GENETICS


GEN 103 Careers in Biochemistry and Genetics
1(1,0) Introduces students to biochemistry and genetics career paths, professional organizations, ethical issues, and requirements for advanced study. A logic gives students training in design of a professional portfolio. A student may not receive credit for both BIOCH 103 and GEN 103. Prereq: Freshman or sophomore standing in Biochemistry or Genetics or consent of instructor.

GEN 300 Fundamental Genetics 3(3,0) Introducatory course covering fundamental principles of genetics in prokaryotes and eukaryotes. Emphasis is given to Mendelian genetics, physical and chemical basis of heredity, and population genetics. Prereq: BIOL 104 or consent of instructor.

GEN 301 Fundamental Genetics Laboratory 1(0,3) Experimental and observational approach addressing the concepts presented in GEN 300. Inheritance patterns in a wide variety of eukaryotic and prokaryotic organisms are covered. Prereq: GEN 300 (or concurrent enrollment).

GEN 302, 302 Molecular and General Genetics 3(3,0) Rapidly-paced course covering Mendelian and molecular genetics, with introductory coverage of quantitative and population genetics. Emphasis is on the molecular basis of heredity and gene expression in prokaryotes and eukaryotes and modern genetic technology. Prereq: BIOL 111 or consent of the instructor.

GEN 303 Molecular and General Genetics Laboratory 1(0,3) Laboratory exercises introducing fundamental principles of inheritance in prokaryotes and eukaryotes. Prereq: GEN 302 or concurrent enrollment.

GEN (BIOCS) 405, 405, 605 Molecular Genetics of Eukaryotes 3(3,0) Molecular genetic analyses of eukaryotes in relation to mutations and repair, complex phenotypes, biochemical pathways, short- and long-term regulation of gene expression, and evolution. Prereq: GEN 302 or equivalent and one semester of biochemistry, or consent of instructor.

GEN 410, 410, 610 Fundamentals of Genetics I 3(3,0) First in a two-semester sequence in genetics covering Mendelian genetics, topics in cytogenetics, extranuclear inheritance, quantitative, evolutionary, conservation, and population genetics. Prereq: CP SC 120 (or equivalent), EX ST 301, GEN 302, or consent of instructor.

GEN 411 Fundamentals of Genetics I Laboratory 1(0,3) Crosses are carried out using eukaryotic organisms (C. elegans, Drosophila, yeast) with appropriate markers to follow inheritance. Population and evolutionary genetics concepts are also examined. Prereq: GEN 410 or concurrent enrollment.

GEN (BIOCS) 416, 616 Recombinant DNA 3(3,0) Familiarizes students with the most current facts and concepts of molecular genetics. Lectures focus on gene organization, structure, and expression in prokaryotes and eukaryotes, highlighting current technologies and research in these areas. Prereq: GEN 302 or equivalent and one semester of biochemistry or consent of instructor. A developmental biology course is also strongly recommended.

GEN (BIOCS, MICRO) 418, 618 Biotechnology 1: Nucleic Aids Techniques 4(2,4) Basic training in the manipulation of genetic information using recombinant DNA technology. Includes techniques in molecular cloning, Southern and Northern analyses, cloning library construction. Prereq: BIOCH 301 or 305, MICRO 305 or consent of instructor.

GEN 420, 420, 620 Fundamentals of Genetics II 3(3,0) Second in a two-semester sequence in genetics covering molecular genetics, gene expression, recombinant DNA technology, genomics, bioinformatics, proteomics, developmental, human, cancer, and behavioral genetics. Prereq: GEN 410 or consent of instructor.

GEN 421 Fundamentals of Genetics II Laboratory 1(0,3) Molecular genetics is emphasized using prokaryotic organisms (lambda or T4 phage, E. coli, B. subtilis) and yeast. Slime molds are used to model developmental processes. Bioinformatic methods are integrated into laboratory exercises by employing simulations illustrating genetic principles underlying human behavior and cancer biology. Prereq: GEN 420 or concurrent enrollment.

GEN 440, 440, 640 Bioinformatics 3(3,0) Theory and application of computational technology to analysis of the genome, transcriptome, and proteome. Prereq: CP SC 120 (or equivalent). Prereq: GEN 302, 410, or consent of instructor.

GEN 450, 450, 650 Comparative Genetics 3(3,0) Outlines the genome structure, function, and evolution based on available complete genome sequences. Topics include the evolution of multigene families, origin of eukaryotic organelles, molecular phylogeny, gene duplication, domain shifting, transposition, and horizontal gene transfer. Prereq: GEN 440, 440 or consent of instructor.

GEN (BIOCS, HORT) 465, 665 Plant Molecular Biology 3(3,0) See HORT 465.

GEN 470, 670 Human Genetics 3(3,0) Basic principles of inheritance; population, molecular and biochemical genetics; cytogenetics; immunogenetics; complex traits; cancer genetics; treatment of genetic disorders; genetic screening and counseling; and the Human Genome Project. Prereq: GEN 302 or consent of instructor.

GEN 490 Selected Topics in Genetics 1-4(0-4,0) Comprehensive study of selected topics not covered in other courses. May be repeated for a maximum of eight credits, but only if different topics are covered. Prereq: Junior standing or consent of instructor.

GEN 491, 491 Special Problems in Genetics 1-8(0,3-24) Orientation in genetic research (i.e., experimental planning, execution, and reporting). May be repeated for a maximum of eight credits. Prereq: GEN 410, 411, 420, 421 or consent of instructor.
Courses of Instruction

GEOG 330 Geography of the Middle East and North Africa 3(3,0) Thematic survey of a world region extending from Morocco to Afghanistan. Emphasis is on climate, environment, social geography, historical development of the regional culture of Islam, and common problems facing the area today. Preq: GEOG 101 or 103, or consent of instructor.

GEOG 340 Geography of Latin America 3(3,0) Introduction to the physical, economic, political, and human/cultural geography of Latin America. Special focus on regional unity and diversity and the historical interaction of man and environment.

GEOG 360 Geography of Africa 3(3,0) Study of how tropical, or sub-Saharan, Africa functions in the modern world. Africa's physical environments, peoples and cultures, colonial and post-colonial history, and ideologies of economic development. Five basic themes are covered: population, natural resources, environmental quality, political organization, economic development. Preq: GEOG 101 or 103 or consent of instructor.

GEOG 401, 601 Studies in Geography 3(3,0) Intensive study of the geography of a selected world region, such as North America, Europe, or the Middle East, or the geography of a topic, such as the geography of oil or the geography of under-development. May be repeated once for credit with departmental consent. Preq: GEOG 101 or 103 or consent of instructor.

GEOG 410, 610 Geography of the American South 3(3,0) Study of the geography of the American South in its changing complexities across almost 400 years of development. Preq: GEOG 101 or 103 or consent of instructor.

GEOG 420, 620 Historical Geography of the United States 3(3,0) Survey of the spatial concepts of geography into a time sequence with special emphasis upon the United States. Preq: GEOG 101 or 103 or consent of instructor.

GEOG (PRTM) 430, 630 World Geography of Parks and Equivalent Reserves 3(3,0) See PRTM 430.

GEOG 440, 640 Geography of Historic Preservation 3(3,0) Apects of historic preservation with emphasis on sites and structures in their geographical, historical, and socioeconomic context. Examples are drawn from American architectural styles and settlement forms. Preq: GEOG 101 or 103 or consent of instructor.

GEOG 499 Independent Study in Geography 3(3,0) Study of selected topics in geography under the direction of a faculty member chosen by the student. Student and faculty member develop a course of study designed for the individual student and approved by the department chair prior to registration.

GEOLOGY

Professors: A. W. Elzerman, Director; R. W. Falta, Jr., F. J. Molz, J. R. Wagner, R. D. Wanner; Associate Professors: J. W. Castle, R. A. Christopher, C. M. Lee, L. C. Murdock; Assistant Professors: E. R. Caraway, M. A. Schlautean; Lecturers: W. G. Dean, L. B. Krause

GEOI 100 Current Topics in Geology 1(1,0) Lectures and demonstrations covering topics of current interest in the different fields of geology. Recent research developments and career opportunities in the geosciences are emphasized.

GEOI 101, H 101 Physical Geology 3(3,0) Study of minerals and rocks which compose earth's crust, their origins and transformations. Emphasizes geological processes, both internal and external, by which changes are produced on or in the earth.

GEOI 102, H 102 Earth History 4(3,3) Survey of the earth's geologic history emphasizing how the continents and ocean basins have evolved through geologic time. Evolution of life from the beginning of the fossil record through the present; identification of fossil plants and animals and interpretation of earth's past through study of geologic maps. Field trips illustrate principles. Preq: GEOI 101, 103.

GEOI 103, H 103 Physical Geology Laboratory 1(0,2) Laboratory to accompany GEOI 101. Instruction is provided in the identification of minerals and rocks and in the interpretation of geologic processes through study of topographic maps. Field trips provide direct observation of processes and results. Coreq: GEOI 101.

GEOI 112 Earth Resources 3(3,0) Survey of earth's mineral, energy, water, and land resources and environmental and societal impacts associated with the use of these resources. Preq: GEOI 101.

GEOI 114 Earth Resources Laboratory 1(0,2) Laboratory to accompany GEOI 112. Instruction is provided in the identification of ore and gem minerals and of other earth materials of economic importance. Land and water resources are explored through the use of topographic maps, aerial photographs, remotely sensed images, and field trips. Preq: GEOI 103. Coreq: GEOI 112.

GEOI 206 Mineralogy and Introductory Petrology 4(3,3) Crystal symmetry and introduction to x-ray crystallography, composition and stability of minerals, survey of common rock-forming minerals, petrological classification of rocks and introduction to rock associations. Laboratory focuses on identification of rock-forming minerals and important ore minerals based on their physical properties, and hand specimen petrology. Preq: GEOI 101, 103, or consent of instructor.

GEOI 210 Geology of the National Parks 3(3,0) Survey of selected national parks and monuments emphasizing the dynamic geologic processes which have shaped the landscapes of these areas. Special attention is focused on parks exhibiting recent geological activity related to volcanoes, earthquakes, and glaciers. Slides and films are used to highlight specific geological features.

GEOI 211 Geoaalysis I 4(3,3) Students develop a working knowledge of statistical methods used to formulate and solve problems in the earth sciences. Emphasis is on sampling methods and experimental design for geologic settings and on formulating and evaluating hypotheses using statistical inference of data sets. Preq: MTHSC 108.

GEOI 212 Geoaalysis II 4(3,3) Students develop a working knowledge of deterministic methods used to formulate and solve problems in the earth sciences. Emphasis is on developing conceptual models from geologic field observations, formulating idealized problems, and analyzing and interpreting solutions. Special focus is on using computer software to support analyses. Preq: GEOI 211, MTHSC 108.


GEOI (ASTR) 220 Planetary Science 3(3,0) Survey of the formation and evolution of planetary bodies. Emphasis is on the origin of planetary material and comparative study of the primary processes operative on planetary surfaces. Major features of the planets and moons in our solar system, as revealed by recent space missions, are described.

GEOI 291 Introduction to Research I 1(1,0) Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research approaches in geology. Social and ethical contexts, communication skills, and professional development are incorporated.

GEOI 292 Introduction to Research II 1(1,0) Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research approaches in geology. Social and ethical contexts, communication skills, and professional development are incorporated. Preq: GEOI 291 or consent of instructor.

GEOI 300, H 300 Environmental Geology 3(3,0) Discussion-oriented introductory study of the relationships of man to his physical surroundings and problems resulting from upsetting the established equilibria of geologic systems; man's role as a geologic agent, environmental conservation and management. Preq: GEOI 101 or consent of instructor.

GEOI 302, H 302 Structural Geology 4(3,3) Diverse geological structures of the earth, their description, origin, and field recognition. Practical problems in interpreting geologic structures are utilized, in addition to theoretical considerations of the mechanics and causes of tectonism. Preq: GEOI 102 or consent of instructor.

GEOI 313 Sedimentology and Stratigraphy 4(3,3) Topics include origin, composition, and texture of sediments and sedimentary rocks; sedimentation processes, depositional environments, facies relationships, and diagenesis; introduction to stratigraphic methods and geochronology. Laboratory involves description and classification of hand specimens and thin sections and analytical methods. Preq: GEOI 206 or consent of instructor.
### Courses of Instruction

**GEOL 314 Sedimentary Petrology 3(2,3)** Origin, composition, and texture of sediments and sedimentary rocks, including both siliciclastic and chemical varieties. Interpretation of tectonic settings, depositional systems, facies relationships, and diagenesis. Laboratory involves description and classification of hand specimens and thin sections and analytical methods. Preq: GEOL 206 or consent of instructor.

**GEOL 316, H316 Igneous and Metamorphic Petrology 3(2,3)** Classification, occurrence, and origin of igneous and metamorphic rocks. Discussion of the chemical and physical processes involved in magmatic crystallization and metamorphism. Laboratory study of igneous and metamorphic rocks in hand specimen and thin section. Preq: GEOL 206, 216 or consent of instructor.

**GEOL 318 Introduction to Geochemistry 3(3,0)** Introduction to distribution of elements in the core, mantle, and crust of the earth. Control of rock type on trace element content in soils and sediments. Weathering, soil and regolith formation; water-sediment interactions; solubility, mobility, and bioavailability in relation to redox, pH and complexation; biogeochemical cycles of selected elements. Preq: GEOL 101 and CH 102 or consent of instructor.

**GEOL 320, H320 Engineering Geology 3(3,0)** Application of engineering principles to geologic problems. Identification of important material properties and mechanics of earth materials. Techniques of geologic site evaluation with emphasis on civil works and construction projects. Preq: GEOL 101, 103, MTHSC 108, PHYS 122.

**GEOL 375 Bahamian Field Study 3(1,4)** Relationships among marine sediment types, physical processes, and biological activity are observed. The world’s third largest barrier reef is examined. Students stay one week at a field station on Andros Island in the Bahamas and travel by van and boat to various sites. A differential fee is required. Preq: GEOL 101 or consent of instructor.

**GEOL 391 Research Methods I 1(1,0)** Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research methods in geology. Social and ethical contexts, communication skills, and professional development are incorporated. Preq: GEOL 292 or consent of instructor.

**GEOL 392 Research Methods II 1(1,0)** Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research methods in geology. Social and ethical contexts, communication skills, and professional development are incorporated. Preq: GEOL 391 or consent of instructor.

**GEOL 403, 603 Invertebrate Paleontology 3(2,3)** Study of life of past geologic ages as shown by fossilized remains of ancient animals, with emphasis on the invertebrates. Preq: GEOL 101 or consent of instructor.

**GEOL 405, 605 Geomorphology 3(2,3)** Study of the surface features of the earth—their form, nature, origin, development, and rates and patterns of changes they are undergoing. Laboratory studies emphasize a process approach to terrain analysis stressing complex interactions of geologic, climatic, and tectonic forces. Preq: GEOL 101, 102, or consent of instructor.

**GEOL 408, 608 Geohydrology 3(3,0)** Study of the hydrologic cycle, aquifer characteristics, theory of groundwater movement, mechanics of well flow, experimental methods, and subsurface mapping. Preq: GEOL 101, 102.

**GEOL 409 Subsurface Methods 4(3,3)** Students develop an understanding of the principles and methods used to acquire, analyze, and interpret subsurface geological data. Emphasis is on borehole measurements; seismic gravimetric, magnetic, and electrical methods; and on their applications to hydrogeology, remediation, and oil and gas exploration. Preq: GEOL 313.

**GEOL 411, H411 Research Problems 3-10(3-9)** Field, laboratory, or library study of an approved topic in geology. Topic would be one not normally covered in formal courses, but may be an extension of a course. Taught every semester. May be repeated for a maximum of six credits. Preq: Senior standing or consent of instructor.

**GEOL 413, 613 Stratigraphy 3(2,2)** A study of stratified rocks as the repository of earth history and the conceptual framework used to synthesize the world geologic record as a coherent whole. Emphasis is placed not only on traditional lithostratigraphy but also on modern seismic stratigraphy and current stratigraphic issues. Preq: GEOL 314 or consent of instructor.

**GEOL 415 Analysis of Geologic Processes 3(3,0)** Introduction to methods for analyzing geologic processes. Mathematical methods are introduced to solve problems related to stream flow, reaction kinetics, radioactive decay, heat flow, diffusion, fluid flow through geologic media and related processes. Preq or Coreq: MTHSC 206 or consent of instructor.

**GEOL 421, 621 GIS Applications in Geology 3(1,4)** Introduction to geographic information systems with applications to current geological and hydrological problems. Topics include the use of global positioning systems, spatial analysis, and image analysis. Hands-on training with geographic information systems software and techniques is covered in lab. Preq: Senior standing, strong computer skills.

**GEOL 451, 651 Selected Topics in Hydrogeology 1-4(1-3,0-3)** Selected topics in hydrogeology, with emphasis on new developments in the field. May be repeated for a maximum of six credits, but no more than two of these credits may be used toward the Geochemistry major. Preq: GEOL 300 or 408, or consent of instructor.

**GEOL 475 Summer Geology Field Camp 6(4,6)** Introduction to field techniques emphasizing methods applied to hydrogeology. Description and mapping of hydrogeologic units and structures using outcrop data and lithologic and geophysical well logs. Construction of potentiometric maps from water level data. Performance of pumping tests on mapped aquifers and analysis of data to determine aquifer characteristics. Preq: GEOL 302 and 206, or consent of instructor.

**GEOL 491 Research Synthesis I 4(3,3)** Required capstone group learning and research experience for Geology majors (open to others with consent of instructor). Synthesis of applied geology and other approaches for problem solving through collaborative teams. Culmination of sequence of case studies. Incorporates social and ethical contexts, communication skills, and professional development. Preq: GEOL 392 or consent of instructor.

**GEOL 492 Research Synthesis II 4(3,3)** Required capstone group learning and research experience for Geology majors (open to others with consent of instructor). Synthesis of applied geology and other approaches for problem solving through collaborative teams. Culmination of sequence of case studies. Incorporates social and ethical contexts, communication skills, and professional development. Preq: GEOL 491 or consent of instructor.

**GERMAN**


**GER 101 Elementary German 4(3,1)** Course for beginners in which, through conversation, composition, and dictation, the fundamentals of the language are taught and a foundation is provided for further study and the eventual ability to read and speak the language. Three hours a week of classroom instruction and one hour a week in the language laboratory.

**GER 102 Elementary German 4(3,1)** Continuation of GER 101; three hours a week of classroom instruction and one hour a week in the language laboratory.

**GER 104 Basic German 4(3,1)** Intensive one-semester program combining GER 101 and 102 for students who have previously studied German. Includes fundamentals of grammar and vocabulary as a foundation for written and oral proficiency.

**GER 151 German for Graduate Students 3(3,0)** Intensive program only for graduate students preparing for the reading examination in German. A minimum grade of B on a final examination will satisfy graduate school foreign language requirement. May be repeated once for credit. To be taken Pass/Fail only. Preq: Graduate standing.

**GER 201, H201 Intermediate German 3(3,1)** Brief review of GER 101 and 102, with conversation, composition, and dictation, and the reading of more serious German prose in short stories and plays. Includes literary and cultural perspectives. Preq: GER 102.
GER 202, H 202 Intermediate German 3(3,1)
Emphasis on reading nontechnical German prose more rapidly. Writing, speaking, and listening skills continue to be developed. Includes literary and cultural perspectives. Preq: GER 201 or consent of instructor.

GER 299 Foreign Language Drama Laboratory 1(0,3)
Participation in foreign language drama productions. No formal class meetings, but an average of three hours per week in a foreign language drama workshop for production. May be repeated for a maximum of three credits. Preq: Consent of instructor directing the play.

GER 305 German Conversation and Composition 3(3,0)
Training in spoken and written German with emphasis on vocabulary acquisition, oral and written communication strategies, appropriate linguistic formulations for specific cultural contexts, and stylistics. Preq: GER 202 or consent of instructor.

GER 306 The German Short Story 3(3,0)
Examines the Austrian, German, and Swiss short story as a distinct literary genre that flourished particularly after 1945. A multiple conversation and composition practice, as well as introduction to principles of literary prose analysis. Preq: GER 202 or consent of instructor.

GER 310 Summer Immersion Program 6(6,0)
Conducted entirely in German for eight hours daily. Program consists of activities that combine interrelating cultural topics with language skill practice. Frequent opportunities to converse with native speakers during meals and on excursions. Students receive six credits, three of which may be taken in lieu of 202. Preq: GER 201.

GER 316 German for International Trade I 3(3,0)
Spoken and written German common to the German-speaking world of business and industry, with emphasis on business practices and writing and translating business letters and professional reports. Cross-cultural references provide opportunity for comparative and contrastive analysis of American and German cultural patterns in a business setting. Preq: GER 202 and 305 (or concurrent enrollment); or consent of department chair.

GER 340 German Culture 3(3,0)
Examines the cultures of German-speaking nations from their origins to the present. Emphasis is on the Federal Republic of Germany both before and after the German unification of 1990. Preq: GER 202 or consent of instructor.

GER 360 German Literature to 1832 3(3,0)
Examines topics in German literature from the Middle Ages to 1832. Readings may include works by Lessing, Goethe, Schiller, and the Romantics. Preq: GER 305 or 306 (or concurrent enrollment) or consent of instructor.

GER 361 German Literature from 1832 to Modernism 3(3,0)
Examines poetry, prose, drama, and essay from the Romantic period through naturalism and realism to the advent of Modernism. Preq: GER 305 or 306 or consent of instructor.

GER 369 Special Topics in German Literature 3(3,0)
Study of a significant aspect of German literature. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: GER 305 or 306 or consent of instructor.

GER 398 Directed Reading 1-3(1-3,0)
Directed study of selected topics in German literature, language, and culture. May be repeated for a maximum of six credits. Preq: Consent of department chair.

GER 405 Aavanced Contemporary German Language 3(3,0)
Aavanced study of spoken and written contemporary German based on modern autobiographical texts, eyewitness accounts of recent historical events, and media coverage of current events. Employs Internet, print and audio texts, TV programs, and photo series. Preq: One 300-level German course or consent of instructor.

GER 416 German for International Trade II 3(3,0)
Study of language and cultural environment of the German-speaking markets of the world, including linguistic and cultural idioms which support global marketing in general and the international marketing of textiles, agricultural products, and tourism in particular. Preq: GER 316.

GER 417 Topics in German for International Trade 3(3,0)
Examination and analysis of selected topics related to the business culture and economy of Germany. Austeria, Switzerland, the European Union, or the European Free Trade Association. Topics may include the reconstruction of eastern Germany's economy, the expansion of the European Union, or current events of economic importance. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: One 300-level German course or consent of department chair.

GER 450 Aavanced Studies in German Drama 3(3,0)
Extensive study of a major theme or aspect of German drama. May include recorded live performances, stage design, theatre architecture, and the music and art of the theatre. Preq: GER 305 or 306 or consent of instructor.

GER 455 German Film 3(2,3)
Overview of German cinema including the expressionist classics of the Weimar Republic, entertainment and documentary movies of the Nazi era, classics of the postwar New German Wave (West Germany), distinctive East German films, and vanguard contemporary films. Preq: GER 305 or 306 or consent of instructor.

GER 460 Modernism in German Literature 3(3,0)
Study of major works of German literature and culture in the modernist era (1888-1933). May include drama, music, philosophy, and the plastic arts. Preq: GER 305 or 306 or consent of instructor.

GER 461 German Literature Since 1933 3(3,0)
Study of selected authors, texts, or genres in contemporary German literature. Preq: GER 305 or 306 or consent of instructor.

GER 475 Aavanced German Seminar 3(3,0)
Concentrated research and discussion on advanced topics, works, or texts in German literature, film, art, drama, music, or philosophy. Conducted in German. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: One 400-level German course or consent of instructor.

GER 476 Aavanced Seminar in German Thought 3(3,0)
Concentrated research and discussion on advanced topics, works or texts in German literature, film, art, drama, music or philosophy. Conducted in English. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Senior standing or consent of instructor.

G C 101 Orientation to Graphic Communications 1(1,0)
Introduction to the curriculum and the industry including its processes, products, and careers. Emphasis is placed on the attributes which are most desirable for successful entry and advancement up a variety of career ladders.

G C 104, H 104 Graphic Communications I 4(2,6)
Emphasis on basic graphic arts industrial concepts, principles, and practices, with laboratory applications in typography, layout and design, conventional and electronic copy preparation, reproduction photography, offset lithography, screen printing, and finishing operations. Flexography, gravure, letterpress, and specialty printing processes are also covered, along with environmental, health, and safety concerns.

G C 207, H 207 Graphic Communications II 3(1,6)
Continuation of G C 104. Intermediate course for graphic communications and graphic arts specialists which broadens skills and technical knowledge in areas of layout, copy preparation, reproduction photography, film assembly, screen printing, lithographic presswork, and finishing. Preq: G C 101, 104, typewriter/computer keyboarding skills of 20 net words per minute.

G C 215, H 215 Photographic and Digital Imaging Techniques 3(1,6)
Emphasizes application of black and white and color imaging by photographic and digital technologies. Laboratory experiences assure confidence in the use of photographic and digital techniques for creating and enhancing original images for graphic reproduction and distribution.

G C 245 Graphic Communications Mechanical Systems 3(2,3)
Concepts in mechanical systems and their controls as related to equipment and facilities in graphic communications industrial manufacturing. Preq: G C 207 and THRD 180, or consent of instructor.
COURSES OF INSTRUCTION

G C 310, H 310 A Pplied Principles of Electronic Workflow 4(2,6) Promotes the refining of skills learned in G C 104 and 207, with an in-depth study and application of computerized prepress systems and methodologies. Serves as a transition course to the advanced graphic classes teaching offset lithography, flexography, screen printing, and gravure. Prev: G C 207, 215, or consent of instructor.

G C 350 Graphic Communications Internship I 1(0,3) Full-time supervised employment in an industrial in-plant setting for expansion of experience with materials and processes, production people, and organizations. Restricted to Graphic Communications majors. Prev: G C 104 or equivalent, consent of instructor. Coreq: CO-O P 101.

G C 405, H 405, 605 Package and Specialty Printing 2(2,0) Problems and processes for printing and converting in package, label, and specialty printing industries. Flexographic preparation, printing, die making, diecutting, transfer printing, screen container printing, pad printing, and bar code production are covered. New developments and trends are discussed. Prev: G C 245, 310, 350; concurrent enrollment in G C 406; or consent of instructor.

G C 406, H 406, 606 Package and Specialty Printing Laboratory 2(0,6) Laboratory in techniques for printing and converting in package, label, and specialty printing industries. Flexographic preparation, printing, die making, diecutting, transfer printing, screen container printing, pad printing, and bar code production are covered. New developments and trends are discussed. Prev: G C 245, 310, 350; concurrent enrollment in G C 406; or consent of instructor.

G C 407, H 407 A dvanced Flexographic Methods 4(2,6) In-depth study of the methods used in flexographic printing and converting of porous and nonporous substrates. Theory and laboratory applications include setting standards for process color, preparation of plate systems, ink mixing and color matching, testing of films and foils, analysis of recent developments, and prediction of future markets. Prev: G C 406 or consent of instructor.

G C 440, H 440, 640 Commercial Printing 5(2,9) A dvanced skills learned in previous graphic communications courses and applies the knowledge to large format presses. Students work from the design conception stage through all aspects of preparation, production, and finishing. Emphasis is placed on understanding and incorporating emerging technologies into the production workflow. Prev: G C 310 and 350 or consent of instructor.

G C 444, H 444, 644 Current Developments and Trends in Graphic Communications 4(2,6) A dvanced course for Graphic Communications majors. Emphasis is on the theory and technical developments that affect process and equipment selection. Topics include color theory and application, electronic color scanning, electronic prepress and communications, gravure color quality control and analysis. Prev: G C 405, 406, 440.

G C 445, H 445 A dvanced Screen Printing Methods 3(2,3) In-depth study of the systems and materials used with the screen printing process. Emphasis is placed on techniques of control and procedures for establishing screen printing methods and standards. Prev: G C 207 or consent of instructor.

G C 446, 646 Ink and Substrates 3(2,3) Covers components, manufacturing, process use as well as end use of ink and substrates used in lithography, flexography, gravure, and screen printing. Examines the interrelationship between inks, substrates, and the printing process. Through controlled testing and examination, optimum conditions for improved printability are determined. Prev: G C 405; 406 or 440; or consent of instructor.

G C 448, H 448, 648 Planning and Controlling Printing Functions 3(2,3) Study of systems for setting printing production standards, estimating, scheduling, job planning, and the selection of new hardware and technologies. Prev: G C 350, 405, 406, 440, 450 or consent of instructor.

G C 450 Graphic Communications Internship II 1(0,3) Continuation of G C 350. Prev: G C 350, 405, 406 or 440; consent of instructor. Coreq: CO-O P 102.

G C 451, H 451 Special Projects in Graphic Communications 1-6(0,3-18) A dvanced projects covering theory and/or practices going beyond the scope of regular coursework. Written project approval required before registering. May be repeated with advisor's approval. Prev: Junior standing, three graphic communications courses completed, or consent of instructor.

G C 455 A dvanced Graphic Communications Internship 1(0,3) Full-time employment in an industry directly or indirectly related to printing. Work site and job must be approved in advance. Prev: G C 350.

G C 480 Senior Seminar in Graphic Communications 2(2,0) Study of current trends and issues in the graphic communications industry. Class centers around group discussions dealing with relevant topics facing the graphic communications manager today. Students draw upon academic experiences, internship experiences, and library research to facilitate discussion. Must be taken during student's last semester on campus. Prev: G C 450.

G C 490, 690 Graphic Communications Selected Topics 1-3 (1-3,0) Subjects not covered in other graphic communications courses, organized according to industry trends and student needs. May be repeated for a maximum of 18 credits, but only if different topics are covered. Prev: Consent of instructor.

GREAT WORKS

G W (ENGL) 301, H 301 Great Books of the Western World 3(3,0) Introduces great works in terms of its history and its approach to problem-solving through study of selected great works. Emphasizes developing students' abilities to reflect on the problems and methodologies encountered in the scientific method.

G W 403, H 403 Special Topics in Continental Literature 3(3,0) Important primary texts written in modern European languages are taught in English. Content varies according to instructor. Prev: Sophomore literature.