Zoology 1118-28 (Zoology 2530-50 may be substituted for Zoology 1118-20-30). Chemistry 1116-20-30. Corequisites are: Mathematics 1411-51-53 or 1401-51-53. Additional prerequisites: 9 hours of science courses numbered at the 3000 level or above.

Minor: Consists of 24 hours of zoology, or zoology and biology, courses. (Zoology courses must be at the upper-division level, but biology courses may be at the lower-division level.) Students must complete all courses with the exception of 3090 and 4940.

Note: Students majoring in zoology are advised to exercise care in fulfilling the Science and Mathematics Traid requirements. Students are advised to complete all requirements while in residence except 3090 and 4940.

Note: Certain zoology courses require the proper sequence of information on the quarter a course is to be offered before the student is eligible for the departmental office.

1118-20: Honors General Zoology (6,6) 5 hrs and 4 labs.

4050 Developmental Biology (4) Experimental manipulation, measurement, cellular interactions, hormonal effects, and related topics with examples drawn primarily from invertebrates and vertebrates. Prereq: 3050. 3 hrs and 2 labs.
4110-20-30: Senior Research Project (2,2,2,2,2,2,2,2,2,2) Experimental research projects under the direction of faculty members. May be taken for additional credit. Prereq: 3050 and senior standing. Prereq: 3050.
4140 Experimental Zoology (3) Participation in practical application of zoology in ocean biology. Prereq: 3050 and senior standing. Prereq: 3050.
4140 Mammatology (1) Classification, evolution, distribution, reproduction, populations, and behavior. 2 hrs and 2 labs.
4201 Pathology (1) Classification, collection and identification, distribution, life histories, and anatomy of parasites. Prereq: 3050 and senior standing. Prereq: 3050.
4210 Cell Physiology (5) Development of modern concepts in cell physiology from point of view of
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information and control which examines kinetics and integration of cellular activities. Prereq: Cell biology or any physiology, and organic chemistry. Biochemistry recommended. 3 lectures and 1 lab.

435 Animal Ecology (4) Environmental factors determining distribution and numbers of animals; intro- and extrinsic relations, problems and methods. Prereq: Biology 3130. 2 hrs and 2 labs.

436 Comparative Animal Physiology (2) Environmental physiology. Survey of physiological mechanisms and their relation to ability of animals to survive in diverse physical environments. Prereq: Biology 3120-30. 2 years of chemistry, 3 hrs.

439 Comparative Animal Physiology Laboratory I (1) Coreq: 435.

440 Comparative Animal Physiology Laboratory II (1) Prereq: 3080 and consent of instructor. Coreq: 436.

444 Biochemistry (4) Study of biochemical reaction, methods and principles. 3 hrs and 2 lab periods. (Not open to students with credit for 4619.)

447 Fishes and Environment (4) Fish biology, behavior, reproduction, population, evolution, field identification. 2 hrs and 2 lab periods. (Not open to students with credit for 4619.)

451 Comparative Animal Behavior Laboratory (4) Methods and principles. (Same as Psychology 4720.)

452 Comparative Animal Behavior (4) Methods and principles. (Same as Psychology 4720.)

4720 Comparative Animal Behavior Laboratory (4) Laboratory and field studies. Coreq: 4720 (Same as Psychology 4720.)

4910-30 Insect Morphology and Taxonomy (4, 4) Insect morphology of both generalized and specialized forms. 4920—Taxonomy of major orders. 4930—Taxonomy of minor orders and invertebrates. Prereq: For 4920-30: 3119 or consent of instructor. 2 hrs and 2 labs.

4940 Physiology of Exercise (4) Functions of body in muscular work; physiological aspects of fatigue, training, and physical fitness. Prereq: 2920-30 or 3080. 3 hrs and 1 lab. (Not open to students with credit for 4910.)

GRADUATE

5000 Thesis

5020 Graduate Research Participation (3)

5110-20 Special Problems (2, 2, 2)

5150 Zoological Bibliography (1)

5160 Fresh-Water Invertebrates (4)

5210 Plant Parasitic Nematodes (4)

5260 Physiology of Hormones (4)

5270 Advanced Neuroanatomy (5)

5280 Insect Physiology (4)

5290 Reproductive Physiology (4)

5310-20 Seminar in Teaching of College Zoology (2, 2)

5350 Biometry (3)

5410 Advanced Parasitology (4)

5420 Advanced Medical Entomology (5)

5430 Advanced Animal Physiology (5, 5)

5450 Advanced Ornithology (4)

5470 Animal Populations (3)

5490-20 Foundations of Radiobiology (4)

552 Methods of Experimentation with Laboratory Mammals (5)

560 Physiology of Development (3)

5670 Cellular Immunology (4)

5760 General Vertebrate Neuroanatomy (3)

5780 Radiation Physiology (4)

5820 Methods of Taxonomy (4)

5840 Aquatic Insects (4)

5900 Geographic Distribution of Animals (4)

6000 Doctoral Research and Dissertation

6110 Seminar in Cellular Biology (2)

6140 Seminar in Immunology (8)

6201 Seminar in Physiology (2)

6310 Seminar in Cytology (2)

6350 Seminar in Developmental Biology (3)

6410 Seminar in Parasitology (2)

6510 Seminar in Genetics (2)

6510 Seminar in Ornithology (2)

6560 Seminar in Aquatic Biology (2)

6710 Seminar in Ecology (2)

6810 Seminar in Entomology (2)

6910 Seminar in Radiation Biology (2)
The College of Nursing at The University of Tennessee, Knoxville, was established in July 1971 in response to a long-recognized and well-established need for nurses prepared at the collegiate level and as a part of a statewide comprehensive plan approved for The University of Tennessee system by its Board of Trustees and for the state by the Tennessee Higher Education Commission.

The undergraduate program offered by the college is fully accredited by the National League for Nursing. It combines the unique resources of the University with those of several cooperating health agencies in a manner which enables both faculty and students to become aware of and responsive to an evolving dynamic culture, rapid scientific and technological advances, and changing concepts of health, human beings, and of society.

The baccalaureate nursing program has as its central focus and frame of reference human beings, society, and health. It is based on the belief that nursing has equal concern for the prevention of illness, the promotion of health, and the care of the sick. General education courses, Nursing courses, and electives are organized in a manner designed to promote creative thinking and innovative approaches at both the theoretical and practical levels. General education courses are incorporated into the nursing curriculum at both lower- and upper-division levels. Certain aspects of general education, particularly in the natural and behavioral sciences, are prerequisite to any courses in the nursing major. Other supporting courses are taken concurrently with Nursing courses.

Since nursing is a humanistic science and an art, Nursing courses provide theoretical content which draws heavily from the theories and principles of related sciences and disciplines. This content is organized, integrated, and synthesized in a manner which promotes a comprehensive understanding of the life process from conception through senescence. In nursing practice, this knowledge and understanding is combined with intellectual judgments, practical skills, and human compassion. Opportunities to develop this kind of expertise in a variety of settings and situations are integral components of all Nursing courses.

A broad base of general education, a thorough study of human behavior, emphasis on health maintenance and promotion, and a strong family and community orientation are essential components of baccalaureate education in nursing. It is these characteristics which differentiate it from other types of basic nursing education.

Because of the expanding role of the professional nurse, the increasing complexity of health care delivery, and the ever-changing health needs of society, the goals of the program are to prepare graduates who are able to:

1. Assume beginning leadership positions in nursing in a variety of settings.
2. Work collaboratively with other health professionals.
3. Function as socially conscious and contributing citizens.
4. Pursue advanced education on either a formal or an informal basis.

GENERAL REQUIREMENTS

In order to obtain a Bachelor of Science in Nursing Degree, 12 quarters of full-time study, or their equivalent are required. Students may enroll in Nursing courses following successful completion of 30 quarter hour credits in prescribed general education courses. These courses may be taken at The University of Tennessee or at any accredited senior college or community college.

One hundred eighty-nine quarter hour credits must be successfully completed in order to be awarded the Bachelor of Science in Nursing Degree.

NOTE: Students are advised to consult the University's degree requirements as stated in the front section of this catalog as well as the requirements for the College of Nursing.

GRADING POLICY

The Satisfactory-No Credit option is not permitted for any Nursing course. The minimum acceptable grade for all courses in the nursing curriculum, other than electives, is a C. A course in which a grade of D or F is achieved may be repeated once if a grade of D or F is achieved on the second attempt, the student will be required to withdraw from the program.

Any student who achieves a grade of D or F for more than two clinical Nursing courses will be required to withdraw from the program even if previous courses in which the grades of D or F were achieved have been repeated and a grade of C or better has removed the D or F. Clinical courses are: 2800, 3010, 3210-20, 3410, 4110, 4230, 4510-20, 4760.

If a student receives an Incomplete (I) in a required Nursing course, the incomplete must be removed before the student may enroll in any other required Nursing courses.

If a student's clinical laboratory performance for any Nursing course is deemed unsatisfactory, the grade for that course will be F regardless of any grades related to the theoretical component of the course. If the unsatisfactory clinical performance is characterized by dangerous, inappropriate, or irresponsible behavior, behavior which actually or potentially places the patient's or family's welfare in jeopardy, the student will be required to withdraw from the program.

ADMISSION AND PROGRESSION

PROCEDURES

(1) Nursing students must achieve a course grade of C or better in all required lower-division courses, exclusive of electives.

(2) During the academic year in which the student will be required to withdraw from the program or F is achieved may be repeated once. If a grade of D or F is achieved on the second attempt, the student will be required to withdraw from the program.

(3) Any student who achieves a grade of D or F in Nursing courses following successful completion of 30 quarter hour credits in prescribed general education courses. These courses may be taken at The University of Tennessee or at any accredited senior college or community college. One hundred eighty-nine quarter hour credits must be successfully completed in order to be awarded the Bachelor of Science in Nursing Degree. Students who fail to achieve a grade of D or F is achieved on the second attempt, the student will be required to withdraw from the program.

(4) Pursue advanced education on either a formal or an informal basis.

A broad base of general education, a thorough study of health needs of society, the goals of the program are to prepare graduates who are able to:

1. Assume beginning leadership positions in nursing in a variety of settings.
2. Work collaboratively with other health professionals.
3. Function as socially conscious and contributing citizens.
4. Pursue advanced education on either a formal or an informal basis.

GENERAL REQUIREMENTS

In order to obtain a Bachelor of Science in Nursing Degree, 12 quarters of full-time study, or their equivalent are required. Students may enroll in Nursing courses following successful completion of 30 quarter hour credits in prescribed general education courses. These courses may be taken at The University of Tennessee or at any accredited senior college or community college. One hundred eighty-nine quarter hour credits must be successfully completed in order to be awarded the Bachelor of Science in Nursing Degree.

NOTE: Students are advised to consult the University's degree requirements as stated in the front section of this catalog as well as the requirements for the College of Nursing.

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Students selected for progression must successfully complete Nursing 2800 prior to enrollment in upper-division Nursing courses. This course is offered in both the spring and summer quarters. Only students selected for progression may enroll in Nursing 2800.

(3) Students who expect to enroll in The University of Tennessee at Knoxville, College of Nursing, once they have completed lower-division requirements elsewhere, should contact the Associate Dean for Student Affairs at the UC Knoxville College of Nursing as soon as they begin their lower-division courses. They must have met lower-division requirements in order to submit a petition to begin upper-division courses. Transfer students who believe they have met lower-division requirements elsewhere, should contact the Office of Student Affairs at the UTK College of Nursing.

(4) Transfer students who have not been accepted by the University must complete all course requirements identified in the nursing curriculum. Transcripts will be evaluated on an individual basis. Students are free to take proficiency or challenge examinations in order to determine whether it is necessary for them to enroll in a course or whether they have met those course requirements in another way.

(5) Registered nurses seeking a baccalaureate degree in nursing must also apply for admission to the University and must be accepted on the same basis as others. They must complete all prerequisites and all required credits identified in the nursing curriculum. They may also take challenge or proficiency examinations in order to determine whether it is necessary for them to enroll in a course or whether they have met those course requirements in another way.

Registered nurses who have completed Chemistry 1410-20 with a grade of C or better are eligible to begin upper-division nursing courses if they take or have taken the challenge exam. Registered nurses may complete Nursing 4440, 4510-20, 4660, 4760, 4810, 4820, 4840, 4850, 4860, 4870, 4890, and 4900. After successfully completing Nursing 2800, registered nurses may challenge up to a maximum of 40 hours of other required clinical nursing courses and they will be eligible to take the NCLEX-RN (Pharmacology) if they take or have taken the NUN Pharmacology Achievement Test and achieved a score of 80 or above the 50th percentile. The challenge exam requirements are waived for registered nurses: Nursing 3010, 3410, and Psychology 3850.

COURSE LOAD

The maximum credit hours per quarter allowed for any student without special permission is 18.

BACHELOR OF SCIENCE IN NURSING CURRICULUM

The following curriculum leads to the Bachelor of Science in Nursing degree. A minimum of 189 quarter hours of credit is required.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Hours Credit</th>
</tr>
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<tbody>
<tr>
<td>Freshman</td>
<td>3</td>
</tr>
<tr>
<td>Junior</td>
<td>11 11 11</td>
</tr>
<tr>
<td>Senior</td>
<td>13 13 15</td>
</tr>
<tr>
<td>TOTAL</td>
<td>189 hours</td>
</tr>
</tbody>
</table>

Nursing (720)

Professor: K. P. Conlon, Ph.D., New York.

Associate Professor: D. H. Smith, M.S. SUNY (Buffalo); M. E. Gross, Ph.D., Illinois; K. J. Kant, Ph.D., New York; K. M. Montag, M.S.N., Emory; B. M. Reid, M.N., Columbia.

Instructors:

M. E. Banks, M.S.N., Wisconsin; M. T. Boyton, M.S., Saint Louis University; K. E. Burton, M.S.N., State University of New York; W. S. Carroll, M.S.N., Western Carolina University; K. M. Dunne, M.S.F., Florida; R. N. Haan, M.S.F., Iowa State University; M. M. Johnson, M.S.F., Minnesota; C. M. Sampere, M.S., Ohio State; D. M. Smith, M.S., University of Tennessee; R. D. Smith, M.S., Texas Women's University, Ph.D., Emory; J. T. Hunter, M.N., Emory; P. L. Smith, M.S., Emory; M. L. Jolly, M.S., Columbia; M. F. Kull, M.S., Miami University; M. L. Fort, M.A., Emory; M. F. Gill, M.S.F., Texas Women's University; L. B. Weisbrod, M.S., Louisiana State; J. P. White, M.S., Emory; C. J. G. Conlon, M.S., Emory; M. W. Huffman, M.S., Monroe College; J. D. G. Delaney, M.S., Pittsburgh College; J. J. G. Simpson, M.S., State University of New York; T. D. Martel, M.S., Texas Women's University; B. M. Reid, M.S., Columbia.

Assistant Professors:

K. E. Overton, M.P.H., Tennessee; M. A. Pierce, M.L.S., Vanderbilt; D. M. Droppleman, M.S., Rutgers; M. E. Groer, Ph.D., Illinois; J. N. Mozingo, M.S., Emory; G. A. Evans, B.S.N., East Tennessee State; J. P. Conlon, M.S.N., SUNY (Buffalo); M. E. Banks, M.S.N., Wisconsin; M. T. Boyton, M.S., Saint Louis University; K. E. Burton, M.S.N., State University of New York; W. S. Carroll, M.S.N., Western Carolina University; K. M. Dunne, M.S.F., Florida; R. N. Haan, M.S.F., Iowa State University; M. M. Johnson, M.S.F., Minnesota; C. M. Sampere, M.S., Ohio State; D. M. Smith, M.S., University of Tennessee; R. D. Smith, M.S., Texas Women's University, Ph.D., Emory; J. T. Hunter, M.N., Emory; P. L. Smith, M.S., Emory; M. L. Jolly, M.S., Columbia; M. F. Kull, M.S., Miami University; M. F. Gill, M.S.F., Texas Women's University; L. B. Weisbrod, M.S., Louisiana State; J. P. White, M.S., Emory; M. W. Huffman, M.S., Monroe College; J. D. G. Delaney, M.S., Pittsburgh College; J. J. G. Simpson, M.S., State University of New York; T. D. Martel, M.S., Texas Women's University; B. M. Reid, M.S., Columbia.
4010 Physiological Principles Applied to Health Sciences (5) Application of selected physiological principles to varying stages of health and illness. Prereq: Basic human concepts or consent of instructor. Not credit for students who have taken 3210 and/or 3235.

4110 Family Health Nursing (2) Nurturing needs of families in health and crisis. Emphasis on provision of care or support for care to families in the child bearing and child nursing phases of family development. Application of theories of human growth and development, family dynamics, and crisis intervention. Laboratory experiences to develop skills necessary to identify and meet the health needs of families. Focus on selected physiological, psychological, sociocultural, and genetic factors experienced by normal or abnormal families undergoing various stages of health and illness. Prereq: All 3000-level Nursing courses. 3 hrs, 2 labs, Prereq: All 3000-level Nursing courses or their equivalent. For nursing majors only.

4000-19 Integrated Psychosexual and Developmental Theories I, II (2, 2) Examination and appreciation of selected behavioral theories applied to the nursing process, 4200 is a prerequisite to 4210. Open only to MSN candidates lacking an undergraduate major in nursing; others with consent of instructor. Prereq: 19 hrs of behavioral science courses.

5030 Psychosocial and Long-Term Nursing (10) Nursing needs of clients whose primary health problem are of a developmental, behavioral, or long-term nature. Equal emphasis on prevention, health promotion, and rehabilitation. Laboratory experiences in a variety of psychiatric, extended care, and outpatient clinics. 9 lectures, 9 labs. Prereq: All 3000-level Nursing courses or their equivalent. For nursing majors only.

4240 Nursing in Acute Care Settings (5) Theory and clinical practice related to care of hospitalized children and adults who are experiencing acute illnesses. Open only to MSN candidates lacking an undergraduate major in nursing; others with consent of instructor. Prereq: 19 hrs of behavioral science courses. All required 2000- and 3000-level Nursing courses, 3 lectures, 2 labs.

4260 Community Mental Health Nursing (3) Theory and clinical practice related to care of clients whose primary diagnosis is mental illness or potential health problem is psychosocial or developmental. Community orientation with emphasis on mental health needs of community and promotion of mental health. Open only to MSN candidates lacking an undergraduate major in nursing; others with consent of instructor. Prereq: All required 2000- and 3000-level Nursing courses, 4 hrs of psychology, 4110; 2 lectures, 2 labs.

4260 Nursing the Child Bearing Family (3) Theory and clinical practice related to care of clients and their families in varying stages of child bearing and child rearing phases of family development. Normal and abnormal states are examined and explored. Open only to MSN candidates lacking an undergraduate major in nursing; others with consent of instructor. Prereq: All required 2000- and 3000-level Nursing courses, 3 lectures, 2 labs.

4320 Nursing the Specialties (2-4) Application of principles from behavioral, physical, social, and nursing sciences to solution of nursing problems. Includes exploration of nursing intervention needed to maintain or restore health in clients experiencing selected psychological and/or behavioral deviations. Specific topics to be determined by faculty and can be repeated with consent of instructor. Maximum credit 12 hrs. Prereq: Consent of instructor.

4350 Oncology Nursing (3) An in-depth exploration of the cancer problem; medical and nursing interventions. Relative cellular kinetics to theories of cancer growth and spread. Examination of patient reactions and the prevention, initial treatment, and control of selected gynecologic disturbances. 5 hrs, 5 labs. Prereq: All 3000-level Nursing courses or their equivalent and Nursing 4220 and 4260. For nursing majors only.

4440 Scientific Inquiry in Nursing (B) Introduction to the language of research, types of research design, methodological approaches, sampling, data analysis, and significance of research findings. Emphasis on ongoing and upcoming nursing research studies. Prereq: 10 hrs of 4000-level Nursing courses. For nursing majors only.

4520 Critical Thinking, Leadership and Management in the Community II (3) Theory and clinical practice in nursing management of family, community, and group relationships. Focus on selected physiological, psychological, sociocultural, and genetic factors affecting community and interpersonal relationships. Emphasis on health promotion and maintenance. Socio-cultural and economic variables affecting health care delivery are analyzed. 2 lectures, 1 lab. Prereq: All 3000-level Nursing courses, coreq: 4110 or 4260. For nursing majors only.

4520 Nursing in the Community II (3) Continuation of 4510. 1 lecture, 2 labs. Prereq: 4510.

4660 Professional Nursing Seminar (5) Critical examination of legislative, legal, ethical, social, and economic variables affecting health care delivery. Open only to MSN candidates lacking an undergraduate major in nursing; others with consent of instructor. Prereq: 19 hrs of behavioral science courses.

4760 Management of Patient Care (3) Theories of administration, supervision, organization, management, and leadership as they apply to the delivery of patient care services. Emphasis on role of the nurse in health care delivery. In the 21st century it is necessary for nurses to develop the skills necessary for function as an effective member of the health team. 2 hrs, 1 lab. Prereq: 10 hrs of 4000-level Nursing courses. For nursing majors only.

4770 Comprehensive Health Assessment (6) Principles and theories underlying health screening of adults and children, including health history, interview, and physical examination. Practicum is offered in 2 hrs and 2 labs, 4 hrs each. Prereq: All 3000-level Nursing courses 8.5 hrs. For nursing majors only.

4810 Management of Patient Care (3) Theories of leadership, management, and supervision as applied to professional practice. Open only to MSN candidates lacking an undergraduate major in nursing; others with consent of instructor. Prereq: 4820 Clinical Nursing Practicum and Seminar (8). Note: This seminar is intended to provide opportunities for advanced practice nurses to develop the skills necessary for function as an effective member of the health team. 4 hrs of study. 4 hrs of practicum. 8 hrs of total credit. Prereq: 15 hrs of 4000-level Nursing courses. For nursing majors only.

4820 Clinical Nursing Practicum and Seminar (8) Intensive clinical laboratory with opportunity to apply nursing and nursing related theories in a variety of healthcare settings. Weekly seminars are conducted with the clinical faculty. Open only to MSN candidates lacking an undergraduate major in nursing; others with consent of instructor. Prereq: 4800-4565-00. Core: 4810.

4840 Independent Study in Nursing (2, 4) In-depth study of some aspect of nursing in which student has developed special interest. Study is pursued independently utilizing guidelines developed by the student under appropriate faculty guidance, supervision, and evaluation. May be repeated with consent of instructor. Maximum credit 12 hrs. Prereq: 10 hrs of 4000-level Nursing courses. For nursing majors only.

GRADUATE

5000 Thesis (5)

5002 Non-Thesis Graduation Completion (3-15)

5010 Applied and Pathophysiology (5)

5020 Current Health Issues (2)

5030 Behavioral Dynamic (3)

5050 Applied Pharmacology (4)

5130 Independent Study in Nursing I (1-4)

5150 Geriatrics and Gerontology (3)

5180 The Acutely Ill Adult I (9)

5180 The Acutely Ill Adult II (9)

5180 The Acutely Ill Child I (9)

5180 The Acutely Ill Child II (9)

5170 Readings in Applied Physiology (2)

5210 Nursing Research Methods (4)

5240 Management of Common Health Problems (8)

5250 Chronic Health Problems (4)

5260 Advanced Family Health Care (4)

5290 Secondary Care Nursing Field Work I (9)

5290 Secondary Care Nursing Field Work II (9)

5290 Community Nursing Seminar I (3)

5340 Secondary Care Nursing Seminar II (3)

5410 Principles of Community Mental Health I (3)

5430 Principles of Community Mental Health II (3)

5430 The Adult and Mental Health (3)

5440 The Child and Mental Health (3)

5470 Advanced Psychiatric Nursing Skills (3)

5510 Community Mental Health Nursing Field Work I (6)

5530 Community Mental Health Nursing Field Work II (6)

5530 Community Mental Health Seminar I (2)

5540 Community Mental Health Seminar II (2)

5550 Nursing the Child Bearing Family (3)

5560 Nursing Practitioner Field Work I (9)

5560 Nursing Practitioner Field Work II (9)

5560 Teaching Strategies and Practice (9)

5560 Nurse Practitioner Seminar I (2)

5560 Nurse Practitioner Seminar II (2)

5730 Management Strategies and Practice (9)

5770 Special Topics (5)
Independent Departments

Department of Air Force Aerospace Studies

Air Force ROTC Program
Professor of Air Force Aerospace Studies
Col. W. J. Hays, USAF, M.S.A., Inter-American
Assistant Professor
Maj. C. J. O. Dutt, M.S.A., Texas
Capt. F. D. Darnell, M.A., Webster College
Capt. P. M. Hanks, M.S., Troy State

PURPOSE
The Air Force Reserve Officers’ Training Corps (AFROTC) is an educational program designed to provide the college student an opportunity to earn an Air Force commission as a second lieutenant while completing the University requirements for a bachelor’s degree. The program provides education that will develop the skills and attitudes vital to the professional Air Force officer. Upon successful completion of the program and graduation from the University, students are commissioned as second lieutenants and they enter active duty.

THE PROGRAMS

The Four-Year Program: A formal application is not required for students entering the Four-Year Program. They may register for the program at the same time and in the same manner as they enroll in their other college courses and there is NO MILITARY OBLIGATION during their freshman and sophomore years. Students enroll in the General Military Course (GMC). They then may compete for entry into the Professional Officer Course (POC) which is normally taken during the last two years of college. Selection into the POC is highly competitive and is based on qualifications on an Air Force medical examination, scores achieved on the Scholastic Aptitude Test (SAT) or American College Test (ACT), scores achieved on the Air Force Officer Qualifying Test (AFOQT), successful completion of a four-week field training course at an Air Force base, and the recommendation of the Professor of Aerospace Studies.

The Two-Year Program: The Two-Year Program consists of the Professional Officer Course (POC), the last two years of the Four-Year Program. It is designed to provide greater flexibility to meet the needs of students desiring Air Force opportunities. The basic requirement is that applicants have two academic years remaining at either the undergraduate or graduate levels, or a combination of both. After being nominated by a Professor of Aerospace Studies, applicants seeking enrollment in the Two-Year Program are evaluated on scores achieved on the AFOQT, the Air Force medical exam, and a personal interview by a board of Air Force officers. Since the processing procedure must be completed approximately six months in advance of intended enrollment, interested students must apply early in the year preceding the fall term in which they intend to enter the program. Application should be made in writing or by a personal visit to the Professor of Aerospace Studies.

WOMEN IN AFROTC

AFROTC at The University of Tennessee has been coeducational since 1970. Women complete the same courses as men and have the same opportunities. Upon successful completion of the AFROTC program and degree requirements, women are commissioned in the Air Force as second lieutenants. Pay and job opportunities are equal for women and men. Virtually all career fields in the Air Force are open to women, to include flying positions (pilot and navigator).

THE COURSES

The General Military Course (GMC): This is a two-year course taken during the freshman and sophomore years with one hour of academic instruction and one hour of Leadership Laboratory a week. The curriculum covers two main themes—the mission and organization of the Air Force, and the history of the development of air power. These courses are open to any student enrolled in the University, and there is no military obligation associated with taking them.

The Professional Officer Course (POC) is a two-year course of instruction normally taken during the junior and senior years with three hours of academic instruction and one hour of Leadership Laboratory a week. The curriculum covers Air Force management and leadership and American defense policy. Admission is not automatic but is limited to fully qualified students selected by the Air Force ROTC staff.

Leadership Lab: Leadership Lab involves cadet participation, in and cadet direction of, corps leadership activities. It is largely cadet planned and organized in line with the premise that leadership training experiences will improve a cadet’s ability to perform as an Air Force officer. The freshman and sophomore Leadership Lab program involves initial leadership experiences such as: preparing the cadet for individual, squad, and flight movements in drill and ceremonies: customs and courtesies to include wearing of the uniform and saluting the flag; career opportunities; educational benefits and training problems; environment of the Air Force officer to include the military community, organizations, and functions; and preparation for field training. The junior and senior Leadership Lab program involves the cadets in advanced leadership experiences. The cadets will be responsible to a large degree for planning, organizing, directing, coordinating, and controlling the activities of the cadet corps; for preparing briefings and written communication; and to provide interviews, guidance, information, and other services which will increase the performance and motivation of other cadets.

Field Training: Every AFROTC cadet or applicant is required to attend a summer camp, called field training, normally between the sophomore and junior years. Cadets in the Four-Year Program attend for four weeks, while Two-Year Program applicants attend for six weeks. The curriculum consists of four weeks of aircraft, aircrew, career and survival orientation, physical training, small arms training, a social action program, and Suspension of Ground Support training is conducted at a number of Air Force bases throughout the United States. In addition to receiving travel pay to and from the Air Force.
PAY AND ENTITLEMENTS
All cadets enrolled in AFROTC are furnished textbooks and uniforms. Enrollees are required to deposit $105 as security to the University against loss or damage to the uniforms. The deposit, minus a nominal fee to cover cost of sheets, is returned to the student upon successful completion of AFROTC or upon written request to the AFROTC Cadet office. Course cadets receive a subsistence allowance of $100 each month during the academic year. In addition they are paid $300 for each flight hour successfully completed by a non-flying duties will be required to serve four years on active duty. Those graduates going into pilot assignments will be required to serve six years' active duty after completion of pilot training. Those graduates going into navigation assignments will be required to serve five years' active duty after completion of navigation training.

Curriculum
Air Force Aerospace Studies (094)
1210-20-30 Air Force Flight Training Ground School (3)
Surveys the missions, functions, and organization of the Air Force. Emphasizes the Air Force as an instrument in which the Air Force operates, and how the Air Force works with the Army and the Navy. Consults with the Armed Forces and the Air Force can build. 1 hr and 1 hr lab (Leadership Laboratory).
1220-30-30 Air Force Aerospace Studies (2, 2, 2) Introduction to pilot training. Remedial flight training developed from a historical perspective starting before the establishment of the FAA winter session in the 1960s, 4 hrs and 1 lab (Leadership Laboratory).
3240 Flight Training (Academic Program) (6) Flights of United States military forces in contemporary war, with particular attention to United States Air Force, its organization and mission, various components forces of U.S. military power, organization of America's defense structure, policies of major powers, and elements and processes in molding of defense policy. Conducted at Field Training bases in the country. Approximately 60 credits.
3210-30 Air Force Aerospace Studies (3, 3, 3) Air Force Leadership at junior officer level, including theoretical, professional, and legal aspects, with attention to communicative skills. Military management functions, principles, and techniques are covered. 3 hrs and 1 lab (Leadership Laboratory).
3410-20-30 Air Force Aerospace Studies (3, 3, 3) Emphasis on role and function of professional officer in a democratic society. Socialization process, public at Department of Defense; political, economic, and military competencies, and effectiveness of U.S. defense policy. Impact of technological and international developments upon strategic pre- components, emphasis on developing communicative skills. 3 hrs and 1 lab (Leadership Laboratory).

Department of Military Science
Army Reserve Officers

Army Reserve Officers

Corps of Cadets

Army Reserve Officers

Corps of Cadets

Professor of Military Science


UNIVERSITY ROTC PROGRAM

The University of Tennessee offers a voluntary ROTC program leading to professional appointment as an officer in the United States Army Reserve.

PURPOSE AND OBJECTIVE

The purpose is to provide professional education which will prepare students for commission as officers in the Regular Army or the United States Army Reserve.

Objectives of the program are to provide students with an understanding of the fundamental concepts and principles of military art and science; to develop in them a basic understanding of associated professional knowledge, a strong sense of personal integrity, honor, and individual responsibility, and an appreciation of the requirements for national security; and to establish a sound basis for the students' future professional development.

ROTC draws young men and women for training from all geographical, economic, and social strata of our society as well as from the many educational disciplines required for the modern Army. The program insures that men and women, educated in a liberal and broad spectrum of American institutions of higher learning are commissioned annually into the officer corps.

ARMY ROTC SCHOLARSHIP PROGRAM

The Army ROTC scholarship program offers financial assistance to outstanding students who are women in the Army ROTC program who are interested in the Army as a military career and are selected for free tuition, textbooks, and laboratory fees in addition to a subsistence allowance of $100 per month for the period that the scholarship is in effect. Scholarships may be awarded for either one, two, three, or four years. High school seniors should contact their guidance counselors early in November or December of their senior year to apply for the four-year scholarship. One-, two-, and three-year scholarship applicants should contact the Professor of Military Science for further information. Certain other privately financed scholarships and grants are available to ROTC cadets.

UNIVERSITY CREDIT

Tennessee grants the following credit for military science: 2(10-20)-9 quarter hours (MS 1110) 2(10-20)-9 quarter hours (MS 1110)

Military Science II—6 quarter hours (MS 210)

Military Science II—6 quarter hours (MS 210)

Military Science II—12 quarter hours (MS 310-32-30)

Military Science II—12 quarter hours (MS 410-20-30)
ENROLLMENT AND CONTINUANCE REQUIREMENT

The general requirements for enrollment and continuance in the ROTC program are:

1. Basic Course—MS I and II
   a. Be a citizen of the United States.
   b. Be physically qualified.
   c. Be not less than 14 years of age and have not reached 23 years of age at the time of enrollment.
2. Advanced Course—MS III and IV.
   a. All cadets applying for enrollment in the Advanced Course Army ROTC must fulfill the Commissioning Officer must:
      a. Have already completed the Basic Course or an off-campus six-week field training course, or have the required amount of prior military service.
      b. Have two academic years of college remaining (either graduate or undergraduate).
      c. Be enrolled as a full-time student, either at the University of Tennessee at Knoxville or at a nearby institution in a cooperative program.
      d. Meet military screening and physical requirements.
      e. Regularly enrolled students who meet the academic prerequisites and do not desire a commission may take individual courses as electives with the permission of the department head and academic adviser.

ADVANCED MILITARY STANDING

On the basis of previous honorable active military service in any branch of the Armed Services, or participation in a cooperative program such as Army ROTC Summer Studies-6 quarter hour requirements for subjects in Military Science Core Curriculum.

APPOINTMENT AS SECOND LIEUTENANT

Students may apply for appointment as an officer. Selection for appointment as an officer is based upon:

a. The personal interests of the cadet.
b. The major course of study.
c. The needs of the Service.
d. Leadership potential.
e. The academic qualification of the cadet.

REGULARLY ENROLLED STUDENTS WHO MEET THE REQUIREMENTS MUST:

a. Be a citizen of the United States.
b. Be physically qualified.
c. Be not less than 14 years of age and have not reached 23 years of age at the time of enrollment.
d. Be enrolled as a full-time student, either at the University of Tennessee at Knoxville or at a nearby institution in a cooperative program.
e. Meet military screening and physical requirements.
f. Regularly enrolled students who meet the academic prerequisites and do not desire a commission may take individual courses as electives with the permission of the department head and academic adviser.

PROFICIENCY EXAMINATIONS

Students may apply for proficiency examinations in Military Science 1110, 2110, and 2120. These examinations are offered mainly during the last six weeks of intensive training at the Basic Camp at Fort Knox, Kentucky. A student applying for a proficiency examination should present evidence that he or she has developed those abilities and attitudes expected of a student when he or she has taken the course involved. The application must be approved by the department head.

EMOLUMENTS

All students enrolled in the Army ROTC program are furnished textbooks by the Army through the Military Property Officer. Students enrolled in the ROTC Advanced Course receive uniforms and equipment plus an allowance of $100 per month during the academic year. While attending the ROTC summer studies, each cadet receives approximately $450 worth of clothing, equipment, and requires special equipment.

COURSES AVAILABLE

The curriculum of the Army ROTC program is designed to qualify the cadet for appointment as an officer. Selection for appointment to the various branches of the Army is based upon:

a. The personal interests of the cadet.
b. The major course of study.
c. Academic accomplishment.
d. Leadership potential.
e. The needs of the Service.

If this system of cadet training is satisfactory, this student may be commissioned in any branch for which he or she is qualified and in which a need for officers exists. After graduation and commissioning, the officer will attend a service school for further specified military training which will qualify him or her for the branch to which he or she is assigned.

Curriculum

Military Science (688)

1110 Fundamentals of Leadership and Management (3) Development of American military institutions, policies, practices, and traditions in peace and war from colonial times to present. Historical examples of effective and ineffective leadership and application of principles of war. Practical exercises in leadership development.

2110 Applied Leadership and Management (3) Concentrated study of leadership. Factors affecting human behavior, human leadership, principles, and traits. Development of leadership qualities through practical exercises. Military teaching principles and development of teaching skills.

2130 Applied Leadership and Management (4, 4) Applied leadership to include operation of the military team, electronic communications, land navigation, small unit leadership, and internal defense and development. Two field trips. Leadership Laboratory: Philosophy of organization and operation of military in tactical and administrative roles. Prereq: 2110.

4000 Army ROTC Summer Camp (6) Six-week encampment (4 hours of instruction are scheduled each week) is a prerequisite to commissioning and normally scheduled upon completion of 3130. Camp is conducted at Fort Knox, Kentucky. The instruction is presented by ROTC faculty from colleges and universities. Course of instruction is an extension of leadership and management curricula. Prereq: 3130.

4110 Theory and Dynamics of the Military Team (4) Organization, management, and operation of division military teams, development and functioning of military staff, and operation and planning of the military team. Leadership Laboratory: Staff and Tactical Planning, preparation of briefings, development of course objectives, and instruction of plan. Prereq: 4000 or consent of instructor.

4120-30 Seminar in Leadership and Management (4, 4) Development and application of leadership and management problems involved in unit administration, mission control, and inter-branch relationships. Leadership Laboratory. Prereq: 4110.
The Division of Continuing Education is responsible for the operation of all statewide continuing education programs, both on campus and off campus. The Division is concerned with policies and programs required for effective offering of educational opportunities, including attainment of college-level degrees, to qualified students of all ages and walks of life who pursue knowledge outside the traditional on-campus setting. All continuing education programs of the University are coordinated through the Division.

Information concerning continuing education programs of the various campuses is set forth in the respective catalogs. Information on continuing education programs of The University of Tennessee, Knoxville, is given on page 99 of this catalog.

Center for Extended Learning
Associate Directors: B. W. Wallace, M.S. Tennessee; R. H. Conedire, Ph.D. Tennessee.
Assistant Directors: A. Gettelfinger, B.A. Tennessee; D. F. Holton, Ph.D. Kansas.

- CEU Programs: Continuing Education Units are available for approved non-credit professional programs.
- CLEP Open Center: Administers College Level Examination Program tests each month.
- College Credit for High School Seniors: Coordinated in cooperation with the State Board of Education.
- College Entrance Courses: To remove entrance deficiencies or to complete high school requirements.
- Conferences: For specific clientele statewide.
- Independent Reading: The student should contact the academic department for the desired reading course and then register for credit through the CEL.
- Independent Study: Extends instructional services of the University from all campuses to the citizens of the state. Courses may be started at any time.
- Non-Credit Courses and Certificate Programs: In areas of general interest and in technical, business, and professional fields.

Statewide Media Programs: Courses for credit by cable and open-circuit television, radio, and newspapers.

Undergraduate Cooperative Education Program: For students desiring to work alternate quarters while going to school.

For information on enrollment, costs, books, and credit, write: Center for Extended Learning, 447 Communications and University Extension Bldg., The University of Tennessee, Knoxville, Tennessee 37916. Telephone: (615) 974-5135.

Head Start State Training Office
Director: L. C. Biggs, M.S. Wisconsin.
Assistant Director: R. J. Hamilton, B.S. Tennessee.
Training Officers: L. J. Champion, Ph.D. Tennessee; K. J. Davis, B.S. Iowa State; N. F. Bland, B.S. Middle Tennessee State; M. D. Griffin, M.S. Tennessee; C. J. Howard.

The State Training Office of Head Start is a program of services to the 20 area Head Start programs in Tennessee. The services include organizing training programs for personnel of the various local programs, development of special workshops, publication of a newsletter, and organizational work with parents of children in the Head Start program. This office provides training through the coordination of Head Start Supplementary Training and the State Training Office grants.

Library Services
Director: D. J. Harkness, M.S. Columbia.

This statewide service administered by the system Division has four major facets.
- Package Library and Book Services: provide material for use by clubwomen, teachers, librarians, and other individuals in preparing talks and papers and in doing special study and reference work. Books from the Extension Library and the University Library are loaned to individuals within the state and to students taking courses by correspondence. Study club outlines, bibliographies, suggestions for club yearbooks, reading lists, and information-reference services are provided.
- Club Program Service: includes a series of program manuals on historical, literary, and biological subjects designed to help clubwomen, teachers, and librarians in their work and individuals in their reading and study in informal adult education.
- Drama Loan Service: makes possible for directors of drama in schools, colleges, universities, Little Theatres, and church drama groups to borrow copies of one-act and three-act plays and material for special days for reading and examination. Information on sets, costumes, and the original Broadway productions, along with material on playwrights, actors, and actresses, is also available.
- School Program Service: includes aids to teachers, librarians, and directors of speech and drama through package libraries, drama loans, and production aids.

Publications: Publications are a direct means of extending to Tennesseans the information resulting from studies by University departments and various extension materials.
Division of Continuing Education

designed for general enrichment of civic, cultural, and economic understanding. The University of Tennessee Continuing Education Series is used as an outlet for these materials. A list of available titles, most of them free to Tennessee residents, may be had upon request.

Radio Services

Director: H. A. Shirley, M.A. Tennessee.

Associate Director: N. L. Dryer, B.S. Indiana.


Staff: M. J. Bell, B.A. North Carolina; D. B. Burris; R. J. England; W. G. Hauser, B.A. New Mexico; P. J. Rebmann, B.S. Middle Tennessee State; R. W. Stagg.

This department conducts an extensive statewide program of adult education and information by radio, offering hundreds of different cultural and educational experiences. Its activities may be grouped into three categories:

1. WUOT, the University's 100,000-watt stereo FM station, operating 19 hours a day every day of the year, with a high quality and varied program of music, public affairs, discussion, drama, and documentaries from local, state, national, and international sources. The station is a member of the National Public Radio Network.

2. A network of over 150 Tennessee radio stations which provides without charge the time for over 22,000 quarter-hour programs on subjects of public interest, with production, duplication on audio tape, and distribution accomplished by the department. Its close contact with all broadcasting, and its staff and facilities, equip the department ideally for work with the other campuses in the production, duplication, and distribution of audio materials for educational use. It will upon request assist all of the campuses in communications development.

3. A technical service which includes high-speed duplication of reel-to-reel or cassette audio tapes for University departments, recording conferences and workshops, audio consulting, and educational radio consulting.

Teaching Materials Center

Director: J. T. Benton, M.S. Tennessee.

This department provides educational films for the public schools, colleges, churches, civic clubs, and other interested organizations on a wide variety of subjects, ranging from agriculture to technical material on the space age, and also films for industrial use. Film councils throughout the state encourage the use of these materials for forum discussions and general adult education. An advisory service on effective film use is also provided by the department. Films, equipment, and other services are made available to the academic faculty for classroom instruction, and experimentation and educational films are provided for the students both on and off campus for student teaching, previews, and special projects.

Television Services

Director: F. A. Lester, M.A. Tennessee.


Programs: S. H. Gordon, B.S. Tennessee; W. P. Wilson, B.S. Tennessee.

Television services include the complex closed-circuit administration and production work which results in many lower-division resident classes being taught to some 8000 students by television on the campus; the production of 52 half-hour programs each year on WSKJ-TV, the State Department of Education station in East Tennessee; and instruction for three resident courses in broadcasting for the College of Communications. The department jointly administers an off-campus secondary school accelerated entrance program by television tape and the Video Tape Electrowriter Remote Mode program of professional development studies.
The University Library

Donald R. Hunt, Director
Kenneth E. Marks, Associate Director/Public Service
Richard C. Pollard, Associate Director/Technical Services
George W. Shipman, Associate Director/Administrative Services

Professors:
Donald R. Hunt (Director), M.A.L.S., Michigan; M. A. L. S., University of Michigan;
G. M. Abel (Emeritus), M. S., Chicago;
R. J. Bassett, A. M. L. S., Michigan;
H. Branch, B. A. L. S., New York;
E. E. Goehring (Emerita), B. S. L. S., Columbia;
L. B. Vandiver (Emerita), M. A. Florida State.

Associate Professors:
P. S. Bayne, M. S. L. S., North Carolina;
M. F. Crawford, M. S. L. S., Kentucky;
P. C. Field, M. S. L. S., Indiana;
J. H. Dobson, M. S. L. S., Indiana;
E. E. Goehring (Emerita), B. S. L. S., Columbia;
L. B. Vandiver (Emerita), M. A. Florida State.

Instructors:
A. L. Cristan, M. S. L. S., Texas;
S. V. McCallum, M. A. Chicago;
D. C. Picquet, M. S. L. S., Tennessee;
J. K. Shelby, M. S. L. S., Tennessee;
J. D. Thompson, M. S. L. S., South Carolina;
M. A. Watkins, M. L. S., Tennessee;
J. D. Webster, M. S. L. S., Tennessee;
H. L. Wells, M. S. L. S., North Carolina.

The UTK Library, as the premier library of the state, seeks to acquire and service all necessary recorded information, both print and non-print, that meets the needs of the University's teaching, research, and service programs. The books, periodicals, non-print and any other materials contained in the five UTK Library units are available to all students, faculty and staff of the University of Tennessee, Knoxville. Included among the holdings are 1,436,193 books, 1,241,006 microforms, 5,102 audio tapes, 1,541 slide carousels, 736 videotapes, 5,187 phonodiscs, 1.9 million manuscripts, and various ephemeral materials. More than 25,000 periodical and other serial titles are received annually.

The library in its five locations is open to all students and faculty, regardless of their fields of study. The James D. Hoskins Library at 1401 West Cumberland is the main library where administrative and technical services offices are located. The dictionary catalog, listing the library holdings for the entire campus, is in Main, as are the general and research collections, comprehensive reference, interlibrary services, documents, 4000:5000 level reserves, newspapers, non-print materials, and Special Collections, the last a repository of local and regional source materials.

The John C. Hodges Undergraduate Library, on Volunteer Boulevard at Andy Holt Ave., has a limited collection of 150,000 volumes selected to meet the needs of students in undergraduate courses. Reserve materials for 1000-3000 level courses are available in this library as is a large collection of audio tapes, slides, and videocassettes.

Other libraries serving specialized areas are Agriculture-Veterinary Medicine in the Veterinary Medicine building, Music in the Music Building, and Science/Engineering in Dabney-Buehler.

The libraries are administered by a director, three associate directors (for public, technical, and administrative services) and a number of department heads. Questions and comments are invited in person or through the suggestion boxes located in each library. Continuing evaluation and building of the collections is the responsibility of the Collection Development Librarian. While most materials are selected by faculty, recommendations for purchase are invited from all students and staff.

Copies of Your Libraries, the library handbook for students and faculty, are available at all libraries.
The University of Tennessee Computing Center (UTCC) provides computing facilities and services for the University's teaching, research, public service, and administrative activities. UTCC maintains close contact with the UTK academic community by supporting research and instructional users with professional computer staff.

UTCC is principally located in the Stokely Management Center and in Andy Holt Tower. From the Stokely location, UTCC supplies computing services to all campuses in the UT system through job entry facilities located on each campus. At UTK, UTCC maintains six job entry stations for batch work and eight sites for interactive computer work.

UTCC's equipment consists of an IBM 360/65, an IBM 370/3031, and a DECsystem-10 which are used for research, instruction, and administrative computing work. UTCC also has an IBM 360/40 used exclusively for administrative work. The IBM 360/65 has 2.75 million bytes of memory, and the IBM 370/3031, four million bytes. The DECsystem-10 is a 1090 configuration with 512K words of memory.

UTCC supports remote job entry stations (card reader/line printer) with the IBM 360/65 and 370/3031-DECsystem-10 combination and CalComp plotters. The IBM 360/65 runs under OS/360 MVT with HASP II. The IBM 370/3031 runs under SVS with HASP II. The DECsystem-10 runs under TOPS-10. Time sharing features include ATS/360, Coursewriter III, APL, FORTRAN, BASIC, COBOL, MACRO, and other special purpose application programs.

UTCC publishes a User's Guide which describes the use of the IBM 360/65-370/3031 and the DECsystem-10 User's Guide which describes the use of the DECsystem-10. The guides are available at the UT Book and Supply Store. UTCC also publishes a monthly Newsletter which announces systems, equipment, and procedural changes and contains other items of interest to users. Program write-ups and special user's guides are also available.

UTCC periodically offers intensive training seminars of several days' duration in computer utilization on the IBM 360/65-370/3031 and the DECsystem-10. These seminars are primarily for faculty, staff, and graduate students who use or plan to use UTCC facilities. UTCC offers non-credit short courses each quarter in topics such as programming languages and special purpose programs. These courses are announced in the Newsletter and in the UT Notes section of the UT Daily Beacon.

Computing services can be requested via the request for services form available from the receptionist, 200 Stokely Management Center. All users of UTCC facilities are assigned a consultant to provide user assistance.
The Institute comprises the system-level public service operations listed below.

**County Technical Assistance Service**

**Executive Director**: J. W. Westdahl, Jr., B.S., Tennessee.

**Associate Director**: C. R. Prabhu, M.S., Vендлнгті.

Local Specialists: M. W. Catalano, J.D., Tennessee; E. E. Fulg, J.D., Tennessee; W. C. McIntyre, J.D., East Tennessee State.

Cookeville, Jackson, Johnson City, and Knoxville.

The Institute for Public Service was established in 1971 within the Office of the Vice President for Urban and Public Affairs. The purpose of the Institute is to coordinate and promote public service activities throughout the University system, excluding services provided through the Institute of Agriculture.

The basic goal of the University public service effort is to bring to the citizens of Tennessee—their business, their industry, and their governments—the problem-solving capabilities uniquely embodied within their statewide University system.

Public service at The University of Tennessee includes all services offered to those outside the University, including teaching in certain non-degree situations, technical assistance, and applied research which is conducted specifically at the request and for the benefit of non-University organizations in Tennessee.

The Institute provides: (1) a system-wide focal point for urban and public services; (2) means to coordinate the various system-level public service activities; and (3) an organizational base for communication and program development that relates to both outside service clientele of the University and the campuses of the University system.

The Institute is headquartered in Knoxville, and maintains regional offices in Cookeville, Jackson, Johnson City, and Nashville.
The Center for Industrial Services is headquartered in Cookeville. Regional offices are maintained in Cockeekike, Jackson, Johnson City, and Knoxville.

Center for Government Training

Executive Director: D. M. Sullivan, D.P.A. Nova.
Associate Director: M. D. Vaughan, B.S. Motie Tennessee State.
Supervisor of Field Services: A. C. North, Jr., B.S. Motie Tennessee State.
Regional Managers: T. R. Carpenter, Jr., M.S. Tennessee; J. W. Fort, M.A. Audit Pay State; P. J. Olson, B.S. Belmont College; D. R. Waynick, B.S. Lambuth.
Program Coordinator: J. W. Winter, M.S. Tennessee.
Program Director: C. E. McLarty III, M.A. Harvard.

The Center for Government Training has responsibility for providing professional assistance and establishing training and career development programs for state and local government officials and employees throughout the state. Headquarters is located in Nashville, but regional offices are also maintained in Jackson and Knoxville. The Center is charged with identifying and analyzing needs for public service education and training at the state and local levels in Tennessee, and with developing and conducting programs for training of public agency employees, working with institutions of higher education in the state and other educational facilities. The Center acts as a clearing house for information relative to public service personnel education and training programs. In addition, the Center serves as the central administrative agency in a statewide local government training network which includes four campuses of the University and the six senior institutions in the Board of Regents system.

Technical Assistance Center

Director: J. Y. Brothers, B.S. Tennessee.
Associate Directors: J. R. Atia, M.B.A. Inter-American.

The Technical Assistance Center, created in March 1970, is funded in part by a grant from the Economic Development Administration of the U.S. Department of Commerce.

The Center gives assistance to small business or industry, prospective business or industry, development districts, local governments, or local economic development groups in activities which will promote the economic development of 48 counties in the eastern portion of the state.

The types of help that may be given include economic feasibility studies, market studies, management review and assistance, and management seminars and conferences.

The technical work of the Center is performed by faculty and students at the University.

The technical work of the Center is performed by faculty and students at the University.
## Administration

**Trustees:**
- Appointed by the Governor: 18
- Ex-Officio: 5

**Officers of Administration:**
- President: 1
- Vice Presidents: 8
- Associate/Assistant Vice Presidents: 10
- Chancellors: 5
- Vice Chancellors and Provost: 19
- Associate/Assistant Vice Chancellors: 11
- Deans and Directors: 290

## Full-Time and Part-Time Faculty 1979-80

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<th>Center for the Health Sciences*</th>
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*Includes two vice presidential titles held by one person.

**Instruction, Research, and Public Service**

| Officers of the Agricultural Experiment Station | 37 |
| Officers of the Agricultural Extension Service (Includes County Agents) | 429 |
| Lecturers                                      | 133 |
| Graduate, Research, and Teaching Assistants, Fellows, Trainees | 2,013 |
| Officers of the UT Center for the Health Sciences-Knoxville Unit | 78 |

*Includes UTCHS-Knoxville Unit.
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**Note:**

1. The enrollment data in this state-wide summary of The University of Tennessee System represent full-time, degree-seeking students enrolled only on a non-credit or audit basis are not included.
2. Center for the Health Sciences does not include 586 graduate medical students residing and
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