A&S 100 SPECIAL INTRODUCTORY COURSE: Title to be Assigned. (1-6)
This course permits the offering at the introductory level of special courses of an interdisciplinary, topical, or experimental nature. Each proposal must be approved by the Dean of the College of Arts and Sciences. A particular title may be offered at most twice under the A&S 100 number. Students may not repeat under the same title. May be repeated to a maximum of 12 credits. Prereq: Will be set by instructor.

A&S 101 SPECIAL INTRODUCTORY COURSE: TITLE TO BE ASSIGNED. (1-6)
This course permits the offering at the introductory level of special courses of an interdisciplinary, topical or experimental nature. Each proposal must be approved by the Dean of the College of Arts and Sciences. A particular title may be offered at most twice under the A&S 101 number. Students may not repeat under the same title. Offered pass/fail only. May be repeated to a maximum of 12 credits. Prereq: Will be set by instructor.

A&S 103 BASIC INSTRUCTION IN LESS COMMONLY TAUGHT LANGUAGES I (Subtitle required). (3-5)
This course provides elementary language instruction with an emphasis upon the spoken language of everyday use where appropriate. Writing and the elements of grammar are gradually introduced. Students may not repeat this course under the same subtitle. Prereq: Will be set by instructor.

A&S 104 BASIC INSTRUCTION IN LESS COMMONLY TAUGHT LANGUAGES II (Subtitle required). (3-5)
A continuation of A&S 103. Students may not repeat this course under the same subtitle. Prereq: A&S 103.

A&S 203 INTERMEDIATE INSTRUCTION IN LESS COMMONLY TAUGHT LANGUAGES I (Subtitle required). (3-5)
A continuation of A&S 103. Students may not repeat this course under the same subtitle. Prereq: A&S 203 in the same language or permission of instructor.

A&S 204 INTERMEDIATE INSTRUCTION IN LESS COMMONLY TAUGHT LANGUAGES II (Subtitle required). (3-5)
A continuation of A&S 203. Students may not repeat this course under the same subtitle. Prereq: A&S 203 in the same language or permission of the instructor.

A&S 300 SPECIAL COURSE. (1-6)
Interdisciplinary, topical or experimental courses to be approved by the Dean of the College of Arts and Sciences. A particular course may be offered at most twice under the A&S 300 number, and no A&S 300 course may be given for more than six credits per semester. Open to all University students, subject to such limits or prerequisites as set by the instructor. May be repeated to a maximum of 12 credit hours under different sub-titles.

A&S 303 SPECIAL INTRODUCTORY COURSE: TITLE TO BE ASSIGNED. (1-6)
Interdisciplinary, topical or experimental courses to be approved by the Dean of the College of Arts and Sciences. A particular course may be offered at most twice under the A&S 303 number, and no A&S 303 course may be given for more than six credits per semester. Open to all University students, subject to such limits or prerequisites as set by the instructor. Offered pass/fail only.

A&S 500 SPECIAL COURSE (Subtitle required). (1-6)
Interdisciplinary, topical, or experimental courses to be approved by the Dean of the College of Arts and Sciences and the Dean of the Graduate School. A particular course may be offered at most twice under the A&S 500 number. Open to all University students, subject to such limitations or prerequisites as set by the instructor. May be repeated to a maximum of six credits under different sub-titles. Prereq: As specified by the instructor.

A&E 270 INTRODUCTION TO ART EDUCATION. (2)
A lecture-laboratory course investigating the theoretical, historical, psychological and sociological foundations of art education. Critical examination of individual and group activities currently offered in the elementary school art program. Lectures, curriculum design, evaluation of process and technique. Introduction to the visual arts through studio experiences. Lecture, one hour; laboratory, two hours per week. A&E 270 and A&E 272 together satisfy the state art requirement for general elementary teacher certification. Prereq: EDP 202.

A&E 272 WORKSHOP IN DESIGN EDUCATION. (2)
Exploration and analysis of design, media and concepts with special attention to classroom application. Lecture, one hour; laboratory, two hours per week. Prereq: A&E 270.

A&E 395 INDEPENDENT WORK: ART EDUCATION. (1-3)
Supervised individual research, practicum, and field experience leading to the development of art education curriculum theory, and teaching techniques appropriate for various populations and conditions. A learning contract will be submitted to both the department and to the office of the dean at the time of registration. May be repeated to a maximum of six credits. Prereq: Major and consent of instructor.

A&E 399 EXPERIENTIAL EDUCATION. (1-15)
Development of personally motivated and planned projects and internships in art education and interdisciplinary program activities outside the academic classroom experience, encompassing recreation, general education, adult education, special education, state programs, and group field experiences and workshops. May be repeated to a maximum of 15 credits. (Approval of A&S dean required for more than six credits per semester.) Prereq: Recommendation of art faculty member and department chairman; completion of departmental learning agreement.

A&E 515 INTRODUCTION TO ART THERAPY. (3)
An examination of various historical and contemporary conceptions of the therapeutic function and value of art from an art education perspective. The impact of art experience on emotional, intellectual and behavioral development and/or rehabilitation will be explored through readings, discussions, guest lectures, and lab experiences. Lecture, two hours per week; laboratory, two hours per week. Prereq: PSY 331 and major or consent of instructor.

A&E 525 THE ELDERLY AND THE ARTS. (3)
An examination of the problems of the elderly and the possibilities of art education for older persons in various settings including nursing homes, day care and recreation centers, housing complexes, and continuing education programs. The impact of art experience on the psychological, social, and physical well-being of the older person and the initiation of quality programs in the arts will be explored through readings, lectures, demonstrations, and field experience. Lecture, two hours; laboratory, two hours.

A&E 538 ADVANCED ARTS AND CRAFTS IN THE ELEMENTARY SCHOOL. (3)
Planned to give the elementary teacher an understanding of teaching methods involved in, and construction of, art activities which would enrich the classroom program.

A&E 545 TOPICAL STUDIES IN ART EDUCATION (Subtitle required). (3)
Intensive study and analysis of a designated topic, issue or development in the philosophy, history, theory, or methodology of art education in community and public school settings. May be repeated to a maximum of six credits. Prereq: Art education major or consent of the instructor.

A&E 577 ART IN SECONDARY SCHOOLS. (3)
This course provides students with an overview of the secondary school in American education and explores the history, theory, techniques and contemporary issues of teaching art in the secondary schools. Skills in the planning of multicultural activities and the teaching and evaluation of secondary art experiences are stressed. Full class instruction, video, micro-teaching, laboratory and studio experiences are incorporated into class design. Prereq: Major in art education or consent of instructor.

A&E 578 ART IN ELEMENTARY SCHOOLS. (3)
Study of perceptual and aesthetic awareness in children. Field and practicum experiences with methods and materials appropriate to the teaching of art in the elementary school. Multicultural activities stressed. Lesson planning, curriculum design, evaluation, teaching skills, classroom safety, multicultural activities included: lecture, demonstration, micro-teaching laboratory and studio experiences. Prereq: Major in art education, or consent of the instructor.
A-E 579 SEMINAR IN ART EDUCATION.  
Inquiry into the relationship of current philosophies of art education and aesthetics; a consolidation of art education ideas with a formation of criteria for making value judgments; the development of a personal viewpoint consistent with education and art as humanistic endeavors. Prereq: Major in art education, or consent of the instructor.  

A-E 645 TOPICAL RESEARCH IN ART EDUCATION (Subtitle required).  
Advanced study and research of a designated topic, issue, or development in the philosophy, history, or methodology of art education in community and public school settings. May be repeated to a maximum of six credits. Prereq: Graduate standing in art education.  

A-E 695 INDEPENDENT WORK: ART EDUCATION.  
Supervised individual research, experimental practicum, and the initiation of field programs leading to the discovery and development of new knowledge in art education theory and method. A formal learning contract between student and supervising faculty member is required. May be repeated to a maximum of six credits. Prereq: Graduate standing in the department and consent of instructor.  

A-E 748 MASTER'S THESIS RESEARCH.  
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.  

A-H Art History  

A-H 105 ANCIENT THROUGH MEDIEVAL ART.  
Survey of the development of art and architecture with primary emphasis on cultures of Egypt, Western Asia, Greece, Rome, and medieval Europe.  

A-H 106 RENAISSANCE THROUGH MODERN ART.  
Historical development of Western art and architecture from the fourteenth century through the present.  

A-H 307 ANCIENT NEAR EASTERN AND EGYPTIAN ART.  
Study of the art, architecture, and material culture of the civilizations in the ancient Near East (Mesopotamia, Assyria, Persia) and of Egypt, from Neolithic origins through the first millennium BCE. Prereq: A-H 105 recommended.  

A-H 308 AFRICAN ART.  
A study of African art: the philosophy and myths that govern the people’s art productions. These philosophies and myths, in most cases, will be compared to the western point-of-view of thinking about art and art production. Prereq: A-H 105 recommended.  

A-H 312 ART OF GREECE.  
Study of the art and architecture of Greece from Mycenaean through Hellenistic times. Emphasis will be on interpreting the arts of Greece of the 5th and 4th centuries B.C. in the context of the political, social, and intellectual life of Classical Athens. Prereq: A-H 105 recommended. (Same as CLA 312.)  

A-H 313 ROMAN ART.  
Study of the art and architecture of Rome from the early Republic through the age of Constantine. Attention will focus on painting, sculpture and architecture as reflections of political, social and cultural developments in the Roman world. Prereq: A-H 105 recommended. (Same as CLA 313.)  

A-H 322 BYZANTINE ART.  
Study of the art forms of Byzantium (the Eastern Medieval Empire) from its origins in Late Antique and Early Christian art to its final demise in 1453. Emphasis on the continuity and transformation of the classical tradition and on the innovations peculiar to Byzantine art within its religious, imperial, and social context. Prereq: A-H 105 recommended.  

A-H 323 WESTERN MEDIEVAL ART.  
Examination of the art and architecture of Western Europe from the fourth through the fifteenth centuries CE (Common Era). Considers the interrelationships of art, religion, literature, politics, and other expressive forms as they shape and are shaped by the visual arts communicating the ideas of medieval patrons and artists. Prereq: A-H 105 recommended.  

A-H 334 RENAISSANCE ART.  
Study of art and architecture in Italy and Northern Europe from C. 1300-1520. Art is interpreted in the context of the social, political, and intellectual life of the Renaissance. Prereq: A-H 106 recommended.  

A-H 335 MANNERIST AND BAROQUE ART.  
Study of European art and architecture of the Mannerist and Baroque periods, with primary emphasis on Baroque. Baroque art is examined in the social, political, and intellectual contexts of individual regions to distinguish regional differences as well as cultural interrelationships. Prereq: A-H 106 recommended.  

A-H 340 MODERN ART I: 18TH AND 19TH CENTURIES.  
A study of the visual arts in the eighteenth and nineteenth centuries with emphasis on their historical and cultural background, and interdisciplinary connections in the arts and humanities, especially in Europe. Prereq: A-H 106 recommended.  

A-H 341 MODERN ART II: TWENTIETH CENTURY ART.  
Examination of the visual arts from the 1890s to the present with emphasis upon Europe and North America. Major developments in painting and sculpture (and to a lesser extent, design, architecture, film, and performance) are analyzed in their contemporary social, intellectual, and political contexts. Prereq: A-H 106 recommended.  

A-H 342 AMERICAN ART.  
A chronologically organized examination of the visual arts of the peoples of the United States from the colonial period to the present. Different genres of art, the changing roles of artists, and the emergence of art institutions and audiences for art are explored within the context of democratic public life in the United States. Prereq: A-H 106 recommended.  

A-H 343 HISTORY OF PHOTOGRAPHY.  
Chronological survey of the history of photography from its inception to the present day. Emphasis on fine art photography, the work and contributions of its practitioners, the relationship of photography to other art forms, general issues within the medium. Prereq: A-H 106 recommended.  

A-H 350 CONTEMPORARY ART.  
Through lectures, readings, discussions, and research, this course examines major issues raised in art and art criticism since 1965. Particular attention is given to the impact of social, intellectual, and technological developments upon art making and concepts of art and the artist. Prereq: A-H 106 recommended.  

A-H 399 EXPERIENTIAL EDUCATION IN ART HISTORY.  
A community-based or field-based experience in Art History. A formal learning contract among student, field supervisor, and supervising faculty member required. May be repeated to a maximum of 15 hours. Prereq: A-H 105 and A-H 106.  

A-H 501 MUSEUM STUDIES I: INTRODUCTION.  
An introduction to the varied types of professional activity found within the typical university or regional art museum. Intended for advanced students in arts related disciplines. Team taught in the seminar format in the University of Kentucky Art Museum by a member of the art history faculty and the UK Art Museum staff. Prereq: Junior standing.  

A-H 502 MUSEUM STUDIES II: INTERNSHIP.  
A supervised internship in a professional museum setting that builds upon Museum Studies I. The focus may be on a single aspect or several areas of museum activity: administration, curatorship, education, registration and collection management, design, development, public relations, etc. Laboratory, 10 hours per week. May be repeated to a maximum of 9 credits within different contexts. Prereq: Completion of A-H 501 with a grade of B or better.  

A-H 503 ART HISTORY THROUGH THE ART OBJECT (Subtitle required).  
Examination of original works of art on campus or in regional collections within an art historical context. The course may focus on a particular medium, class or objects, period, or artist. May be repeated up to 6 credits with different course subtitles. Prereq: Junior standing.  

A-H 525 STUDIES IN GENRES AND MEDIA (Subtitle required).  
Study of a particular genre (type of subject, such as still life) or a particular medium (type of object, such as the icon) in the history of art. May be repeated to a maximum of 6 credits when identified by a different subtitle. Prereq: Junior standing.  

A-H 526 ART AND THE ARTIST IN SOCIETY (Subtitle required).  
Art historical study of a topic or period with particular emphasis on artists and the social and cultural context of their roles in the production of visual art forms. May be repeated to a maximum of 6 credits when identified by a different subtitle. Prereq: Junior standing.
A-H 527 ART WITHIN ITS INTERDISCIPLINARY FRAMEWORK (Subtitle required). (3)
Art historical study of a topic or period with particular emphasis placed on establishing
the interdisciplinary connections for visual art forms. Depending on the topic, students
might research in a wide variety of areas over the course of the semester, for example,
literature, music, theatre, history, political science, philosophy, the classics, anthropo-
logy, etc. May be repeated to a maximum of 6 credits when identified by different
subtitles. Prereq: Junior standing.

A-H 528 TOPICAL SEMINAR IN ART HISTORY (Subtitle required). (3)
In-depth study of a work of art, a particular artist, an artistic period, or an iconographic
or thematic study. May be repeated up to six credits with different subtitles. Prereq: Junior
standing.

A-H 555 METHODS IN ART HISTORY. (3)
A seminar introduction to the range of approaches scholars have historically used to study
art’s history (e.g., connoisseurship, formal analysis, iconography, etc.). Exact course
content may vary to emphasize historiography, current methods, or the relation of critical
to art historical practice. Prereq: Junior standing.

A-H 592 AESTHETICS. (3)
Problems of method in aesthetics; major types of aesthetic theory. Aesthetic materials
of the arts, in literature, music, and the space arts. Form and types of form. Meaning
in the arts. Interrelations of the arts. (Same as PHI 592.)

A-H 598 COORDINATE STUDY. (3)
Course number for those students wishing to do advanced work on a special subject in
conjunction with a regularly scheduled 300-level class not previously taken by the
student. May be repeated to a maximum of six credits. Prereq: Two art history courses
or consent of instructor.

A-H 603 THE ART OBJECT: (Subtitle required). (3)
Examination of original works of art on campus or in regional collections within an art
historical context. The course may focus on a particular medium, class of objects, period,
or artist. May be repeated up to six credits with different subtitles. Prereq: Graduate status
in Art History.

A-H 625 PROBLEMS IN GENRES AND MEDIA: (Subtitle required). (3)
Study of a particular genre (type of subject), such as still life) or a particular medium
(type of object, such as the icon) in the history of art. May be repeated to a maximum
of six credits when identified by a different subtitle. Prereq: Graduate standing.

A-H 626 THE ARTIST IN SOCIETY: (Subtitle required). (3)
Arthistorical study of a topic or period with particular emphasis on artists and the social
and cultural context of their roles in the production of visual art forms. May be repeated
to a maximum of six credits when identified by a different subtitle. Prereq: Graduate
standing.

A-H 627 INTERDISCIPLINARY APPROACHES TO ART HISTORY: (Subtitle required). (3)
Art historical study of a topic or period with particular emphasis placed on establishing
the interdisciplinary connections for visual art forms. Depending on the topic, students
might research in a wide variety of areas over the course of the semester, for example,
literature, music, theatre, history, political science, philosophy, the classics, anthropo-
logy, etc. May be repeated to a maximum of six credits when identified by a different subtitle. Prereq: Graduate standing.

A-H 628 ART HISTORY TOPICAL SEMINAR: (Subtitle required). (3)
In-depth study of a work of art, a particular artist, an artistic period, or an iconographic
or thematic study. May be repeated to a maximum of six credits when identified by a
different subtitle. Prereq: Graduate standing.

A-H 738 MASTER’S SEMINAR. (3)
Seminar devoted to instruction and practice of professional skills applied to develop a
previous project of each student for an appropriate application. Prereq: Graduate status
in Art History and approval of the Director of Graduate Studies.

A-H 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters.
Prereq: All course work toward the degree must be completed.

A-H 780 INDEPENDENT WORK: ART HISTORY. (1-3)
Supervised and sustained individual research and interpretation in the history of art
leading to the discovery and demonstration of new knowledge. A formal learning contract
between student and supervising faculty member required. May be repeated to a
maximum of six credits. Prereq: Graduate standing in the department, 18 credits in art
history and consent of instructor.

A-S Art Studio

A-S 102 VISUAL EXPLORATION I. (3)
Introductory studio experience in two-dimensional representation and abstraction using
a variety of basic drawing materials and processes. Six studio hours per week.

A-S 103 VISUAL EXPLORATION II. (4)
Introductory studio experience in three dimensional representation and abstraction. A
variety of sculptural materials and basic shop processes will be studied. Eight studio
hours per week.

A-S 200 STUDIO I. (3)
Study investigation of recent ideas, values, and directions in Art introduced through
a variety of traditional and nontraditional processes, materials, and methods. Nine studio
hours per week. Prereq: A-S 102 and 103.

A-S 215 STUDIO II. (3)
Continued studio experience emphasizing the descriptive and expressive function of
shape and color in visual organization using two dimensional marking and shaping

A-S 255 STUDIO III. (3)
Continued studio experience in three dimensional expression, emphasizing design and
technical development, including modeling, mold making, fabrication and assemblage
in a variety of materials. Nine studio hours per week. Prereq: A-S 103.

A-S 310 PAINTING I. (3)
Concentrated painting experience stressing enlargement of formal understanding and
personal expression. Prereq: A-S 215 or consent of instructor.

A-S 311 PAINTING II. (3)
A continuation of A-S 310. Prereq: A-S 310 and consent of the instructor.

A-S 320 PRINTMAKING I. (3)
Introductory studio experience in printmaking media and procedures relevant to
individual development. Nine studio hours per week. Prereq: A-S 102 or consent
of instructor.

A-S 321 PRINTMAKING II. (3)
A continuation of A-S 320. Nine studio hours per week. Prereq: A-S 320 or consent
of instructor.

A-S 330 INTERMEDIATE DRAWING. (3)
Continued studio experience in two-dimensional representation and abstraction using
a variety of drawing materials and processes. When offered in the fall, emphasis will be
on the human figure. When offered in the spring, course content will cover a broad range
of traditional and experimental subjects including landscape, still lifes, collage, and
mixing words with images. May be repeated to a maximum of six credits. Nine studio
hours per week. Prereq: A-S 102 or consent of instructor.

A-S 340 GRAPHIC DESIGN I. (3)
Introductory studio experience in the application of visual design to graphic com-
munication. Nine studio hours per week. Prereq: A-S 102 and A-S 103, or consent
of instructor.

A-S 341 GRAPHIC DESIGN II. (3)
Continued exposure to the aesthetics and principles of design and their creative
application in visual communication. Class projects will develop sensibilities gained
in A-S 340 such as the use of type as a spatial element; selection of typefaces, hand-
lettering, and graphic imagery. Mass production procedures and techniques will be
introduced. Studio, nine hours per week. Prereq: A-S 340.

A-S 350 FIBER I. (3)
Introductory studio experience to the design and fabrication of woven and non-woven
fiber art in two and three dimensions; emphasis on color, structure and related aesthetic
values. Nine studio hours per week. Prereq: A-S 102 or A-S 103 or consent of instructor.

A-S 351 FIBER II. (3)
Continuation of A-S 350, emphasis on developing perceptual and technical skills toward
increasing aesthetic involvement with woven and nonwoven fiber and fabric. Nine studio
hours per week. Prereq: A-S 350 or consent of instructor.
A-S 360 SCULPTURE I. (3)
Concentrated sculptural experience in a variety of media emphasizing expanded understanding of material and methods. Nine studio hours per week. Prereq: A-S 255 or consent of instructor.

A-S 361 SCULPTURE II. (3)
A continuation of A-S 360. Nine studio hours per week. Prereq: A-S 360 or consent of instructor.

A-S 370 CERAMICS I. (3)
Introductory studio experience to a variety of ceramic materials and processes. Nine studio hours per week. Prereq: A-S 103 or consent of instructor.

A-S 371 CERAMICS II. (3)
A continuation of A-S 370. Nine studio hours per week. Prereq: A-S 370 or consent of instructor.

A-S 380 PHOTOGRAPHY I. (3)
A-S 380 is an introductory course in photography. Although it provides a thorough background in basic techniques that students may apply to any discipline, its primary emphasis is upon the practice of the medium as a fine art. Students receive technical instruction in camera and lens construction, exposure controls, processing of black and white negatives and prints, and presentation. Studio, nine hours per week.

A-S 381 PHOTOGRAPHY II. (3)
A-S 381 is a continuation of A-S 380. The emphasis is upon refining visual perception and basic photographic skills with an introduction to some of the more advanced techniques of black and white photography. Students receive technical instruction in the Zone System, archival processing, toning, and presentation. Studio, nine hours per week.

A-S 384 COLOR PHOTOGRAPHY I. (3)
A-S 384 is an introductory course in color photography. The emphasis is upon the unique qualities of color photography relating to visual perception. Students receive technical instruction in negative and transparency film development and printing. Studio, nine hours per week. Prereq: A-S 380 or consent of instructor.

A-S 386 NONSILVER PHOTOGRAPHY I. (3)
A-S 386 is an introductory course in nonsilver photography. The emphasis is upon the unique qualities of nonsilver photography relating to visual perception. Students receive technical instruction in the use of orthochromatic films, half-tone separations, cyanotypes, Van Dyke brown prints, and gum-bichromate prints. Studio, nine hours per week. Prereq: A-S 380 or consent of instructor.

A-S 390 TOPICAL STUDIES (Subtitle required). (3)
Studio investigation of art forms, processes, and topics not specially treated in the regular studio course of study. Topics announced in schedule book for each semester. Nine studio hours per week. May be repeated to a maximum of 12 credits when identified by different course subtitles. Prereq: To be specified as appropriate when topic is identified.

A-S 395 INDEPENDENT WORK: ART STUDIO. (1-3)
Supervised individual work in Art Studio. A learning contract will be submitted both to the department and the office of the dean at the time of registration. May be repeated to a maximum of nine credits. Prereq: Art major, senior standing, grade-point average of 3.0 within the department and consent of instructor.

A-S 396 WORKSHOP (Subtitle required). (1-6)
Workshops in a variety of media dealing with supervised investigation of Art-StUDIO problems. Studio, 3-18 hours per week. May be repeated to a maximum of nine credits when identified by different subtitles. Prereq: Consent of instructor.

A-S 398 COORDINATED STUDIES IN ART STUDIO. (3)
Supervised independent study in conjunction with regularly scheduled upper-division classes. Coordinate study credits may not be attached to any upper-division course in which the student is concurrently enrolled. Studio, nine hours per week. May be repeated to a maximum of nine credits. Prereq: Art major, junior standing or above, grade-point average of 3.0 in the department.

A-S 399 EXPERIENTIAL EDUCATION. (1-15)
Off-campus studio experience outside the academic environment leading to significant professional growth. A formal learning contract among student, field supervisor and the department. Studio hours per week by arrangement. May be repeated to a maximum of 15 credits. Prereq: Upper division standing; written statement of objective, recommendation of a studio faculty member and the approval of the department chairperson and the Office of Experimental Education.

A-S 400 SENIOR SEMINAR. (1)
Readings and discussions in art. Selection, preparation, and presentation of senior exhibitions and portfolios. To be taken during the student’s final semester of study. Two lecture hours per week. Prereq: Senior standing in Department of Art.

A-S 510 PAINTING III. (3)
Supervised individual development in painting. Nine studio hours per week. Prereq: A-S 311 or consent of instructor.

A-S 511 PAINTING IV. (3)
Continuation of A-S 510; emphasis on professional awareness and development. May be repeated to a maximum of six credits. Nine studio hours per week. Prereq: A-S 510 or consent of instructor.

A-S 520 PRINTMAKING III. (3)
Supervised individual development in printmaking. Nine studio hours per week. Prereq: A-S 321 or consent of instructor.

A-S 521 PRINTMAKING IV. (3)
Continuation of A-S 520; emphasis on professional awareness and development. May be repeated to a maximum of six credits. Nine studio hours per week. Prereq: A-S 520 or consent of instructor.

A-S 530 ADVANCED DRAWING. (3)
Supervised individual development in drawing. When offered in the Fall, emphasis will be on the human figure. When offered in the Spring, students may select from a broad range of traditional and experimental subjects. May be repeated to a maximum of six credits. Nine studio hours per week. Prereq: A-S 330 or consent of instructor.

A-S 540 GRAPHIC DESIGN III. (3)
The analysis of popular graphic formats and their relationship to current ideas in painting and photography, stressing experiences gained by the student in other art-studio classes. Additional emphasis on practical considerations in developing visual communication design problems from initial concept to finished artwork. Exploration of specification procedures as they relate to printing papers, typesetting, and photographic methods. Studio, nine hours per week. Prereq: Successful admission to BFA program.

A-S 550 FIBER III. (3)
Supervised individual development in fiber. Nine studio hours per week. Prereq: A-S 351 or consent of instructor.

A-S 551 FIBER IV. (3)
Continuation of A-S 550; emphasis on professional awareness and development. May be repeated to a maximum of six credits. Nine studio hours per week. Prereq: A-S 550 or consent of instructor.

A-S 560 SCULPTURE III. (3)
Supervised individual development in sculpture. Nine studio hours per week. Prereq: A-S 361 or consent of instructor.

A-S 561 SCULPTURE IV. (3)
Continuation of A-S 560; emphasis on professional awareness and development. May be repeated to a maximum of six credits. Nine studio hours per week. Prereq: A-S 560 or consent of instructor.

A-S 570 CERAMICS III. (3)
Supervised individual development in ceramics. Nine studio hours per week. Prereq: A-S 371 or consent of instructor.

A-S 571 CERAMICS IV. (3)
Continuation of A-S 570; emphasis on professional awareness and development. May be repeated to a maximum of six credits. Nine studio hours per week. Prereq: A-S 570 or consent of instructor.

A-S 580 PHOTOGRAPHY III. (3)
A-S 580 is a continuation of A-S 381. The emphasis is upon advanced black and white photographic processes and continued acquisition of skills for self-expression through the medium. Students receive technical instruction in the use of different photographic films, papers, and chemicals, as well as master printing processes. Studio, nine hours per week. Prereq: A-S 381 or consent of instructor.

A-S 581 PHOTOGRAPHY IV. (3)
A-S 581 is a continuation of A-S 580. The emphasis is upon advanced black and white photographic processes and continued acquisition of skills for self-expression through the medium. May be repeated to a maximum of six credits. Studio, nine hours per week. Prereq: A-S 580 or consent of instructor.
A-S 584 COLOR PHOTOGRAPHY II. (3)
A-S 584 is a continuation of A-S 384. The emphasis is on advanced color photographic processes and continued acquisition of skills for self-expression through the medium. May be repeated to a maximum of six credits. Studio, nine hours per week. Prereq: A-S 384 or consent of instructor.

A-S 586 NONSILVER PHOTOGRAPHY II. (3)
A-S 586 is a continuation of A-S 386. The emphasis is on advanced nonsilver photographic processes and continued acquisition of skills for self-expression through the various media. May be repeated to a maximum of six credits. Studio, nine hours per week. Prereq: A-S 386 or consent of instructor.

A-S 596 WORKSHOP. (1-6)
Workshops in a variety of media dealing with supervised investigation of advanced art studio problems. Prereq: Consent of instructor.

A-S 610 PAINTING V. (3)
Advanced studio investigation of current ideas in painting. Exploration of contemporary and traditional procedures, materials, and issues in a context of a group discussion and review. May be repeated to a maximum of nine credits. Prereq: Graduate standing in the department and approval of the instructor.

A-S 611 PAINTING VI. (3)
Continued studio investigation of current ideas in painting, with increased concentration on critical group discussions of student work and readings in contemporary art. May be repeated to a maximum of nine credits. Studio, nine hours. Prereq: A-S 610 and consent of instructor.

A-S 620 PRINTMAKING V. (3)
Advanced studio investigation of current ideas in printmaking. Exploration of contemporary and traditional procedures, materials, and issues. May be repeated to a maximum of nine credits. Studio, nine hours. Prereq: Graduate standing in the department and consent of the instructor.

A-S 621 PRINTMAKING VI. (3)
Continued advanced studio investigation of current ideas in printmaking. Increased concentration of technical and aesthetic development in preparation for entry into the professional environment. May be repeated to a maximum of nine credits. Studio, nine hours. Prereq: A-S 620.

A-S 630 GRADUATE DRAWING. (3)
Supervised studio course in graduate-level drawing and mixed media works on paper or other two-dimensional surfaces. Emphasis will be placed on personal style, its identification, definition and further development in the context of contemporary drawing. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: Twelve credits in upper division studio work and consent of instructor.

A-S 650 FIBER V. (3)
In this supervised graduate studio course in fiber, emphasis will be placed on personal style, its identification, definition, and further development in the context of major directions in the fiber arts. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: 12 credits in upper division studio work and consent of instructor.

A-S 651 FIBER VI. (3)
Continued advanced studio investigation of current ideas in the fiber arts. Increased concentration on technical and aesthetic development, professional readings, and group discussion. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: A-S 650.

A-S 660 SCULPTURE V. (3)
In this supervised studio course in graduate sculpture, emphasis will be placed on personal style, its identification, definition, and further development in the context of modern sculpture. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: 12 credits in upper division studio work and consent of instructor.

A-S 661 SCULPTURE VI. (3)
Continued advanced studio investigation of current ideas in sculpture. Increased concentration on technical and aesthetic development, professional readings, and group discussion. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: A-S 660.

A-S 670 CERAMICS V. (3)
In this supervised studio course in graduate ceramics, emphasis will be placed on personal style, its identification, definition, and further development in the context of direction in modern ceramics. Studio, nine hours per week. May be repeated to a maximum of nine credits. Prereq: 12 credits in upper division studio work and consent of instructor.

A-S 671 CERAMICS VI. (3)
Continued advanced studio investigation of current ideas in ceramics, increased concentration on technical and aesthetic development, professional readings, and group discussions. Studio, nine hours per week. May be repeated to a maximum of nine credits. Prereq: A-S 670.

A-S 680 PHOTOGRAPHY V. (3)
A-S 680 is a continuation of A-S 581. In this supervised studio course in graduate photography, emphasis will be placed on personal style, its identification, definition, and further development in the context of major directions in photography. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: A-S 581 and consent of instructor.

A-S 681 PHOTOGRAPHY VI. (3)
A-S 681 is a continuation of A-S 680. The emphasis will be upon continued advanced studio investigation of current ideas in photography with increased concentration on technical and aesthetic development, professional readings, and group discussion. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: A-S 680 and consent of instructor.

A-S 710 PROBLEMS IN PAINTING. (3)
Sustained individual projects focusing on problems and experimental work in the technical and theoretical aspects of painting. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: Twelve credits in upper division studio work and consent of instructor.

A-S 720 PROBLEMS IN PRINTMAKING. (3)
Sustained individual projects focusing on problems and experimental work in the technical and theoretical aspects of printmaking. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: Twelve credits in upper division studio work and consent of instructor.

A-S 730 PROBLEMS IN DRAWING. (3)
Sustained individual projects focusing on problems and experimental work in the technical and theoretical aspects of drawing. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: Twelve credits in upper division studio work and consent of instructor.

A-S 740 PROBLEMS IN FIBER. (3)
Sustained individual problems and experimental work in the technical and theoretical problems of fiber. May be repeated two times to a maximum of nine credits. Nine studio hours per week. Prereq: Twelve credits in upper division studio work and consent of instructor.

A-S 750 PROBLEMS IN SCULPTURE. (3)
Sustained individual problems and experimental work in the technical and theoretical problems of sculpture. May be repeated to a maximum of nine credits. Nine studio hours per week. Prereq: 12 credits in upper division studio work and consent of instructor.

A-S 767 M.F.A. STUDIO THESIS PROJECT. (1-6)
Independent research and preparation for the M.F.A. thesis exhibition. For the student working in a highly technical medium or process, the preparation of a correlated written thesis under close guidance will be the outcome. The student will be expected to know the standard forms for photographic records and the preparation of a professional portfolio. May be repeated to a maximum of six credits. Prereq: Normally taken during final semester for graduate study.

A-S 770 PROBLEMS IN CERAMICS. (3)
Sustained individual problems and experimental work in the technical and theoretical problems of ceramics. May be repeated two times for a maximum of nine credits. Nine studio hours per week. Prereq: 12 credits in upper division studio work and consent of instructor.

A-S 779 PROBLEMS IN PHOTOGRAPHY. (3)
A-S 779 emphasizes sustained individual problems and experimental work in the technical and theoretical problems of photography. May be repeated to a maximum of nine credits. Studio, nine hours per week. Prereq: Twelve credits in upper division studio work and consent of instructor.

A-S 780 PROBLEMS IN DESIGN. (3)
Sustained individual problems and experimental work in the technical and theoretical problems of design. May be repeated two times for a maximum of nine credits. Nine studio hours per week. Prereq: 12 credits in upper division studio work and consent of instructor.
AAD 101 ARTS ADMINISTRATION PROFESSIONS. (1) Arts administrators will describe their organizations and their roles in managing them. Significant arts events taking place on campus, in the surrounding area, and nationally will be identified and discussed. Arts administration volunteer and internship opportunities will be examined, as will methods of identifying and pursuing employment opportunities while in school and upon graduation. May be repeated to a maximum of four credits.

AAD 201 INTRODUCTION TO ARTS ADMINISTRATION. (3) An introduction to the field of arts administration, describing the management structures and professional opportunities found in organizations such as arts centers, arts councils, community arts organizations, dance companies, museums, galleries, operas, orchestras and theatres. The type of work carried out by arts administrators is also examined through several public relations related projects.

AAD 310 MARKETING THE ARTS. (3) Provides an understanding of marketing terminology and methods, and how they apply to the strategic planning process for arts organizations. Emphasis is placed on how arts organizations define, place and price their products, how they target consumers, and what promotional channels they use throughout the course of a season or year. Prereq: AAD 201 or consent of the instructor.

AAD 320 FUND RAISING FOR THE ARTS. (3) An introduction to methods used by nonprofit arts organizations such as arts councils, museums, orchestras and theatres to raise money from sources other than selling art work or admissions to regular season events. Topics covered include raising funds from individuals, foundations, businesses and government, through such activities as annual campaigns, special events, capital campaigns, and planned giving. Prereq: AAD 201 or consent of instructor.

AAD 330 MANAGING ARTS ORGANIZATIONS. (3) Overview of business management issues and how they relate to arts organizations. Topics covered will include organizational behavior, strategic planning, personnel and budget management, arts-related legal issues, financial procedures and policies, risk management and managing information. Prereq: AAD 201 and ACC 201 or consent of instructor.

AAD 402 TOPICS IN ARTS ADMINISTRATION (Subtitle required). (1-3) A seminar which covers topics in arts administration. Two approaches to the seminar may be taken. The first examines the management of specific types of arts organizations such as theatres, arts centers, museums, galleries, arts councils, orchestras, etc. The second examines philosophical issues related to arts management, such as the role the arts play in society, the case for and against governmental support of the arts, and censorship in the arts. May be repeated when identified by different subtitles. May be repeated to a maximum of 12 credits when identified by different subtitles. Prereq: AAD 201 or consent of instructor.

AAD 499 INTERNSHIP IN ARTS ADMINISTRATION. (1-12) An internship with a university, community, state, regional or national arts organization, providing practical work experience related to arts administration. The internship is identified and conducted under the supervision of a faculty member. Students must file a learning contract with the College of Fine Arts. May be repeated to a maximum of twelve credits. Prereq: Junior standing; AAD 201.

AAS 263 AFRICAN AND CARIBBEAN LITERATURE AND CULTURE OF FRENCH EXPRESSION IN TRANSLATION (Subtitle required). (3) This course treats major cultural questions concerning the exchange between Africa and the Caribbean in terms of historical, sociological, political, and literary events. No knowledge of French is required. (Same as FR 263.)

AAS 264 MAJOR BLACK WRITERS. (3) A cross-cultural and historical approach to written and oral works by major Black authors of Africa, the Caribbean and the United States. The course includes writers such as Chinua Achebe (Africa), Wilson Harris (Caribbean), and Toni Morrison (USA). (Same as ENG 264.)

AAS 328 GEOGRAPHY OF THE MIDDLE EAST AND NORTH AFRICA. (3) A comprehensive regional overview, emphasizing cultural adaptation to desert environments. The interrelationships among religions, cultures, and the physical environment will be examined, along with the region’s position and influence in the global system. Prereq: GEO 152, GEO 160, GEO 172, or consent of instructor. (Same as GEO 328.)

AAS 336 GEOGRAPHY OF SUB-SAHARAN AFRICA. (3) This course focuses on the cultural and environmental geographies of the subcontinent, rural landscapes and cultures and environmental problems, the historical geography of precolonial and colonial Africa, and the social geography of contemporary economic development. Prereq: GEO 130 and 152, 160, or 172. (Same as GEO 336.)

AAS 356 STUDIES IN BLACK AMERICAN LITERATURE. (3) An analytical-historical approach to the development of black American literature from Douglass and DuBois to Ellison, Baldwin, and Cleaver. (Same as ENG 356.)

AAS 400 SPECIAL TOPICS IN AFRICAN-AMERICAN STUDIES (Subtitle required). (3) Detailed investigation of a particular topic in African-American Studies, with emphasis both on content and existing research. Topics will vary from semester to semester and are announced the preceding semester. May be repeated to a maximum of six credits when identified by a different subtitle. Prereq: Twelve hours of African-American Studies minor courses, including AAS 200.

AAS 401 INDEPENDENT READING AND RESEARCH IN AFRICAN-AMERICAN STUDIES. (3) For African-American Studies minors. The student pursues a course of reading and research under the guidance of a staff member, completes a major research project, and takes an examination. A written contract defining the area of study is negotiated between student and instructor at the beginning of the course. May be repeated to a maximum of six credits. Prereq: African-American Studies minor, 12 hours of African-American Studies minor courses, including AAS 200.

AAS 417G SURVEY OF SUB-SAHARAN POLITICS. (3) A survey of sub-Saharan government and politics intended to give the student broad knowledge about the setting of African politics, precolonial African political systems, the political legacies of major European colonial powers, and problems of political development. (Same as PS 417G.)
### ABT 201 SCIENTIFIC METHOD IN BIOTECHNOLOGY.
(1)
A course designed to acquaint students with the common experimental methods used in agricultural biotechnology. Students will be presented with several case studies which demonstrate basic scientific reasoning and experimental strategies. The students will then use their understanding of basic scientific methods and agricultural systems to critically evaluate work from the current scientific literature. Each student will be required to provide a written and oral evaluation of a research project in some aspect of agricultural biotechnology. The class will provide the students with the basic skills needed for preparing their own research proposals. Prereq: ABT 101 and enrollment in the Agricultural Biotechnology degree program or consent of instructor.

### ABT 360 GENETICS.
(3)
The basic principles of heredity as currently understood from evidence accumulated in classical, cytoplasmic, molecular, and quantitative genetic experiments. Emphasis is placed on a thorough understanding of genetic principles and the relationship of genetics to all biological disciplines. Prereq: Six credits in biological sciences and one course in general chemistry. (Same as ASC/ENT 360.)

### ABT 395 INDEPENDENT STUDY IN BIOTECHNOLOGY.
(1-4)
Independent study in biotechnology under the supervision of a faculty member. Prereq: Agricultural Biotechnology major and consent of appropriate instructor before registration.

### ABT 399 EXPERIENTIAL LEARNING IN BIOTECHNOLOGY.
(1-6)
An internship in biotechnology under the supervision of a faculty member. May be repeated to a maximum of six credits. Prereq: Consent of the instructor, chairperson for the Agricultural Biotechnology degree program and completion of a learning contract before registration.

### ABT 401 TECHNICAL WRITING AND PRESENTATIONS IN BIOTECHNOLOGY.
(2)
This course will focus on effective communication of ideas and research results in biotechnology. It will focus on both written presentations, in the form of research publications and research proposals, and oral presentations. The focus of this course is on student participation. Students will be required to provide both oral and written evaluations of research publications and research proposals. The first part of the semester will focus on a discussion, evaluation, and discussion of recent biotechnology-related research publications. Students will be required to provide both oral and written evaluations of the publications that are discussed. Next, they will discuss the aspects of successful oral presentations, including the effective use of visual aids. The middle of the semester will be spent developing a research proposal, focusing on the separate components of a proposal. The end of the semester will involve student presentations of a research proposal that they have developed. These presentations will be evaluated and discussed by the other members of the class. The goal of this course is to develop skills in the evaluation of research, to provide practice in scientific writing, to prepare Biotechnology students to write their independent study research proposals and written reports, to develop oral communication skills, and to expose students to current literature and research in biotechnology. Lecture, discussion and oral presentations. Prereq: Agricultural Biotechnology major or consent of instructor.

### ABT 460 INTRODUCTION TO MOLECULAR GENETICS.
(2)
Molecular genetics is the study of the biochemical basis of heredity and focuses on the expression and structure of DNA at the molecular and cellular level. The course will provide a detailed understanding of the biochemical events involved in replication, transcription, and translation, and the theoretical underpinnings of genetic engineering. Prereq: AGR 360 or BIO 404G or consent of instructor. (Same as ENT 460.)

### ABT 461 INTRODUCTION TO POPULATION GENETICS.
(2)
This survey course examines the population dynamics and equilibria of genes in nuclei, chloroplasts and mitochondria. Emphasis will be on biological relevance (in plants, animals, and microorganisms), but some theoretical derivations will also be introduced. Prereq: AGR 360 (or equivalent) and one course in probability/statistics. (Same as BIO/ENT/FOR 461.)

### ABT 495 EXPERIMENTAL METHODS IN BIOTECHNOLOGY.
(4)
A laboratory techniques course designed to give students the technical skills and understanding necessary to critically examine biological systems at the molecular level. The course will emphasize the principles of chemistry, biochemistry and molecular biology as applied to a model system for laboratory investigations. Laboratory, nine hours per week. Prereq: BIO 150 and AGR 360, or consent of instructor.
ACC Accounting

ACC 201 FINANCIAL ACCOUNTING I. (3)
This course is designed to provide an introduction to financial accounting from the users’ perspectives. Its primary purposes are to promote understanding of financial accounting information for decision making purposes and to focus on financial accounting’s role in communicating business results. Prereq: Sophomore standing.

ACC 202 MANAGERIAL USES OF ACCOUNTING INFORMATION. (3)
An introduction to the use of accounting data within an organization to analyze and solve problems and to make planning and control decisions. This course is designed for non-accounting majors. Prereq: ACC 201 or BE 161 and BE 162.

ACC 208 CONTEMPORARY ACCOUNTING METHODS. (3)
An introduction to basic accounting problem-solving fundamentals using a case approach. The course covers selected problem-solving methods and decision aids, presenting them in an accounting frame of reference with emphasis on team building. Unique aspects of the interpretation and communication of accounting information are explored. Prereq: ACC 201. Enrollment priority will be given to accounting and finance majors.

ACC 211 FINANCIAL ACCOUNTING LAB. (1)
A laboratory-based approach to introductory financial accounting applications, with the primary focus on the accounting cycle. The primary objective is to promote an understanding of how accounting information is identified, recorded, and processed for financial reporting. Prereq: ACC 201. Enrollment priority will be given to accounting and finance majors.

*ACC 300 FINANCIAL ACCOUNTING II. (3)
This course is designed for non-accounting majors to provide expanded study of the impact of relevant financial accounting issues on the users of financial reporting. Topics may include financial statements; income recognition; cash and receivables; inventories; operational assets; investments; intangible assets; current liabilities; long-term liabilities emphasizing leases, pensions, postretirement benefits, and bonds; financial instruments; accounting for income taxes; and owner’s equity. Not open to Accounting majors. Prereq: ACC 201 and ACC 202.

*ACC 301 INTERMEDIATE ACCOUNTING I. (3)
This course is the first of a two-course financial accounting series, providing in-depth study of the accounting cycle, conceptual framework of financial accounting, valuation of balance sheet accounts, recognition of revenues, matching of expenses, and the reporting of the financial condition, operating results, and cash flows of an entity. Prereq: ACC 201, ACC 208, and ACC 211.

*ACC 302 INTERMEDIATE ACCOUNTING II. (4)
This course is the second of a two-course financial accounting series, providing an in-depth study of the accounting cycle, conceptual framework of financial accounting, valuation of balance sheet accounts, recognition of revenues, matching of expenses, and the reporting of the financial condition, operating results, and cash flows of an entity. Prereq: ACC 301 and ACC 308.

*ACC 308 COST MANAGEMENT. (4)
Traditional and contemporary concepts and techniques that provide accounting information for management decision making at both strategic and operational levels. Topics include the costing of products and services; project and activity analysis; planning and control methods; and performance measurement. Prereq: Grade of C or better in ACC 201, ACC 208, and ACC 211.

ACC 324 ACCOUNTING INFORMATION SYSTEMS. (3)
This course focuses on two major components of accounting information systems: conceptual models and physical implementation. Accounting systems are studied from an accounting cycles perspective, emphasizing the nature and relevance of accounting internal controls and the relationship of accounting systems to the functional areas of accounting. Using contemporary information technology, students analyze, design, and implement accounting systems along with relevant internal control structures. Prereq: ACC 301 and ACC 308.

ACC 395 INDIVIDUAL WORK IN ACCOUNTING. (1-6)
Students confer individually with the instructor. Written paper usually expected and filed in chairperson’s office. May be repeated to a maximum of six credits. Prereq: GPA of 3.0 in major, approval of instructor and chairperson.

ACC 399 INTERNSHIP IN ACCOUNTING. (1)
A course designed for undergraduate accounting students who, through the Accounting Internship Director, have secured full-time, salaried, career-related positions under the supervision of a sponsoring employer. Enrollment in the course constitutes full-time status. Course may be taken on a pass-fail basis only and for no more than two consecutive semesters, repeated to a maximum of three credits. Prereq: Junior standing in accounting and approval of the Accounting Internship Director.

ACC 401G ACCOUNTING THEORY. (3)
An investigation into earlier attempts to develop a coordinated statement of accounting theory; a critical examination of selected current accounting practices; and discussion of recent developments in accounting research. Prereq: ACC 301.

*ACC 403 AUDITING. (3)
This course examines the attest function in accounting. Emphasis is placed on audit standards and objectives, including the evaluation of internal control structures for the purpose of determining relevant auditing procedures. Prereq: ACC 302 and ACC 324.

ACC 407 CONCEPTS OF INCOME TAXATION. (3)
A study of the federal income tax structure with emphasis upon the conceptual foundations of taxation relating to the three types of taxpayers: businesses, individuals, and estates and trusts. Prereq: Junior standing and ACC 202 or ACC 208.

*ACC 410 NOT-FOR-PROFIT AND REGULATORY ACCOUNTING. (3)
The requirements of adequate accounting systems for various governmental units, including the recording of usual transactions and the form and content of reports. Prereq: ACC 302.

ACC 503 ADVANCED AUDITING. (3)
A case-oriented study of current practices in public accounting including applications of statistical sampling; computer-assisted auditing and official pronouncements issued by the AICPA. This course also examines professional, ethical standards, professional liability and SEC reporting requirements. Students are expected to analyze actual case data; prepare written reports; and orally present and defend those reports. Prereq: ACC 403G.

ACC 507 ADVANCED TOPICS IN TAXATION. (3)
A study of advanced topics in taxation, including a more in-depth study of corporations, partnerships, estates and trusts, and individuals. Prereq: ACC 407.

ACC 508 CONTROLLERSHIP. (3)
A comprehensive study of the controller’s objectives, responsibilities, functions, organizational roles, etc. Prereq: ACC 308.

*ACC 516 ADVANCED TOPICS IN FINANCIAL REPORTING. (3)

ACC 524 ADVANCED ACCOUNTING INFORMATION SYSTEMS. (3)
The course covers the design of accounting systems and subsystems to implement effective planning and control for a variety of business decision-making problems. Case analysis and class projects are used to accomplish the course objectives. The microcomputer is integrated in the course through a vigorous overview of existing hardware and software technology. Widely used microcomputer applications software, including database management, spreadsheets, statistical analysis, and others, is introduced and used to accomplish course objectives. Prereq: ACC 302, 324, and 403G.

ACC 601 RESEARCH IN ACCOUNTING THEORY. (3)

ACC 603 ATTEST FUNCTION. (3)
A critical examination of contemporary professional attestation theory and practice including a comprehensive review of AICPA audit case studies, statements on audit procedure, and their application in simulated business situations. Prereq: ACC 403G or consent of instructor.

ACC 608 ADVANCED MANAGERIAL ACCOUNTING. (3)
Accounting procedures for the evaluation of performance in business, including the analysis of revenues and costs by projects and responsibilities and the use of budget cost studies and rates of return. Prereq: ACC 408G.

ACC 610 NOT-FOR-PROFIT AND REGULATORY ACCOUNTING. (3)
A study of the contemporary issues in the area of not-for-profit and regulatory accounting. Prereq: ACC 410G or consent of instructor.
ACC 617 INCOME TAX DEVELOPMENT. (3)
A theoretical and historical approach to the study of federal income taxation with emphasis on the public finance, legal, and accounting aspects of its development. Consideration will be given to tax research and planning as well as to the critical appraisal of the current law and proposals for its revision. Prereq: ACC 417G or consent of instructor.

ACC 619 INDEPENDENT STUDY IN ACCOUNTING. (1-3)
Designed for students undertaking special studies to be conducted in regular consultation with the instructor. Prereq: Consent of instructor.

ACC 624 ACCOUNTAMETRICS. (3)
A study of the techniques and methods available to measure and evaluate the response of sub-systems to stimuli within the total systems concept. Both the analytical and computer simulation approaches are used to displace uncertainty associated with typical business problems in which the data are generated by the accounting system. A knowledge of FORTRAN is advisable. Prereq: Six hours of accounting and ECO 391 or equivalent.

ACC 627 CORPORATE TAXATION. (3)
A detailed study of the income taxation of corporations and shareholders. Prereq: ACC 417G or consent of instructor.

ACC 628 FINANCIAL/MANAGERIAL ACCOUNTING. (3)
A study of the application of accounting information and services in the recognition or solution of management problems in business. Prereq: Graduate standing, ACC 202 or its equivalent, MA 123 or its equivalent.

ACC 637 TAXATION OF PARTNERSHIPS AND PARTNERS. (3)
A detailed study of the income taxation of partnerships and partners. Prereq: ACC 417G or consent of instructor.

ACC 647 TAXATION OF ESTATES, GIFTS, AND TRUSTS. (3)
A detailed study of the income taxation of estates, gifts, and trusts. This course will include both the estate and gift transfer taxes as well as the income taxation of trusts under Subchapter J. Prereq: ACC 417G or consent of instructor.

ACC 700 TOPICAL SEMINAR IN ACCOUNTING RESEARCH (Subtitle required). (1-3)
An advanced seminar on selected topics such as cross-disciplinary research on behavioral decision-making, researching archival data, and analytical models in accounting. May be repeated to a maximum of eighteen credits. Prereq: Doctoral student status in accounting.

ACC 708 SEMINAR IN MANAGEMENT ACCOUNTING. (3)
A study of contemporary literature in the field of management accounting, with emphasis on the need for additional research into uses of techniques and concepts. Prereq: Consent of instructor.

ACC 795 INDEPENDENT STUDY IN ACCOUNTING. (1-6)
Designed for students undertaking special studies to be conducted in regular consultation with instructor. Class hours by appointment. Prereq: Consent of instructor.

AEC Agricultural Economics

*AEC 101 THE ECONOMICS OF FOOD AND AGRICULTURE. (3)
An introduction to the field of agricultural economics and some of the basic tools and concepts of decision making. Concepts are illustrated in terms of selected current social and economic issues including the role of agriculture in both a national and international dimension.

*AEC 201 INTRODUCTION TO FARM AND NATURAL RESOURCE FINANCE. (3)
This course provides an introduction to basic concepts used in financial analysis that can be applied to farms and small agriculturally-related businesses. It provides an overview of basic financial statements and their role in business planning. These tools will be applied to case studies of farms, agribusiness, and forestry firms. Prereq: MA 123 and ECO 201 or ECO 202 or AEC 101.

*AEC 300 TOPICS IN AGRICULTURAL ECONOMICS (Subtitle required). (1-3)
Study in special topics in agricultural economics. May be repeated under a different subtitle to a maximum of 6 credits. A course may be offered twice under a given subtitle. Lecture, 1-3 hours; laboratory, 0-6 hours per week. Prereq: AEC 101, ECO 201.

*AEC 302 AGRICULTURAL MANAGEMENT PRINCIPLES. (4)
A comprehensive study of economic principles and management tools useful in farm and agribusiness decision making. Utilizes a systems approach to the planning, implementation and control of the agricultural business. Specific attention to application of management and decision theory, economic principles used in decision making, and risk management strategies. Emphasis on planning the future course of the business, acquiring and managing the necessary resources, and establishing physical and financial control over the business. Lab incorporates microeconomic applications of management developed in lectures. Prereq: AEC 101, ECO 201.

*AEC 303 MICROECONOMIC CONCEPTS IN AGRICULTURAL ECONOMICS. (3)
Emphasis on the development of theoretical models of production and consumption economics and application of these models to problems. The importance of concepts of marginality to managers and consumers is emphasized. Role of risk and uncertainty in resource allocation is outlined. Prereq: AEC 101, ECO 201, MA 123 or 113.

*AEC 304 MACROECONOMIC CONCEPTS IN AGRICULTURAL ECONOMICS. (3)
This course addresses the concern that U.S. farmers and the food industry are increasingly affected by macroeconomic forces and general conditions in the national economy. Interdependencies between agriculture, farm size, rural economic well-being and key macroeconomic variables including interest rates, foreign exchange rates and the rate of inflation will be examined. Prereq: AEC 101, ECO 202.

*AEC 305 FOOD AND AGRICULTURAL MARKETING PRINCIPLES. (3)
Analysis of the market’s role in determining prices and coordinating productive activities in the food and agricultural systems. Prereq: AEC 101, ECO 201.

*AEC 309 INTERNATIONAL AGRICULTURE, WORLD FOOD NEEDS AND U.S. TRADE IN AGRICULTURAL PRODUCTS. (3)
Present and projected world food/population balance by geographic regions; food production and world trade in agricultural products with an emphasis upon the implications for U.S. agriculture; an introduction to agricultural development problems of the less developed nations of Latin America, Africa, and Asia. Prereq: AEC 101 or equivalent.

AEC 311 LIVESTOCK AND MEAT MARKETING. (1)
Provides students with a comprehensive look at the unique characteristics of the marketing system for livestock. Problems in both the feeder animal sector and the fed animal sector will be considered. Lecture, three hours per week for one-third of the semester. Prereq: AEC 305.

AEC 312 DAIRY MARKETING. (1)
A comprehensive analysis of the unique characteristics of the marketing system for milk and milk products with emphasis on pricing at the farm level, the role of producer cooperatives and government policy and regulations. Lecture, three hours per week for one-third of the semester. Prereq: AEC 305.

AEC 313 TOBACCO MARKETING. (1)
Analysis of the structure of the production and marketing system for tobacco including institutions and public regulation. Application of marketing methods and principles to tobacco. Lecture, three hours per week for one-third of the semester. Prereq: AEC 305.

AEC 314 GRAIN MARKETING. (1)
Study of production and utilization of grain by areas of the world, the marketing systems for grain, and the application of economic and marketing principles to the pricing and movement of grain. Prereq: AEC 305, AEC 321.

AEC 315 FARM SUPPLY MARKETING. (1)
A comprehensive analysis of the unique characteristics of the marketing system for farm supplies. Special attention is given to the structure of national and local markets, competitive behavior and pricing strategies, product quality and labeling, and logistics characteristics of various product lines. Prereq: AEC 305.

AEC 316 COOPERATIVE MANAGEMENT AND MARKETING. (1)
This course provides knowledge about the unique features of cooperatives and their role in a market economy and examines the structure organization, finance, management, and operations of cooperative organizations. Prereq: AEC 305.

AEC 317 MARKETING HORTICULTURAL PRODUCTS. (1)
This course examines the market structure and institutions associated with horticultural and nursery product markets within the context of formulating and evaluating alternative, firm-specific marketing strategies. Prereq: AEC 305.
**AEC 320 AGRICULTURE PRODUCT MARKETING AND SALES.** (3)
This course examines marketing activities within the U.S. food system. Sector performance is considered as well as the competitive behavior of firms within various agricultural market channels. Firm level marketing principles, methods, and strategies are considered, with a special focus on developing effective sales programs for agricultural products. Prereq: AEC 305.

**AEC 321 AGRICULTURAL FUTURES MARKETS.** (3)
The mechanics, theory, and practical application of hedging as related to agricultural commodities. The historical development of futures markets, functions of the futures markets, and the role of the speculator will also be explored. Prereq: AEC 305.

* AEC 324 AGRICULTURAL LAW. (3)
A study of legislation, administrative regulations, constitutions and court cases that have economic ramifications on agricultural and rural life. Prereq: AEC 101.

* AEC 341 AGRICULTURAL CREDIT INSTITUTIONS. (1)
Designed to teach applications of key segments of macro agricultural finance. The course primarily examines credit needs in agriculture and the institutions that are capable of supplying agricultural credit. Various credit instruments are identified and examined. Prereq: AEC 101.

**AEC 399 EXPERIENTIAL LEARNING IN AGRICULTURAL ECONOMICS.** (1-6)
A field or community-based experience in the application of economics to agricultural and rural problems. May be repeated; a maximum of six credits allowed. Pass-fail only. Prereq: GEN 101, nine hours in agricultural economics or economics, and permission of instructor, department chairperson, and completion of learning agreement prior to registration.

**AEC 410 INTERNATIONAL TRADE AND AGRICULTURAL MARKETING.** (3)
A study of institutional, economic and cultural factors that influence aggregate agricultural trade and exports of individual agribusinesses. Macro issues of agricultural trade policies are examined along with elements of international marketing for agricultural products. Prereq: AEC 305.

**AEC 422 AGRIBUSINESS MANAGEMENT.** (3)
Examines and analyzes decision-making tools and problem-solving techniques available to agribusiness managers. Provides learning experience in addressing contemporary economic, marketing and management issues through case study analyses, selected readings and computerized business simulations. Prereq: AEC 305 and MGT 301.

**AEC 425 TIMBER MANAGEMENT.** (4)
The principles of sustained yield timber management, organization of the forest area, management objectives, timber valuation, regulation of the cut, and timber management plans. Lecture, three hours; laboratory, two hours. Prereq: MA 162, FOR 201, and Summer Camp (FOR 375, 376, 377, 378, and 379), or consent of instructor. (Same as FOR 425.)

**AEC 441G AGRICULTURAL FINANCIAL MANAGEMENT.** (3)
Applies micro agricultural finance to farm and other agricultural business firms. Reviews elementary mathematics of finance and the objectives of financial management. Uses financial statements, cash flow analysis, financial leverage and other elements in applying the theory of capital investment for making management decisions. Prereq: ACC 201, ECO 201, FIN 300.

**AEC 445G INTRODUCTION TO RESOURCE AND ENVIRONMENTAL ECONOMICS.** (3)
Economic analysis of the problems of assuring resource availability and environmental quality. Theoretical concepts and empirical tools for evaluating resource and environmental policy. Prereq: ECO 201, or consent of instructor.

**AEC 471 INTERNATIONAL ECONOMICS.** (3)
The basic exchange model is the most important topic in this course. The exchange model is used to illustrate the gains from trade, the role of opportunity costs, and the properties of relative prices. Production considerations, the concept of comparative advantage, and the resulting factor rewards are introduced. Trade distortions are introduced and studied from the point of view of protectionism and its consequences. Fixed and flexible exchange rates and the concept of balance of payments are also covered. Prereq: ECO 202 or equivalent. (Same as ECO 471.)

**AEC 479 PUBLIC ECONOMICS.** (3)
An application of economic analysis to the study of the role of government. Emphasis is on the reasons for and the effects of government intervention in the economy. Topics covered include: market failure, public goods and externalities, welfare policy, voting and public choice, taxation, public debt and cost-benefit analysis. Prereq: ECO 202 or equivalent. (Same as ECO 479.)

**AEC 483 REGIONAL ECONOMICS.** (3)
This course presents an economic approach to the study of regions. The emphasis is on the role of spatial relationships in economic activity. Topics considered include market area analysis, location theory, economic base and input-output analysis as well as regional economic development. Prereq: ECO 202.

**AEC 502 ADVANCED FARM MANAGEMENT.** (3)
Integration of production and business management principles through planning and analysis for application in the management of commercial farms. The case farm approach is utilized for the application of management techniques. Prereq: AEC 302.

**AEC 516 RURAL REAL ESTATE APPRAISAL.** (3)
The theory, principles and procedures that a professional appraiser uses in appraising the fair market value of rural real estate. Field trips are included to apply procedures and techniques. As three to four field trips are taken, no courses should be scheduled after this one on Tuesday and Thursday. Prereq: AEC 302 or consent of instructor.

**AEC 531 AGRICULTURAL PRICE ANALYSIS.** (3)
Price behavior of agricultural products and inputs including factors affecting supply and demand for individual products, price-supply relationships and the relationship of agricultural prices to the general price level. Prereq: AEC 305 and STA 291.

**AEC 532 AGRICULTURAL AND FOOD POLICY.** (3)
This course surveys a variety of current public policies that influence the agricultural and rural economies. Students are exposed to the conflicting views of those concerned with food and agricultural policy issues in an international economy. Economic principles are used to evaluate alternatives in terms of the general welfare of society. Prereq: AEC 305.

**AEC 545 RESOURCE AND ENVIRONMENTAL ECONOMICS.** (3)
This course builds on the principles of economics to analyze the problems in achieving an efficient allocation of resources. It provides the theoretical concepts for evaluating environmental policies and the tools necessary in the application of benefit/cost analysis. Prereq: ECO 201.

**AEC 580 SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS.** (1-3)
Directed independent study of a selected problem. May be repeated to a maximum of six credits. Prereq: Consent of instructor and chairperson of department.

**AEC 590 INTRODUCTION TO QUANTITATIVE ECONOMICS I.** (3)
An introduction to mathematical approaches to economic theory. Emphasis on linear models, constrained optimization, and techniques used in comparative statics. Prereq: ECO 488G; MA 113; or consent of instructor. (Same as ECO 590.)

* AEC 606 ADVANCED AGRICULTURAL MARKETING. (3)
A critical examination of objectives and results of various types of research in market organization, marketing functions, price analysis, markets over time, space and form, market information, commodity promotion programs, quality standards, and macro-economic linkages to marketing. Prereq or concer: AEC 590 and ECO 601.

* AEC 610 INTERNATIONAL TRADE IN AGRICULTURAL PRODUCTS. (3)
This course analytically examines current empirical research in the area of agricultural trade. Prereq: ECO 601, AEC 624 and ECO 671.

* AEC 620 ADVANCED PRODUCTION ECONOMICS I. (3)
An advanced treatment of production economics with emphasis on flexible product and factor price situations, factor demand functions, multiple product production, and poly-periodic production theory. Prereq: ECO 601.

**AEC 624 ADVANCED QUANTITATIVE METHODS IN AGRICULTURAL ECONOMICS.** (3)
This course uses statistical tools to model agricultural and economic systems. Subjects covered include: (1) the classical linear regression model, (2) statistical hypotheses tests, and (3) estimation techniques for single and simultaneous equation models. Prereq: ECO 488G and STA 570.

**AEC 625 AGRICULTURE AND ECONOMIC DEVELOPMENT.** (3)
This course builds on the principles of economics to analyze the problems in achieving an efficient allocation of resources. It provides the theoretical concepts for evaluating environmental policies and the tools necessary in the application of benefit/cost analysis. Prereq: ECO 201.

**AEC 690 ADVANCED AGRICULTURAL LAW.** (3)
A critical examination of objectives and results of various types of research in market organization, marketing functions, price analysis, markets over time, space and form, market information, commodity promotion programs, quality standards, and macro-economic linkages to marketing. Prereq or concer: AEC 590 and ECO 601.

**AEC 697 SPECIAL PROBLEMS IN AGRICULTURAL AND FOOD POLICY.** (3)
A critical examination of objectives and results of various types of research in market organization, marketing functions, price analysis, markets over time, space and form, market information, commodity promotion programs, quality standards, and macro-economic linkages to marketing. Prereq or concer: AEC 590 and ECO 601.

**AEC 797 INDIVIDUAL STUDY.** (1-3)
Directed independent study of a selected problem. May be repeated to a maximum of six credits. Prereq: Consent of instructor and chairperson of department.
AEC 627 PROJECT ANALYSIS FOR RURAL DEVELOPMENT. (3)
A study of the theory and practice of planning and analyzing public sector investments in the agricultural sector in the third world. Among the methods covered are economic analysis, financial analysis, PERT and critical path analysis. Case studies are utilized to teach methods. Prereq: ECO 660.

*AEC 640 ADVANCED AGRICULTURAL POLICY. (3)
This course focuses on development of a framework to analyze alternate paradigms of the political economy. The framework focuses on the role of institutions that modify behavior of decision makers. Agricultural and food policies are evaluated in terms of the efficient use of resources and the general welfare of society. Prereq: ECO 601.

*AEC 645 NATURAL RESOURCE ECONOMICS. (3)
Economic analysis of natural resource use and environmental issues. Discussion of criteria for public decision making, welfare economics, market failure, benefit-cost analysis, and benefit estimation, as applied to natural resources and the environment. Prereq: ECO 590 and ECO 601.

*AEC 650 ADVANCED AGRICULTURAL PRICES. (3)
Advanced study of agricultural price behavior by the application of economic theory and statistical analysis. Prereq: AEC 624 and ECO 601.

AEC 653 LOCAL ECONOMIC DEVELOPMENT. (3)
The course develops the capacity to employ the theories, practices and philosophies of economic development as applied to local areas. The primary geographic focus of the course is the rural south-east of the United States, but examples will be drawn from rural areas in other developed countries. Prereq: Graduate status in agricultural economics, public administration, economics, or consent of instructor. (Same as PA 653.)

*AEC 661 PROGRAMMING MODELS IN AGRICULTURAL ECONOMICS. (3)
A study of some programming models useful in agricultural economics; includes an examination of the structure of the models themselves, economic interpretation of their components and their use in research in agricultural economics. Prereq: MA 416G and either AEC 620 or ECO 601.

AEC 662 QUANTITATIVE METHODS IN RENEWABLE RESOURCE MANAGEMENT. (3)
Design and analysis of optimization models in renewable resource management. Includes survey of applications in mathematical programming, CPM-PERT, Markov processes, and Game theory. Case examples are used to demonstrate applicability and problem formulation in management of industrial and public forests. Prereq: MA 113 and MA 162 or equivalent, and AEC 445G or equivalent. (Same as FOR 662.)

AEC 691 STRUCTURE OF U.S. AGRICULTURE. (3)
This seminar will analyze the structural transformation of U.S. agriculture in the 19th and 20th centuries in the context of sociological theory. Emphasis is given to key historical transitions, changing social relations of production and state policy. Such emphases provide a framework for understanding the historical roots and future prospects for the socioeconomic problems confronting contemporary U.S. agriculture. Prereq: Graduate standing in sociology/agricultural economics or consent of instructor. (Same as SOC 691.)

AEC 748 MASTER'S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

AEC 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

AEC 768 RESIDENCE CREDIT FOR MASTER'S DEGREE. (1-6)
May be repeated to a maximum of 12 hours. Prereq: Consent of adviser and chairperson of department.

AEC 769 RESIDENCE CREDIT FOR DOCTOR'S DEGREE. (0-12)
May be repeated indefinitely. Prereq: Consent of adviser and chairperson of department.

AEG 780 SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS. (1-3)
Open to graduate students who have the necessary training and ability to conduct research on a selected problem. May be repeated three times for a total of nine credits. Prereq: Consent of instructor and departmental chairperson.

AEC 796 SEMINAR (Subtitle required). (3)
An extended original investigation of a specific topic designed to give students experience in methods of research and an intensive study of a particular subject in the field of agricultural economics. May be repeated to a maximum of six credits under different subtitles. Prereq: Ph.D. applicant or candidate.
AED 680 DIRECTING EXPERIENCE PROGRAMS IN VOCATIONAL EDUCATION. (3)
Directing experience programs including projects, activities, internships, and co-op education. Such areas as setting standards, planning, supervision, records, and evaluation will be discussed. (Same as HEE 680.)

AED 684 CURRENT TRENDS IN VOCATIONAL EDUCATION. (3)
Class work in current trends and significant developments in vocational education. May be repeated to a maximum of nine credits. (Same as AED 684.)

AED 686 EVALUATION IN VOCATIONAL EDUCATION. (3)
A course to acquaint teachers of vocational education with techniques used in measuring attainment in vocational education in middle and high school, college, and adult education. Prereq: Teaching experience. (Same as AED 866.)

AED 689 SUPERVISION IN VOCATIONAL EDUCATION. (3)
This course includes practice in teaching for observation by others, student teaching, and school visiting. Prereq: Two years of teaching experience and EDV 687. (Same as HED 693.)

AED 694 THE ADMINISTRATION OF VOCATIONAL EDUCATION. (3)
A course designed for superintendents, high school principals, and other administrators. Its purpose is to train for administering and supervising vocational education in schools. (Same as EDA/EHD 694.)

AED 695 SPECIAL PROBLEMS IN VOCATIONAL EDUCATION. (3)
An independent work course for students interested in vocational education. Students make individual investigations and report on special problems. (Same as HED 695.)

AED 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed. (Same as AED 748.)

AED 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours. (Same as AED 768.)

AED 779 SEMINAR IN VOCATIONAL EDUCATION. (1-3)
A critical study of selected problems in vocational education. The course is open only to students with experience in the field. May be repeated to a maximum of nine credits. (Same as HED 779.)

AED 789 INDEPENDENT WORK IN VOCATIONAL EDUCATION. (1-3)
An independent work course for students who have completed a minimum of 12 semester hours of graduate work, one-half of which must have been in vocational education. May be repeated to a maximum of nine credits. (Same as AED 789.)

AED 793 RESEARCH IN VOCATIONAL EDUCATION. (1-3)
Individual research of importance to vocational education. May be repeated to a maximum of nine credits. (Same as HED 793.)

AEN Agricultural Engineering

AEN 102 INTRODUCTION TO BIOSYSTEMS ENGINEERING. (1)
An introduction to the engineering of food and fibers, production, and processing systems. Professionalism and the engineering approach to problem solving will be emphasized.

AEN 103 BASIC PRINCIPLES OF SURVEYING. (2)
General use of surveying equipment, development of topographic maps, layout of engineering systems, earthwork computations, and introduction to boundary surveys for Agriculture students. This course is not available for credit to persons who have received credit in another introductory surveying course. Lecture, one hour; laboratory, three hours. Prereq: A course in trigonometry, enrollment in the College of Agriculture and/or consent of instructor.

AEN 202 BIOSYSTEMS ENGINEERING PROBLEMS. (2)
Introduction to biosystems engineering; engineering problem solving; computer applications and structured programming; probability; statistics. Emphasis on application of these skills to biosystems applications. Lecture, two hours; laboratory, one hour per week. Prereq: MA 113 and sophomore standing; prerequisite or coreq: CS 221.

AEN 220 FARM TRACTORS AND ENGINES. (3)
Principles of selection and application of farm tractors and engines. Operating principles of internal combustion engines including carburetion, fuel injection, ignition, and lubrication. Power transmission application and efficiency are considered. Lecture, two hours per week; laboratory, two hours per week.

AEN 252 FARM SHOP. (3)
Wood and metal work, including blueprint reading, oxyacetylene and arc welding, power woodworking tools, soldering and pipe work. Lecture, one hour; laboratory, four hours. Prereq: Major in agricultural education or consent of instructor.

AEN 301 MICROELECTRONIC APPLICATIONS IN BIOSYSTEMS ENGINEERING. (2)
An introduction to the use of digital electronics and integrated circuits in solving agricultural engineering problems. Digital circuits, microprocessor concepts, computer interfacing, transducers, signal conditioning and control applications are discussed. Lecture, one hour; laboratory, two hours per week. Prereq: EE 307 or consent of instructor.

AEN 302 ANALYTICAL AND NUMERICAL METHODS FOR BIOSYSTEMS. (3)
An introduction to engineering problems encountered in agricultural and biological engineering systems. Introduction of psychrometries; emphasis is on the solution of case studies using computer simulation and analysis, statistical methods and numerical techniques. Topics of current relevance used and case studies. Prereq: Junior standing, CS 221; prerequisite or concurrent: MA 214.

AEN 308 ENGINEERING PROPERTIES OF BIOLOGICAL MATERIALS. (3)
Physical properties of agricultural materials and food products as related to engineering design for handling, storage, and processing. Lecture, three hours; laboratory, two hours per week. Prereq: Junior standing and completion of mathematics requirement in Food Science curriculum.

AEN 343 FLUID MECHANICS OF BIOSYSTEMS. (3)
Principles of fluid dynamics as applied to biosystems; Newtonian and non-Newtonian fluid flow processes; theory and application of pumps and low pressure fans; flow measuring devices and techniques. Prereq: ME 330 or CE 341 and engineering standing.

AEN 400 SENIOR SEMINAR IN AGRICULTURAL ENGINEERING. (1)
A course for senior students in agricultural engineering with emphasis on oral communications skills. Students will do literature searches on topics related to the agricultural engineering profession and present oral and written reports. Prereq: COM 199 and senior standing in agricultural engineering.

AEN 401 ADVANCED AGRICULTURAL ENGINEERING. (4)
A course for senior students in agricultural engineering with emphasis on the engineering design process and effective oral communication. Creative involvement of students is required in solving open-ended problems where previously learned engineering principles culminate to produce actual designs which are appropriate to the profession of agricultural engineering. Lecture, two hours per week; laboratory, four hours per week. Prereq: Senior standing in agricultural engineering program and consent of instructor.

AEN 402 DYNAMICS OF BIOLOGICAL SYSTEMS. (3)
Energy capture and flow in biological systems; application of mathematical and simulation techniques to the analysis of biosystems. Topics include: study of the principle methods of energy capture in living organisms, population dynamics of living systems, energy flows in the biosphere, cellular chemical reactions, reaction kinetics, absorption and transfer processes, and growth dynamics. Topics are examined and modeled from an engineering standpoint. Prereq: ME 220 or equivalent or consent of instructor.

AEN 406G PHYSICS OF PLANT AND ANIMAL ENVIRONMENT. (3)
A study of the thermal, moisture, light and gaseous components of plant and animal environments with emphasis on interactions between these biological systems and their environment. Lecture, two hours; laboratory, two hours. Prereq: ME 329, engineering standing or consent of instructor.
AEN 407 ECONOMIC ANALYSIS OF BIOSYSTEMS. (2)
The financial and managerial aspects of biosystems in evaluating design alternatives to biosystems. Typical topics included are: concepts of present and future value, techniques of managerial economics, and biosystem design analysis in the evaluation of alternatives. Retirement/replacement policies and risk analysis. Prereq: Engineering standing.

AEN 417G DESIGN OF MACHINE SYSTEMS. (3)
A study of the operational characteristics and design features associated with production and processing equipment for food and fiber products and an introduction to conceptualization, analysis and design of these systems. Lecture, two hours; laboratory, two hours per week. Prereq: EM 313, ME 330, engineering standing or consent of instructor.

AEN 435G WASTE MANAGEMENT FOR BIOSYSTEMS. (3)
A study of the characteristics; treatment and utilization principles; and analysis and design of systems for managing waste from the production and processing of food and fiber. Lecture, two hours; laboratory, three hours per week. Prereq: MA 214 and BIO 108.

AEN 438G FUNDAMENTALS OF GROUNDWATER HYDROLOGY. (3)
The first course in the physics of saturated flow in porous media. Topics include groundwater occurrence, Darcian flow, well hydraulics, flow nets and layered systems flow. The basic concepts of pollutant movement and unsaturated flow are introduced and case studies are analyzed. Prereq: ME 330 or CE 341 or consent of instructor. (Same as GE 460.)

AEN 450 SPECIAL PROBLEMS. (1-3)
An intensive study of some phases of agricultural engineering in which the student is particularly interested. Approval of the instructor is required. May be repeated to a maximum of six credits.

AEN 461G BIOMETEOROLOGY. (3)
An introduction to the impact and relationship of the atmosphere on living organisms. Emphasis on the practical application of meteorology to everyday problems within the biosphere. Weather analysis, interpretation, psychometrics of the atmosphere, and the impact of weather and climate on animals, plants and man are discussed. Lecture, two hours; laboratory, two hours per week. Prereq: BIO 150 and STA 291 or consent of instructor.

AEN 462 RESIDENTIAL AND COMMERCIAL IRRIGATION DESIGN. (3)
The utilization of hydraulic principles in the design, assimilation, installation and operation of residential and commercial irrigation systems in applications which emphasize water conservation, nutrient management and environmental protection. Lecture, two hours; laboratory, two hours per week. Prereq: Consent of instructor.

AEN 463G AGRICULTURAL SAFETY AND HEALTH. (3)
The course provides a comprehensive overview of major safety and health hazards in agricultural production and an overview of the basic approaches for the prevention and control of agricultural injuries and illnesses. The course is oriented toward upper class and graduate students. Prereq: AEN 220, AEN 252, and junior standing or consent of instructor.

AEN 480G HEATING, VENTILATING AND AIR-CONDITIONING. (3)
An introductory course emphasizing the engineering systems aspects of thermal environmental design. Principles and applications of building energy requirements and thermal comfort criteria. Prereq: ME 325 and engineering standing or consent of instructor. (Same as GE 480G.)

AEN 513 SOIL DYNAMICS IN TILLAGE AND TRACTION. (3)
A course for advanced undergraduate and graduate students which presents the principles of dynamic soil-machine interaction. The performance characteristics of tractive devices are presented along with the corresponding soil compliance. Soil response to mechanical disturbance or tillage is also presented. Lecture, two hours; laboratory, two hours per week. Prereq: EM 313, AEN 417G.

AEN 515 FLUID POWER SYSTEMS. (3)
Analysis and design of fluid power systems used in agricultural, industrial and processing equipment. Selected topics to include: positive displacement components, control devices, actuators, fluid transmission and system dynamics. Lecture, two hours; laboratory, two hours per week. Prereq: ME 330, ME 340 and engineering standing or consent of the instructor.

AEN 536 FLUVIAL HYDRAULICS. (3)
Rainfall physics, principles of erosion on upland areas and construction sites, stable channel design in alluvial material, mechanics of sediment transport, river mechanics, reservoir sedimentation. Prereq: CE 461G, ME 330 and engineering standing. (Same as GE 546.)

AEN 537 IRRIGATION AND DRAINAGE ENGINEERING. (3)
Planning and design of irrigation system; sprinkler, traveling gun, center pivot, trickle, subirrigation and residential and commercial irrigating; pumps; water quality treatment and supply; ponds and wells; principles of water movement and plant-soil relationships; surface and subsurface drainage. Prereq: ME 330 or CE 341 or consent of instructor.

AEN 545 ENGINEERING HYDRAULICS. (3)
Analysis of flow in closed conduits and natural and artificial open channels. Design of hydraulic structures. Prereq: CE 341, CE 441 and engineering standing. (Same as CE 549.)

AEN 549 FOOD AND BIOPROCESS ENGINEERING. (3)
An analysis of the most common unit operations utilized in the processing of food products. The principles of heat and mass transfer and reaction kinetics associated with processing operations will be used in defining process systems for drying, evaporation, refrigeration, freezing, fermentation, etc. Prereq: ME 325 or equivalent.

AEN 556 SOLID AND HAZARDOUS WASTE MANAGEMENT. (3)
Study of the generation and management of solid and hazardous wastes. Application of engineering principles to the collection, transport, processing, resource recovery and ultimate disposal of these wastes. Prereq: CE 471G, CE 521 or consent of instructor and engineering standing. (Same as CE 556.)

AEN 569 WATER RESOURCES SYSTEM DESIGN. (4)
Application of principles of hydrology, hydraulics, and environmental engineering in the planning, design, and analysis of a comprehensive water resource project. Emphasis on basic ideas and their application to the practical design of water supply, distribution, collection and treatment facilities. Written and oral presentation of student projects will be required. Lecture, three hours; laboratory, three hours per week. Prereq: CE 451, 461G, 549 and engineering standing. (Same as CE 569.)

AEN 599 TOPICS IN AGRICULTURAL ENGINEERING. (2-3)
A detailed investigation of a topic of current significance in agricultural engineering such as: design of small earth dams, vacuum dehydration systems, small particle mechanics, environmental control in green houses, sprinkler irrigation, energy conversion in agriculture, bio-simulation. May be repeated to a maximum of six credits, but only three credits can be earned under the same title. A particular topic may be offered at most twice under the AEN 599 number. Prereq: Variable; given when topic identified.

AEN 618 ADVANCED PLANT, SOIL AND MACHINERY RELATIONSHIPS. (3)
A consideration of fundamental concepts of energy and materials in the identification and mensuration of parameters needed in the development of new machines for agriculture. Lecture, two hours; laboratory, two hours. Prereq: AEN 417G and 505.

AEN 625 TOPICS IN ADVANCED ENVIRONMENT CONTROL AND ANALYSIS (Subtitle required). (3)
A study of current research in environment control and analysis of agricultural, commercial and residential structures. May be repeated three times for a maximum of nine credits, but not more than three credits may be earned under a particular topic. Prereq: Senior course in environment control and HVAC, AEN/ME 480G, or consent of instructor.

AEN 638 GROUNDWATER HYDROLOGY. (3)
The equations of saturated and unsaturated groundwater flow, the formulation of boundary value problems, and some analytical methods of solution. Solutions using Fourier series, solutions involving the Fourier transform and the Fourier sine and cosine transforms. The Boltzman transformation, development of the Philip solution for horizontal and vertical flow. Mathematical statement of the saturated and unsaturated groundwater pollution problem and some analytical methods of solution. The semigroup solution of the resulting evolution equation, examples of solutions using the Laplace transform and the Fourier transform, more complex solutions in two-dimensional and three-dimensional domains, solutions for distributed sources in time and space, solutions for time-varied boundary conditions. Prereq: MA 214, CE 461G or equivalent. (Same as GE 660.)

AEN 642 OPEN CHANNEL FLOW. (3)
The hydraulics of free surface flow including such topics as uniform flow, varied flow, unsteady flow, the hydraulic jump flow transitions, spillways and channel delivery. Prereq: CE 341. (Same as CE 642.)
AEN 647 SYSTEM OPTIMIZATION I. (3)
Introduction to linear and nonlinear optimization and their use in engineering design. Emphasis on numerical approaches and use of optimization methods for engineering systems (e.g., biological, mechanical, structural). Prereq: CS 221; one mathematics course beyond MA 214 or equivalent. (Same as ME 647.)

AEN 648 ENERGY AND MASS TRANSFER IN AGRICULTURAL PROCESSING. (3)
A comprehensive and in-depth study of the principles of energy and mass transfer as they apply to the processing of agricultural and biological materials. Prereq: AEN 548 or consent of instructor.

AEN 653 WATER QUALITY IN SURFACE WATERS. (3)
Water quality requirements for various beneficial uses. Analysis of dispersion, advection, evaporation, natural aeration, biological oxidation and photosynthesis; their effects on the physical, chemical and biological quality of waters in streams, lakes, reservoirs, estuaries and other surface waters. Eutrophication. Prereq: MA 214 and CE 451, or consent of instructor. (Same as CE 653).

AEN 658 INSTRUMENTATION FOR ENGINEERING RESEARCH. (3)
Instrumentation and measuring system characteristics; transducers for engineering measurements; and data acquisition and analysis. Lecture, two hours; laboratory, two hours per week. Prereq: Consent of instructor.

AEN 660 SIMILITUDE IN ENGINEERING. (3)
An advanced approach to engineering problems through the theory of similitude and its application to models. The use of geometrically similar, distorted and dissimilar models will be discussed. Prereq: Graduate standing.

AEN 665 WATER RESOURCES SYSTEMS. (3)
Application of systems analysis, mathematical modeling, and optimization in water resources management and design. Solution of engineering problems found in water supply, water quality, urban drainage, and river basin development and management by use of linear, nonlinear, and dynamic programming models. Prereq or concur: CE 421 and CE 569 or consent of instructor. (Same as CE 665).

AEN 667 STORMWATER MODELING. (3)
Introduction to deterministic and parametric modeling approaches for mathematically simulating stormwater runoff and quality. Emphasis on modeling concepts and model formulation. Analysis of deterministic component models and their linkage. Formulation of existing parametric models. Presentation of methods for parameter optimization and regionalization. Demonstration of linkage between the two approaches with illustrative examples. Prereq: CE 341 and CE 461G, or consent of instructor. (Same as CE 667).

AEN 748 MASTER'S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

AEN 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

AEN 750 SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING. (1-3)
Independent work on selected research problems in one of the various fields of biosystems and agricultural engineering. Consultation and laboratory by appointment. May be repeated three times for a maximum of nine credits. Prereq: Approval of chairperson of department.

AEN 768 RESIDENCE CREDIT FOR MASTER'S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

AEN 769 RESIDENCE CREDIT FOR DOCTOR'S DEGREE. (0-12)
May be repeated indefinitely.

AEN 775 SEMINAR. (0)
Weekly meetings with members of the staff for reports and discussions on research and current trends and practices in agricultural engineering. May be repeated twice. One class hour.

AEN 795 THESIS. (0)
May be repeated twice.

AFS 111 AEROSPACE STUDIES I. (1)
A course designed to provide the student with a basic understanding of the nature and principles of war, national power, and the Department of Defense role in the organization of national security. The student also develops leadership abilities by participating in a military organization, the cadet corps, which offers a wide variety of situations demanding effective leadership.

AFS 112 LEADERSHIP LABORATORY I. (1)
A course designed for development of basic skills required to be a manager, including communications, human relations, and administration of equal opportunity. Credit will not be granted toward the hours requirements for the degree. Pass/fail only. Coreq: AFS 111.

AFS 113 AEROSPACE STUDIES I. (1)
A course designed to provide the student with a basic understanding of the contribution of aerospace power to the total U.S. strategic offensive and defensive military posture. The student also develops leadership abilities by participating in a military organization, the cadet corps, which offers a wide variety of situations demanding effective leadership. Prereq: AFS 111.

AFS 114 LEADERSHIP LABORATORY I. (1)
A continuation of AFS 113. A course designed to develop managerial skills including superior/subordinate relationships, communications, customs and courtesies, basic drill movements and career progression requirements. Credit will not be granted toward the hours requirements for the degree. Pass/fail only. Coreq: AFS 113.

AFS 211 AEROSPACE STUDIES II. (1)
Introduces the study of airpower from a historical perspective; focuses on the development of airpower into a primary element of national security. Leadership experience is continued through active participation in the cadet corps. Lecture, one hour; leadership laboratory, one hour. Prereq: AFS 111, 113 or PAS approval.

AFS 212 LEADERSHIP LABORATORY II. (1)
A course designed for development of advanced skills required to be a manager/leader, including leadership styles, public speaking, group dynamics, motivation and preparation for field training. Credit will not be granted toward the hours requirements for the degree. Pass/fail only. Coreq: AFS 211.

AFS 213 AEROSPACE STUDIES II. (1)
Provides a foundation for understanding how airpower has been employed in military and non-military operations to support national objectives. Examines the changing mission of the defense establishment, with particular emphasis on the United States Air Force. Leadership experience is continued through participation in the cadet corps. Lecture, one hour; leadership laboratory, one hour per week. Prereq: AFS 111, 113 or PAS approval.

AFS 214 LEADERSHIP LABORATORY II. (1)
A continuation of AFS 213. A course designed to develop supervisory management skills to include communications, techniques of critique, social actions, personnel evaluation procedures, problem solving, role playing and field training preparation. Credit will not be granted toward the hours requirements for the degree. Pass/fail only. Coreq: AFS 213.

AFS 311 AEROSPACE STUDIES III. (3)
A study of management functions with emphasis on the individual as a manager in an Air Force environment. Individual motivational and behavioral process, communication, and group dynamics are included to provide a foundation for the development of professional skills as an Air Force Officer. Students refine their leadership and managerial abilities by organizing and managing a quasi-military unit. Prereq: Acceptance into POC or approval of PAS.

*AFS 312 LEADERSHIP LABORATORY IIIA. (1)
A course designed and focused on developing advanced leadership skills. Students fill the mid-level management function within the cadet corps. The course involves the planning and controlling of military activities of the cadet corps, and the preparation and presentation of briefings and other written and oral communications. Pass/Fail only. Coreq: AFS 311.

*AFS 313 AEROSPACE STUDIES III. (3)
A study of leadership with specific emphasis on the Air Force leader. Includes theoretical, professional and communicative aspects. In addition, military justice and administrative law are discussed within the context of the military organization. Students continue to develop and refine their leadership abilities by organizing and managing a military unit, the cadet corps, which offers a wide variety of situations requiring effective leadership. Prereq: AFS 311.
AGC 400 AGRICULTURAL COMMUNICATIONS CAMPAIGNS. (3)
Exploration of communications campaigns and strategies in the agricultural sector.
Students will learn how to plan and enact communications campaigns centered on
agricultural issues and audiences.

AGC 450 TOPICS IN AGRICULTURAL COMMUNICATIONS
(Subtitle required). (3)
Special topics or experimental courses in agricultural communications. Particular title
may be offered twice at most under this course number. Students may not repeat under
same title. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

AGC 490 SEMINAR IN AGRICULTURAL COMMUNICATIONS. (3)
A capstone course for seniors in agricultural communications. Presentations, research
papers, outside speakers, and career guidance will be significant course components.
Prereq: AGC 320 and AGC 400 and senior standing; or consent of instructor.

AHP Allied Health Professions

AHP 840 ETHICS IN HEALTH PRACTICE. (2)
A study of selected ethical issues that arise in the practice of health professionals. The
health professional’s obligations to patients, colleagues, employing institutions, and
the community will be considered, and relevant case studies will be analyzed.

AHP 841 ALLIED HEALTH PRACTICUM:
THE CONTEXT OF HEALTH CARE PRACTICE. (3)
An interdisciplinary course designed to increase students’ ability to interact with health
professionals in their practice. Emphasis is on problem-solving, roles/responsibilities
of health professionals, communication (interpersonal, team, and interprofessional), and
organizational dynamics. Lectures, workshops, and small group and practicum
activities, both on and off campus, will be included. Lecture, one hour; laboratory, two
hours; and field practicum, four hours per week. Required for Allied Health Professions
baccalaureate students. Prereq: Admission to a CAHP professional program or consent
of instructor.

AMS American Military Studies

BASIC COURSES

AMS 101 INTRODUCTION TO THE ARMY. (2)
This introductory level course is designed to give students an appreciation for the role
the Army currently plays in our society. The course covers the history of the Army and
the roles and relationships of the Army within our society. The course also covers some
of the basic skills necessary for today’s leaders to include oral presentation, time
management, map reading, basic rifle marksmanship and squad tactics.

AMS 102 INTRODUCTION TO LEADERSHIP. (2)
This course is designed to acquaint the student with the fundamental skills necessary
to be a leader, both in military and civilian context. Course also covers basic military
map reading skills.

AMS 201 AMERICAN MILITARY HISTORY. (2)
Study of the development of the U.S. from a military perspective. Pre-parallel
development of technology and warfare; and emphasis on the evaluation of military
leadership from the historically tested principles of warfare from the Civil War to the
present.

AMS 202 EFFECTIVE MILITARY COMMUNICATIONS. (2)
This course provides instruction and practical experience in the art of speaking and
writing in the Army style. Students will demonstrate competency through a series of
oral presentations and writing assignments. Small unit tactics and map reading skills
will also be used in the implementation of the oral presentations.

ADVANCED COURSES

AMS 301 LEADERSHIP AND MANAGEMENT I. (3)
Course of study in development of basic skills required to function as a manager: study
of leadership styles, group dynamics, communications, motivation and military
instruction methods; and school of the soldier and exercise of command. Prereq: AMS
101, 102 graduate or undergraduate student (male or female), successful completion
of basic course or basic camp, physically fit to pursue program; consent of PMS.
AMS 302 ADVANCED TACTICS. (3)
Small unit tactics and communications; organization and mission of combat arms units; leadership and the exercise of command. Prereq: AMS 101, 102, graduate or undergraduate student (male or female), successful completion of basic course or basic camp, physically fit to pursue program; consent of PMS.

AMS 341 LEADERSHIP AND MANAGEMENT II. (3)
An advanced study of logistics, operations, military administrations, personnel management, military justice, world change and military implications, service orientation and leadership training. Prereq: AMS 301, 302.

AMS 342 COMMAND MANAGEMENT. (3)
An advanced study of logistics, operations, military administration, personnel management, military justice, world change and military implications, service orientation and leadership training. Prereq: AMS 301, 302.

AMS 350 MILITARY SCIENCE LABORATORY. (1)
A hands-on practicum which exposes the student to the military skills required for basic technical and tactical competence as an Army officer. The course affords the student opportunities to develop and refine his/her leadership style and abilities under differing constraints and environments. Laboratory, two hours per week and two week-end exercises. May be repeated to a maximum of four credits. Concur: AMS 301, 302, 341, or 342.

AMS 395 INDEPENDENT STUDY IN LEADERSHIP. (1-2)
Advanced study in leadership. Students are under guidance and confer individually with faculty on approved topic(s). A written report or paper is expected and will be filed in the chairperson’s office. May be repeated to a maximum of four credits. Prereq: Completion of AMS 302 and approval of AMS.

ANA Anatomy and Neurobiology

ANA 206 BASIC HUMAN ANATOMY. (3)
The structure of the human body will be examined at various levels: cellular, tissue and organ system. The gross anatomical arrangement of the body will be studied in a system-by-system format relating structure to function. A regional review will then place the various systems into relationship with one another. This course was specifically designed for students in the pre-pharmacy program and as such places a major emphasis on the components and organization of the central nervous system. Prereq: Introductory biology/zoolgy.

ANA 299 FUNCTIONAL HUMAN ANATOMY. (3)
The basic concepts of systemic and regional human anatomy are presented. This course correlates certain fundamentals of human embryology and developmental malformations with human anatomy. All organ systems are covered and certain functional and clinical implications are presented. Course utilizes a lecture format with textbook reading assignments and some visual materials (TV tapes and projection slides). Prereq: Introductory courses in biology or zoology.

ANA 395 INDEPENDENT RESEARCH IN ANATOMY AND NEUROBIOLOGY. (1-3)
Independent research with faculty members. May be repeated to a maximum of 12 credits. Laboratory, three to nine hours per week. Prereq: Biology or psychology majors with sophomore, junior, or senior standing and consent of a faculty member.

ANA 503 INDEPENDENT WORK IN ANATOMY. (3)
Reading and laboratory work in a defined area of anatomy are carried out under the direct supervision of one staff member. Hours of discussion and laboratory work by individual arrangement. May be repeated to a maximum of 12 credits. Prereq: An introductory course in biology, zoology, or botany and consent of instructor.

ANA 511 INTRODUCTION TO HUMAN ANATOMY. (5)
The principles of organization of the human body are presented. Gross anatomy lectures initially follow a systemic plan. This is succeeded by a regional presentation. Several methods of studying anatomy are utilized. These include radiology, palpation of living structures, and the demonstration of preserved fresh and fixed materials. Prereq: Some background in biology, including one or more such courses as biology, zoology, botany, comparative anatomy or embryology, and enrollment in the College of Medicine or a graduate program in the biomedical sciences. In addition, students from graduate programs outside of anatomy must obtain the consent of the course director before registration.

ANA 512 MICROSCOPY AND ULTRASTRUCTURE. (4)
The organization of cells, tissues and organs are presented through lectures and in the laboratory, through the microscopic study of histological sections and illustrations. Prereq: Some background in biology, including one or more such courses as biology, zoology, botany, histological techniques, comparative anatomy or embryology and enrollment in the College of Medicine or a graduate program in the biomedical sciences. In addition, students from graduate programs outside of anatomy must obtain the consent of the course director before registration.

ANA 513 DEVELOPMENTAL ANATOMY. (2)
Human development is presented through lectures, visual aids, and occasional laboratory demonstrations in conjunction with laboratory exercises in ANA 511. The course deals entirely with intrauterine development, and includes some discussion of common abnormalities. Prereq: ANA 511, which may be taken concurrently, and enrollment in the College of Medicine or a graduate program in the biomedical sciences. In addition, students from graduate programs outside of anatomy must obtain the consent of the course director before registration.

ANA 516 ANATOMY OF THE NERVOUS SYSTEM. (3)
The gross and microscopic structure of the central and peripheral nervous systems and their blood supply will be studied. The course will include the functional interpretation of anatomical structures and clinical correlations. Lecture, two hours; laboratory, two hours. Prereq: ANA 511, 512, 513; PGY 511; and enrollment in the College of Medicine or a graduate program in the biomedical sciences. In addition, students from graduate programs outside of anatomy must obtain the consent of the course director before registration.

ANA 529 CONCEPTS OF MORPHOLOGY. (2)
The objective of this course is to present concepts of morphology as they concern cells, tissues, or organs, systems and/or regions of the human body. Necessarily, the history of the development of ideas about the selected topic will be surveyed. Inherent also in the presentation of concepts of structure will be the presentation of controversies which have resulted from differing methods and interpretations. Lecture, four hours. Course material will be presented in lectures, seminars, laboratory, through selected readings or a combination of these instructional methods. May be repeated to a maximum of four hours. Prereq: Advanced work in biological sciences and consent of the instructor.

ANA 530 COMBINED HISTOLOGY AND SPECIAL ORAL MICROANATOMY. (5)
An analysis of the histological structure and organization of the human body, including an especially detailed treatment of the tissues and organs related to the oral cavity. Prereq: Admission to the College of Dentistry or some background in biology and consent of instructor.

ANA 532 SYSTEMIC HUMAN ANATOMY. (2)
A presentation at the gross-anatomical level of the structure and organization of the several organ systems that constitute the human body. Prereq: Admission to the College of Dentistry.

ANA 534 ANATOMY OF THE HUMAN HEAD AND NECK. (3)
The detailed regional anatomy of the human head and neck is studied by various techniques, the most important of which is dissection. Emphasis is placed on the anatomical relationships with each region. Lecture, two hours; laboratory, six hours. Prereq: Admission to the College of Dentistry.

ANA 536 HUMAN EMBRYOLOGY, AN ABBREVIATED COURSE. (1)
A concise presentation of developmental mechanisms, early development of the embryo, and subsequent development of selected systems and regions of the body. Lecture, one hour. Prereq: Admission to the College of Dentistry.

ANA 538 HUMAN NEUROANATOMY, AN ABBREVIATED COURSE. (1)
A concise presentation of the functional organization of the human nervous system. Lecture, two hours. Prereq: Admission to the College of Dentistry.

ANA 600 SEMINAR IN ANATOMY. (1)
A weekly seminar devoted to presentation and discussion of classic and new research in the field. May be repeated to a maximum of four credits. Prereq: Admission to the anatomy graduate program or permission of the course director.
ANA 605 PRINCIPLES OF NEUROBIOLOGY. (4)
The objective of this course is to provide graduate students of diverse backgrounds with an introduction and overview of neurobiology. Areas covered will include neuronal and glial cell biology, neurotransmitters, signaling mechanisms, neuroanatomy, and neuronal development. The course is designed to provide a brief overview of each of the areas and introduce students to current research questions. The course will consist of lectures and informal presentations in a ‘Journal Club’ format. The course will be interdisciplinary and will be of interest to graduate students in anatomy, biology, biochemistry, immunology, pharmacy, pharmacology, physiology, psychology and toxicology and to neurology and neurosurgery residents. Prereq: Introductory biochemistry course, or equivalent, and/or consent of instructor. (Same as BCH/NEU/PGY/PHA 605.)

ANA 606 MECHANISMS OF NEUROLOGIC DISEASE. (4)
The objective of this course is to provide graduate students of diverse backgrounds with an introduction and overview of current problems and controversies in neurobiology and clinical neurology. The course will cover a variety of illnesses including epilepsy, neurodegenerative diseases, stroke, psychiatric illness, pain, diseases of immuneorigin, motor dysfunction and inherited disorders. Prereq: ANA/BC/NEU/PGY/PHA 605 or consent of instructor. (Same as NEU/PHA 606.)

*ANA 612 BIOLOGY OF AGING.
A multidisciplinary discussion of how the process of aging affects biological systems. Coverage will be quite broad and includes topics such as subcellular and cellular aging, genetics, immunology, anatomy and physiology, animal model of aging, etc. Prereq: Enrollment in a graduate program of a biomedical science department or consent of instructor. (Same as BIO/GRN/PGY 612.)

ANA 613 BEHAVIORAL ECOLOGY AND COMPARATIVE NEUROBIOLOGY. (2)
This course introduces students to major topics in behavioral ecology and comparative neurobiology with an emphasis on inter-relationships between these fields. Topics to be covered vary each semester, but typically include: the optimality approach to understanding behavior, predator-prey behavior, mating and social behavior, behavioral genetics, neural circuits and behavior, sensory biology, neural development, and neural plasticity. Prereq: Permission of the instructor. (Same as BIO/ENT/PGY/PSY 613.)

ANA 614 TECHNIQUES IN BEHAVIORAL ECOLOGY AND COMPARATIVE NEUROBIOLOGY. (2)
This course provides students with instruction and experience in the experimental research techniques employed in the study of behavioral ecology and comparative neurobiology with emphasis on the integration of these approaches for understanding animal behavior. Each student will carry out three small research projects in the laboratories of three of the participating faculty. Techniques to be covered include: molecular and genetic methods, neuroanatomical and neurophysiological techniques, and field and laboratory methods for quantifying behavior and studying effects of social and environmental influences on behavior. Prereq: Permission of the instructor. (Same as BIO/ENT/PGY/PSY 614.)

ANA 618 MOLECULAR NEUROBIOLOGY. (4)
This course provides knowledge base and analytical skills in the field of molecular neurobiology. An in-depth introduction to current technologies, their rationale and limitations, will be the focus to address normal brain function and neuropathological conditions. Prereq: BCH 501, 502, NEU 605, or consent of instructor. (Same as BIO/MI/PGY 618.)

ANA 629 TECHNIQUES OF ANATOMICAL RESEARCH. (2)
The objective of this course is the familiarization of students with research techniques in anatomy. The relationship will be tutorial. Students will work under the direction of given staff members for determined periods of time, usually on a problem. The exact length of time will depend upon the student’s purposes, progress and the techniques. The problem may be new research or a repetition of previous work. May be repeated to a maximum of four hours. Prereq: Previous senior college or graduate level work in biology and consent of instructor.

ANA 631 ADVANCED HUMAN ANATOMY. (3-5)
The objective of this course is to meet individual student needs for increased knowledge in particular areas of gross human morphology. Investigations of problems involving gross morphology will be carried out. One or several defined areas of the body will be studied in considerable detail by dissection, by intensive use of the pertinent literature, by the use of visual aids, prosected materials and other appropriate learning aids. Prereq: A background in gross human anatomy equivalent to a medical school course in regional anatomy and consent of course director and/or Director of Graduate Studies in Anatomy and Neurobiology.

ANA 633 ADVANCED DEVELOPMENTAL ANATOMY. (2-5)
This is a detailed study of intra-uterine development, both normal and abnormal, usually arranged as a tutorial or small seminar series. Enrollment limited to 10 students. Prereq: ANA 511 or 811 and ANA 513 or their equivalents; or consent of instructor.

ANA 636 ADVANCED NEUROANATOMY. (3-5)
The objectives include specific and detailed correlation of microscopic and ultrastructural morphology of structures in the nervous system with function of these structures. Emphasis will be placed on structure-function relationships, neurotransmitters, chemical constituents of the nervous system, neuronal as well as non-neuronal cells, plasticity of the nervous system and developmental biology. The detailed content and emphasis will depend on both the background and goals of the students. Depending on number of credits a student registers for, and the topic and course orientation, laboratory work, library work, written and/or oral presentations may be a course requirement. Prereq: ANA 511, 512, 513, 516, or equivalents, or consent of instructor.

ANA 638 DEVELOPMENTAL NEUROBIOLOGY. (3)
An explanation of the processes which contribute to the development of the nervous system. Neurophysiological, cell biological and molecular approaches to cell differentiation, neuronal pathfinding and synapse formation and stabilization will be explored and discussed. Examples will be drawn from both vertebrate and invertebrate preparations. Prereq: BIO 535 or consent of instructor. (Same as BIO/PGY 638.)

ANA 660 BIOLOGY OF REPRODUCTION. (3)
Advanced study of current topics in reproductive biology. The course is comprised equally of student-led discussions and lectures given by faculty with research expertise in selected topics. Readings will be taken from current and classic literature. Topics covered include (but are not limited to) molecular and cellular endocrinology, hormone receptors and mechanism of action, reproductive neuroendocrinology, reproductive behavior, gametogenesis, fertilization, sexual differentiation, puberty, menopause and environmental effects on reproduction. Emphasis will be placed on the analysis and understanding of the experimental basis for current concepts in reproductive biology. Prereq: ASC/PGY 601 and ASC 364 or BIO/PGY 502 or consent of instructor. (Same as ASC 660 and GY 660.)

ANA 662 ULTRASTRUCTURAL ANATOMY. (2-5)
The objectives of this course are to advance the students’ knowledge of the submicroscopic structure of cells and tissues. Correlation of intra- and extracellular morphology and function will be emphasized. Students will do detailed laboratory work in the techniques of electron microscopy. Depending on the number of credits a student registers for, and the topic and course orientation, laboratory work, library work, written and/or oral presentations may be a course requirement. Prereq: ANA 512, previous work in microscopy including histology or cytology, or equivalents, and consent of instructor.

#ANA 710 AGING OF THE NERVOUS SYSTEM. (3)
This course will examine the alterations in the brain that occur with aging and in neurodegenerative disorders such as Alzheimer’s disease. The emphasis will be on human aging although the relevance of animal models to studies of human aging will be a recurrent theme. The course will examine aging at several levels, including molecular, cellular, organizational, and behavioral. Prereq: GRN 620. A strong background in the basic sciences. (Same as GRN/PGY/PHA 710.)

ANA 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

ANA 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

ANA 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

ANA 769 RESIDENCE CREDIT FOR THE DOCTOR’S DEGREE. (0-12)
May be repeated indefinitely.

ANA 790 RESEARCH IN ANATOMY. (1-12)
Individualized laboratory and research experience under the supervision of a faculty member. May be repeated to a maximum of 12 credits. Prereq: Consent of the instructor.

ANA 801 HISTOLOGY FOR PHYSICAL THERAPY STUDENTS. (1)
A survey of selected basic and specialized mammalian tissues most commonly involved in diseases treated by physical therapists. The course provides information required for understanding the cellular mechanisms behind the various diseases and the rationale for subsequent treatment. Prereq: Admission to the College of Allied Health.
### ANA 802 NEUROANATOMY FOR PHYSICAL THERAPY STUDENTS.
A concise account of the functional anatomy of the central nervous system. The anatomical organization is correlated with physiological activity. Emphasis is placed upon the morphological basis for progressively higher levels of control of activity from the simple reflex to voluntary motor activities controlled by the cerebral cortex. This type of knowledge is required for proper understanding and performance of physical therapy technicians in the treatment of medical and surgical disease.

### ANA 811 HUMAN ANATOMY FOR ALLIED HEALTH PROFESSIONS.
A dissection-based gross anatomy course designed to present the principles of the human body in a regional format with special emphasis on functional-clinical anatomical relationships. Prereq: Enrollment in either the PAS or PT programs of the College of Allied Health Professions or a graduate program in the biomedical sciences. Students from graduate programs outside of Anatomy and Neurobiology must obtain the consent of the course director before registration.

### ANS 812 HUMAN STRUCTURE/CELL AND TISSUE BIOLOGY.
The organization of cells, tissues and organs is presented in lectures and in the laboratory through the study of in vivo materials, histological sections and electron microscopic illustrations with focus on the correlation of structure and function. Small group discussions on select topics supplement full classroom work. Lecture, 20 hours per week. Prereq: Admission to Medical School (first year). (Same as MD 812.)

### ANS 813 DEVELOPMENTAL ANATOMY FOR PHYSICAL THERAPY STUDENTS.
The course of intrauterine somatic development is presented through class discussions, visual aids, and occasional laboratory demonstrations in conjunction with ANA 811. This course should not be elected by a student desiring a detailed review of prenatal human development. Prereq: ANA 811, which may be taken concurrently, or consent of instructor.

### ANA 814 HUMAN STRUCTURE/GROSS ANATOMY.
The course consists of lecture, small group, laboratory, and palpation exercises that provide a basic understanding of anatomical principles, organization and development. Anatomical structures are introduced as a basis for future functional correlates and principles are taught via laboratory discussions, dissections, films and skeletal materials. Lecture, 20 hours per week. Prereq: Admission to Medical School (first year). (Same as MD 814.)

### ANS 850-899 FOURTH-YEAR ELECTIVE FOR MEDICAL STUDENTS.
With the advice and approval of the faculty adviser and the Student Progress and Promotions Committee, the fourth-year student may choose approved electives offered by the various departments in the College of Medicine. The intent is to provide the student an opportunity to develop his/her fund of knowledge and clinical competence. Prereq: Admission to the fourth year, College of Medicine and/or by the permission of the Student Progress and Promotions Committee.

**Approved electives:**
- ANS 850 APPLIED HUMAN ANATOMY
- ANS 851 RESEARCH IN ANATOMY

### Key:
- # = new course
- * = course changed
- † = course dropped
- ¶ = course removed from Bulletin due to inactivity
ANT 245 FOOD CULTURE AND SOCIETY. (3)
This course is designed for students in anthropology, food and nutrition, agriculture and environmental studies. It explores food in terms of human food systems. Human food systems include the knowledge, values, and practices used to produce, distribute, process, exchange and consume food. These are embedded in culture and operate within societies. Thus, why we eat, what we eat, when, where and with whom we eat, how and where we obtain our food, how we prepare it, and distribute it in specific ways may vary as a function of the culture in which we live, our place of residence and our location within society. We will explore these issues through the lectures, readings, videos and discussions to gain a better understanding of the complexity of food-related behaviors among people around the world.

ANT 255 HUMAN SEXUALITY IN CROSS-CULTURAL PERSPECTIVE. (3)
The study of human sexuality in evolutionary and cross-cultural perspective; considers gender identity, sexual response, cultural rules and norms concerning sexual behavior and the social organization of sexual behavior. Prereq: ANT 120 or ANT 121 or PSY 100 or SOC 101.

*ANT 301 HISTORY OF ANTHROPOLOGICAL THEORY. (3)
The purpose of this course is to acquaint the undergraduate student with the history of the development of anthropological ideas from their precursors in thought about human nature and behavior beginning with ethnographic and philosophical literature from Greek and Roman civilization, and ending with discussion of current emphases in anthropological theory. The course will provide anthropology majors with the foundations they need to master this area of disciplinary knowledge. Prereq: ANT 220.

†ANT 312 COMPARATIVE CIVILIZATIONS.
ANT 320 ANDINE CIVILIZATION. (3)
A study of the Inca and other pre-Hispanic civilizations of highland South America in terms of their origins, their development, and their material, social, and intellectual achievements.

ANT 322 AZTEC AND MAYA CIVILIZATION. (3)
The course provides a study of the Aztec, Maya and related cultures of the New World. It provides a detailed discussion of pre-Columbian subsistence practices, economy, religion and politics by tracing the development of Mesoamerican civilization from its earliest beginnings to the Spanish conquest.

ANT 323 PEOPLES OF THE PACIFIC ISLANDS. (3)
A consideration of the various cultures of the Pacific Islands. Attention will be given to both traditional cultural features and the responses of contemporary Pacific societies to economic, political, and social influences from industrialized countries. Prereq: ANT 121.

*ANT 324 CONTEMPORARY LATIN AMERICAN CULTURES. (3)
This course is a detailed survey of societies and cultures of contemporary Latin America, utilizing contributions from anthropological research. Prereq: Introductory social science course.

ANT 325 PEOPLES OF INNER ASIA. (3)
A study of the pastoral nomadic societies and the oasis communities of central Russia, China, and Tibet, emphasizing their traditional culture patterns, their role in history, and their adaptation to the modern conditions of Russian and Chinese rule.

ANT 326 PEOPLES OF EAST ASIA. (3)
A survey of the societies and cultures of China, Japan, and Korea as revealed through anthropological studies of peasant communities, urban elites, and tribal minorities.

ANT 327 CIVILIZATION AND CULTURE OF INDIA. (3)
Considers the content and interrelationships between India’s religious and philosophical tradition and the structure and organization of rural village life in historic, demographic and geographic context.

ANT 332 HUMAN EVOLUTION. (3)
Basic concepts and theory of evolution will be reviewed and applied to the study of fossil man. The evidence for the evolution of man and his primate relatives will be studied, with attention paid to alternate interpretations of the data. Prereq: ANT 120 or BIO 150.

*ANT 333 CONTEMPORARY HUMAN VARIATION. (3)
This course focuses on human variation resulting from adaptation to a wide range of environments and the stresses inherent in each. It explores how humans respond to natural stresses, e.g., cold, heat, aridity and altitude, and human-made stresses, e.g., poverty, malnutrition and chemical pollution. Prereq: ANT 220.

†ANT 338 PEOPLES OF THE NEAR EAST.
ANT 515 PHONOLOGICAL ANALYSIS. (3) An investigation of speech-sounds and systems of speech-sounds. Articulatory phonetics, analysis of phonological systems, phonological theories. Includes fieldwork on the phonology of a non-Indo-European language; within a given academic year, the same language serves as the basis for fieldwork in ANT/ENG/LIN 515 and ANT/ENG/LIN 516. Prereq: ENG/LIN 211 or equivalent. (Same as ENG/LIN 515.)

ANT 516 GRAMMATICAL ANALYSIS. (3) Emphasis on the systematic interrelationships of morphemes within words and sentences. Practical training in the writing of grammars and exposure to various theories of grammatical description. Includes fieldwork on the morphology and syntax of a non-Indo-European language; within a given academic year, the same language serves as the basis for fieldwork in ANT/ENG/LIN 515 and ANT/ENG/LIN 516. Prereq: ENG/LIN 211 or equivalent. (Same as ENG/LIN 516.)

ANT 519 HISTORICAL LINGUISTICS. (3) Language change; reconstruction of linguistic systems, language classification; comparative linguistics; temporal, spatial, and social context of language change. Prereq: ANT 215, ENG/LIN 211, or ENG 414G; or equivalent. (Same as LIN 519.)

†ANT 523 HUMAN VARIATION IN EVOLUTIONARY PERSPECTIVES. (3) Principles of policy research and intervention in cultural anthropology with attention to the theoretical and ethical basis of such research and intervention. Intervention techniques considered include research and development anthropology; action anthropology, community development, community advocacy anthropology and culture brokerage. Prereq: Nine hours of cultural anthropology or consent of instructor.

ANT 526 PSYCHOLOGICAL ANTHROPOLOGY. (3) Explores the interrelations of culture, social structure, and individual psychology. The historical development of theory treating the relationships between culture and personality, as well as recent theory are emphasized. Prereq: Nine hours of cultural anthropology or consent of instructor.

ANT 527 CHILDREN AND FAMILY IN APPALACHIA. (3) Exploration of family life and the socialization of children in the Appalachian Southern Highlands from both an historical and a contemporary comparative perspective. Prereq: Six hours of social sciences or consent of the instructor. (Same as FAM 550.)

ANT 532 POLITICAL ANTHROPOLOGY. (3) The course examines political systems, process, and action in formal and informal arenas. Emphasis is put on cross-cultural variation, and evolutionary processes in political systems in contemporary as well as historical perspectives. Prereq: Nine hours of cultural anthropology or consent of instructor.

ANT 534 THE SOUTHERN APPALACHIANS: A SOCIOLOGICAL INTERPRETATION. (3) A sociological interpretation of the Southern Appalachians, emphasizing the great diversity—social, cultural, economic—in the various parts of this area by study of the major institutions, value orientations, and social and cultural changes affecting both the whole area and its sections. Prereq: Six hours of social science or consent of instructor. (Same as SOC 534.)

ANT 538 ECONOMIC ANTHROPOLOGY. (3) History of the development of various theoretical approaches to the cross-cultural study of economic systems and inquiry into the relationships existing between economy and the other systems within a society. Prereq: Nine hours of cultural anthropology or consent of instructor.

ANT 539 AGING IN CROSS-CULTURAL PERSPECTIVE. (3) A systematic examination of the ways in which aging and the aged are dealt with in cultures around the world with an emphasis on non-western cultures. Comparative examination of theories of aging in developing and industrial societies. Prereq: Nine hours of cultural anthropology or consent of instructor.

ANT 541 ARCHAEOLOGICAL METHOD AND THEORY. (3) Examines the concepts, aims and methodology of archaeology as a scientific discipline within the social sciences. Attention given to the basic principles and recent advances of archaeological fieldwork and post-field analysis. Prereq: ANT 240 and six hours of cultural anthropology or archaeology courses, or consent of instructor.

ANT 543 CULTURAL RESOURCE MANAGEMENT. (3) Introduction to the theory and practice of culture/resource management as it has developed in the historic preservation movement in the United States. The history of preservation is covered along with the development of the contemporary legal tools. The implications of these for the field evaluation of sites is presented.

ANT 545 INTRODUCTION TO HISTORICAL ARCHAEOLOGY. (3) Historical archaeology applies archaeological methods and techniques to the remains of societies having written histories. The course introduces students to the history and theoretical development of the discipline, and to the variety of the data sources used by historical archaeologists. Particular attention is given to the ways in which historical archaeologists use material culture to address research issues of interest in anthropology, history, and other relevant disciplines.

ANT 550 SYMBOLS AND CULTURE. (3) Examines the way in which symbolic systems create the meanings through which we experience life. The course will explore symbols and symbolic behavior from a humanistic perspective, and will present examples of non-Western symbolic systems. Prereq: ANT 121 or consent of instructor.

ANT 551 BIOARCHAEOLOGY. (3) Human osteology (the study of the human skeletal system) within the context of archaeological anthropology. Identification of the bones of the human skeleton with additional information on growth and development, morphological variations, and skeletal responses to biophysical stress (malnutrition, disease, and physical activity patterns). The analysis of human remains from archaeological contexts will be covered in detail.

†ANT 552 PREHISTORIC FOODWAYS. (3) Details analyzed of prehistoric cultures of eastern United States with emphasis on interpretation of prehistory in Ohio River Valley. Prereq: ANT 120, 121, and 442G or consent of instructor. Prereq: ANT 240 and six hours of archaeology or cultural anthropology, or consent of instructor.

ANT 580 TOPICS IN ANTHROPOLOGY. (3) Selected topics of theoretical or methodological importance in anthropology, with special attention to topics of contemporary relevance. Refer to Schedule of Classes for topics. May be repeated to a maximum of six credits.

ANT 581 INDEPENDENT WORK IN ANTHROPOLOGY. (1-4) May be repeated three times to a maximum of 12 credits. Prereq: Major and a standing of 3.0 in the department.

ANT 582 SENIOR INTEGRATIVE SEMINAR. (3) Seminar focusing on current issues in anthropology. Purpose is to provide a format in which advanced undergraduates can integrate knowledge acquired in previous anthropological course work and evaluate the contribution of the different anthropological subdisciplines to understanding contemporary problems. Emphasis placed on oral and written communication. Prereq: Major in anthropology; senior standing.

ANT 585 FIELD LABORATORY IN ARCHAEOLOGICAL RESEARCH. (3-6) Practical supervised training in-field in archaeological research methods and techniques, problem analysis, field laboratory procedures, recording methods. Laboratory, 20 to 40 hours per week. May be repeated to a maximum of 12 credits. Prereq: Consent of instructor.

ANT 600 PRACTICUM IN TEACHING ANTHROPOLOGY. (1) Guided practical experience in teaching, supplemented with group discussions of teaching practice and selected reading on lecture technique, course development, test writing and other skills for participation in the professorate. May be repeated to a maximum of three credits. Prereq: Graduate status in anthropology or consent of instructor.

ANT 601 INTRODUCTORY SEMINAR IN ETHNOGRAPHY. (3) A critical examination of key writings in ethnography, focusing on issues of data gathering, analysis and interpretation of results, and disciplinary significance. This seminar is a requirement for the advanced degree in anthropology. Prereq: Admission to the anthropology graduate program; ANT 510 and ANT 533 or equivalents; consent of instructor.

ANT 602 INTRODUCTORY SEMINAR IN CULTURE DYNAMICS. (3) An in-depth discussion of the theory and method of the various approaches to the study of long-term culture change in past and present societies. This course stresses interdisciplinary problem-oriented research on a specific theme of culture change. Emphasis also is placed on the development of writing skills, oral presentations, professional standards or performance in research and communication, and critical thinking. Prereq: Admission to the Anthropology graduate program and ANT 601; consent of instructor.
ANT 620 TOPICS AND METHODS OF EVALUATION. (3)
An examination of a subset of evaluation methods, topics, and problems. An introductory course in the area with minimal emphasis on quantitative methods. The course is designed to: provide a perspective from which evaluation studies may be viewed; and, to provide experiences for those who will learn from or conduct evaluations. Prereq: Consent of instructor, and a basic course in statistics or research. (Same as EDP/EPE 620/SOC 622.)

ANT 621 ADVANCED TOPICS AND METHODS OF EVALUATION. (3)
An advanced course in evaluation methods and techniques with an emphasis on quantitative methodology. State of the art ideas and methods of conducting evaluation studies and analyzing data from those studies are presented. The course is designed primarily for those who are conducting or will conduct evaluation studies. Prereq: A basic course in statistics or its equivalent; EDP/EPE 620/SOC 622; and consent of instructor. (Same as EDP/EPE 621.)

ANT 637 SOCIOCULTURAL DIMENSIONS OF ECONOMIC DEVELOPMENT. (3)
Examination of social, cultural, and economic conditions in lesser developed countries. Discussion of the various socioeconomic and cultural theories of change and developments, and of alternative policies for the world of the future. Considers the possible roles for social scientists in policy formulation and application. Prereq: Six graduate credits in social sciences or consent of instructor. (Same as SOC 637.)

ANT 638 FOOD SYSTEMS AND AGRARIAN CHANGE. (3)
An examination of the way in which the organization of food procurement, distribution, and consumption in developing countries has affected and been affected by agrarian change. Prereq: Consent of instructor. (Same as SOC 638.)

ANT 640 SCIENCE, AGRICULTURE, AND DEVELOPMENT. (3)
An in-depth examination of the interrelations between science, agriculture, and development. Both domestic and international issues are explored. Prereq: Graduate standing in the social or agricultural sciences. (Same as SOC 640.)

ANT 641 GENDER ISSUES IN DEVELOPMENT. (3)
An examination of gender issues in domestic and international development. Prereq: Graduate standing in the social or agricultural sciences or permission of the instructor. (Same as SOC 641.)

ANT 650 THEORY IN ARCHAEOLOGY. (3)
This seminar examines the development of archaeological theory with specific emphasis on the discipline of archaeological archaeology in the New World. Particular schools and trends in contemporary archaeological theory are discussed in detail. Prereq: ANT 541 or consent of instructor.

ANT 651 ARCHAEOLOGICAL DATA ANALYSIS. (3)
This course examines the manipulations of archaeological data that follow fieldwork. These procedures, usually consisting of data processing and classification, are often undertaken in the field as data are being gathered. Data organization and analysis are the basic goals of this course. May be repeated to a maximum of six credits. Prereq: ANT 541 or consent of instructor.

ANT 652 DEMOGRAPHIC ARCHAEOLOGY. (3)
A seminar which examines the theory and methodology used by archaeologists to study population aggregates ranging from individual households to regional populations. Particular emphasis is given to theoretical perspectives which integrate ecological, social and spatial analyses of population data. Prereq: ANT 541 or consent of instructor.

ANT 653 PREHISTORIC ECONOMICS. (3)
This seminar examines the theory and methodology used by archaeologists to study and reconstruct the economic structure of past societies. Discussion examines forms of subsistence and craft production and systems of resource distribution and exchange. Prereq: ANT 541 or consent of instructor.

ANT 654 ARCHAEOLOGY OF POLITICAL SYSTEMS. (3)
This course is designed to study the archaeology of political systems. The goals are to discuss the major trends, concepts, and perspectives in researching event and process in the evolution of political organization and social integration. A corollary goal is to examine the empirical evidence for, and archaeological correlates of, political evolution. It is not intended to provide a comprehensive coverage of all theories about past political systems, or as a survey of the rise and development of political forms in complex societies around the world. Prereq: ANT 541, ANT 602 or consent of instructor.

ANT 660 ETHNOGRAPHIC RESEARCH METHODS. (3)
Cultural anthropology research techniques including key informant and ethnosemantic interviewing, participant observation, field note preparation and coding, survey methods, photography, mapping, rapid assessment procedures and other specialized techniques are discussed and practiced. Ethical responsibilities of anthropologists reviewed. Prereq: Major or graduate standing in a social science, or consent of instructor.

ANT 661 ETHNOGRAPHIC DATA ANALYSIS. (3)
A practical, learning-by-doing approach to the analysis of qualitative and quantitative ethnographic data. Students will work with ethnographic field notes, life histories, ethnographic survey data, and other results of field research. Prereq: ANT 660 and a statistics course.

ANT 662 RESEARCH DESIGN. (3)
Seminar discussion and guided individual student research covering the relationship between theory, methods, and reality; how to better design anthropological inquiry. Prereq: One year of graduate work in a behavioral science field and consent of instructor.

ANT 664 CULTURAL ISSUES IN MENTAL ILLNESS. (3)
An in-depth discussion of theory and method of the various approaches to cultural and social factors in the etiology, distribution, and treatment of mental illness. Data from non-Western and Western cultures are examined. Prereq: Enrollment in graduate program in anthropology, sociology, psychology, educational and counseling psychology, or consent of instructor. (Same as BSC/PSY 664.)

ANT 684 FARMING SYSTEMS RESEARCH METHODS. (3)
A critical analysis of the concepts, methods, and practices of farming systems research. Design and carry out an FSR project. Prereq: Graduate standing in the social or agricultural sciences. (Same as SOC 684.)

ANT 691 CULTURAL RESOURCE MANAGEMENT CLERKSHIP. (1-3)
Practical experience in aspects of the cultural resource management process are provided through a one-semester rotation of work in the Office of State Archaeology (OSA), Museum of Anthropology (UKMA), and the program for Cultural Resource Assessment (PCRA). Students are assigned tasks at each work assignment rotation during the semester and are evaluated on the basis of work performance and a journal summary of this experience by a committee of their supervisors. Prereq: Consent of instructor.

ANT 720 SEMINAR IN CULTURAL ANTHROPOLOGY. (3)
Intensive examination of selected topics of theoretical and/or methodological interest in cultural anthropology. Possible topics include religion, kinship and marriage, political systems, law, economic systems, modernization, urbanization, cross-cultural methodology, and others. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

ANT 725 SEMINAR IN APPLIED ANTHROPOLOGY. (3)
Seminar discussion and individual or group research in the applications of social anthropology theory and methods to the solution of institutional, community, regional or national problems. Attention will be given to ethics, to the role attributes of the applied anthropologist, and to the history of applied anthropology. Prereq: ANT 525 or consent of instructor.

ANT 731 ADVANCED SEMINAR IN SOCIAL AND POLITICAL DYNAMICS. (3)
Theoretical frameworks for the analysis of political systems and processes. The seminar explores politics as action and systemic process in contemporary, prehistoric, and historical contexts. Students are expected to formulate research questions and discuss current theory in a critical fashion. Prereq: ANT 601 and 602 or consent of instructor.

ANT 732 ADVANCED SEMINAR IN ECOLOGICAL ANTHROPOLOGY. (3)
A study of interactions among populations, organization, environment, technology and symbols. The course focuses on recent anthropological contributions to the understanding of ecological relationships both now and in the past, including how people exploit the environment and how resource exploitation impact on environmental change. Prereq: Completion of ANT 601 and ANT 602 or consent of instructor.

ANT 733 ADVANCED SEMINAR IN SYMBOLS AND MEANING. (3)
Advanced seminar in the development of anthropological approaches to cultural meaning in actions, thought, and language from the 1960s. Includes the social structural approach to symbolism and ritual, cognitive approaches to meaning, the anthropology of experience and expression, interpretive and post-modern approaches, and topical applications of these approaches. Prereq: ANT 601 and 602 or consent of instructor.

ANT 734 ADVANCED SEMINAR IN ECONOMIC ANTHROPOLOGY. (3)
Theoretical frameworks for the analysis of economic systems and processes. The seminar explores the interaction between economic phenomena and other aspects of social and political organization both as action, structure, and systemic process in contemporary, prehistoric, and historical contexts. Students are expected to formulate research questions and discuss current theory in a critical fashion. Prereq: ANT 601 and 602 (ANT 538 is recommended) or consent of instructor.
### ANT 735 ADVANCED SEMINAR IN PRACTICE AND ACTION. (3)
Comparative analysis of various modes of social action including action research, advocacy, cultural action, and participatory action research. Foundations in social theory considered. Prereq: Admission to graduate program in anthropology or consent of instructor.

### ANT 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

### ANT 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

### ANT 750 GRADUATE FIELD STUDY IN ANTHROPOLOGY. (1-6)
Field research as part of a long-range anthropological research program for graduate interns training under direct faculty supervision. Provides student with experience conducting scientific research as research team member. Report required. Laboratory, three hours to full time. Prereq: Appropriate language fluency; preparatory area study plus consent of instructor.

### ANT 765 ADVANCED SEMINAR IN MEDICAL ANTHROPOLOGY. (3)
(1) Advanced history and theory of medical anthropology; (2) research design, field work, analysis of data in medical anthropology. Prereq: ANT 529 or equivalent, or consent of instructor. (Same as BSC 765.)

### ANT 767 PRACTICUM IN APPLIED ANTHROPOLOGY. (1-6)
Practical field experience in which the student applies the theory and method of social anthropology to the solution of a problem defined by the student in consultation with a community or a public or private service agency. Required of all doctoral students in Applied Anthropology. Prereq: Consent of instructor.

### ANT 768 RESIDENCE CREDIT FOR MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

### ANT 769 RESIDENCE CREDIT FOR DOCTOR’S DEGREE. (0-12)
May be repeated indefinitely.

### ANT 770 TOPICAL SEMINAR: (Subtitle required). (3)
Intensive work in particular fields of anthropology. May be repeated four times. Prereq: Graduate standing.

### ANT 774 BEHAVIORAL AND ECOLOGICAL ASPECTS OF HUMAN NUTRITION. (3)
This course will examine the social ecology of human nutrition using the evolutionary perspective. It will apply the concepts and principles of social science to the study of human nutrition. The course serves also as an introduction to nutritional anthropology. Discussions will focus on the origins of the human diet; human dietary adaptation to diverse ecological and technological situations; social, cultural, behavioral and ecological factors that influence dietary choices in primitive, peasant, modernizing and contemporary societies; and methodological issues in studying food habits and assessing nutritional status. Among the topics that may be addressed are: social, cultural, and psychological factors involved in eating disorders; infant feeding cross-culturally; causes of malnutrition in the Third World as well as in developed countries; ethnic variation in food ideology and food habits; issues in the applicability of anthropometric measures to diverse populations and culturally appropriate approaches to nutritional change. Prereq: Consent of instructor. (Same as BSC 774.)

### ANT 776 SEMINAR IN DEPENDENCY BEHAVIOR. (3)
The course is designed to explore theories of dependency behavior by examining the concept of dependency as it can be applied to the study of various phenomena including alcohol use and abuse; dependency on other psychoactive substances; institutional dependency; dependency in work settings; and poverty and welfare. Prereq: Consent of instructor. (Same as SOC/PSY/BSC 776.)

### ANT 790 RESEARCH PROBLEMS IN ANTHROPOLOGY. (1-6)
Intensive study in the fields of physical anthropology, archaeology and ethnology with qualified staff members. May be repeated to a maximum of nine credits. Prereq: Admission into the graduate program.

### APP Appalachian Studies

#### APP 200 INTRODUCTION TO APPALACHIAN STUDIES. (3)
A multidisciplinary introduction to Appalachian culture, history and society. Examines how Appalachia came to be viewed as a distinct region; looks at its place in American life.

### ARC Architecture

#### ARCHITECTURAL STUDIO SEQUENCE

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC 825 DRAWING STUDIO I.</td>
<td>(1)</td>
<td>Focuses on the rigor of observational drawing. Structure, contour, line, and color are explored through study of the human body with attention to their application to the architectural experience. Studio, three hours per week. Prereq: Admission to the College.</td>
</tr>
<tr>
<td>ARC 826 DRAWING STUDIO II.</td>
<td>(1)</td>
<td>A continuation of Drawing Studio I with further development of the themes of two-dimensional representation integral to the architectural experience. Studio, three hours per week. Prereq: ARC 825.</td>
</tr>
<tr>
<td>ARC 827 RE-PRESENTATION.</td>
<td>(2)</td>
<td>A review of the twentieth century tectonic themes through readings and visual analyses and an interpretation and re-presentation of these themes looking toward new plastic expressions. Prereq: ARC 860.</td>
</tr>
<tr>
<td>ARC 860 TECHNICS AND KINEMATICS I.</td>
<td>(4)</td>
<td>Full-scale, three-dimensional construction, investigations of two-dimensional expression, analysis of texts, and writing as the means to explore theoretical constructs. Lecture, one hour; studio, two hours per week. Prereq: Admission to the College.</td>
</tr>
<tr>
<td>ARC 861 BASIC ARCHITECTURAL DESIGN I.</td>
<td>(4)</td>
<td>Exploration of varieties of architectural experiences through tectonics and individual experimentation. Studio, eight hours per week. Prereq: Admission to the College of Architecture.</td>
</tr>
<tr>
<td>ARC 862 BASIC ARCHITECTURAL DESIGN II.</td>
<td>(4)</td>
<td>A continuation of Basic Architectural Design I with further exploration of tectonics and experimentation as vehicles for the creation of architectural experiences. Studio, eight hours per week. Prereq: ARC 861 with at least a grade of C.</td>
</tr>
<tr>
<td>ARC 863 ARCHITECTURAL DESIGN STUDIO I: MODERN SPACE.</td>
<td>(6)</td>
<td>Offers the student an understanding of architectural language based on the new hypotheses about space proposed by Cubism and Neoplasticism. Projects explore their aesthetic and poetic possibilities, with an emphasis on coherence in space, structure, and program. Studio, twelve hours per week. Prereq: ARC 862 with at least a grade of C.</td>
</tr>
<tr>
<td>ARC 864 ARCHITECTURAL DESIGN STUDIO II: SINGLE AND MULTIPLE OBJECTS.</td>
<td>(6)</td>
<td>Extends the consideration of the issues related to the isolated object to that object upon its multiplicity, introduces the issues of site and context, and focuses attention on strategies to obtain thematic unity in a manner that enables the student to develop an architectural language. Studio, twelve hours per week. Prereq: ARC 863 with at least a grade of C.</td>
</tr>
<tr>
<td>ARC 865 ARCHITECTURAL DESIGN STUDIO III: CONTEXT.</td>
<td>(6)</td>
<td>Emphasizes the problems of site and context and the way they influence the specificity of the object as well as the programmatic strategies. Studio, 12 hours per week. Prereq: ARC 864 with at least a grade of C.</td>
</tr>
<tr>
<td>ARC 866 ARCHITECTURAL DESIGN STUDIO IV: TRANSFORMATION AT THE LARGE SCALE.</td>
<td>(6)</td>
<td>Explores the relationship between one type of unit and another, between a type of unit and a series, between the aggregation of a series and the structural integrity and unity of a building, and between a building’s image, scale, and context. Studio, 12 hours per week. Prereq: ARC 865 with at least a grade of C.</td>
</tr>
<tr>
<td>ARC 867 ARCHITECTURAL DESIGN STUDIO V: COMPLEX PROGRAM IN COMPLEX CONTEXT.</td>
<td>(6)</td>
<td>Explores the dialogue between the functional requirements of a complex program and its context through a consideration of the program and the constraints of the site and a detailed development of a portion of the project. Studio, twelve hours per week. Prereq: ARC 866 with at least a grade of C.</td>
</tr>
</tbody>
</table>
ARC 868 ARCHITECTURAL DESIGN STUDIO VI: A PIECE OF THE CITY. (6)
Confronts the problem of the design of public space in the urban and/or suburban fabric of the city and explores the transformation of a fragment of the city through a socially responsive project. Studio, twelve hours per week. Prereq: ARC 867 with at least a grade of C.

ARC 869 ARCHITECTURAL DESIGN STUDIO VII: READING THE OBJECT. (6)
Presents the theme of an object with restrained scale in order to permit the evaluation and refinement of the knowledge, methods of design, and skill at the student’s disposal after four years of study. Studio, twelve hours per week. Prereq: ARC 868 with at least a grade of C.

ARC 870 ARCHITECTURAL DESIGN STUDIO VIII: RECAPITULATION. (6)
A continuation of the evaluation and refinement of knowledge, methods of design, and skills, which was begun in ARC 869 with the opportunity for independent investigation. Studio, twelve hours per week. Prereq: ARC 869 with at least a grade of C.

ARC 901 ARCHITECTURAL DESIGN THESIS (6)
Supervised individual exploration of an architectural problem which permits the student to demonstrate his competence as a designer of buildings and to formalize a coherent personal view of architecture. Studio, twelve hours per week. Prereq: ARC 869 and ARC 899 with at least grades of C.

HISTORY AND THEORY OF ARCHITECTURE SEQUENCE

ARC 101 INTRODUCTION TO ARCHITECTURE. (3)
An introductory course for students not enrolled in the College of Architecture. Familiarizes students with the profession with emphasis on understanding architectural theory, design, and practice through the study of critical issues in architecture and their relationships to society and culture.

ARC 120 INTRODUCTION TO THE HISTORY AND THEORY OF ARCHITECTURE. (3)
Introduces recurrent themes in the history and theory of architecture through an examination of seminal examples from different cultures in various historical periods and serves as an introduction to surveys of the history and theory of architecture. Prereq: Admission to College of Architecture or permission of dean.

ARC 121 HISTORY AND THEORY OF ARCHITECTURE I. (3)
The first of four courses in the survey of the history and theory of architecture in the West, with attention to the achievements in Mesopotamia and Egypt, the empires of the Greeks and Romans, and medieval Europe. Prereq: ARC 120.

ARC 122 HISTORY AND THEORY OF ARCHITECTURE II. (3)
Introduces the architecture of the Renaissance and baroque architecture, with emphasis on the seminal Italian contributions as a basis for the investigation of regional varieties elsewhere and the influence of the heritage on contemporary issues in design. Prereq: ARC 121.

ARC 223 HISTORY AND THEORY OF ARCHITECTURE III. (3)
Introduces the developments in architecture and theory in the Enlightenment, the nineteenth century, and the early twentieth century. Prereq: ARC 222.

ARC 324 HISTORY AND THEORY OF ARCHITECTURE IV. (3)
Continues the investigations of the history and theory of architecture in the twentieth century. Prereq: ARC 223.

ARC 325 THEORIES OF URBAN FORM. (3)
An investigation of the factors and a consideration of the theories which have affected urban form.

ARC 589 AMERICAN LANDSCAPES. (3)
A review and analysis of America’s vernacular landscapes. Topics include: the history of settlement by Europeans, Africans, and others; evolving political allegiances; and the expansion of agricultural and industrial technologies in the context of diverse physical environments. The role of political philosophy in landscape development and historic preservation will be highlighted. Prereq: GEO 172 or consent of instructor. (Same as GEO 490G).

ARC 820 STUDIES IN HISTORY AND THEORY OF ARCHITECTURE I: THEORIES. (3)
A series of seminars devoted to investigations of theories of architecture. Prereq: ARC 324.

ARC 821 STUDIES IN HISTORY AND THEORY OF ARCHITECTURE II: URBAN FORM. (3)
A series of seminars devoted to investigations of topics in urban forms. Prereq: ARC 325.

ARC 822 STUDIES IN HISTORY AND THEORY OF ARCHITECTURE III: TECHNIQUES. (3)
A series of seminars devoted to investigations of the means by which architecture is made. Prereq: ARC 324.

STRUCTURAL DESIGN AND ANALYSIS

ARC 830 STRUCTURAL DESIGN AND ANALYSIS I. (3)
Conception of building forms and behaviors as total structural systems and major subsystems. The use of mathematics and physics to determine forces, stresses, and deformations in structural systems. Prereq: MA 109 or 123, MA 112 and PHY 201 or their equivalents.

ARC 831 STRUCTURAL DESIGN AND ANALYSIS II. (3)
A continuation of ARC 830 with an introduction to computer-aided analysis. Prereq: ARC 828 and ARC 830.

ARC 832 STRUCTURAL DESIGN AND ANALYSIS III. (3)
Design of steel structures and timber structures. Prereq: ARC 831.

ARC 833 STRUCTURAL DESIGN AND ANALYSIS IV. (3)
Design of reinforced concrete structures, masonry structures, and foundations. Prereq: ARC 832 or consent of instructor.

MATERIALS AND METHODS OF CONSTRUCTION

ARC 829 MATERIALS AND METHODS OF CONSTRUCTION. (3)
Introduces the art and technics of building, with attention to their influence on the formal language of architecture. Considerations of the properties of materials and methods of construction through analyses of selected works, lectures, and tours of construction sites.

ARC 836 BUILDING SYSTEMS INTEGRATION. (3)
A continuation of ARC 829, with an emphasis on the integration of materials, structural systems, and environmental controls. Detailed investigations of the interpretation and employment of materials and systems of construction, with attention to the manner in which they order architecture. Prereq: ARC 829 and ARC 835; coreq: ARC 833.

ENVIRONMENTAL CONTROLS

ARC 834 ENVIRONMENTAL CONTROLS I. (3)
Introduces concepts of the luminous, thermal, and acoustical environment and the mechanical and electrical systems of buildings. Prereq: PHY 203.

ARC 835 ENVIRONMENTAL CONTROLS II. (3)
A continuation of ARC 834. Prereq: ARC 834.

PROFESSIONAL PRACTICE

ARC 850 PROFESSIONAL PRACTICE. (3)
Professional and ethical responsibility to profession and community; procedural matters pertaining to practice and management.

ADVANCED ARCHITECTURAL PROBLEMS SEQUENCE

ARC 828 COMPUTERS AND ARCHITECTURE. (3)
Introduces computers with an emphasis on the exploration of their applications in architecture. Students will be exposed to the creative potential of computers in design as well as to their analytic capabilities. Lecture, two hours; laboratory, three hours per week.

ARC 899 THESIS RESEARCH. (3)
Supervised investigation which is intended to identify the salient issues which will be addressed in the thesis and to provide a rationale for the student’s approach to these issues. Prereq: ARC 868 with at least a grade of C and approval of the faculty advisor for the thesis.

ARC 912 INDEPENDENT STUDY. (3)
Supervised, independent investigations of selected topics in architecture. May be repeated to a maximum of nine credits when topics differ sufficiently. Prereq: Written consent of instructor.
ARCH 602 DYNAMICS OF HISTORIC PRESERVATION: LAW, LAND USE PLANNING AND ECONOMICS. (3)
A sequel to DMT 589, this course is an advanced examination of the history, theory, and legal and economic aspects of architectural preservation. Course readings and discussions will address issues on preservation legislation, the planning process, historic districts and landmarks, tax and economic incentives for preservation/ restoration, and rural and urban real estate. Practicing professionals to serve as guest speakers. Prereq: DMT 589 or consent of instructor.

ARCH 610 AMERICAN ARCHITECTURE I. (3)
This course will trace the development of architecture from its first appearance in colonial America through its evolution in the early republic until 1860. Vernacular as well as monumental architecture will be examined, and the contributions of craftsmen and the influences of styles in Europe will be assessed. Investigations of well-known examples will provide the student with a basis for the evaluation of more anonymous examples of architecture.

ARCH 611 AMERICAN ARCHITECTURE II. (3)
This course, which will provide a sequel to American Architecture I, will trace the development of modern architecture through an examination of the works of prominent architects, beginning with the triumvirate of the greatest American architects - Richardson, Sullivan, and Wright - and continuing with the Saarinen, Mies van der Rohe, and Kahn. Influences on the evolution of the Modern Movement will be investigated, as will recent responses such as post-modern architecture. Prereq: ARC 610 or consent of instructor.

ARCH 612 DOCUMENTATION OF HISTORIC BUILDINGS AND SITES. (3)
This course will be an introduction to the techniques for the documentation of historic architecture and sites. Among the methods of documentation to which the students will be introduced will be the location and interpretation of deeds, tax rolls, wills, photographs, and other primary sources, as well as the analysis of architectural evidence for determination of the chronology of construction. Field investigations, descriptions and drawings will provide practical experience.

ARCH 613 HISTORICAL STRUCTURAL SYSTEMS AND BUILDING MATERIALS. (3)
An introduction to basic principles of traditional construction in stone, masonry, wood, and cast iron. The student will gain an understanding of the structural systems used with each of these building materials by preparing drawings and/or studying such details as floor and roof framing, window and stair construction, and finishes. The course concludes with a discussion of traditional mechanical systems and strategies for inserting modern systems in older buildings.

ARCH 616 PRESERVATION DESIGN STUDIO. (6)
An introductory studio in architectural preservation, using sites in Kentucky. Design projects in restoration/preservation and adaptive reuse of historic structures, new urban infill structures, and new structures within historic urban and rural contexts. Individual and team projects, involving interaction with local preservation and planning groups. Lecture, two hours; studio, 12 hours per week. Prereq: Enrollment in program or consent of instructor.

ARCH 699 SUMMER INTERNSHIP. (1-6)
Summer internship either in or out of Kentucky, providing intensive, practical experience in historic preservation. Internships for which the student can apply in other states or countries will be encouraged to provide practical experience outside of Kentucky, and work at several sites is possible. Possible internship programs include those offered by the Smithsonian Institution, National Park Service, or in various foreign countries, depending on the student’s interest and subject to approval of the Director. Prereq: Two semesters of course work or consent of the Director.

ARCH 702 CASE STUDIES IN PRESERVATION. (3)
An elective seminar in which case studies of significant local, regional, national and international preservation projects will be presented, analyzed and evaluated. Site visits, lectures by preservationists, architects, developers, and agency officials. Case studies will vary each semester, focusing upon preservation projects of current interest, including individual structures, rural and urban preservation, and community preservation planning. Interaction with groups, analysis projects, student presentations. Prereq: DMT 589 and ARC 602 or consent of instructor.

ARCH 720 INTERPRETATION OF HISTORIC BUILDINGS AND SITES. (3)
This course addresses the issues and problems involved in documenting and re-establishing historic buildings and sites as local/national museums. Students will examine museum types, methods of interpretation, and concerns for the handling and displaying of historic materials. Students will discuss house museums in a larger historical context, including social and political history. The course is especially recommended for students with curatorial and restoration interests. Prereq: Consent of instructor.

ARCH 721 HISTORIC ARCHITECTURE AND CULTURAL LANDSCAPES. (3)
This course will review Kentucky’s architectural tradition - both high style and vernacular - within the perspective of historical development and ecological setting. It will include discussion of historic migration patterns and the diffusion of ideas from east coast culture heartlands. Emphasis will be placed upon understanding how the built and physical environments became the context for cultural landscape development. Rural, small town, and urban landscapes will be examined.

ARCH 722 HISTORIC PROPERTIES MANAGEMENT AND ADMINISTRATION. (3)
A practical introduction to the management of historic structures, sites, and small museums with particular stress on administration - including budget preparation, grant writing, trustee relations, volunteers, and members - together with collection development, management, curatorship, and conservation. Case studies of selected museums will be utilized. Much of this course will apply to the operation of other types of nonprofit preservation organizations.

ARCH 723 KENTUCKY ARCHITECTURE AND CULTURAL LANDSCAPES. (3)
This course will review Kentucky’s architectural heritage - both high style and vernacular - within the perspective of historical development and ecological setting. It will include discussion of historic migration patterns and the diffusion of ideas from east coast culture heartlands. Emphasis will be placed upon understanding how the built and physical environments became the context for cultural landscape development. Rural, small town, and urban landscapes will be examined.

ARCH 724 ADVANCED HISTORICAL STRUCTURAL SYSTEMS AND BUILDING MATERIALS CONSERVATION. (3)
A practical discussion of the most effective methods for conserving buildings, organized by building material - wood, masonry, metals, and glass. Readings will be supplemented by site visits and discussion of actual projects. Prereq: ARC 613 or consent of instructor.

ARCH 725 PRESERVATION PRACTICUM. (3)
An in-semester practicum with a state or local agency, private firm or university research unit to provide the student with intensive, practical experience in historic preservation. Students will execute a learning contract with the Preservation Program Director and prospective employer detailing the work they will carry out, identifying achievable, measurable learning objectives, specifying the criteria by which their work will be evaluated, and setting meetings dates with the participating parties to chart their progress. Prereq: Two semesters of course work or consent of the Director.

ARCH 726 AMERICAN MATERIAL CULTURE. (3)
Survey of approaches to the study of American material culture by various academic disciplines such as history, geography, anthropology, interior design, folklore and architecture. First half of course will review how the various disciplines study material culture. Second half will present ways in which various approaches can be combined to restore, interpret, furnish, and landscape historic structures and sites. Specific examples will be provided on a case study basis.

ARCH 728 HISTORIC LANDSCAPE AND GARDEN RESTORATION AND INTERPRETATION. (3)
Building on the discussions of rural preservation and landscape analysis found in earlier courses, this course will focus on the principles and techniques of landscape restoration and interpretation at various scales from restoration of previously existing gardens to documentation of entire landscapes. Prereq: DMT 589, ARC 610, 611, or consent of instructor.

ARCH 750 ARCHITECTURE DESIGN STUDIO. (6)
An advanced studio in architectural design for students with academic preparation in architecture who intend to practice as architects specializing in preservation. Projects include adaptive reuse of historic structures and the design of new structures within historic contexts, using sites in Kentucky as a case for investigation. Individual and team projects of public interest, involving interaction with local preservation and planning groups and other professional and academic disciplines. Lecture, two hours; studio, 12 hours per week. Prereq: B.Arch. or equivalent or consent of instructor.
ARC 790 FINAL PROJECT. (6)
This project is designed to serve as the capstone of the student's experience in the program. Chosen in consultation with and evaluated by the Graduate Committee and the Director, the project will reflect the student's major interest. For this reason, many types of projects could be chosen, including design projects, research in architectural history, or exercises in practical preservation planning. Prereq: 39 hours of course work or consent of instructor.

ART 100 INTRODUCTION TO ART. (3)
This course is open to all University students interested in an understanding and appreciation of the visual arts. The formal and expressive qualities of major art forms are examined through lectures and presentations.

ART 191 ART PROFESSIONS. (1)
Lectures and discussions on the various art professions as they affect the student, the professional artist, the art historian, the art educator, and the community. May be repeated to a maximum of eight hours.

ART 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

ART 768 RESIDENCE CREDIT FOR MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

ASC Animal Sciences

ASC 106 INTRODUCTION TO ANIMAL SCIENCES. (3)
Relationships of food production and consumption to income of humans throughout the world; major livestock (beef and dairy cattle, sheep, swine, poultry and horses) production areas of the world; relationships between live animal merit and yield of retail cuts of meat; identification of skeletal components; identification and functions of reproductive and digestive tract components; characteristics of breeds of beef and dairy cattle, sheep, swine, poultry and horses.

ASC 120 INTRODUCTORY ANIMAL SCIENCE LABORATORY. (1)
Provides a laboratory for training students in the basic concepts of livestock production. Students will identify breeds, analyze daily feed allowances, study anatomy and external part nomenclature, observe behavioral characteristics and develop annual management plans for cattle, sheep, swine, poultry and horses produced for food, fiber and recreation. Students will learn to evaluate animals for food, fiber and recreational purposes. To complete the total production cycle, students will participate in food and fiber processing exercises. Laboratory, three hours per week. Prereq. or concur: GEN 106.

ASC 300 MEAT SCIENCE. (5)
A historical perspective of the meat industry together with major changes in body type and composition in both the live animal and its end product meat. Students will evaluate live market animals (swine, cattle, sheep) and follow their carcasses and cuts through fabrication and distribution channels. Major topics of discussion will focus on growth, development, nutrition, meat cookery, meat selection, health issues and consumer information. Prereq: ASC 106 or FSC 107.

ASC 301 LIVESTOCK SELECTION AND EVALUATION. (3)
Selection principles of purebred and commercial beef cattle, sheep, swine and horses. Evaluation of live animal and carcass characteristics of beef cattle, sheep and swine. Emphasis placed on oral reasons. Laboratory, six hours. Not open to freshmen. Prereq: or concur: GEN 106, BIO 104, CHE 230 or CHE 236.

ASC 303 EVALUATION AND GRADING OF MEATS. (2)
A detailed consideration of the factors involved in the selection, grading and evaluation of carcasses and wholesale cuts of beef, pork and lamb. Specific emphasis will be given to cuts, quality and maturity as they relate to palatability and acceptability by the consumer. Laboratory, four hours. Prereq: ASC 304 or FSC 306.

ASC 309 ADVANCED EVALUATION AND GRADING OF MEAT. (2)
Further consideration of the factors involved in selecting, grading and evaluating carcasses and wholesale cuts of beef, pork, and lamb. Emphasis will be placed on writing reasons. Laboratory, four hours. Prereq: ASC 303 or consent of instructor.

ASC 310 EQUINE ANATOMY AND CONFORMATION. (2)
Anatomy of the horse with emphasis on the feet and legs. Topics will also include analysis of gaits, movement and the causes of common unsoundness with particular attention to the relationship between conformation and soundness and the application of visual appraisal to the selection of horses for performance and breeding. Prereq: ASC 106 and ASC 120.

ASC 311 ADVANCED EQUINE EVALUATION. (1)
Advanced study of conformation and performance in the horse. Selection of horses of different breeds based on conformation, breed character and movement. Emphasis will be placed on developing a knowledge of industry standards and preparation of oral reasons. Prereq: ASC 310.

ASC 312 ADVANCED LIVESTOCK SELECTION AND EVALUATION. (2)
Selection of purebred and commercial beef cattle, sheep, swine and horses. Special emphasis on oral reasons, livestock contest procedures and herd improvement principles. Laboratory, six hours. Prereq: ASC 301 or consent of instructor.

ASC 320 EQUINE MANAGEMENT. (3)
Study of the basic principles associated with horse management. Topics will include equine behavior, equine diseases and herd health programs, facilities and environmental management, nutrition and feeding management. Prereq: ASC 106 and ASC 120.

ASC 321 DAIRY CATTLE EVALUATION. (2)
Evaluation of dairy cattle for type characteristics. Laboratory, four hours.

ASC 323 ADVANCED DAIRY CATTLE EVALUATION. (1)
Open only to those who have consent of instructor. Laboratory, two hours. Prereq: ASC 321.

ASC 340 POULTRY PRODUCTION. (3)
A study of the application of avian biology to modern poultry production. Topics include anatomy, physiology, reproduction, incubation and embryonic development, breeding and genetics, nutrition and feeding, disease control, housing and environmental control, management, poultry and egg products, and the structure of the poultry industry. For majors and non-majors. Prereq: ASC 106 or equivalent.

ASC 360 GENETICS. (3)
The basic principles of heredity as currently understood from evidence accumulated in classical, cytogenetic, molecular, and quantitative genetic experiments. Emphasis is placed on a thorough understanding of genetic principles and the relationship of genetics to all biological disciplines. Prereq: Six credits in biological sciences and one course in general chemistry. (Same as ABT/ENT 360.)

ASC 362 ANIMAL BREEDING. (3)
Study of roles of selection and mating systems for production of genetically superior livestock populations. Prereq: ASC 360.

ASC 364 REPRODUCTIVE PHYSIOLOGY OF FARM ANIMALS. (3)
Introduction to the anatomical and physiological processes of farm animal reproduction. Evaluation of management procedures as they relate to reproductive physiology. Prereq: GEN 106, BIO 104, CHE 230 or CHE 236.

ASC 378 ANIMAL NUTRITION. (3)
A fundamental study of the nutrients, their utilization and their role in the animal. Prereq: CHE 230 or 236.

ASC 380 FEEDS AND FEEDING. (3)
The composition and nutritional characteristics of common feedstuffs. The digestive systems, nutritional requirements, formulated rations and economical feeding programs for farm animals. Lecture, two hours; laboratory, two hours. Prereq: ASC 378.

ASC 382 PRINCIPLES OF LIVESTOCK NUTRITION. (3)
A study of the basic principles of livestock nutrition and the application of these principles in the use of various feeds and products in the feeding of beef cattle, dairy cattle, horses, sheep and swine— including the study of tables of nutrient requirements and feed composition and detailed study on the systematic balances of daily rations and formulation of feed mixtures. Lecture, two hours; laboratory, two hours per week. For nonmajors only.

ASC 395 SPECIAL PROBLEM IN ANIMAL SCIENCE/FOOD SCIENCE. (2)
Course designed for students interested in pursuing independently some specific problem. May be repeated for maximum of four credits. Prereq: Consent of Instructor. (Same as FSC 395.)
ASC 399 EXPERIENTIAL LEARNING IN ANIMAL SCIENCES/FOOD SCIENCE. (1-6)
A field-based learning experience in animal sciences and food science under the supervision of a faculty member. May be repeated to a maximum of six credits as an elective on a pass/fail basis. Prereq: Consent of instructor and department chairperson and completion of a departmental learning contract before registration. (Same as FSC 399.)

ASC 404G SHEEP SCIENCE. (4)
History and importance of the sheep industry; application of the principles of selection, breeding, feeding and management of sheep for efficient lamb and wool production. Lecture, two hours per week; laboratory, four hours per week. Prereq: ASC 300, ASC 362, ASC 364 and ASC 380 or consent of instructor.

ASC 406 BEEF CATTLE SCIENCE. (4)
Scope and importance of the beef cattle industry; roles of the major cattle breeds and organizations associated with the beef cattle industry; application of equipment, identification, nutrition, reproduction, genetics, health, marketing, taxation and management principles to beef cattle production; impact of current economic, social, and environmental issues on the beef cattle industry. Prereq: ASC 300, ASC 362, ASC 364, ASC 380.

ASC 408G SWINE SCIENCE. (3)
A study of scope and importance of the swine industry. The application of the principles of selection, reproductive physiology, breeding, nutrition, housing, environment and management to the modern production of swine. Lecture, two hours; laboratory, two hours. Prereq: ASC 300, ASC 362, ASC 364, and ASC 380.

ASC 410G HORSE SCIENCES. (3)
Detailed study of the anatomy and physiology of the horse as they relate to the nutrition, reproduction, athletic ability, soundness and control of diseases and parasites. Lecture, two hours; laboratory, two hours. Prereq: ASC 362, ASC 364, and ASC 380.

ASC 420G DAIRY CATTLE SCIENCE. (3)
Scope and importance of the dairy cattle industry; selection, breeding, housing, feeding and management of dairy cattle. Lecture, two hours; laboratory, two hours. Prereq: ASC 362, ASC 364, and ASC 380.

ASC 462G ARTIFICIAL INSEMINATION AND FERTILITY OF FARM ANIMALS. (2)
A course designed to acquaint students with current methods of applying artificial insemination to the improvement of farm animals with special reference to cattle. Emphasis will be on management of herds for maximum fertility. Lecture, one hour; laboratory, two hours per week. Prereq: ASC 364 and permission of instructor.

ASC 470 CAPSTONE FOR ANIMAL AGRICULTURE. (3)
Discussion of the importance of livestock production to society and consideration of major issues impacting animal agriculture. Principles and practices learned in disciplinary and commodity Animal Sciences courses are integrated into a unified perspective, and the scientific method is employed as an approach to problem analysis and resolution. Refinement of skills in critical thinking, information gathering, writing, and oral communication is emphasized. Prereq: Senior standing in College of Agriculture, Animal Sciences major.

ASC 564 MILK SECRETION. (3)

ASC 580 PRINCIPLES OF ANIMAL NUTRITION. (3)
The chemistry and physiology of animal nutrition and the nutritive requirements for growth, fattening, reproduction, lactation, and other body functions. Prereq: ASC 378 and ASC 380 or graduate standing.

ASC 601 MAMMALIAN ENDOCRINOLOGY. (3)
An introduction to the basic anatomy, physiology and biochemistry of endocrine systems with emphasis on mechanisms of hormone synthesis, secretion and action. Lectures and reading assignments will focus on endocrine function in mammalian species, including laboratory animals, humans and livestock. Prereq: BCH 401G and BIO 350 or equivalents. (Same as PGY 601.)

ASC 630 ADVANCED MEAT SCIENCE. (4)
Advanced meat science with special reference to the histological, chemical, physical and microbiological properties as they relate to meat quality, organoleptic acceptability and processing procedures. Lecture, three hours; laboratory, two hours. Prereq: ASC 304, ASC/FSC 360 or equivalent; one course in histology or biochemistry or consent of instructor. (Same as FSC 630.)

ASC 660 BIOLOGY OF REPRODUCTION. (3)
Advanced study of current topics in reproductive biology. The course is comprised equally of student-led discussions and lectures given by faculty with research expertise in selected topics. Readings will be taken from current and classic literature. Topics covered include (but are not limited to) molecular and cellular endocrinology, hormone receptors and mechanism of action, reproductive neuroendocrinology, reproductive behavior, gametogenesis, fertilization, sexual differentiation, puberty, menopause and environmental effects on reproduction. Emphasis will be placed on the analysis and understanding of the experimental basis for current concepts in reproductive biology. Prereq: ASC/PGY 601 and ASC 364 or BIO/PGY 502 or consent of instructor. (Same as PGY 660 and ANA 660.)

ASC 664 ADVANCED ANIMAL BREEDING. (3)
Advanced study of selection and mating system theory applicable to production of genetically superior livestock populations. Prereq: ASC 362 and STA 570; STA 671 and STA 672 desirable.

ASC 680 LABORATORY METHODS IN NUTRITIONAL SCIENCES. (4)
The use of laboratory techniques and instrumentation in the solution of fundamental problems of nutrition. Lecture, one hour; laboratory, six hours. (Same as NS 680.)

ASC 681 ENERGY METABOLISM. (2)
An in-depth discussion of nutritional energetics, from the standpoint of factors which influence the utilization of dietary energy. A critical review of current literature. Prereq: ASC 378 or equivalent, BCH 502 or equivalent or consent of instructor.

ASC 682 MICROBIAL ECOLOGY OF DIGESTION. (4)
Principles of microbiology as they relate to nutrition and digestion in ruminant and nonruminant animals. Procedures for cultivation, isolation and characterization of anaerobic bacteria from the gastrointestinal tract. Methods for measuring and evaluating microbial growth and activity in the gastrointestinal tract. Lecture, two hours; laboratory, four hours. Prereq: BIO 476G or equivalent and consent of instructor.

ASC 683 PROTEIN METABOLISM. (2)
A study of the principles and present concepts of protein and amino acid nutrition and metabolism in the animal. Prereq: Graduate level biochemistry.

ASC 684 ADVANCED RUMINANT NUTRITION. (3)
Principles of ruminant metabolism in the utilization of feedstuffs for meat, milk, and wool production. Prereq: ASC 682 and two or more courses from ASC 681, ASC 683, ASC 685 and ASC 687 or consent of instructor.

ASC 685 MINERAL METABOLISM. (2)
An in-depth review of the function, requirement deficiency and toxicity of mineral elements in nutrition. Emphasis on the interactions between elements and current literature will be made. Prereq: ASC 378 or NFS 510 or equivalent, BCH 502 or equivalent or consent of instructor. (Same as NFS 685.)

ASC 686 ADVANCED NONRUMINANT NUTRITION. (3)
A study of nutrient utilization as influenced by ingestion, absorption and metabolism with emphasis on swine and poultry. Prereq: One course each in nutrition and biochemistry.

ASC 687 VITAMIN METABOLISM. (2)
Detailed study of the metabolism of vitamins and the role of vitamins in the metabolism of carbohydrates, proteins, lipids, and minerals. Prereq: BCH 502 or CHE 552 or consent of instructor.

ASC 688 EQUINE NUTRITION. (2)
Detailed study of anatomical, physiological and microbiological factors influencing the nutritive requirements of the equine for maintenance, growth, reproduction, lactation and work. Prereq: One course in nutrition and physiology or biochemistry or consent of instructor.

ASC 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

ASC 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

ASC 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.
ASC 769 RESIDENCE CREDIT
FOR THE DOCTOR’S DEGREE. 
(0-12)
May be repeated indefinitely.

ASC 771 ANIMAL SCIENCE SEMINAR. 
(1)
May be repeated twice for a maximum of three credits.

ASC 780 SPECIAL PROBLEMS
IN ANIMAL DERIVED FOODS. 
(1-4)
May be repeated for a maximum of nine credits. Prereq: Consent of graduate adviser. 
(Same as FSC 780.)

ASC 781 SPECIAL PROBLEMS IN
GENETICS AND ANIMAL BREEDING. 
(1-4)
May be repeated to a maximum of nine credits. Prereq: Consent of graduate adviser.

ASC 782 SPECIAL PROBLEMS IN ANIMAL NUTRITION. 
(1-4)
May be repeated to a maximum of nine credits. Prereq: Consent of graduate adviser.

ASC 783 SPECIAL PROBLEMS IN REPRODUCTIVE
PHYSIOLOGY (Subtitle required). 
(1-4)
Intensive study or investigation of topics in physiology not covered in formalized courses. May be repeated under different subtitle to a maximum of nine credits. Prereq: Consent of graduate adviser.

ASC 790 RESEARCH IN ANIMAL DERIVED FOODS. 
(1-6)
Problems involving original investigation. May be repeated for a maximum of nine credits. Prereq: Consent of graduate adviser. 
(Same as FSC 790.)

ASC 791 RESEARCH IN GENETICS
AND ANIMAL BREEDING. 
(1-6)
Problems involving original investigation. May be repeated for a maximum of nine credits. Prereq: Consent of graduate adviser.

ASC 792 RESEARCH IN ANIMAL NUTRITION. 
(1-6)
Problems involving original investigation. May be repeated for a maximum of nine credits. Prereq: Consent of graduate adviser.

ASC 793 RESEARCH IN REPRODUCTIVE
PHYSIOLOGY (Subtitle required). 
(1-6)
Original investigation of mechanisms and problems related to mammalian reproduction. May be repeated under different subtitle to a maximum of nine credits. Prereq: Consent of graduate adviser.

AST 191 THE SOLAR SYSTEM. 
(3)
One part of the two-semester introduction to astronomy. This course is primarily about the nature, origin, and evolution of the planets of our solar system and of their satellites. Special emphasis is given to recent spacecraft studies of the solar system. Related topics include the nature of comets, the uses of astronomical telescopes, and eclipses and other solar phenomena. Prereq: Two years of high school algebra or MA 108R concurrently.

AST 192 GALACTIC AND EXTRA-GALACTIC ASTRONOMY. 
(3)
One part of a two-semester introduction to astronomy. This course concentrates on the universe outside our own solar system. A principle theme is the origins and evolution of stars, of galaxies, and of the universe at large. Highlights include the nature of black holes and quasars, synthesis within stars of the chemical elements essential for life, the Big Bang model of the formation of the universe, and the possible fates of the universe. Prereq: Any AST or PHY course or consent of instructor.

AST 591 ASTROPHYSICS I - STARS. 
(3)
Structure of the universe - an overview: hierarchy of objects, the distance ladder. Stellar structure: hydrostatic equilibrium, energy transport, nuclear energy generation, equilibrium solutions. Stellar evolution: nucleosynthesis, evolution off the main sequence, final stages of stellar life - white dwarfs, supernovae, neutron stars and black holes. Binary stellar systems. Prereq: PHY 361, PHY 416G, PHY 417G. (Same as PHY 591.)

AST 592 ASTROPHYSICS II - THE GALAXY. 
(3)
Interstellar matter: gas and dust, interstellar reddening, absorptions lines, 21 cm observations. Phases of the interstellar medium: HII regions, atomic and molecular clouds. Star formation. Stellar populations. Galactic structure and dynamics: the galactic nucleus, spiral structure, rotation curve, dark matter. Prereq: PHY 591. (Same as PHY 592.)

AST 639 PHYSICAL PROCESSES IN ASTROPHYSICS. 
(3)
A lecture and problem course covering the physical processes encountered in astrophysics. The topics covered will include micro-physical processes in stellar atmospheres and the interstellar medium, high-energy astrophysics, and basic hydrodynamics and shock waves. Prereq: PHY/AST 592 or consent of instructor. (Same as PHY 639.)

AST 640 GALAXIES AND COSMOLOGY. 
(3)
A course covering extra-galactic astronomy and cosmology. Topics include properties of galaxies, active galaxies and quasars. The standard big bang model of the universe will be discussed in detail, including observational cosmology, nucleosynthesis in the early universe and formation of large scale structure. Prereq: PHY/AST 592 or consent of instructor. (Same as PHY 640.)