GC 4060* Package and Specialty Printing 4 (2) In-depth study of the problems and processes for printing and converting in package label and specialty printing industries. Flexographic prepress, workflow, proofing, printing, die making, die cutting, converting, inventory marks, and consumer experience graphics are covered. New developments and trends are explored as well. Laboratory techniques in printing, press [

GC 4061* Package and Specialty Printing Laboratory 0 (6) Non-credit laboratory to accompany GC 4060. Coreq: GC 4060.

GC 4070* Advanced Flexographic Methods 4 (2) 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. Preq: GC 4060. Coreq: GC 4071.

GC 4071* Advanced Flexographic Methods Laboratory 0 (6) Non-credit laboratory to accompany GC 4070. Coreq: GC 4070.

GC 4400* Commercial Printing 4 (2) Advances skills learned in previous graphic communications courses and applies the knowledge to large format presses. Students work from the design conception through all aspects of preparation, production, and finishing. Emphasizes understanding and incorporating emerging technologies into the production workflow. Includes Honors sections. Preq: GC 3400. Coreq: GC 4401.

GC 4401* Commercial Printing Laboratory 0 (6) Non-credit laboratory to accompany GC 4400. Coreq: GC 4400.

GC 4440* Current Developments and Trends in Graphic Communications 4 (2) Advanced course for Graphic Communications majors. Emphasizes 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. Includes Honors sections. Preq: GC 4060 and GC 4400. Coreq: GC 4441.

GC 4441* Current Developments and Trends in Graphic Communications Laboratory 0 (6) Non-credit laboratory to accompany GC 4440. Coreq: GC 4440.

GC 4450* Advanced Screen Printing Methods 3 (2) In-depth study of the systems and materials used with the screen printing process. Emphasizes techniques of control and procedures for establishing screen printing methods and standards. Preq: GC 2070. Coreq: GC 4451.

GC 4451* Advanced Screen Printing Methods Laboratory 0 (3) Non-credit laboratory to accompany GC 4450. Coreq: GC 4450.

GC 4480* Planning and Controlling Printing Functions 3 (2) Study of systems for setting printing production standards, estimating, scheduling, job planning, and the selection of new hardware and technologies. Includes Honors sections. Preq: GC 3500 and GC 4060 and GC 4400 and GC 4500. Coreq: GC 4481.

GC 4481* Planning and Controlling Printing Functions Laboratory 0 (3) Non-credit laboratory to accompany GC 4480. Coreq: GC 4480.

GC 4500 Graphic Communications Internship II 1 (3) Continuation of GC 3500. Preq: GC 3500; and either GC 4060 or GC 4400. Preq or concurrent enrollment: COOP 2020.

GC 4510 Special Projects in Graphic Communications 1-6 (1-6) Advanced projects covering theory and/or practices going beyond the scope of regular coursework. Written project approval is required before registering. May be repeated for a maximum of six credits with advisor's approval. Includes Honors sections. Preq: Junior standing and completion of three graphic communications courses.

GC 4550 Advanced Graphic Communications Internship 1 (3) Full-time employment in an industry directly or indirectly related to printing. Work site and job must be approved in advance. Preq: GC 3500 and consent of instructor.

GC 4800 Senior Seminar in Graphic Communications 2 (2) 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. Preq: GC 4500.

GC 4900* Graphic Communications Selected Topics 1-3 (1-3) Subjects not covered in other graphic communications courses; organized according to industry trends and student needs. May be repeated for a maximum of 15 credits, but only if different topics are covered. Preq: Consent of instructor.

GC 4990 Creative Inquiry—Graphic Communications IV 1-3 (1-3) Under the direction of a faculty member, students pursue approved scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Senior standing.

GENETICS

GEN 1030 Careers in Biochemistry and Genetics 1 (1) Introduction to biochemistry and genetics career paths, professional organizations, ethical issues, and requirements for advanced study. Also gives students training in design of a professional portfolio. Students may not receive credit for both BCHM 1030 and GEN 1030. Preq: Biochemistry or Genetics major.

GEN 3000 Fundamental Genetics 3 (3) Introductory course covering fundamental principles of genetics in prokaryotes and eukaryotes. Emphasizes Mendelian genetics, physical and chemical basis of heredity, and population genetics. Preq: BIOL 1030 or BIOL 1100.

GEN 3020 Molecular and General Genetics 3 (3) Rapidly-paced course covering Mendelian and molecular genetics, with introductory coverage of quantitative and population genetics. Emphasizes the molecular basis of heredity and gene expression in prokaryotes and eukaryotes and modern genetic technology. Includes Honors sections. Preq: BIOL 1100 with C or better.

GEN (BCHM) 3040 Molecular Biology Laboratory 2 (4) Introduces fundamental molecular biology laboratory techniques commonly used in biochemistry, genetics, and molecular biology research. Principles and applications of these techniques are also discussed. May also be offered as BCHM 3040. Preq: BIOL 1100. Preq or concurrent enrollment: BCHM 3010 or GEN 3020.

GEN (BIOI) 4050* Molecular Genetics of Eukaryotes 3 (3) 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. May also be offered as BIOI 4050. Preq: BCHM 3010 or BCHM 3050; and GEN 3000 and GEN 3020.

GEN 4100 Population and Quantitative Genetics 3 (3) Classical and computational genetics topics, including Mendelian vs. non-Mendelian inheritance, genetic variation, evolutionary, conservation, coalescent theory, molecular evolution, quantitative trait locus, and association mapping in the framework of population and quantitative genetics. Includes Honors sections. Preq: STAT 2300 and GEN 3020, each with C or better.

GEN 4110 Population and Quantitative Genetics Laboratory 2 (4) Crosses are performed using eukaryotic organisms with appropriate markers, and molecular markers are amplified, sequenced, and analyzed. Collected data are used to test hypotheses regarding possible modes of inheritance and for patterns of molecular evolution. Population and molecular evolutionary genetics concepts are also examined. Preq or concurrent enrollment: GEN 4100.

GEN 4200* Molecular Genetics and Gene Regulation 3 (3) Molecular genetics, including replication, transcription and translation, gene expression, recombinant DNA technology, developmental, human, cancer, and behavioral genetics. Includes Honors sections. Preq: BCHM 3010 and GEN 3020, each with C or better.

GEN 4210 Molecular Genetics and Gene Regulation Laboratory 2 (4) Explores molecular genetics techniques (transformation, cloning, PCR, gel electrophoresis, Southern Blotting, reporter genes, gene mapping) using prokaryotic and eukaryotic organisms. Preq or concurrent enrollment: GEN 4220.

GEN (BCHM) 4400* Bioinformatics 3 (3) Theory and application of computational technology to analysis of the genome, transcriptome, and proteome. Includes Honors sections. May also be offered as BCHM 4400. Preq: BCHM 3010 or BCHM 3050 or GEN 3000 or GEN 3020, with C or better.
GEN 4500* Comparative Genetics 3 (3) 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 shuffling, transposition, and horizontal gene transfer. Includes Honors sections. Preq: GEN 4200 with a C or better. Preq or concurrent enrollment: GEN 4400.

GEN 4700* Human Genetics 3 (3) 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. Preq: GEN 3000 with a C or better; or GEN 3020 with C or better.

GEN 4900 Selected Topics in Genetics 1-4 (1-4) 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. Preq: Consent of instructor.

GEN 4910 Directed Research in Genetics 1-8 (3-24) Orientation in genetic research (i.e., experimental planning, execution, and reporting). May be repeated for a maximum of 20 credits. Includes Honors sections. Preq: Consent of instructor.

GEN 4920 Honors Thesis in Genetics 1 (1) Students complete a senior thesis and oral presentation detailing their honors research in genetics. Preq or concurrent enrollment: Students are expected to have completed or be concurrently enrolled in their second semester of an Honors section of GEN 4910 for a minimum of four credits when registering for this course.

GEN 4930 Senior Seminar 2 (2) Analysis and discussion of papers from the primary literature in the life sciences particularly in genetics. Students find pertinent articles in the primary literature and present and analyze the selected reading. Includes Honors sections. Preq: BCHM 5010 and GEN 3020, each with a C or better; and one of the following with a C or better: GEN 4100 or GEN 4200 or GEN 4500.

GEN (ENT) 4950* Insect Biotechnology 3 (3) Considers many unique genetic features exhibited by insects and describes the applications of biotechnology to enhance useful products from insects and to affect the control of destructive insects. May also be offered as ENT 4950. Preq: ENT 3010 and GEN 3020.

GEOG 1010 Introduction to Geography 3 (3) Survey of the nature of geography emphasizing the discipline's organizing themes of earth science, relations between people and their environments, interrelations between places, locational analysis, and area studies.

GEOG 1030 World Regional Geography 3 (3) Systematic and descriptive survey of the major regions of the world, including their physical and cultural features. Provides a global context for courses in the social sciences and humanities.

GEOG 1060 Geography of the Physical Environment 4 (3) Examines the condition of the physical environment, especially the earth's surface and the processes that act on it. Topics range from earth-sun relations to the evolution of landscapes; human habitats and human alteration of the environment. Coreq: GEOG 1061.

GEOG 1061 Geography of the Physical Environment Laboratory 0 (3) Non-credit laboratory to accompany GEOG 1060. Coreq: GEOG 1060.

GEOG 2010 Political Geography 3 (3) Geographic basis of states: sovereignty, territory, power within states, relations between states. The geography of international affairs. Preq: GEOG 1010 or GEOG 1030.

GEOG 3020 Economic Geography 3 (3) Spatial analysis of economic activity emphasizing regional economics and development. Topics include world population; technology and economic development; principles of spatial interaction; and geography of agriculture, energy manufacturing, and tertiary activities. Preq: GEOG 1010 or GEOG 1030.

GEOG 3030 Urban Geography 3 (3) Historical and contemporary survey of the urban world, with particular attention paid to the relationship between people and urban places. Topics include the rise of cities, urban hierarchies, urban land use, and the social geography of cities. Preq: GEOG 1010 or GEOG 1030.

GEOG 3050 Cultural Geography 3 (3) Broad examination of the basic cultural variables in the human occupation of the earth using ecological, spatial, regional, and historical approaches. Topics vary but may include cultural areas and distributions, cultural change, cultural landscape, and cultural ecology. Preq: GEOG 1010 or GEOG 1030.

GEOG 3060 Historical Geography 3 (3) Exploration of geographical change and the varied patterns of past human activities and people's relationships with the physical environment. Case studies from around the world are used to emphasize key themes in historical geography. Preq: GEOG 1010 or GEOG 1030.

GEOG 3300 Geography of the Middle East and North Africa 3 (3) Thematic survey of a world region extending from Morocco to Afghanistan. Emphasizes climate, environment, social geography, historical development of the regional culture of Islam, and common problems facing the area today. Preq: GEOG 1010 or GEOG 1030.

GEOG 3400 Geography of Latin America 3 (3) Introduction to the physical, economic, political, and human/cultural geography of Latin America. Special focus is on regional unity and diversity and the historical interaction of man and environment.

GEOG 3600 Geography of Africa 3 (3) 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 1010 or GEOG 1030.

GEOG 3990 Creative Inquiry—Geography 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of nine credits. Preq: GEOG 1010 or 1030.

GEOG 4010* Studies in Geography 3 (3) 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 underdevelopment. May be repeated once for credit with departmental consent. Preq: GEOG 1010 or GEOG 1030.

GEOG 4010* Geography of the American South 3 (3) Study of the geography of the American South in its changing complexities across almost 400 years of development. Preq: GEOG 1010 or GEOG 1030.

GEOG 4200* Historical Geography of the United States 3 (3) Survey that places the spatial concepts of geography into a time sequence with special emphasis upon the United States. Preq: GEOG 1010 or GEOG 1030.

GEOG (PRTM) 4300* World Geography of Parks and Equivalent Reserves 3 (3) Major international patterns in the provision and use of urban and rural parks and recreation are examined. May also be offered as PRTM 4300. Preq: 2.0 cumulative grade-point average.

GEOG 4400* Geography of Historic Preservation 3 (3) Aspects of historic preservation emphasizing sites and structures in their geographical, historical, and socioeconomic contexts. Examples are drawn from American architectural styles and settlement forms. Preq: GEOG 1010 or GEOG 1030.

GEOG 4990 Independent Study in Geography 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: J.W. Castle, L.C. Murdoch, M.A. Schlautman; Associate Professors: S.M. Moyley, B.A. Powell; Assistant Professor: L. Shuller-Nickels; Lecturers: S. Brame, A. Coulson

GEOL 1000 Current Topics in Geology 1 (1) 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.

GEOL 1010 Physical Geology 3 (3) Study of the minerals and rocks that 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. Includes Honors sections.

GEOL 1030 Physical Geology Laboratory 1 (2) Laboratory to accompany GEOL 1010. Provides instruction 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. Includes Honors sections. Preq or concurrent enrollment: GEOL 1010.