GEN Agriculture – General

GEN 100 ISSUES IN AGRICULTURE: THE DEVELOPMENT OF MODERN AGRICULTURE. (3) An introductory course requiring critical analysis of the major social, economic, political and scientific issues in agriculture and related disciplines. The historical development of agriculture will be surveyed, followed by discussions of major issues in modern agriculture. Development of skills in information gathering, critical analysis of issues and written and oral communication will be emphasized. Prereq: Freshman enrolled in College of Agriculture.

GEN 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.

GEN 102 THE DYNAMICS OF RURAL SOCIAL LIFE. (3) Introduces major concepts of sociology by exploring social, political and cultural issues confronting rural society and American agriculture, such as: population change, industrialization, energy developments, agricultural change. Student may not receive credit for both this course and SOC 101.

GEN 103 AGRICULTURE PEST AND DISEASE MANAGEMENT. (3) An interdisciplinary study of the importance of agriculture to weeds, plant pathogens, insects, and animal pathogens; methods for managing pests and diseases, including chemical and environmental considerations.

*GEN 104 PLANTS, SOILS, AND PEOPLE: A GLOBAL PERSPECTIVE. (3) A survey of important world grain, oil, fiber, forage, fruit, vegetable and specialty crop plants. Principles of plant, soil and climatic factors governing adaptation and production of these plants are discussed and applied. Intended to provide substantial plant and soil science background for students not majoring in plant and soil science, but is open and should appeal to beginning plant and soil science majors as well.

GEN 105 ENGINEERING APPLICATIONS IN AGRICULTURE. (3) This course is a comprehensive overview of basic engineering principles and technology which have applications in agricultural production and resource management. It is designed for freshman and sophomore students in the College of Agriculture.

GEN 200 ISSUES IN AGRICULTURE: CONTEMPORARY PROBLEMS IN AGRICULTURE AND FORESTRY. (3) An intermediate course which extends the critical analysis of selected issues in agriculture and related disciplines begun in GEN 100. Continues the development of skills in information gathering, critical analysis, and written and oral communication. Students will be required to investigate scientific literature germane to the issues covered and develop reviews, reports and position papers. Prereq: Sophomore enrolled in College of Agriculture.

GEN 300 SPECIAL COURSE. (1-3) Interdisciplinary, topical or experimental courses to be approved by the Dean of the College of Agriculture. A particular course may be offered at most twice under the GEN 300 number, and no GEN 300 course may be given for more than three credits per semester. Open to all University students, subject to such limits or prerequisites as set by the instructor. Hours are variable with each special course. Prereq: As specified by the instructor.

GEN 301 AN INTRODUCTION TO CHINESE CULTURE THROUGH AGRICULTURE. (3) This course is designed to introduce students to basic culture in China. Students will learn about Chinese agriculture, languages, customs, history, the political and educational system, geography and the economy. The culmination of the course is a three-week trip to China. Only students committed to go on trip to China will be enrolled in the course. First priority for the trip is given to College of Agriculture students.

GEO Geography

GEO 130 PHYSICAL GEOGRAPHY. (3) The basic earth environment discussed from the stand point of process. Weather, landforms, climates, vegetation, and soils are emphasized. Fulfills elementary certification requirements for education requirements.
GEO 310 QUANTITATIVE TECHNIQUES IN GEOGRAPHY. (3) The application of spatial techniques geographers use to collect, sample, map, and analyze data in human and physical geography. Students will be introduced to automated data processing. Prereq: STA 200.

GEO 320 GEOGRAPHY OF THE UNITED STATES AND CANADA. (3) A systematic review of the physical, economic, historic, and cultural characteristics that distinguish U.S. and Canadian regions. Topical emphasis on the geographical aspects of regional problems. Prereq: GEO 130 or 152 or 172, or consent of instructor.

GEO 321 LAND, PEOPLE, AND DEVELOPMENT IN APPALACHIA. (3) Major themes revolve around regional diversity and regional development. Major topics examined include physical geography, historical development, economic geography, and population geography. The region to be examined includes the upland areas between Southern New York State and Northern Alabama. Prereq: GEO 130 or 152 or 172, or consent of instructor.

GEO 322 GEOGRAPHY OF KENTUCKY. (3) A study of the cultural, economic, and environmental characteristics of Kentucky. Emphasis is placed on Kentucky geography in a regional and national context. Prereq: GEO 130 or 152 or 172, or consent of instructor.

GEO 324 GEOGRAPHY OF CENTRAL AND SOUTH AMERICA. (3) Examination of the diversity of physical environments in the region, how the processes of physical geography may affect human activity, how Indian cultures developed in varied environmental niches and have been impacted through contact with Europeans, and how current cultures utilize their environment to adapt to the influence of the world economy. Prereq: GEO 152 or 160 or 172.

GEO 326 GEOGRAPHY OF EUROPE. (3) A study of the countries of Europe; their physical characteristics, their cultural endowments, and the expression of these in regional variations in the European landscape. Prereq: GEO 152 or 172.

GEO 328 GEOGRAPHY OF THE MIDDLE EAST AND NORTH AFRICA. (3) A comprehensive overview of the region, emphasizing cultural adaptation to desert environments. The interrelationships among religions, cultures, and the physical environment will be examined. Prereq: GEO 152, GEO 160, GEO 172 or consent of instructor.

GEO 329 GEOGRAPHY OF THE SOVIET UNION. (3) A study of the geography of the Soviet Union with emphasis on the role of socialist location theory, spatial decision making behavior, and ideology. Special consideration of resources and resource use, perception of the environment, and Marxist planning strategies. Prereq: GEO 152 or 172.

GEO 330 GEOGRAPHY OF SOUTH ASIA. (3) A study of the human, economic, and environmental aspects of India, Pakistan, Bangladesh, Himalayan Nepal and Bhutan, and Sri Lanka. Topics include basic physical and cultural regionalisms, land use and population problems, and patterns of economic development involving urbanization, resources, and industrialization. Prereq: GEO 152 or 160 or 172.

GEO 332 GEOGRAPHY OF SOUTHEAST ASIA. (3) A study of the cultural, economic, and political patterns and processes in mainland and insular Southeast Asia. Major themes examined are how the region’s diverse physical geography, uneven natural resource base, cultural diversity, and colonial heritage provide a background to understanding contemporary development. Prereq: GEO 152 or 160 or 172.

GEO 333 GEOGRAPHY OF EAST ASIA. (3) To provide an understanding of the relationships between the physical, historical-cultural, and economic geography of the nations of East Asia. Contemporary development and problems are addressed for the entire region. Primary emphasis on China and Japan. Prereq: GEO 152, GEO 160, GEO 172 or consent of instructor.

GEO 336 GEOGRAPHY OF SUB-SAHARAN AFRICA. (3) A cultural approach to the geography of the region. This course covers the belief systems as well as the physical, economic, and social geography of Africa south of the Sahara. Emphasis is in cultural adaptations to African environments and present-day political problems. Prereq: GEO 152 or 160 or 172.
GEO 495 INTERNSHIP IN CARTOGRAPHY. (6 or 9)
Professional commercial cartography laboratory experience. Awarded competitively. Student assumes an entry level position involving research, production, or pre-press experience under the direction of a corporate operations supervisor. Applicants should request a faculty or University Cartography Laboratory advisor to direct and record the student’s experience for academic credit, and with the advisor’s assistance, file a signed learning agreement with the department chair prior to the start of the internship. Available fall, spring, and summer sessions. Credit: six hours fall and spring; nine hours summer session. Pass-fail only. Students should apply to the Director of Undergraduate Studies at least sixty days before the beginning of each semester. Prereq: Major in geography, GEO 405G and 415. The following courses are also recommended: GEO 505, 506, 507 or 508.

GEO 505 PRACTICUM IN CARTOGRAPHY. (3)
Experience credit in which a small number of advanced students work under the direct supervision of the faculty or staff cartographer and in conjunction with other faculty members on departmental and contracted projects. May be repeated to a maximum of six hours. Prereq: GEO 305 and GEO 405; or GEO 506.

GEO 506 INTRODUCTION TO COMPUTER CARTOGRAPHY. (3)
This course is a basic introduction to numerical cartography and a review of standard computer mapping programs such as CMAP, SYMAP, and SYMVIEW. Emphasis is given to data compilation for machine presentation of cartographic information. Prereq: GEO 305 or permission of instructor.

GEO 507 REMOTE SENSING IN GEOGRAPHY. (3)
A course designed to acquaint the student with a variety of remote sensing techniques and their application in land-use mapping, urban change detection, inventory of natural resources, detection of environmental planning problems. The material is useful to those in agriculture, forestry, earth sciences, and urban studies. Prereq: GEO 305 or consent of instructor.

GEO 508 GEOGRAPHIC INTERPRETATION OF AERIAL PHOTOGRAPHY. (3)
Aerial photography is commonly used as a means of collecting information and enhancing the analysis of the earth’s landscapes. This course provides the technical background necessary to use aerial photography in a research setting and includes the application of the techniques in specialized fields, including agriculture, forestry, geology, and urban studies. Prereq: GEO 305 or equivalent, or consent of instructor.

GEO 509 APPLICATIONS OF GEOGRAPHIC INFORMATION SYSTEMS. (3)
An intermediate course tailored to individual work. The student may either become familiar with several Geographic Information Systems (GIS) or may make intensive use of one system. Actual data will be used and actual spatial problems or issues will be addressed. The student will be responsible for data procurement and input, analysis design, and output production, including maps. May be repeated to a maximum of six credits. Prereq: An introductory GIS course (GEO 409G) or permission of instructor.

GEO 542 POLITICAL GEOGRAPHY. (3)
A study of politico-geographic phenomena in their areal context, such as the analysis of boundaries, geographical patterns resulting from the application of governmental authority, the political viability of state units, and the spatial (territorial) variations and interrelationships of political activities and systems.

GEO 544 POPULATION GEOGRAPHY. (3)
An analysis of population distributions, locational arrangements of growth, densities, and migration flows; spatial relationships between population variables and social, economic, and environmental factors.

GEO 545 TRANSPORTATION GEOGRAPHY. (3)
Examination of the bases for transportation and spatial interaction; structure, growth, and location of networks; analysis of spatial flows. Prereq: GEO 355 or permission of instructor.

GEO 547 GEOGRAPHY OF INFORMATION AND COMMUNICATIONS. (3)
The increasing role of information, communications, and telecommunications in the economic and social transformations in rural and urban areas. Topics include geographic influences on the growth of information industries, the diffusion of innovations and patterns in newspaper, radio and television systems on economic development, and impacts of satellites and computers on information availability. Prereq: GEO 172 or consent of instructor.

GEO 550 GEOGRAPHY OF ENERGY AND NATURAL RESOURCES. (3)
A study of the locational patterns of industrial mineral and energy resources, their uses, the major producers and consumers, resource management and mismanagement. Also the influence of institutional constraints on resource development, conservation efforts, and the implication of resource utilization for quality of the environment. Prereq: GEO 151 or 152 or consent of instructor.

GEO 560 INDEPENDENT WORK IN GEOGRAPHY. (3)
Individual research involving such problems as (1) materials and methods in teaching geography; (2) the historical evolution of geography; (3) map reading and interpretation; (4) special area studies; (5) other topics may be elected by consent of instructor. May be repeated to a maximum of six credits. Prereq: Major and a standing of 3.0 in the department.

GEO 565 TOPICS IN GEOGRAPHY. (3)
Discussion, readings, and papers focusing on relevant topics in geography directed by a staff member having specific competence for the topics under study. Current research developments in particular geographic subfields will be stressed. May be repeated under different subtitles to a maximum of six credits. Prereq: Consent of instructor.

GEO 585 AGING AND ENVIRONMENT. (3)
Explores the elderly person’s changing experience of environment. Physiological, psychological and social changes are related to adjustment within urban and rural community environments, special housing for the elderly, and long-term care environments. Prereq: Graduate or advanced undergraduate standing and consent of instructor. (Same as FAM 585.)

GEO 600 ANALYTICAL METHODS IN GEOGRAPHY. (3)
An introduction to the application of analytical methods to geographic problem solving. Topics cover sampling theory, probability theory and both parametric and nonparametric statistical techniques. Prereq: STA 570 or equivalent or consent of instructor.

GEO 643 URBAN TRANSPORTATION PLANNING. (3)
A detailed review of the transportation planning process; inventory methodologies; trip generation, distribution and assignment with associated mathematical models and theories; prediction of future travel; land and use models; modal split, developing and testing proposed systems; simulation. Prereq: CE 543 or equivalent and STA 381 or 681 or equivalent statistics course. (Same as CE 631.)

GEO 655 SPECIAL STUDY OF SYSTEMATIC GEOGRAPHY. (3)
The application of the methods of systematic geography to particular special studies in topical areas, such as conservation, urban areas, climatology, cartography, or others. May be repeated to a maximum of six hours. Prereq: Appropriate 500-level course work in systematic or topical geography (e.g., conservation, urban, climatology, cartography).

GEO 700 ADVANCED ANALYTICAL METHODS IN GEOGRAPHY. (3)
A survey of the application of multivariate statistical techniques to geographic problem solving. Prereq: GEO 600 or consent of instructor.

GEO 702 CONCEPTS IN GEOGRAPHY. (3)
Contemporary geographic concepts and theories are examined with emphasis on concepts within human geography, especially with reference to the economic, urban, cultural, and population subfields within the discipline. Prereq: Graduate student status.

GEO 707 SEMINAR IN DEVELOPMENT OF GEOGRAPHIC THOUGHT. (3)
An analytical review of the evolution of geographic thought, in terms of concepts, methodologies and scholars, emphasizing the basic literature through a series of topics. Prereq: Geography major or consent of instructor.

GEO 710 RESEARCH METHODS AND METHODOLOGY IN GEOGRAPHY. (3)
A comprehensive review of the problems involved in designing geographical research, planning field work, analysis of data, and in writing geographic reports. Prereq: GEO 560 or equivalent.

GEO 716 TOPICAL SEMINAR IN CULTURAL GEOGRAPHY (Subtitle required). (3)
Study of selected topics on historic preservation, landscape evolution, regionalism, ethnicity, religion, architecture, and settlement. May be repeated to a maximum of nine credits under different subtitles. Prereq: Consent of instructor.
GER 112 ELEMENTARY GERMAN. (3)
Continuation of GER 111 (correspondence course). Prereq: GER 111 or one year of high school German.

GER 201 INTERMEDIATE GERMAN. (3)
Systematic review of grammar and furthering of reading, writing, listening, and speaking skills based upon cultural and literary materials. Prereq: GER 102, or two years of high school German, or equivalent.

GER 202 INTERMEDIATE GERMAN. (3)
Continuation of GER 201. Prereq: GER 201 or three years of high school German, or equivalent.

GER 205 READING AND WRITING PRACTICE. (2)
This course concentrates on the development of reading and writing skills. Students learn to build vocabulary systematically and develop strategies for reading texts of varying kinds and levels of difficulty. Writing assignments ranging from brief descriptions and reports to translations and original compositions enable students to develop and sharpen writing skills. Prerequisite for upper division courses. Prereq or concur: GER 202 or equivalent.

GER 206 ORAL PRACTICE. (2)
This course concentrates on the development of speaking and listening skills. Students learn to negotiate everyday communication situations by acquiring verbal strategies and idiomatic expressions needed for meaningful interaction in a German-speaking environment. Prereq or concur: GER 202 or equivalent.

GER 261 MASTERPIECES OF GERMAN LITERATURE IN TRANSLATION. (3)
Academically and professionally supervised field experience in specific areas of planning and applied geography, for example, in private industry and government. May be repeated to a maximum of nine credits. Prereq: Consent of instructor.

GER 264 THE GERMAN CULTURAL TRADITION II. (3)
An introduction to the social, intellectual and aesthetic tradition of German-speaking cultures from the Enlightenment to the present. Texts in English translation. Films with English subtitles to be viewed outside of regular class time.

GER 268 RESIDENCE CREDIT FOR THE DOCTOR'S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

GER 272 TOPICAL SEMINAR IN SOCIAL AND POLITICAL GEOGRAPHY (Subtitle required). (3)
Examination of selected topics on diffusion of diseases, health care delivery, the elderly, geopolitics, the nation-state, elections, squatters, suburbs, and impacts of technological hazards. May be repeated to a maximum of nine credits under different subtitles. Prereq: Consent of instructor.

GER 277 SPECIAL RESEARCH PROBLEMS IN GEOGRAPHY. (1-6)
Open to doctoral candidates who have the necessary training and ability to conduct research on a selected problem. May be repeated to a maximum of 12 credits. Prereq: Approval of the director of graduate studies.

GER 307 INTERMEDIATE GERMAN COMPOSITION AND CONVERSATION I. (3)
Continuation of GER 306. Prereq: GER 306, or two years of high school German.

GER 308 INTERMEDIATE GERMAN COMPOSITION AND CONVERSATION II. (3)
Continuation of GER 307. Prereq: GER 307, or equivalent.

GER 311 INTRODUCTION TO GERMAN LITERATURE: THEMES (Subtitle required). (3)
An introductory course that explores such themes in German literature as Fathers and Daughters, Authors and Readers. May be repeated once for a total of six credits by nonmajors if theme changes. Prereq: GER 205 or GER 206 or equivalent.

GER 312 INTRODUCTION TO GERMAN LITERATURE: POPULAR FORMS. (3)
An introductory course that focuses on social, political, anthropological and aesthetic aspects of popular forms of German literature. Readings include fairy tales, folk songs and legends, children’s literature, detective stories, comics and other popular literary forms. Prereq: GER 205 or GER 206 or equivalent.

GER 316 MASTERPIECES OF GERMAN LITERATURE II. (3)
Continuation of GER 315. Taught in German. Prereq: GER 311 or GER 312 or equivalent.

GER 317 HISTORY OF GERMAN CULTURE. (3)
An introduction to German culture with emphasis on the epochs important to the development of modern German-speaking countries. Readings in German from philosophy, the sciences, the arts, history, politics and literature. Visual materials documenting high culture and everyday life. Taught in German. Prereq: GER 205 or GER 206 or equivalent.
GER 319 CONTEMPORARY GERMAN LITERATURE AND CULTURE. (3)
Selected works of post-war German literature by Austrian, East and West German, and Swiss authors are read relative to the economic, social, political, artistic, and ideological developments in the four countries of the German-speaking world. Taught in German. Prereq: GER 205 or 206 or equivalent.

GER 361 GERMAN CINEMA. (3)
A history of the cinema in the German-speaking world from its beginnings to the present, emphasizing the evolution of the production, distribution and reception of film in relation to changing political, social, economic, ideological and artistic contexts. Some consideration of film theory and criticism in conjunction with class discussion of individual films. Viewing of films (silent or German dialogue with English subtitles) outside of class is required. Class taught in English.

GER 385 INDEPENDENT WORK IN GERMAN. (3)
This course is designed for students who wish to do advanced work in German on any subject. May be repeated once. Prereq: Major and a standing of 3.0 in the department.

GER 415G MAJOR GERMAN AUTHORS (Subtitle required). (3)
The study of a single author or combination of authors in the social, political and cultural context of their day. Special concerns include the interrelationship between literary production and biography, and author’s relation to literary tradition, and his or her historical as well as current relevance. May be repeated once to a maximum of six credits with a new author or complex of authors. Taught in German. Prereq: GER 311 or 312 or equivalent.

GER 416G GENRES OF GERMAN LITERATURE. (3)
The study of a particular genre in German literature with readings of representative examples and with inquiry into concepts of genre in general. May be repeated once to a maximum of six credits with emphasis on a different genre. Taught in German. Prereq: GER 311 or 312 or equivalent.

GER 420G SPECIAL STUDIES IN GERMAN LITERARY AND CULTURAL HISTORY. (3)
Intensive study of selected topics in German literary and cultural history, such as Fascism, War and Literature, Expressionism in Art and Literature, and German Women Authors: Behond Kinder, Küche, Kirche. Students are encouraged to propose topics. May be repeated once, if topic changes, for a maximum of six credits. Taught in German. Prereq: Senior standing or consent of instructor.

GER 507 ADVANCED GERMAN COMPOSITION AND CONVERSATION. (3)
Further development of conversational skill and practice in writing stylistically appropriate German. Study of finer points of grammar. Discussion of special topics and theme writing. Prereq: GER 308 or equivalent.

GER 520 SPECIAL TOPICS SEMINAR. (3)
Investigation of a topic pertinent to the advanced study of German language, literature and culture. May be repeated once with new topic. Prereq: GER 415G, 416G, 420G or equivalent.

GER 532 HISTORY OF THE GERMAN LANGUAGE. (3)
A survey tracing the development of German from its earliest stages to the present, with introduction to basic concepts of historical linguistics. Prereq: GER 308 or equivalent.

GER 553 THE TEACHING OF GERMAN. (3)
The course is designed for teachers and prospective teachers of modern foreign languages, with emphasis on German. Modern methodology, theory and practice of language pedagogy.

GER 612 STUDIES IN LITERARY THEORY. (3)
Course will explore such fundamental issues as the definition of literature, interpretation and evaluation, the reading process, and literary life from the perspective of competing theoretical systems.

GER 615 STUDIES IN MAJOR AUTHORS. (3)
Explorations into one or several major figures of German literature. Reading of primary texts and pertinent scholarship together with an investigation of the authors’ literary, social, or political significance during contemporary or later periods. May be repeated to a maximum of 12 credits.

GER 616 STUDIES IN GENRE. (3)
One major genre or a group of related genres. Readings in genre theory and in the key texts from various periods; study of the development of forms, techniques, and ideas. May be repeated to a maximum of nine credits.

Note: The series of courses GER 620-630 provides a general framework for the systematic study of German literature in its cultural setting and delimits various issues to be investigated further in corresponding 700-level courses. Readings and discussions focus on documents central to the literary life of a given period and to the understanding of its institutional and biographical basis as well as its regional, sociopolitical, motivational, poetological, and ideological diversity. Each course also emphasizes critical methodology and tools of scholarship and identifies new directions for basic research.

GER 620 STUDIES IN THE MIDDLE AGES. (3)
From Carolingian times to the late Middle Ages.

GER 624 STUDIES IN THE 17TH CENTURY. (3)
The Age of Baroque.

GER 625 STUDIES IN THE 18TH CENTURY. (3)
Enlightenment to Classicism.

GER 629 STUDIES IN THE 19TH CENTURY. (3)
Romanticism to Naturalism.

GER 630 STUDIES IN THE 20TH CENTURY. (3)
Turn-of-the-century Modernism to the present.

GER 653 RESEARCH AND ISSUES IN TEACHING GERMAN. (1)
This course builds on GER 553, Methods of Teaching German. The course will address a range of educational issues beyond the teaching of foreign language skills as well as acquaint students with research methods in both a theoretical and practical manner. May be repeated to a maximum of four semesters. Coreq: GER 553.

Note: The course series 720-730 offers the opportunity for the more specialized and greater in-depth investigation of various topics encountered in the corresponding, but more broadly conceived, period courses of the 620-630 series. With changes in topic, each course number of the 720-730 series can be repeated a total of three times—thus enabling the student at the more advanced level to specialize within a particular period or periods.

GER 729 SPECIAL TOPICS IN THE 19TH CENTURY. (3)
May be repeated to a maximum of nine credits with different topics. Prereq: Permission of Director of Graduate Studies.

GER 730 SPECIAL TOPICS IN THE 20TH CENTURY. (3)
May be repeated to a maximum of nine credits with different topics. Prereq: Permission of Director of Graduate Studies.

GER 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.

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

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

GER 781 SPECIAL STUDIES IN GERMAN. (3)
Selected studies and investigations in the German language and literature, permitting the student to work in areas of special interest, and providing opportunity for original endeavor. May be repeated to a maximum of 12 credits.

SCANDINAVIAN
(Offered as required)

GER 141 SWEDISH I. (3)
Introduction to Swedish with emphasis on grammar, pronunciation, reading and writing. Basic information on Swedish customs, history, geography, folklore. Students planning to fulfill part of a language requirement should be aware that the scheduling of Swedish III and IV will be subject to student demand and the availability of a qualified instructor.

GER 142 SWEDISH II. (3)
Continuation of Swedish I with additional emphasis on conversation. Prereq: GER 141 or equivalent.
GLY 101 PHYSICAL GEOLOGY. (3)
A first course in the principles of physical geology, including study of minerals and rocks, volcanoes and earthquakes, plate tectonics and the landforms of Earth’s surface. Prereq: GLY 111.

GLY 102 HISTORICAL GEOLOGY. (3)
The history of Earth: its origin as part of the solar system, and the subsequent evolution of its atmosphere, continents, seas, and life as interpreted from the rock record. In addition to lecture illustrations, examples are presented by a three-hour field trip and several out-of-class exercises. Attention is given to the development of the basic principles used in interpretation. Prereq: GLY 101 and 111.

GLY 111 LABORATORY FOR PHYSICAL GEOLOGY. (1)
Identification of minerals and rocks in hand specimens, interpretation of landscape features as shown on topographic maps, and an introduction to geologic maps. Laboratory, two hours per week. Concurs: GLY 101.

GLY 112 LABORATORY FOR HISTORICAL GEOLOGY. (1)
Interpretation of geological maps and cross-sections, and elementary study of important invertebrate fossil groups. One-hour field trip required. Laboratory, two hours per week. Prereq or concurs: GLY 102.

GLY 140 GENERAL PHYSICAL GEOLOGY. (4)
A first course in the principles of physical geology, including topics from mineralogy, geochemistry, and geophysics. High school chemistry recommended. Lecture, three hours; laboratory, two hours. (Offered in Community College System only.)

GLY 142 GENERAL HISTORICAL GEOLOGY. (4)
A first course in historical geology, including a study of the development of earth’s fundamental features and a review of the history of life. Lecture, three hours; laboratory, two hours per week. Prereq: GLY 140 or 144. (Offered in Community College System only.)

GLY 202 DINOSAURS AND DISASTERS. (3)
More than 65 million years ago, dinosaurs and their kin dominated the earth and relegated our mammalian ancestors to positions of unimportance for nearly 155 million years. This course traces the history of dinosaurs from early vertebrate ancestors to their final extinction and surveys the evolution, paleogeographic, environmental, and possible extraterrestrial causes for the rise to dominance and sudden fall. Along the way, dinosaur interactions with other organisms, various groups, and the new revolutionary view of dynamic, hot-blooded dinosaurs will be examined. Prereq: GLY 101/111.

GLY 210 THE FINITE EARTH: AN INTRODUCTION TO ECONOMIC GEOLOGY. (3)
An introduction to the geology of earth resources (economic geology) including metals, industrial minerals, building materials, nuclear fuels, and fossil fuels: their origin, occurrence, extraction, and utilization. Prereq: GLY 101/111.

GLY 225 FIELD METHODS IN GEOLOGY. (3)
An introduction to methods of observation, measurement, and mapping of rocks and structures in the field, including geologic map interpretation, hand specimen examination, and reporting skills in geology. Laboratory or field work, nine hours per week. Prereq or concurs: GLY 101 and 111, GLY 102 and 112.

GLY 240 ELEMENTARY GEOLOGY FOR ENGINEERS. (3)
An introduction to geologic materials and processes with emphasis on their application to engineering practice. Lecture, two hours; laboratory, three hours; one field trip required. Prereq or concurs: CE 106.

GLY 242 ENDANGERED PLANET: AN INTRODUCTION TO ENVIRONMENTAL GEOLOGY. (3)
Introduction to the study of the environment from a geological standpoint. An emphasis is placed on how man lives with hazards such as earthquakes, volcanoes, and floods and attempts to predict such events. Environmental problems that arise from the utilization of resources are examined, as are ways in which pollution problems could be minimized. Course material is presented in a way that allows the student to apply basic geologic concepts to current environmental issues. Prereq: GLY 101/111.

GLY 260 MINERALOGY. (4)
The introductory study of minerals including classification, crystallography, physical and chemical properties, occurrence, association, and identification. Laboratory work includes study of hand specimens and optical methods of identification. Lecture, three hours; laboratory, three hours per week. Prereq: GLY 101 and 111; CHE 105.

GLY 314 LANDFORMS. (3)
A study of the origin and distribution of landforms. Lecture, three hours; laboratory, two hours substituted for some lectures. Prereq: GLY 101 and GLY 111 or equivalent or GEO 151.

GLY 395 SPECIAL PROBLEMS IN GEOLOGY. (1-3)
Individual work on a special problem in geology. Report required. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

GLY 401G INVERTEBRATE PALEONTOLOGY AND EVOLUTION. (3)
Basic ecologic and evolutionary framework of common fossil invertebrate taxa. Major principles of paleontology, ecology, systemsatics, and evolution; and the use of fossils in paleoecology and biostratigraphy. Laboratory work in classification of common fossils. Lecture, two hours; laboratory, three hours per week. Prereq: GLY 102/112.

GLY 420G STRUCTURAL GEOLOGY. (4)
An introduction to earth structures. Advanced geologic map interpretation. Prereq: GLY 225 or GLY 240, and PHY 201 or PHY 211 or PHY 231, or consent of instructor.

GLY 423 FIELD WORK IN REGIONAL GEOLOGY. (6)
Geologic mapping in the field for a six-week period. Description, measurement, and mapping of a wide variety of rocks and structures, and analysis of geologic events in mountainous regions of the Rockies or Appalachians. Includes practice in writing geologic field reports. Offered only during the summer session. At least 40 hours of field-related work per week. Special fee. Prereq: GLY 225, GLY 420G and GLY 450G or consent of instructor.

GLY 430 ENVIRONMENTAL GEOHYDROLOGY. (3)
A course dealing with the occurrence and movement of water on and beneath the land surface, and its place in the hydrophere, emphasizing the geologic perspective. Prereq: MA 113 or MA 123, three hours of physics, and GLY 242.

GLY 450G STRATIGRAPHY AND SEDIMENTATION. (3)
Basic principles and concepts of stratigraphy and sedimentation. Lithologic correlation and the interpretation of geologic history and paleogeography. Field and laboratory analysis of sedimentary rocks including megascopic and microscopic methods. Lecture, two hours; laboratory, two hours. Prereq: GLY 102 or equivalent course in historical geology.

GLY 461 IGNEOUS AND METAMORPHIC PETROLOGY. (4)
Classification and origins of the common igneous and metamorphic rocks. Lecture material will emphasize the mineralogical, chemical, and physical equilibria within the earth. Laboratory topics will stress hand-specimen and microscopic petrography. Lecture, three hours; laboratory, three hours per week. Prereq: GLY 260.

GLY 470 SEMINAR (Subtitle required). (1)
A required seminar course for majors in the geological sciences. Each semester’s seminar will be organized around a central theme chosen from research topics of wide interest in the geological sciences at the time. Presentations will be judged on the basis of oral skills and content. May be repeated a maximum of two credits. Prereq: Senior standing in a Geological Sciences curriculum.

GLY 511 PETROLEUM GEOLOGY. (3)
The origin and accumulation of petroleum and natural gas. A study of geological methods used in exploratory work. Geology of principal producing fields. Prereq: GLY 450G.

GLY 513 REMOTE SENSING AND AERIAL PHOTOGRAPHY. (3)
Geological applications of remote sensing methods including aerial photography and satellite imagery in the visible and infrared wavelengths to geologic structure, mapping, mineral exploration and mine reclamation. Principles of aerial photography, structural and false color enhancement systems, side looking radar, the production of photo mosaics and photo maps and the planning of exploration programs using remote sensing. Lecture, two hours; laboratory, two hours per week. Prereq: GLY 144, GLY 420G, or consent of instructor.

GLY 515 GENERAL COAL GEOLOGY. (3)
The environments of coal deposition, nature of the coal substance and associated sedimentary rocks, and structural geologic phenomena as bases for understanding the distribution and quality of coal and predicting coal mining conditions. Field trips required. Lecture, two hours; laboratory, two hours per week. Prereq: GLY 420G, GLY 450G, or consent of instructor.
GLY 530 LOW TEMPERATURE GEOCHEMISTRY. (3)
An introduction to sedimentary and environmental geochemistry, including carbonate equilibria, coal and petroleum geochemistry, and the geochemistry of aqueous contaminants. Prereq: GLY 260 and MA 114 or consent of instructor.

GLY 540 ADVANCED GENERAL GEOLOGY. (3)
An advanced course for geological sciences majors serving to integrate information from more specialized upper division courses into the framework of the geological sciences, with special emphasis on a global view. Prereq: Geological sciences major with senior standing.

GLY 552 SEDIMENTARY PETROLOGY. (3)
Detailed description of sedimentary rock types, their origin and classification. Megascopic and microscopic examination of textures and structures of sediments. Mineralogy of sediments and the significance of sedimentary environments. Lecture, two hours; laboratory, two hours. Prereq: GLY 260 and STA 291 or STA 370.

GLY 555 STRATIGRAPHY. (3)
Principles of stratigraphy, depositional systems, sequence stratigraphy, and tectonic framework of sedimentation. Prereq: GLY 552.

GLY 570 SEMINAR IN GEOLOGICAL SCIENCES (Subtitle required). (1)
A general seminar in a broad range of topics in the geological sciences. May be repeated to a maximum of six credits under different subtitles. Prereq: GLY 470 or graduate standing in Geological Sciences.

GLY 571 APPLICATION OF POTENTIAL METHODS IN APPLIED GEOPHYSICS. (3)
A review of electrical, gravity, and magnetic field methods used in exploration geophysics. Course includes an assigned field problem involving geophysical techniques. Lecture, two hours; laboratory, two hours. Lectures are presented more frequently when field trips are not scheduled. Prereq: MA 114 and PHY 231.

GLY 572 EXPLORATION SEISMOLOGY. (3)
An introduction to exploration seismology with emphasis on the fundamentals of gathering, processing and interpretation of seismic data. The course includes the application of ray theory, Fourier and Z-transforms, and spatial filtering techniques as used in seismic exploration. Prereq: MA 114 and PHY 231.

GLY 575 GEODYNAMICS. (3)
A quantitative review of deformation and heat transfer processes encountered in the study of the earth’s crust and upper mantle. Prereq: PHY 211 or 201, MA 114 and GLY 420G.

GLY 579 GROUNDWATER GEOPHYSICS. (3)
Application of geophysical methods to groundwater exploration, emphasis is placed on the use of potential fields in the analysis of groundwater aquifers. Lecture, two hours; laboratory, three hours per week. Prereq: GLY 365 or consent of instructor.

GLY 585 HYDROGEOLOGY. (3)
A study of the physical aspects of groundwater, including regional flow, well hydraulics, and computer simulation. Prereq: GLY 101 and MA 114.

GLY 602 PALEOECOLOGY. (3)
Synthesis of paleontology, sedimentology, and stratigraphy in the interpretation of past organism-environment relationships. One four-day field trip required. Lecture, two hours; laboratory, two hours. Prereq: GLY 401 or consent of instructor.

GLY 617 ORGANIC PETROLOGY. (3)
The geochemical and paleobotanical origin of coal macerals and kerogen. Topics will include: petrology of coal and peat; organic metamorphism; petrology of dispersed organics, including oil shales; inorganic constituents in coal and organic-rich shales; and applications to industrial and geologic problems. Prereq: GLY 515 or consent of instructor.

GLY 620 TECTONICS. (3)
A study of the structural features of the earth’s crust with an analysis of the mechanics involved. Prereq: PHY 211, 213; GLY 420G.

GLY 624 MESOSCOPIC STRUCTURES. (3)
The analysis of structures of mesoscopic and microscopic scales in deformed rocks and their extrapolation to large scale structures. Emphasis is placed on mechanisms, kinematics, and processes. Topics include: strain analysis in shear zones; microstructural evolution of mylonites; rock rheology; deformation mechanisms in the continental crust. One four-day field trip required. Prereq: GLY 420G.

GLY 628 BASIN ANALYSIS SEMINAR. (3)
Methods of analysis of large sedimentary volumes from the point of view of mineral exploration. Prereq: Consent of instructor.

GLY 640 ANALYTIC METHODS IN GEOLOGY. (3)
Review of computer methods, statistics, and data processing in geologic research. Discussion of topics relating to the conduct of investigations, including experimental design, analytic techniques, and the organization and presentation of results. Prereq: Consent of instructor.

GLY 652 ADVANCED STRATIGRAPHY. (3)
A study of dynamic stratigraphy emphasizing the integration of tectonic paleoclimatic and paleogeographic frameworks to explain the origin, nature, distribution and relationship among Paleozoic stratigraphic sequences and unconformities across central portions of the North American continent. One three-day field trip required. Lecture, two hours; laboratory, three hours per week. Prereq: GLY 450G or equivalent.

GLY 670 SELECTED TOPICS IN GEOPHYSICS. (3)
Study of topics of current interest in geophysics. Subject matter will vary from term to term. May be repeated to a maximum of 12 credits. Lecture, two hours; laboratory, two hours. Prereq: GLY 572.

GLY 671 EARTHQUAKE SEISMOLOGY. (3)
A study of wave propagation and earthquake phenomena stressing both theory and delineation of earth structure. Lecture, two hours; laboratory, two hours. Prereq: GLY 572.

GLY 703 PALEOECOLOGY/PALEONTOLOGY SEMINAR (Subtitle required). (1-3)
Discussion and study of advanced topics in paleoecology or paleontology and related fields. One or more field trips required. May be repeated to a maximum of six credits. Prereq: GLY 602 or equivalent or consent of instructor.

GLY 715 COAL GEOLOGY SEMINAR. (2)
Seminar discussion and presentation of current work in coal geology from current literature or ongoing research. May be repeated to a maximum of eight credits. Prereq: GLY 515 or 617 or consent of instructor.

GLY 720 GRADUATE TECTONICS SEMINAR. (3)
Discussion and study of advanced topics in tectonics. May be repeated to a maximum of 12 hours. Prereq: GLY 620 or consent of instructor.

GLY 741 CLAY MINERALOGY. (3)
A comprehensive study of the crystal structures of clay minerals commonly found in soils and sediments. Lecture and discussion, three hours. Prereq: GLY 260 or consent of instructor. (Same as AGR 741.)

GLY 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.

GLY 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.

GLY 750 SEDIMENTOLOGY/STRATIGRAPHY SEMINAR (Subtitle required). (1-3)
Discussion and study of advanced topics in sedimentology or stratigraphy emphasizing current problems or topics pertinent to the sedimentology or stratigraphy of Kentucky and adjacent areas. One or more field trips required. May be repeated to a maximum of six credits. Prereq: GLY 450G, 552, or consent of instructor.

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

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

GLY 780 MODELING IN HYDROGEOLOGY. (3)
Seminar in modeling and computational algorithm hydrogeology. Two or three computer modeling programs are applied to hydrogeological programs. May be repeated to a maximum of six credits. Prereq: GLY 685.

GLY 782 INDIVIDUAL WORK IN GEOLOGY. (1-3)
Problems involving independent laboratory and/or library study conforming to the student’s special interest under the direction of an appropriate staff member having proficiency in the area selected. May be repeated to a maximum of nine credits. Prereq: Geology major with graduate standing.
GLY 787 RESEARCH IN HYDROGEOLOGY AND LOW-TEMPERATURE GEOCHEMISTRY. (3)
Laboratory and/or field research, literature study, discussion, and/or reports in one or both of these fields selected on the basis of the student's needs. May be repeated to a maximum of nine credits. Prereq: GLY 530, GLY 655, and consent of instructor.

GLY 790 RESEARCH IN GEOLOGICAL SCIENCES. (0-6)
Research in the geological sciences. May be repeated to a maximum of twelve credits. Prereq: Approval of instructor and Director of Graduate Studies.

GRN Gerontology

GRN 513 GERIATRIC PHARMACY. (3)
A course designed to educate students in the basic knowledge of attitudes and skills required to meet the pharmaceutical needs of the elderly. Topics include discussions of the aging process, physiological and psychological changes in the elderly, how these changes influence patient compliance and the responses to drug and non-drug treatments, monitoring drug use in long-term care facilities, and special community services available to the elderly. Prereq: PHR 849, 852, 853, 854 and 856 or permission of instructor. (Same as PHR 813.)

#GRN 600 A STUDY OF THE OLDER PERSON. (3)
This will be a didactic/experiential course designed to give the student an overview of the effects of the aging process on the individual person. Didactic lectures will focus on the psychological, social and biological impact of aging. The experiential component will consist of having the students interact with healthy elderly individuals from Donovan Scholars Program, the Sanders-Brown subject registry, and individuals suffering from diseases related to aging.

#GRN 610 AGING AND BIOMEDICAL ETHICS. (3)
This seminar will address the dominant medico-ethical issues surrounding the elderly. The issues will include concerns for the autonomy of the elderly; competency and decisional impairment; surrogate health care decision making; the role of families and elderly relatives; ethical and legal issues regarding the use of life-sustaining procedures such as mechanical ventilation, resuscitation and DNR orders, and nutritional support and hydration; decisions to enter nursing home and rights of nursing home residents; costs of health care to the elderly and costs of long term care; and critical ethical issues in conducting research involving elderly persons.

GRN 612 BIOLOGY OF AGING. (3)
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 612.)

#GRN 620 HUMAN AGING AND ADJUSTMENT. (6)
The second core course of the Gerontology Ph.D. program is designed to provide students with an holistic examination of human aging and health. Five broad focal themes, combining perspectives from the biomedical and the social and behavioral sciences, will provide the framework for this course. These themes include the historical context of aging, theories of aging, individual experience of aging, aging of societies, and aging and health. Prereq: GRN 600.

GRN 643 BIOMEDICAL ASPECTS OF AGING. (3)
A survey of the normal age-associated changes in biological function, the major disease entities found in the older population, and how the health care delivery system presently addresses these issues. Prereq: Graduate status or permission of the instructor. (Same as SW 643.)

#GRN 650 RESEARCH METHODS IN GERONTOLOGY. (3)
This course will provide training in research methods appropriate for the study of aging and the aged and will critically assess special considerations involved in studying this population. Topics to be covered will include: data sources for research on aging (including medical informatics and clinical epidemiology sources); the use of animal models in aging research; research designs for the study of aging [reconciling age, period, and cohort effects]; longitudinal research; measurement tools for assessing the elderly [functional assessment, ADLs, life satisfaction scales, etc.]; issues in interviewing older people; qualitative methods in aging research; the ethics of research on aging and the aged. Prereq: STA 570 or equivalent.

#GRN 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, organismic, and behavioral. Prereq: GRN 620. A strong background in the basic sciences.

#GRN 715 HEALTH POLICY AND AGING. (3)
This course will present an overview of health policy in the United States as it affects the older population. It will provide an overview of the health care system, allocation of health services across the population and projected impact of the increase in the aging population on health care delivery. Various health policy proposals will be analyzed with a focus on their impact on the older population. Prereq: GRN 600 and GRN 620.

#GRN 749 DISSERTATION RESEARCH. (0-12)
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.

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

#GRN 780 APPLIED RESEARCH PRACTICUM I. (1)
This course is designed to provide students an opportunity to serve as an intern within a clinic, service agency or organization which provides services to older persons. The student will gain in-depth experience in the organization and an introduction to problems in applied research. The course will be taken in conjunction with GRN 790. Prereq: GRN 600, GRN 620, GRN 650.

#GRN 781 APPLIED RESEARCH PRACTICUM II. (1)
The course provides an opportunity for students to serve as an intern in a clinic, service agency or organization which provides services to older persons. Students will identify a research problem within the organization and complete a research project. The course will be taken in conjunction with GRN 791. Prereq: GRN 780.

#GRN 785 INDEPENDENT RESEARCH IN GERONTOLOGY. (3)
Independent research involving completion of a major research project resulting in a manuscript of publishable quality. Under the supervision of a Gerontology Program faculty member, this will involve a review of appropriate literature, problem formulation, research design, data collection, data analysis and report writing on a topic in gerontology. Prereq: GRN 600 and GRN 620.

#GRN 790 INTEGRATIVE RESEARCH SEMINAR I. (3)
This seminar will involve students and gerontology program faculty in in-depth exploration of major health and aging-related issues. The substantive focus will be a series of specific topical problems, such as health care access, housing, long-term care, preventive health care, etc. The problem areas will be explored from a variety of disciplinary research perspectives. Prereq: Extensive research methods background.

#GRN 791 INTEGRATIVE RESEARCH SEMINAR II. (3)
This seminar is the second in a two-course sequence focusing on selected topics in aging. In this segment, students will participate in a research seminar team. A major gerontological issue with multidisciplinary implications (e.g. stroke, Alzheimer’s disease, etc.) will be identified. Each member of the seminar team will identify a particular aspect of the topic and conduct a research project. Each member’s findings will be integrated into a comprehensive research report on the topic. Prereq: GRN 790.

GS The Graduate School

GS 600 SPECIAL TOPICAL GRADUATE COURSE. (1-3)
An interdisciplinary, topical or experimental course to be approved by the Dean of the Graduate School. A particular course can be offered only once more than twice under the number GS 600. May be repeated to a maximum of six credits. Prereq: Consent of instructor.