Courses of Instruction

ACADEMIC SCHOOLS

The academic programs at Grove City College are divided into two schools – the ***Alva J. Calderwood School of Arts and Letters*** and the ***Albert A. Hopeman, Jr., School of Science, Engineering, and Mathematics.*** These two schools encompass all departments of instruction, with the exception of Physical Education and Athletics, which provide students with a choice of numerous majors, minors, certifications, and pre-professional programs.

Alva J. Calderwood School of Arts and Letters

Dr. John A. Sparks, Dean; Dr. David J. Ayers, Assistant Dean.

Alva J. Calderwood
1873-1949

Alva J. Calderwood grew up on a farm outside of New Bedford, Pennsylvania, and was tending the crops one day when a journeyman teacher by the name of Dr. Isaac Ketler visited his home in search of students to enroll in the newly-formed Grove City College. Dr. Calderwood subsequently enrolled and graduated from the College in 1896, continued his education at Harvard, and earned both master of arts and doctorate of philosophy degrees. He eventually returned to his alma mater and served as a professor for 53 years and as Dean of the College for 35 years. He was honored for his many years of outstanding service when Calderwood Hall, erected in 1956, was named for him. Calderwood Hall was torn down in February 2003 and replaced by the new Hall of Arts and Letters, and in November, 2002, the Alva J. Calderwood School of Arts and Letters was named in his honor.

The ***Alva J. Calderwood School of Arts and Letters*** is comprised of the Departments of Accounting, Business, Communication, Economics, Education, English, Entrepreneurship, History, Modern Languages, Music and Fine Arts, Philosophy, Political Science, Psychology, Religion, and Sociology.

Albert A. Hopeman, Jr. School of Science, Engineering, and Mathematics

Dr. Stacy Birmingham, Dean; Dr. Timothy A. Mohr, Assistant Dean.

Albert A. Hopeman, Jr.
1911-1998

Albert A. Hopeman, Jr. became the fifth president of the Grove City College Board of Trustees in 1972, joining the Board in 1953 and serving till his death in 1998. He was a firm advocate of excellent education in a Christian environment at a low cost. He led the College during the years of the well-known 1984 U.S. Supreme Court case *Grove City College vs. T. H. Bell, Secretary of the U.S. Department of Education*, which resulted in Grove City College's withdrawal from the federal Pell Grant program. Grove City College also withdrew from federal student loan programs in 1996 and developed a competitive private student loan program under his leadership. The School of Science, Engineering, and Mathematics was named in his honor in May of 1997.

The *Albert A. Hopeman, Jr. School of Science, Engineering, and Mathematics* is comprised of the Departments of Biology, Chemistry, Computer Science, Engineering, Mathematics, and Physics.

The following sections are arranged in alphabetical order by department and include the requirements for each major, course descriptions offered, and all faculty members within each department.

DEPARTMENT OF ACCOUNTING

Dr. Baglia, Chair; Mrs. McFeaters, Dr. J. Patterson. Part-time: Mr. DuCarme, Mr. Falconi, Mrs. Trimpey.

This program prepares students for careers in public accounting, corporate accounting, and various positions in the non-profit sector.

Students completing a major in Accounting may not complete a second major or a minor in the related Departments of Business or Entrepreneurship.

Course Requirements for a Bachelor of Science Degree in Accounting (ACCS)

Accounting Core (30 hours):

Accounting 201-202, 301-302, 303, 321, 401, 403, 405, and 420.

Business Core (30 hours):

Business 201, 203, 204, 207, 301, 303, and 486 (21 hours).

Nine additional hours in Accounting, Business, Economics, or Entrepreneurship (maximum of 3 hours of internship credit).*

Major-related courses (10 hours):

Mathematics 141**; Economics 101-102.

Courses that count in the ACCS major quality point average (MQPA):

All courses with "ACCT" and "BUSA" prefix, excluding BUSA 205 and BUSA 206. A minimum MQPA of 2.00 is required to graduate.

**An Accounting degree candidate will not be permitted to take Accounting, Business or Entrepreneurship courses as electives beyond these 9 hours unless the College's 128-credit hour requirement for graduation has been satisfied. Up to three semester hours of internship credit will be permitted as non-business elective hours.*

*** Mathematics 141 prepares students in the business applications of calculus but Mathematics 161 must be taken as a prerequisite for Mathematics 162 and 261.*

It is recommended that students planning to enter the field of public accounting take additional accounting courses to satisfy their major electives. Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

It is essential for students majoring in the Department of Accounting to possess strong writing, speaking, and information literacy (knowing how to locate, analyze, and use information in decision-making) skills in preparation for careers in business/accounting or graduate studies. The curriculum requirements specifically designed to develop these skills include Business 207, *Business Communication*; and Business 486, *Business Policy and Strategy*. Please see course descriptions that follow for more information.

PUBLIC ACCOUNTING AND THE CPA EXAM

In 1998, the American Institute of Certified Public Accountants went on record as favoring the requirement that a student complete 150 semester hours of credit before being permitted to join the profession of certified public accounting and sit for the CPA examination. Since then, nearly all states or jurisdictions have passed legislation which makes the "150-hour requirement" mandatory at various effective dates. Students planning careers in public accounting usually take the Certified Public Accountant (CPA) examination soon after graduation in the state where they intend to practice. Completion of the Grove City College Bachelor of Science in Accounting, which requires 128 credit hours, prepares the student to take the examination; however, to meet the new "150-hour requirement" the GCC student would need 22 additional credit hours. Currently the 150-hour requirement is not mandatory in Pennsylvania; however, it will go into effect on January 1, 2012. Accounting majors should consider completing 22 credit hours over and above the Bachelor's degree minimum of 128 hours, thereby meeting the 150-hour requirement in effect in other states. At the time of this Bulletin's printing, the Department is in the process of developing a proposed five-year B.S./M.S. in Accounting degree program. Please contact Dr. Baglia, Department Chair, for more information at dsbaglia@gcc.edu.

ACCOUNTING (ACCT)

ACCT 201. PRINCIPLES OF ACCOUNTING I. This introductory course focuses on the preparation and use of accounting information in the financial reporting environment. Emphasis is placed on the understanding and application of steps involved in the accounting cycle as well as on the recognition, measurement, and reporting issues associated with various financial statement accounts for sole proprietorships and partnerships. The course also exposes the student to career opportunities in the accounting profession. *Fall semester only, three hours plus lab.*

ACCT 202. PRINCIPLES OF ACCOUNTING II. Course topics include accounting for debt and stockholder's equity, financial statement analysis, statement of cash flows, as well as introductions to managerial accounting techniques including cost-volume-profit analysis, budgeting, product costing, standard costs, and decision-making analysis. Prerequisite: Accounting 201.
Spring semester only, three hours plus lab.

ACCT 260. INDEPENDENT STUDY. Individual study of specialized topics in Accounting. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

ACCT 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Accounting. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ACCT 301. INTERMEDIATE ACCOUNTING I. A study of the financial statements with an emphasis on the asset section of the balance sheet and related information. This course also focuses on accounting theory and the interpretation of financial accounting standards associated with the balance sheet. Prerequisite: Accounting 202. *Fall semester only, three hours plus lab.*

ACCT 302. INTERMEDIATE ACCOUNTING II. A study of the financial statements with an emphasis on the income statement, statement of cash flows, and liabilities and stockholder's equity. Includes topics such as earnings per share (EPS), accounting for income taxes, revenue recognition, and pensions/leases. This course also focuses on accounting theory and the interpretation of current financial accounting standards. Prerequisite: Accounting 301.
Spring semester only, three hours and lab.

ACCT 303. COST ACCOUNTING. A study of (1) the assignment of direct and indirect manufacturing costs to a company's cost of goods sold and inventory accounts by the application of job order, process, and standard costing systems and (2) the ways in which accounting information is used in operational decision-making. Prerequisite: Accounting 202 and junior standing.
Fall semester only, three hours.

ACCT 305. FORENSIC ACCOUNTING AND BUSINESS INVESTIGATIONS. This course is intended to provide students with an introductory exposure to the field of forensic accounting. Much broader than fraud auditing, forensic accounting involves the use of intelligence-gathering techniques, along with other accounting and business skills, to present trial testimony and to develop information and opinions for use by attorneys in litigation. Specific topics include the roles and responsibilities of the forensic accountant, fraud standards and different types of fraud, ethical considerations, internal controls, business valuation, breach of contract, and damage calculations. Prerequisites: Accounting 202 and junior standing. *Alternate Fall semesters, three hours.*

ACCT 321. ACCOUNTING INFORMATION SYSTEMS. A study of the use of a variety of resources designed to transform financial and other data into financial information for decision-making. Consideration of these systems must deal with issues such as the flow of transactions and related procedures; summarizing the financial data into meaningful formats for both internal and external reporting; documentation for audit trail purposes; data security and backup; and disaster recovery planning. The course will emphasize transaction cycles, business processes, systems controls, and accounting database applications. Prerequisites: Accounting 202 and junior standing.
Spring semester only, three hours.

ACCT 360. INDEPENDENT STUDY. Individual study of specialized topics in Accounting. Prerequisites: Junior standing and permission of the department chairman and a faculty sponsor are required. *Semester course, one, two or three hours.*

ACCT 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Accounting. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ACCT 390. STUDIES IN ACCOUNTING. Studies in areas of accounting not fully covered by regular departmental offerings, such as forensic accounting and international issues.
Semester course, three hours.

ACCT 401. ADVANCED FINANCIAL ACCOUNTING. A study of the financial accounting effects on business entities involved in mergers; consolidations and divestitures with an emphasis on the proper recognition and recording of acquisition and divestiture transactions; the elimination of inter-company transactions; and the preparation of consolidated financial statements. Prerequisite: Accounting 302.
Fall semester only, three hours.

ACCT 403. AUDITING. A study of the duties and responsibilities of professional auditing, including types of audits and audit programs, audit planning, evidence, risk assessment, preparation of audit working papers, and audit reports. Prerequisites: Accounting 302, 321, and senior standing.
Fall semester only, three hours.

ACCT 405. TAX ACCOUNTING FUNDAMENTALS. A study of the provisions of the federal tax laws and the proper practices in preparing tax reports with emphasis on tax preparation for individuals. Prerequisites: Accounting 202 and senior standing. *Fall semester only, three hours.*

ACCT 406. ADVANCED TAX ACCOUNTING. Theory and practice in the treatment of partnership and corporate taxes with emphasis on the accounting and management planning aspects. Prerequisite: Accounting 405. *Spring semester only, three hours.*

ACCT 410. CONTEMPORARY ACCOUNTING THEORY AND PRACTICE. A capstone course that stresses contemporary financial accounting issues and theory and that familiarizes the student with interpretation of current accounting FASB's. Other non-financial topics are briefly covered. Prerequisites: Accounting 302 and senior standing in accounting. *Spring semester only, three hours.*

ACCT 420. GOVERNMENTAL AND INSTITUTIONAL ACCOUNTING. A study of the financial accounting principles used in the preparation of general purpose financial statements for both federal; state; and local governmental units as well as for not-for-profit corporations and associations including colleges and universities; health care entities; and voluntary health and welfare organizations. Prerequisite: Accounting 401. *Spring semester only, three hours.*

ACCT 424. ADVANCED AUDITING AND PROFESSIONAL ETHICS. Additional auditing issues are explored, including practical applications involving the evaluation of audit risk, audit evidence gathering, and materiality. Legal and ethical issues in auditing are also discussed. Prerequisite: Accounting 403 and senior standing in Accounting. *Spring semester only, three hours.*

ACCT 460. INDEPENDENT STUDY. Individual study of specialized topics in Accounting. Prerequisites: Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ACCT 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Accounting. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ACCT 480. INTERNSHIP IN ACCOUNTING. This is an opportunity for accounting majors to participate in a meaningful learning experience under the supervision of both an employer and department faculty member. Most internships take place during the summer months. Students will be graded based on an employer performance evaluation along with a written paper and journal. Prerequisites: good academic standing and completion of the sophomore year of study.
Semester course, one to six hours.

DEPARTMENT OF BIOLOGY

Dr. S. Gribble, Chair, Dr. Brenner, Dr. Dent, Dr. Dudt, Dr. Jenkins, Dr. Ray, Dr. Shaw, Dr. Sodergren. Part-Time: Dr. Darsie, Mrs. Grewell, Mrs. Yeager.

Departmental policy limits students to one major within the Department of Biology. Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

Course Requirements for Bachelor of Science Degree in Biology (BIOL)

Biology Core (21 hours):

Biology 101-102, 231, 234, 301, and 488.

Clusters (7 hours):

Choose a minimum of one course from each of the following clusters:

Health/Medicine: Biology 302, 311, 312, and 407.

Diversity/Ecology: Biology 305, 320, and 409.

Biology Electives (9 hours):

Nine additional hours of biology from 300-400 level courses.

No more than four credit hours of independent, internship, research, or honors study (Biology 260, 270, 360, 370, 372, 375, 376, 390, 460, 470, 475, 476, 480, 497, and 499) may be applied to the additional eight hours.

Major-related requirements (12 hours):

Chemistry 101-102; Mathematics 161.

Courses that count in the BIOL major quality point average (MQPA):

All courses with "BIOL" prefix. A minimum MQPA of 2.00 is required to graduate.

Students planning to do graduate work in biology are encouraged to take physics, calculus, statistics, organic chemistry, and biochemistry. Logic courses are helpful on standardized qualifying exams and one or more psychology courses are recommended for students aiming to enter a health profession. Business, communication, and computer skills are always helpful.

Course Requirements for Bachelor of Science Degree in Molecular Biology (MBIO)

Biology Core (9 hours):

Biology 101, 234, and 488.

Health/Medicine cluster (12 hours):

A minimum of three courses from Biology 302, 311, 312, or 407.

Biology Electives (8 hours):

Choose from any courses from Biology course offerings, with the exception that no more than four credit hours of independent, internship, research, or honors study (Biology 260, 270, 360, 370, 372, 375, 376, 390, 460, 470, 475, 476, 480, 497, and 499) may be applied to the additional eight hours.

Chemistry Core (24 hours):

Chemistry 101-102, 241-242, and 351-352.

Major-related requirements (12 hours):

Mathematics 162; Physics 121-122.

Courses that count in the MBIO major quality point average (MQPA):

All courses with "BIOL" and "CHEM" prefixes. A minimum MQPA of 2.00 is required to graduate.

Students planning to enter a health profession are highly recommended to take one or more psychology courses and a statistics course.

Course Requirements for Biology Major leading to (7-12) certification in Biology/General Science (BGSE)

Major field requirements (37 hours):

Same as Biology Major requirements, with the exception of Biology 486 instead of Biology 488.

Major-related requirements (25 hours):

Chemistry 101, 102; Computer 204; Geology 201; Mathematics 161; Astronomy 206 or 207; and Science 201 and/or Physics 121 (both are recommended, but Science 201 may not follow Physics 121).

Education requirements (38 hours):

Education 103, 201, 202, 203, 303, 305, 309, 371, 431, and 488.

Course Requirements for Biology Major leading to certification in Biology/General Science and Environmental Education—K-12 (BGSV)

Biology Core (34 hours):

Biology 101-102, 208, 231, 234, 301, 320, 407, 484, and 486.

Biology Elective (one hour):

Choose from any courses from Biology course offerings.

Environmental Cluster (3-4 hours):

Choose one course from Biology 305, 409, or 421.

Major-related requirements (35 hours):

Astronomy 206 or 207; Chemistry 101-102; Computer 204; Geology 201; Mathematics 161; and Science 204.

Economics 204.

Either Psychology 203 or Business 201.

Either Science 201 or Physics 121 (both are recommended but Science 201 may not follow Physics 121).

Education requirements (38 hours):

Education 103, 201, 202, 203, 303, 305, 309, 371, 431, and 488.

Course Requirements for a minor in Biology (20 hours)

Biology Core (8 hours):

Select one of the following combinations:

Biology 101 and 234 or

Biology 102 and 231.

Biology Electives (12 hours):

Select 12 hours from 300-400-level courses, excluding Biology 260, 270, 360, 370, 372, 375, 376, 390, 460, 470, 475, 476, 480, 497, and 499.

The Biology curriculum seeks to develop academic competency and professional awareness, to encourage meaningful integration between the biological sciences and other dimensions of life, and to promote lifelong learning skills in problem solving, research, and communication. Writing-intensive, speaking-intensive, and information literacy skills are developed by special assignments in core and seminar courses.

BIOLOGY (BIOL)

BIOL 101. GENERAL BIOLOGY I. An introduction to fundamental biological concepts including biomolecules, cells, energetics, metabolisms, classical/molecular genetics, and vertebrate systems. This course partially fulfills the Writing Intensive (WI) and Information Literacy (IL) requirements for majors in the Department of Biology. Three lectures and one lab per week.
Fall semester only, four hours.

BIOL 102. GENERAL BIOLOGY II. A study of biological concepts with an emphasis on diversity of life including classification, survey of organisms, animal behavior, population genetics, natural history, and ecology. Three lectures and one lab per week. *Spring semester only, four hours.*

BIOL 208. INTRODUCTION TO ENVIRONMENTAL EDUCATION. This course introduces the scope of environmental education. Topics addressed will include history and current trends, issue articulation and methodology, and development of problem-solving and communication skills to address environmental issues. Learning competencies K-12 will be emphasized and reinforced by environmental project-learning experiences. *Spring semester only, two hours.*

BIOL 231. GENERAL ECOLOGY. A study of responses of living systems to a changing environment in relation to selected ecosystems with emphasis on the interrelations of individual, population, community, and habitat. Three lectures and one lab per week. Prerequisite: Biology 102 or permission.
Fall semester only, four hours.

BIOL 234. CELLULAR AND MOLECULAR BIOLOGY. A focus on the organization and physiology of living cells using a problem-solving approach to learning with particular emphasis on web-based resources in biotechnology, genomics, genetic diseases, and immunology. The laboratory provides core experience with model cellular systems and basic tools of biomolecular research. This course partially fulfills the Speaking Intensive (SI) and Information Literacy (IL) requirements for majors in the Department of Biology. Three lectures and one lab per week. Prerequisite: Biology 101 or equivalent. *Spring semester only, four hours.*

BIOL 260. INDEPENDENT STUDY. Individual study of specialized topics in Biology. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

BIOL 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Biology. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

BIOL 301. GENETICS. A study of classical and molecular aspects of genetics with emphasis given to biochemical mechanisms of inheritance, genetic change, human disease, and development. Topics progress from Mendelism to modern DNA science and include history, cytogenetics, gene actions, and controls. Three lectures and one lab per week. Prerequisite: Biology 101.
Fall semester only, four hours.

BIOL 302. DEVELOPMENTAL BIOLOGY. A study of organism development during all temporal phases of its life cycle. Embryological development is compared across several model systems. Topics include fertilization, cleavage, gastrulation, neurulation, and organogenesis. Particular attention is given to the common molecular aspects of differentiation and morphogenesis and to the techniques used to investigate these problems. Selected topics in post-embryologic development are also covered. Three lectures and one lab per week. Prerequisite: Biology 234.
Spring semester only, four hours.

BIOL 305. PLANT TAXONOMY. A study of plants in relation to their habitats, including aspects of plant geography and taxonomy in the lecture portion and methods of plant identification, collection, and preservation with emphasis on local flora in the lab portion. Three lectures and one lab per week. Prerequisite: Biology 102 or permission.
Fall semester only, four hours.

BIOL 308. NEUROBIOLOGY. An investigation of a broad array of topics in neurobiology, building on foundations of the Hodgkin-Huxley model of action potential, and synaptic transmission and neuromodulation. Studies include processing of sensory information in visual and auditory systems, the chemical senses, and others. The connections between sensory integration and motor behaviors in diverse animals will be explored. Neural mechanisms of learning and memory, sleep/wakefulness, and reward and decision-making also will be addressed. Recommended for students considering a career in research, health sciences, or psychology. Prerequisite: Biology 101.
Spring semester only, three hours.

BIOL 311. HUMAN ANATOMY AND PHYSIOLOGY I. A holistic study of the human body integrating anatomy, histology, and physiology. The course explores structure/function principles and has special importance as preparation for health-related careers. Topics are organized according to body system and include skin, skeletal, articulatory, muscular, circulatory, and immune systems. Three lectures and one lab per week. Prerequisite: Biology 234. *Fall semester only, four hours.*

BIOL 312. HUMAN ANATOMY AND PHYSIOLOGY II. A holistic study of the human body integrating anatomy, histology, and physiology. The course is a continuation of Human Anatomy and Physiology I and has special importance as preparation for health-related careers. Topics include nervous, endocrine, respiratory, digestive, and urinary systems. Three lectures and one lab per week. Prerequisite: Biology 234. *Spring semester only, four hours.*

BIOL 320. CONSERVATION AND WILDLIFE BIOLOGY. A comparative study of representative vertebrates with emphasis on population dynamics, biodiversity, morphological adaptation, wildlife conservation, and resource management. The laboratory involves field identifications, aging, and morphological adaptations of representative vertebrates. Three lectures and one lab per week. Prerequisite: Biology 102 or permission. *Spring semester only, four hours.*

BIOL 360. INDEPENDENT STUDY. An opportunity for individual study of specialized topics in the biological sciences. Prerequisite: Permission of the department.
Semester course, one, two, three, or four hours.

BIOL 370. BIOLOGY RESEARCH. Course providing independent opportunity in biological research under the supervision of a faculty mentor. Not to be taken concurrently with Biology 375, 376, 475, or 476. Prerequisites: minimum of 8 hours of Biology credits, consent of faculty research sponsor, and completed research study form for the Registrar. *Semester course, one hour.*

BIOL 372. INVESTIGATIVE PROBLEMS IN BIOLOGY - WWW. Students who have displayed aptitude in biology investigate assigned research problems using web resources and report weekly to the class. A research proposal written according to professional guidelines is required. Prerequisite: consent of the department. *Semester course, one hour.*

BIOL 375. INVESTIGATIVE PROBLEMS IN BIOLOGY I - DNA. Students with special aptitude in molecular genetics investigate assigned problems in DNA research. Prerequisite: Consent of the faculty research supervisor and submission of personalized copy of the course syllabus to the supervisor. *Fall semester only, one hour.*

BIOL 376. INVESTIGATIVE PROBLEMS IN BIOLOGY II - DNA. Students with special aptitude in molecular genetics investigate assigned problems in DNA research. Prerequisite: Consent of faculty research supervisor and submission of personalized copy of the course syllabus to the supervisor. *Spring semester only, one hour.*

BIOL 390. STUDIES IN BIOLOGY. A course permitting students with special interests and needs to examine topics not included in regular course offerings or in greater depth than possible in regular courses. Prerequisite: Consent of the department. *Semester course, one, two, three or four hours.*

BIOL 402. BEHAVIORAL BIOLOGY. A comparative study of the behavior patterns exhibited by vertebrate and invertebrate organisms with field and lab exercises exploring physiological and environmental factors affecting individual and group behavior. Emphasis is on the role of behavior in the regulation and evolution of animal populations and on biological factors affecting learning. Two sessions per week. Prerequisite: Biology 101 or 102 or permission of instructor. *Alternate Fall semesters, three hours.*

BIOL 407. MICROBIOLOGY. An introduction to microorganisms, primarily bacteria, encompassing considerations of taxonomy, structure, physiology, ecology, genetics, immunology, and disease. The course has importance for a variety of careers including areas of healthcare, environment, education, biotechnology, and research. Two lectures and two labs per week. Prerequisites: Biology 101 and Chemistry 101 or permission. *Fall semester only, four hours.*

BIOL 409. ENTOMOLOGY. A study of the class Insecta, including insect diversity, life histories, morphology, physiology, behavior, ecology, and impact on human society. The course includes a combination of lecture and laboratory components. The lab component includes field excursions for collecting insects for display and anatomical/taxonomic investigation. Course traditions include a blacklight party and a bug feast. Three periods per week. Prerequisite: Biology 101 or 102 or permission of instructor. *Fall semester only, three hours.*

BIOL 421. AQUATIC AND FISHERY BIOLOGY. A study of freshwater and marine ecosystems, including the impact of pollution on aquatic environments, water chemistry, taxonomy of aquatic organisms, fisheries, and management of aquatic systems. Two sessions per week. Prerequisite: Biology 231 or permission of instructor. *Alternate Fall semesters, three hours.*

BIOL 460. INDEPENDENT STUDY. An opportunity for individual study of specialized topics in the biological sciences. Prerequisite: Permission of the department. *Semester course, one, two, three, or four hours.*

BIOL 470. BIOLOGY RESEARCH. Course providing independent opportunity in biological research under the supervision of a faculty sponsor. Not to be taken concurrently with Biology 475 or 476. Prerequisite: minimum of 8 hours of Biology credits, consent of faculty research sponsor and completed research study form for the Registrar. *Semester course, one or two hours.*

BIOL 475. INVESTIGATIVE PROBLEMS IN BIOLOGY III—DNA. Senior students with special aptitude in molecular genetics investigate assigned problems in DNA research. Not to be taken concurrently with Biology 497. Prerequisite: consent of the faculty research supervisor and submission of personalized copy of the course syllabus to the supervisor. *Fall semester only, one or two hours.*

BIOL 476. INVESTIGATIVE PROBLEMS IN BIOLOGY IV—DNA. Senior students with special aptitude in molecular genetics investigate assigned problems in DNA research. Not to be taken concurrently with Biology 497. Prerequisite: consent of the faculty research supervisor and submission of personalized copy of the course syllabus to the supervisor.

Spring semester only, one or two hours.

BIOL 480. INTERNSHIP IN BIOLOGY. Rising sophomores, juniors and seniors may participate in individual off-campus experiences in research, medical, environmental, or other approved settings under the guidance of both the on-site host supervisor and the Biology faculty sponsor. International opportunities in consultation with the Office of International Education can be arranged. Clinical experiences through approved medical missions agencies may qualify for credits. Grade is dependent upon required update communication with the faculty sponsor, written evaluation by the on-site supervisor, and submission of an internship paper to the faculty sponsor. Prerequisites: Rising sophomore status, minimum 8 hours of biology, permission of the department.

Summer or semester course – one, two, three, four, five, or six hours.

BIOL 484. ISSUES IN ENVIRONMENTAL EDUCATION. This course will provide reinforcement of the concepts and methods of environmental education; the development, organization, coordination of the environmental learning sequence for K-12; exploration of training in curricula in environmental education; and discussions of issues leading to increased understanding of the interrelatedness of areas of multidisciplinary study including environmental science, economics, political institutions, and technology in relation to environmental management. *Spring semester only, two hours.*

BIOL 486. SEMINAR FOR BIOLOGY TEACHERS. Limited to junior or senior majors in the department accepted into teacher certification programs. Involves instruction, Project WET training, research using library/web resources, student presentation, and experience in preparing and conducting effective learning experiences in biology. This course partially fulfills the Writing Intensive (WI), Information Literacy (IL), and Speaking Intensive (SI) requirements for majors in the Department of Biology. *Spring semester only, one hour.*

BIOL 488. SEMINAR IN BIOLOGY. Required of all majors in the Department of Biology except for those in teacher certification programs. Involves in-depth research using library/web resources and oral presentation of an approved topic selected by the student. This course partially fulfills the Writing Intensive (WI), Information Literacy (IL), and Speaking Intensive (SI) requirements for majors in the Department of Biology, and the SI requirement for the Biochemistry major.

Semester course, one hour.

BIOL 497. HONORS IN BIOLOGICAL RESEARCH-DNA. Seniors who have shown special aptitude in molecular genetics may undertake supervised DNA research. Not to be taken concurrently with Biology 475 or 476. Public presentation (oral or poster) of findings is encouraged, and either a public presentation or a research paper is required. Prerequisites: prior completion of a research experience, either on-campus (Biology 270, 370, 372, 375, 376, 470, 475, or 476) or off-campus (Biology 480 internship or equivalent non-credit research experience), consent of the faculty research supervisor and submission of personalized copy of the course syllabus to the supervisor.

Semester course, one or two hours.

BIOL 499. HONORS IN BIOLOGICAL RESEARCH. Seniors who have shown special aptitude in biology may undertake supervised biological research. Registration for the honors course requires prior completion of a research experience either on-campus (Biology 270, 370, 372, or 470) or off-campus (Biology 480 internship or equivalent non-credit research experience). Public presentation (oral or poster) of findings is encouraged, and either a public presentation or a research paper is required. Prerequisite: consent of the department and submission of research study form for the Registrar. *Semester course, one or two hours.*

GEOLOGY (GEOL)

GEOL 201. GEOLOGY. A study of the dynamic systems operating within and on the earth with special emphasis on the development of materials, landforms, and geological structures with constant discussion of application of geologic principles to the solution of practical problems.

Spring semester only, three hours.

DEPARTMENT OF BUSINESS

Dr. Markley, Chair; Dr. Adels, Dr. Christie, Dr. DalleTezze, Dr. Dupree, Dr. Hinton, Dr. Ketler, Dr. Mech, Mr. Otto, Mr. Powell, Dr. Sparks. Part-Time: Mr. Biddle, Mr. Gregg, The Hon. Judge Schwab.

Four degree programs are offered in business: Bachelor of Science in Business Management, Bachelor of Science in Finance, Bachelor of Science in Marketing Management, and Bachelor of Science in International Business. All four programs include international aspects of management and business administration. The international character of business is integrated in course content as it applies to appropriate functional areas of study. The student may also select from three interdepartmental majors: Computer Information Systems, Entrepreneurship, or Industrial Management.

Students completing a major in Business Management, Finance, Marketing Management, International Business, or Industrial Management majors may only complete one of these five majors and may not complete a second major or a minor in the related Departments of Accounting or Entrepreneurship.

Three of the four Bachelor of Science degree programs mentioned above commence with the following Business Core.

BUSINESS CORE REQUIREMENTS (40 hours)

Business courses (30 hours):

Accounting 201-202; Business 201, 203, 204, 207, 301, 303, 304, and 305.

Major-related courses (10 hours):

Economics 101-102; Mathematics 141*.

** Mathematics 141 prepares students in the business applications of calculus but Mathematics 161 must be taken as a prerequisite for Mathematics 162 and 261.*

Course Requirements for a Bachelor of Science Degree in Business Management (BMGT)

Business Core—see requirements above (40 hours).

Business 302 and 486 (6 hours).

Nine hours from: Business 457, 458, 475 or Entrepreneurship 459.

Twelve additional hours from any 300- or 400-level Accounting, Business or Entrepreneurship course. (maximum of 3 hours of internship credit).*

Courses that count in the BMGT major quality point average (MQPA):

All courses with "ACCT," "BUSA," and "ENTR" prefix, excluding BUSA 205 and BUSA 206. A minimum MQPA of 2.00 is required to graduate.

**A Business Management degree candidate will not be permitted to take Accounting, Business or Entrepreneurship courses as electives beyond these 12 hours unless the College's 128-credit hour requirement for graduation has been satisfied. Up to three semester hours of internship credit will be permitted as non-business elective hours.*

Course Requirements for a Bachelor of Science Degree in Finance (FNCE)

If a career in corporate finance or financial services meets the interest of the student, the candidate is encouraged to pursue this field of study.

Business Core - see requirements above (40 hours).

Business 302, 432, 434, 440, 486 and Entrepreneurship 430 (18 hours).

Nine additional hours of any 300 or 400-level Accounting, Business or Entrepreneurship courses (maximum of 3 hours of internship credit).*

Courses that count in the FNCE major quality point average (MQPA):

All courses with "ACCT," "BUSA," and "ENTR" prefix, excluding BUSA 205 and BUSA 206. A minimum MQPA of 2.00 is required to graduate.

**A Finance degree candidate will not be permitted to take Accounting, Business or Entrepreneurship courses as electives beyond these 9 hours unless the College's 128-credit hour requirement for graduation has been satisfied. Up to three semester hours of internship credit will be permitted as non-business elective hours.*

Course Requirements for a Bachelor of Science Degree in Marketing Management (MMGT)

Marketing is a major link between the organization and the customer, requiring that the marketing personnel know who the customer is and what his/her needs are.

Business Core - see requirements above (40 hours).

Business 302, 411, 414, 415, 419, and 486 (18 hours).

Nine additional hours from these choices: Business 412, 416, 420; Entrepreneurship 306, or any two 300 or 400-level Accounting, Business or Entrepreneurship courses (maximum of 3 hours of internship credit).*

Courses that count in the MMGT major quality point average (MQPA):

All courses with "ACCT," "BUSA," and "ENTR" prefix, excluding BUSA 205 and BUSA 206. A minimum MQPA of 2.00 is required to graduate.

**A Marketing Management degree candidate will not be permitted to take Accounting, Business or Entrepreneurship courses as electives beyond these 9 hours unless the College's 128-credit hour requirement for graduation has been satisfied. Up to three semester hours of internship credit will be permitted as non-business elective hours.*

Course Requirements for a Bachelor of Science Degree in International Business (INBS)

This program focuses on the international context of business and is designed to prepare students for participation in worldwide business activity. This program combines substantial preparation in international business, business, modern languages, and other related international courses. Students must complete the following requirements:

Business Core Requirements (39 hours):

Accounting 201, 202 (6 hours)

Business 201, 203, 204, 207, 301, 304, and 486 (21 hours).

Business Concentration: (12 hours) Choose one of the following four concentrations:

1. Entrepreneurship: Entrepreneurship 312, 430, and 466, and three hours from Entrepreneurship 309, 318, 407 or 423.
2. Finance: Business 432, 434, 440, and Entrepreneurship 430.
3. Management: 9 hours from Business 457, 458, 475, or Entrepreneurship 459, and three additional hours from any 300- or 400- level Accounting, Business or Entrepreneurship course.
4. Marketing: Business 411, 414, 415, and 419.

International Core Requirements (36 hours):

International Business (12 hours):

- Business 305, 416 and 445; Economics 303.

Global Emphasis (9 hours):

- Communication 225 or Global Studies 300.
- Two courses from: Business 480; History 141, 144, or 212; Japanese 101 or 102; Political Science 301, 323, or 341.

Modern Language (15 hours):

Students must complete 15 hours of a single foreign language, choosing from Chinese, French, German, or Spanish. Complete one of the following eight options:

1. Spanish Option 1
   - Spanish 201, 202, 295 and 303.
   - Choose one course from Spanish 300, 319, 320, 322, or 323.
2. Spanish Option 2
   - Either Spanish 295 and one additional Spanish 300-level course, or two Spanish 300-level courses.
   - Spanish 303 and 305.
   - Choose one course from Spanish 300, 319, 320, 322, or 323.
3. French Option 1
   - French 201, 202, 315, and 340.
   - One course from French 307 or 309.
4. French Option 2
   - French 315 and 340.
   - One course from French 307 or 309.
   - Two additional French 300-level courses.
5. German Option 1
   - German 201, 202, 316, and 330.
   - One additional German 300-level course.
6. German Option 2
   - German 316 and 330.
   - Any three additional German 300-level courses.
7. Chinese Option 1
   - Chinese 201, 202, 205, and 301.
   - One course from Chinese 302 or 305.
8. Chinese Option 2
   - Chinese 301, 302 and 305.
   - Any two additional 300- or 400-level Chinese courses.

Major-Related Courses (10 hours – These do not count toward major QPA):

Economics 101, 102; Mathematics 141.

Courses that count in the INBS major quality point average (MQPA):

All courses with "ACCT," "BUSA," "CHIN," "ENTR," "FREN," "GERM," and "SPAN" prefix, COMM 225, ECON 303, GOBL 300, excluding BUSA 205 and BUSA 206. A minimum MQPA of 2.00 is required to graduate.

International Business majors are strongly encouraged to take additional advanced courses in culture, literature, and grammar in their chosen language of study and to study an additional foreign language. They are also encouraged to avail themselves of opportunities to study abroad and obtain international internship experience.

INTERDEPARTMENTAL MAJORS

The Department of Business will assist the student in pursuing any of the following three interdepartmental fields:

Computer Information Systems

The intent of this interdepartmental Bachelor of Science program is to prepare the student to facilitate the development of computer utilization, databases, and information systems to satisfy the requirements and needs of organizational management. See Department of Computer Science for course plan.

Entrepreneurship

See Department of Entrepreneurship for details.

Industrial Management

Contemporary society is placing unprecedented demands on business. In order to effectively compete in international markets, modern firms realize that they must provide their customers with world-class products and prompt deliveries. Internally, organizations must continually improve by incorporating new technologies, eliminating waste, and reducing cost. Because management is responsible for meeting the needs of their organization's customers while maintaining long-term economic viability, the very nature of management is changing. Grove City College offers the student the opportunity to acquire a theoretical understanding of a unique blend of technical and administrative skills necessary to become a successful manager. Going beyond the realm of design engineering or functional area management, these skills may be the key to devising and implementing strategies that will be successful in the international arena.

Industrial Management is an interdepartmental Bachelor of Science program that consists of a select combination of business, natural science, and engineering courses. It features management techniques of top manufacturing and service organizations and is designed to prepare the student in basic technical and managerial competence necessary to administer the technically oriented aspects of contemporary organizations. Students who elect this program must complete the following courses:

Course Requirements for a Bachelor of Science Degree in Industrial Management (INDM)

Science/Engineering related courses (20 hours):

Computer Science 141 (3 hours).

Engineering 156 (2 hours).

Electrical Engineering 210 (3 hours).

Mechanical Engineering 201, 211, 212, and 214 (12 hours).

Business-related courses (36 hours):

Accounting 201- 202 (6 hours).

Business 201, 203, 207, 301, 302, 307, 450, 464, 486, and 3 hours Business elective (30 hours).

Major-related requirements (30 hours):

Mathematics 161-162, 261, and 262 (15 hours).

Physics 101-102; Chemistry 105 (12 hours).

Economics 101 (3 hours).

Courses that count in the INDM major quality point average (MQPA):

All courses with "BUSA," "ENGR," prefix, and ACCT 201, ACCT 202, MECE 201 and MECE 214. A minimum MQPA of 2.00 is required to graduate.

It is essential for students majoring in the Department of Business to possess strong writing, speaking, and information literacy (knowing how to locate, analyze, and use information in decision-making) skills in preparation for careers in business/accounting or graduate studies. The curriculum requirements specifically designed to develop these skills include Business 207, Business Communication; and Business 486, Business Policy and Strategy. Please see course descriptions that follow for more information.

The Business Department offers one minor. The Business Minor is intended for those students who plan careers in larger business firms. The Business and Entrepreneurship minors may not be completed by students completing a major within the Departments of Accounting, Business, or Entrepreneurship.

Course Requirements for a minor in Business (24 hours)

Accounting 201; Economics 101; Business 203, 204, 301, and 303 plus six hours of Accounting or Business electives, excluding Business 205 and 206.

BUSINESS (BUSA)

BUSA 201. BUSINESS STATISTICS. A course designed to familiarize the student with basic statistical techniques used in the management decision-making process, including probability distributions, confidence intervals, hypothesis testing, and regression analysis.
Semester course, three hours.

BUSA 203. MANAGEMENT IN ORGANIZATIONS. A study of the five management functions: planning, organizing, leading, controlling, and decision-making with emphasis on their application in contemporary management. The course examines current trends in the changing business environment, the application of Christian principles in management, selected contemporary management topics, and the interrelationships among organizational theory, organizational behavior, and management practices. *Semester course, three hours.*

BUSA 204. INTRODUCTION TO MARKETING MANAGEMENT. An introductory study of products; pricing; distribution; and promotion with a consumer orientation emphasizing marketing strategy; market institutions and functions; and the role of the consumer in the marketing process. Students learn the purpose and function of marketing in both the corporate and small business setting. Course content may include the use of a simple stand-alone computer simulation where they will manage the marketing mix for a consumer product. *Semester course, three hours.*

BUSA 205. PERSONAL FINANCE. An introduction to the financial problems of individuals such as managing personal debt (including educational debt); choosing health, life, and property insurance; making investments; and understanding income taxation, retirement, and estate planning. The course is open to the non-business/accounting/entrepreneurship student and may not be counted within the 128 hours required for graduation by business, accounting, or entrepreneurship majors.
Semester course, three hours.

BUSA 206. FUNDAMENTALS OF BUSINESS. A general introduction to the organizational environment and operations of contemporary businesses. The course examines the United States business system and how it interacts with global systems; the basic management functions of planning, organizing, leading, and controlling; entrepreneurship and small businesses; marketing processes and consumer behavior; managing operations and information; and financial management. Integrated into these topics are Christian principles that should guide ethical business practices. The course is open to the non-business/accounting/entrepreneurship student and may not be counted within the 128 hours required for graduation by business, accounting, or entrepreneurship majors.
Fall semester only, three hours.

BUSA 207. BUSINESS COMMUNICATIONS. This course provides business majors with instruction and practical exercises using Microsoft Office. It integrates applications of Microsoft Office into the business environment in such a way that students learn to use the software to prepare reports, design oral presentations, and integrate spreadsheets into other documents. In addition, students learn information literacy skills by performing electronic information searches, evaluating information, and using valid information to prepare documents and presentations on various business topics. This course will ordinarily be taken in the sophomore year. For most business majors it will be taken after they have had some core business instruction, but before they take 300-and 400-level business courses. This course satisfies the Writing Intensive (WI) and the Information Literacy (IL) requirements in the major. Note: Students are not permitted to take both this course and Computer 102.
Semester course, three hours.

BUSA 260. INDEPENDENT STUDY. Individual study of specialized topics in Business. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

BUSA 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Business. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

BUSA 301. PRINCIPLES OF FINANCE. An overview of finance, including an introduction to the role of finance in the firm, financial markets and securities, and multinational issues. Special attention is given to discounted cash flow analysis and the relation between risk and return. Prerequisite: Accounting 201. *Semester course, three hours.*

BUSA 302. LEAN MANAGEMENT. An examination of the general theory of lean management and the twenty keys to workplace improvement. Topics include just-in-time, supplier development, and skill versatility. *Semester course, three hours.*

BUSA 303. BUSINESS LAW. A basic introduction, by means of cases and text, to commercial legal relationships with an emphasis on the contract as the foundation of business affairs. This will include the subjects of legal rights, sales, bailment, and personal property. *Semester course, three hours.*

BUSA 304. LEGAL ENVIRONMENT OF BUSINESS. Focuses on the regulation of business including labor and employment law; environmental restraints; antitrust rules; and other regulatory controls with constant consideration of the regulatory/legal climate in which international business is conducted. Prerequisite: Economics 101 and junior or senior standing.
Semester course, three hours.

BUSA 305. INTERNATIONAL BUSINESS. Designed to acquaint the student with those aspects of international business management not associated with traditional functional areas including international trade; foreign currency transactions; theory and institutions; country analysis; and international business strategy. Prerequisites: Business 204 and either Business 203 or Entrepreneurship 101.
Semester course, three hours.

BUSA 307. TEAMS AND TEAM LEADERSHIP. This course provides the student with team-building skills, team dynamics, and a team-oriented problem-solving methodology within the context of the Deming management philosophy. Prerequisite: sophomore standing.
Semester course, three hours.

BUSA 311. NEGOTIATION. Negotiation is the art and science of securing agreements between two or more parties who are interdependent and who are seeking to maximize their outcomes. The central issues of this course deal with understanding the behavior of individuals, groups, and organizations in the context of competitive situations. It is designed to complement the technical and diagnostic skills learned in other courses, with a basic premise being that while a manager needs analytical skills to discover optimal solutions to problems, a broad array of negotiation skills are needed for these solutions to be accepted and implemented. Considerable emphasis will be placed on simulations, role-playing, and cases. Junior standing. *Fall semester only, three hours.*

BUSA 360. INDEPENDENT STUDY. Individual study of specialized topics in Business. Prerequisites: Junior standing and permission of the department chairman.
Semester course, one, two or three hours.

BUSA 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Business. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

BUSA 390. STUDIES IN BUSINESS. Studies in areas of business not fully covered by regular departmental offerings. *Semester course, three hours.*

BUSA 408. ADVANCED BUSINESS LAW. Exploration of complex legal relationships as they affect business and accounting including negotiable instruments; agency; secured transactions; bankruptcy; partnerships and corporations; and real property, using case and text methods. Prerequisite: Business 303. *Spring semester only, three hours.*

BUSA 411. MARKETING RESEARCH. An introduction to the major areas of research in marketing with attention given to problem definition, research design, sampling, interviewing, and analysis to assist marketing management with the decision making process, using both theoretical and empirical concepts of marketing research. Prerequisites: Business 201, 203 and 204.
Fall semester only, three hours.

BUSA 412. RETAIL MANAGEMENT. A study of the institutions, current merchandising practices, promotional activities, and problems of control in the field of retailing. Prerequisite: Business 204.
Spring semester only, three hours.

BUSA 414. SALES. Students study the client-focused non-manipulative sales process and how high-performing achievement-oriented sales professionals are managed. Through the use of lecture, case discussion and interaction with practicing sales professionals, students learn and apply the principles of professional salesmanship and the role of sales management in the firm. Non-business majors may take the course with instructor's permission. Prerequisite: Business 204.
Fall semester only, three hours.

BUSA 415. STRATEGIC MARKETING. An in-depth exploration and application of marketing strategy in the small, medium, and large firm. Students will build upon the theoretical framework of consumer behavior and competitive analysis by developing applied marketing plans. While focused on marketing, the plans will also incorporate financial and management strategies. This is a capstone marketing class and requires the utilization of prior business course work and experience. Prerequisite: Business 204 and junior standing. *Spring semester only, three hours.*

BUSA 416. INTERNATIONAL MARKETING. An introduction to marketing management on a global scale including social and cultural dimensions of marketing; economic environments; political and financial risks; cross-cultural consumer behavior; and international product and channel decisions. Prerequisite: Business 305. *Spring semester only, three hours.*

BUSA 419. CONSUMER BEHAVIOR. An examination of consumer decision processes in the marketplace, emphasizing the effects of external factors such as culture, subcultures, reference groups, demographics, and social status; the effects of internal factors such as motivation, personality, learning, emotion, and attitudes; the steps in the decision process; and differences between individual and organizational buyers. Prerequisite: Business 204. *Spring semester only, three hours.*

BUSA 420. ADVERTISING. A critical exploration of the purposes and functions of advertising and sales promotion in the growth and development of the global market economy. Included are the study of ethics; corporate responsibility in advertising and promotion; basic principles of researching, creating, and planning campaigns; and concepts of effective sales promotion. Prerequisite: Business 204. *Fall semester only, three hours.*

BUSA 431. FINANCIAL PLANNING. This course provides a comprehensive exploration of financial planning topics (in conjunction with the recommendation of the Academy of Financial Services and the CFP Board of Standards) including the financial planning process, client interactions, time value of money applications, personal financial statements, cash flow and debt management, asset acquisition, education planning, risk management, investment planning, retirement planning, special circumstances, plan integration, ethics, and the business of financial planning. Prerequisite: Business 301. *Semester course, three hours.*

BUSA 432. INVESTMENT MANAGEMENT. This course focuses on financial market operations and investment portfolio design. It examines the criteria for investment selection, risk management, and portfolio performance evaluation. The course includes the analysis and use of fixed income, equity, mutual fund and derivative instruments within the investment portfolio. Prerequisite: Business 301. *Fall semester only, three hours.*

BUSA 433. RISK AND INSURANCE. An introduction to and study of risk and liability exposures that face businesses and individuals. Topics include risk management techniques, the insurance industry, and employee benefits packages. Prerequisite: junior or senior standing. *Spring semester only, three hours.*

BUSA 434. INVESTMENT ANALYSIS. This course focuses on the procedures and tools necessary to determine the intrinsic value of securities and analyzes the performance of securities according to recognized benchmarks. It examines the risk and return characteristics of equity, fixed income and derivative instruments. Students will perform fundamental and technical analysis in determining investment value. Prerequisite: Business 432. *Spring semester only, three hours.*

BUSA 440. FINANCIAL POLICY. A case class that applies financial theories and techniques to actual and simulated business situations. Subjects include mergers and acquisitions, risk management, corporate restructuring, and other topics of interest to financial managers. Prerequisites: Business 301. *Semester course, three hours.*

BUSA 445. THE LAW OF INTERNATIONAL BUSINESS TRANSACTIONS. A survey of the important legal aspects of international business transactions. Specific topics examined within the course will include international sales, letters of credit, customs classification, World Trade Organization agreements, settlement of international business disputes, licensing of intellectual property, and foreign direct investment. A number of sessions will be devoted to analyzing common transactional instruments such as letters of credit, technology licenses, and joint venture agreements. Prerequisite: Business 305. *Fall semester only, three hours.*

BUSA 450. QUALITY MANAGEMENT. An examination of the philosophies, principles, and techniques used to study, gain control, and improve processes. Topics include the thought leaders, Six Sigma, tools of QC, designed experiments, and the Baldrige Award criteria. Prerequisite: Business 201 or equivalent. *Spring semester only, three hours.*

BUSA 457. HUMAN RESOURCES MANAGEMENT. This course examines the principles, policies and practices of human resource management functions for an organization; including legal guidelines, recruitment, selection, training, compensation, retention, employee appraisal, and discipline systems. Prerequisite: Business 203. *Fall semester only, three hours.*

BUSA 458. ORGANIZATIONAL BEHAVIOR. An examination of individual, interpersonal, and organizational processes in contemporary organizations emphasizing motivation, job design, performance management, group and team dynamics, leadership, and decision-making. Also covered are organizational culture, design, and change management. The course emphasizes contemporary theories and trends in organizational structures and processes. The course includes extensive use of case studies and applications of theories to management practice. Prerequisite: Business 203.
Semester course, three hours.

BUSA 460. INDEPENDENT STUDY. Individual study of specialized topics in Business. Prerequisites: Senior standing and permission of the department chairman.
Semester course, one, two or three hours.

BUSA 462. MULTINATIONAL FINANCIAL MANAGEMENT. This course focuses on financial issues facing multinational corporate financial managers. International finance is a quickly evolving field that is complicated by cross-border differences in monetary systems, markets for foreign exchange, exchange exposure, security markets and institutions, and corporate investment analysis. Knowledge of international financial transactions is essential as markets become increasingly integrated due to exploitation of comparative advantages between nations. Prerequisite: Business 301.
Semester course, three hours.

BUSA 464. SIX SIGMA MANAGEMENT. This course examines the thought leaders, theories, concepts, and principles of the Six Sigma quality management program. Prerequisite: Business 201 or equivalent. *Spring semester only, three hours.*

BUSA 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Business. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

BUSA 475. LEADERSHIP. A study of historical and current perspectives on leadership with emphasis on leadership theories; Christian principles in leadership; leadership in the new international economy; the attributes of effective contemporary business leaders; development of leadership skills; and case studies of current and past leaders. Prerequisites: Business 203 and junior or senior standing.
Spring semester only, three hours.

BUSA 480. INTERNSHIP IN BUSINESS. An opportunity for junior and senior business and accounting majors, with a minimum of fifteen hours in their major, to participate in individual job experiences, domestic and international, under the supervision of an on-site manager and a department faculty member. Products of the internship will include an evaluation by the on-site manager, a log of the internship experience, and a paper describing the experience and relating it to academic theory. Prerequisite: Minimum grade point, permission of the faculty sponsor, and coordination with the job site.
Semester course, one to six hours.

BUSA 486. BUSINESS POLICY AND STRATEGY. This business capstone course addresses senior management's development and implementation of an organization's mission and strategy. Emphasis is placed on how enterprises use their strengths to take advantage of opportunities in their competitive marketplace. Global competition and international markets are also addressed. Case study presentations and a web-based business simulation are major elements of this course. This course satisfies the Speaking Intensive (SI) requirement in the major. Limited to seniors in the Department of Business only. *Semester course, three hours.*

DEPARTMENT OF CHEMISTRY

Dr. T. Homan, Chair, Dr. Augspurger, Dr. Conder, Dr. Cramer, Dr. DiStasi, Dr. Falcetta, Dr. Kriley, Dr. Shaw. Part-time: Mrs. Grimm.

CHEMISTRY DEPARTMENT MISSION STATEMENT, OBJECTIVES, AND OUTCOMES

The Department of Chemistry is traditional in its approach to the discipline of chemistry and offers a rigorous and well-balanced curriculum. This provides the student with a strong preparation for graduate studies and/or a career in chemistry. The department faculty expertise covers all major areas of chemistry. A variety of research experiences are available to majors through ongoing faculty research programs. In addition, the department attempts to instill in its students an awareness of the beauty and design in nature that reflects the creative hand of God.

There are four separate majors offered within the department:

- **Chemistry:** The traditional chemistry major provides a strong preparation for graduate school or employment in the chemical industry.
- **Biochemistry:** This major provides a strong preparation for graduate or professional schools or for employment in biochemical, molecular biology or genetics industry.
- **Chemistry Secondary Education:** This major prepares the student for teaching chemistry at the secondary school level. It is a program that combines a traditional chemistry curriculum with a number of education courses.
- **Chemistry General Science Secondary Education:** This is essentially the same as Chemistry Secondary Education major. These students, however, in addition to all the chemistry and education courses will take Astronomy and either Geology or Environmental Science. This will qualify them for General Science certification.

Success in the chemical profession requires the ability to search the chemical literature and chemical databases and to effectively communicate that information in written and oral form. Chemists need to be proficient with software designed to operate instruments, analyze data and present results. The Writing Intensive (WI), Speaking Intensive (SI) and Information Literacy (IL) courses in the Chemistry Department are designed to fulfill these academic and professional requirements.

Chemistry Department Program Objectives

Graduates will be prepared with the knowledge and technical skills to successfully pursue career paths in the chemical industry, secondary education, chemistry graduate studies or other professional programs.

Graduates will be prepared to display critical thinking and problem solving skills to enable them to learn, grow and be effective throughout their professional careers.

Graduates will gain knowledge and develop skills within the context of a Christian worldview, including the Christian foundations of science and the practice of chemistry, both ethical and in conduct, according to Christian principles.

Chemistry Department Program Outcomes

Graduates of the Chemistry Department will demonstrate:

1. Knowledge in the areas of general, analytical, organic, physical, inorganic chemistry and biochemistry according to ACS standards.

2. An ability to apply chemical principles and knowledge to solving chemical problems.
3. Knowledge of the mathematical and physical basis of chemical theories.
4. An ability to use laboratory techniques and skills to effectively conduct experiments and interpret results.
5. An ability to accurately maintain a laboratory notebook.
6. Proficiency in the operation of modern instrumentation and the ability to analyze and interpret instrumental data.
7. An ability to search the chemical literature as well as read and comprehend content in professional chemistry journals.
8. An ability to effectively communicate chemical information in written and oral forms according to ACS guidelines.
9. Knowledge of the foundations and the practice of science from a Christian perspective.

Departmental policy limits students to one major within the Department of Chemistry. Students are expected to confer with their advisors for a detailed schedule of courses recommended to meet requirements for a major.

Course Requirements for Bachelor of Science Degree in Chemistry (CHEM)

Chemistry Core (49 hours):

Chemistry 101-102, 227, 241-242, 252, 264, 345-346, 356, 406, 425, and 455- 456.

Chemistry 351 or 352.

Chemistry Electives (8 hours):

Eight hours from Chemistry course offerings, with the exception that no more than two hours may be selected from Chemistry 370, 470, 480, or 499 to fulfill the eight hours of Chemistry elective credit. Chemistry 302 will not be applicable for Chemistry elective credit. Any extra hours earned by research courses, internships, or Chemistry 302 will be applied as general elective credit.

Major-Related requirements (23 hours):

Computer Science 141.

Mathematics 161, 162 and 261.

Physics 101-102 or 121-122.

Courses that count in the CHEM major quality point average (MQPA):

All courses with "CHEM" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Chemistry Secondary Education Major leading to (7-12) certification (CSED)

Chemistry Core (41 hours):

Chemistry 101-102, 227, 241-242, 252, 264, 302, 345-346, 351, 356, and 425.

Major-Related requirements (23 hours):

Computer Science 141 or 204.

Mathematics 161 and 162.

Physics 101-102 or 121-122.

Science 202.

Education requirements (38 hours):

Education 103, 201, 202, 203, 303, 305, 309, 371, 431, and 488.

Courses that count in the CSED major quality point average (MQPA):

All courses with "CHEM" and "EDUC" prefixes, COMP 14 and COMP 204. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Chemistry/General Science Secondary Education Major leading to (7-12) certification (CGSE)

Chemistry Core (41 hours):

Chemistry 101-102, 227, 241-242, 252, 264, 302, 345-346, 351, 356, and 425.

Major-Related requirements (29-30 hours):

Computer Science 141 or 204.

Geology 201 or Science 204.

Mathematics 161 and 162.

Physics 101-102 or 121-122.

Astronomy 206 or 207.

Science 202.

Education requirements (38 hours):

Education 103, 201, 202, 203, 303, 305, 309, 371, 431, and 488.

Courses that count in the CGSE major quality point average (MQPA):

All courses with "CHEM" and "EDUC" prefixes; COMP 141, 204; GEOL 201; PHYS 206; SCIC 202 and 204. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Science Degree in Biochemistry (BIOC)

Biochemistry Core (56 hours):

Biology 101, 234, and 488.*

Chemistry 101-102, 227, 241-242, 252, 264, 345-346, 351-352, 356, 425, and 455.

Chemistry/Biology Electives (9 hours):

Nine hours from Chemistry and/or Biology course offerings, with the exception that no more than two hours may be selected from Biology 370, 460, 470, 497, 499; Chemistry 370, 470, or 499. Chemistry 480 or Biology 480 may supply an additional two hours of elective credit. Research and elective hours in excess of the above four hours will be applied as general elective credit.

Major-Related requirements (16 hours):

Mathematics 161-162.

Physics 121-122 or 101-102.

Courses that count in the BIOC major quality point average (MQPA):

All courses with "CHEM" and "BIOL" prefixes. A minimum MQPA of 2.00 is required to graduate.

**Chemistry 456 for three credits may be substituted in place of Biology 488 that is one credit. One credit of Chemistry 456 will count for Biology 488 and the remaining two credits will count toward the nine required hours of Chemistry/Biology electives.*

Course Requirements for a minor in Chemistry (24 hours)

Chemistry 101 or 105; 102, 227, and 241 (16 hours)

8 hours from:

Chemistry 242, 252, 264, 345, 346, 351, 352, 356, 425, 455, or 456.

Note: Only one course from Chemistry 242, 351 and 352 may be used to fulfill the minor requirement.

CHEMISTRY (CHEM)

CHEM 101. GENERAL CHEMISTRY I. An introductory survey of the fundamental principles of chemistry including chemical reactions and stoichiometry, chemical formulas, nomenclature of compounds, gas laws, redox reactions, thermochemistry of physical change, crystal structures and the enthalpy of chemical change. Three lectures and one lab per week. *Fall Semester, four hours.*

CHEM 102. GENERAL CHEMISTRY II. An introductory survey of the fundamental principles of chemistry including concepts and theories of rates of reaction, chemical equilibrium, Aqueous equilibria, electrochemistry, coordination chemistry, nuclear chemistry, main group chemistry, and an introduction to organic chemistry. A working knowledge of the following instruments: benchtop GC, IC Metrohm, UV-Vis diode array pH meter, and Spectronic 20 will also be expected by the end of the semester. Three lectures and one lab per week. Prerequisite: Chemistry 101 or 105.
Spring Semester, four hours.

CHEM 105. CHEMISTRY FOR ENGINEERS. An introductory survey in the fundamental principles of chemistry, including chemical reactions and equations; behavior of gases; chemical thermodynamics; basics of electrochemistry; crystal structure; and nuclear, organic, and environmental chemical fundamentals. Three lectures and one lab per week. *Semester course, four hours.*

CHEM 227. ANALYTICAL CHEMISTRY. A study of the theoretical basis and laboratory techniques necessary for the solution of problems in quantitative chemical analysis. Three lectures and one lab per week. Prerequisite: Chemistry 102. *Fall semester only, four hours.*

CHEM 241. ORGANIC CHEMISTRY I. An introduction to the structure and chemistry of carbon compounds including alkanes, stereochemistry, haloalkanes, alcohols, ethers and alkenes. Structure determination by spectroscopic methods is introduced. Three lectures and one lab per week. Prerequisite: Chemistry 102. *Fall Semester, four hours.*

CHEM 242. ORGANIC CHEMISTRY II. A continued study in the chemistry of organic compounds including conjugated systems, aromatic compounds, aldehydes and ketones, carboxylic acids and their derivatives, amines and biological molecules. Structure determination by spectroscopic methods is emphasized. Three lectures and one lab per week. Prerequisite: Chemistry 241; corequisite for chemistry, biochemistry and chemistry secondary education majors: Chemistry 252.
Spring Semester, four hours.

CHEM 252. INSTRUMENTAL METHODS & SEMINAR. A course designed to provide instruction in the practical use of instrumentation, chemical informatics, writing scientific papers and the public presentation of scientific information. This course meets the College Information Literacy requirements, and partial components for the Writing Intensive/Speaking Intensive requirements. One laboratory period per week. Prerequisite: Chemistry 241; Corequisite: Chemistry 242.
Spring semester only, one hour.

CHEM 260. INDEPENDENT STUDY. Individual study of specialized topics in Chemistry. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

CHEM 264. CHEMICAL APPLICATIONS OF MATHEMATICAL METHODS. An introduction, built on the foundation of a two-semester calculus sequence, to mathematical concepts and their application to chemistry. Three lectures per week. Prerequisite: Mathematics 161-162 and Chemistry 102. *Spring semester only, three hours.*

CHEM 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Chemistry. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

CHEM 302. TECHNIQUES IN CHEMISTRY LABORATORY INSTRUCTION. A course limited to junior or senior Chemistry Secondary Education and General Science Secondary Education majors involving instruction and experience in setting up and conducting effective educational chemistry demonstrations and laboratories. This course fulfills the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for Chemistry Education majors. Prerequisite: Chemistry 227 and 241. *Spring semester only, one hour.*

CHEM 345. PHYSICAL CHEMISTRY I. An introduction to the principles of quantum mechanics and their application in describing molecular properties. An emphasis is placed on developing a solid understanding of the principles of spectroscopy. Three lectures and one lab per week. Prerequisites: Chemistry 102 or 105 and Chemistry 264. *Fall Semester, four hours.*

CHEM 346. PHYSICAL CHEMISTRY II. Thermodynamics, Statistical Mechanics, and Kinetics. The relationships between the properties of macroscopic systems are developed to gain an understanding of chemical equilibrium. The principles of statistical mechanics are introduced to show how thermodynamic properties can be predicted from molecular properties described by quantum mechanics. Connections are developed between chemical kinetics and reaction mechanisms. Three lectures and one lab per week. Students may not receive credit for both Chemistry 346 and Physics 340. Prerequisites: Chemistry 102 or 105 and Chemistry 264. *Spring Semester, four hours.*

CHEM 351. BIOCHEMISTRY I. A study of the structure-function relationships of biochemical compounds of living systems. This course concentrates on the major pathways of human metabolism. Three lectures and one lab per week. Prerequisite: Chemistry 242. *Fall Semester, four hours.*

CHEM 352. BIOCHEMISTRY II. A study of biochemical compounds and their interactions. This course will center specifically on the structure and functional relationships of DNA, RNA and proteins. Three lectures and one lab per week. Prerequisite: Chemistry 242. *Spring Semester, four hours.*

CHEM 356. MOLECULAR SYMMETRY AND GROUP THEORY. An introduction to the chemical applications of group theory. The relationship between the symmetry of molecules and their physical and chemical properties will be emphasized. One lecture per week. Prerequisite: Chemistry 241. *Spring semester only, one hour.*

CHEM 360. INDEPENDENT STUDY. Individual study of specialized topics in Chemistry. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

CHEM 370. INDEPENDENT CHEMISTRY RESEARCH. Juniors who have displayed aptitude in chemistry perform assigned research problems. This course may not be taken concurrently with Chemistry 499. Three hours of laboratory work per week per credit hour. Prerequisite: an application must be submitted and approved by department. *Semester course, one or two hours.*

CHEM 390. STUDIES IN CHEMISTRY. This course is used to present various advanced topics in chemistry. *Semester course, one to three hours.*

CHEM 406. INSTRUMENTAL ANALYSIS. A course focused on instrumental theory and design, and the application of instruments in the analytical process and analysis of complex samples. Two lectures and one lab per week. Prerequisite: Chemistry 227, 252, and 346. *Spring semester only, three hours.*

CHEM 425. INORGANIC CHEMISTRY. This course emphasizes the role that symmetry plays in chemical structure and bonding theory with descriptive chemistry interwoven to illustrate theoretical concepts. The periodic table is studied in sufficient detail for the student to become aware of the many important trends that form the basis of its organization. Three lectures per week. Prerequisite: Chemistry 242, 252, and 356. *Fall semester only, three hours.*

CHEM 428. ORGANOMETALLIC CHEMISTRY. A study of the synthesis and properties of organometallic compounds and their role in modern catalytic processes. The rapidly growing areas of bioinorganic and bioorganometallic chemistry is discussed. Three lectures per week. Prerequisite: Chemistry 425. *Spring semester only, three hours.*

CHEM 455. CHEMICAL SYNTHESIS AND SPECTROSCOPY I. An introduction to advanced laboratory synthesis coupled with modern spectral analysis for the determination of molecular structure. Organic, inorganic and organometallic sytheses will be interspersed in order to give the student a broad range of laboratory experiences. One lecture and two labs per week. Chemistry 455 fulfills the writing intensive (WI) requirement for Chemistry and Biochemistry majors. Prerequisites: Chemistry 242, 252. *Fall Semester, three hours.*

CHEM 456. CHEMICAL SYNTHESIS AND SPECTROSCOPY II. An advanced laboratory course and introduction to 2-dimensional NMR techniques for the determination of molecular structure. Organic, inorganic and organometallic syntheses will be interspersed in order to give the student a broad range of laboratory experiences. One lecture and two labs per week. Chemistry 456 fulfills the speaking intensive (SI) requirement for Chemistry majors. Prerequisite: Chemistry 455.
Spring Semester, three hours.

CHEM 460. INDEPENDENT STUDY. Individual study of specialized topics in Chemistry. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

CHEM 463. POLYMER CHEMISTRY. An introduction to the structure, synthesis, and physical properties of the major organic polymers. Two lectures per week. Prerequisite: Chemistry 242.
Fall semester only, two hours.

CHEM 466. ADVANCED ORGANIC CHEMISTRY. A detailed study of organic reactive intermediates and organic reaction mechanisms. Two lectures per week. Prerequisite: Chemistry 242.
Spring semester only, two hours.

CHEM 470. INDEPENDENT CHEMISTRY RESEARCH. Seniors who have displayed aptitude in chemistry perform assigned research problems. This course may not be taken concurrently with Chemistry 499. Three hours of laboratory work per week per credit hour. Prerequisite: Chemistry 370 and an application must be submitted and approved by department.
Semester course, one or two hours.

CHEM 480. INTERNSHIP IN CHEMISTRY. Selected students participate in an individual field experiences in a research laboratory under the supervision of professional staff. Minimum two weeks work required per intern credit hour. The grade is determined on the basis of a written evaluation by the cooperating institution mentor and a written report by the student submitted to the Chemistry Department. Prerequisites: Minimum 24 hours chemistry and permission of the department.
Semester course, one to six hours.

CHEM 499. HONORS IN CHEMICAL RESEARCH. Seniors who have shown special aptitude in chemistry may, with consent of the Department of Chemistry, undertake supervised chemistry research. Not to exceed two hours each semester. *Semester course, one or two hours.*

DEPARTMENT OF COMMUNICATION STUDIES

Dr. Scott, Chair; Dr. D. Brown, Dr. D. Dixon, Mrs. K. Miller. Part-Time: Mrs. Cantini-Seguin.

Course Requirements for Bachelor of Arts Degree in Communication Studies (COMA)

Communication Studies Core (21 hours):

Communication 104 or 109 (total of three hours).

Communication 135, 207, 212, 225, 305, and 427.

Communication Studies Electives (18 hours):

Message Production (3 hours):

One course from: Communication 235, 277, 378, 388, or Theatre 251.

Media and Culture (3 hours):

One course from: Communication 222, 350, 362 or 450.

Social Networks (3 hours):

One course from: Business 420, Entrepreneurship 459; Communication 300 or 459.

Additional Electives (9 hours):

Choose nine additional semester hours in Communication Studies electives.

Business 420 and Entrepreneurship 459 may also count as Communication Studies electives. The one credit course, Theatre 259, may be repeated, and a maximum of three hours may count toward the major. A Communication Internship (Communication 480) may not count as an elective course toward the major, though Communication 480 grades will be included in the Major Quality Point Average (MQPA) for Communication Studies majors.

Courses that count in the COMA major quality point average (MQPA):

All courses with "COMM" prefix, BUSA 420 and ENTR 459. A minimum MQPA of 2.00 is required to graduate.

Recommended Electives:

The required courses and electives provide the graduating student a strong foundation for a career in professional communication, graduate study in communication, or more effective performance in the career of his/her choice. Additional recommendations include two-years of language study at the college level and a broad background in Business, English, History, Philosophy, and Psychology courses.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

The faculty in the Department of Communication Studies is committed to providing the opportunities Communication Studies majors and other students need to excel in oral and written communication. For success in today's society, information literacy is also a critical skill. To these ends, Communication 104 is designated as a Speaking Intensive (SI) course; Communication 212 and Communication 427 are designed as Writing Intensive (WI) courses; and Communication 104, 207, 212, 305, and 427 address the key issues involved with Information Literary (IL) and are designated as such. These courses include learning experiences that are designed to prepare Communication Studies majors to be effective and ethical producers and consumers of knowledge.

SUPPORTING ACTIVITIES

The Department of Communication Studies offers students significant co-curricular activities, including:

- The Speech and Debate Team, which participates in both individual events and group debate.
- Lambda Pi Eta, the undergraduate honor society for Communication Studies students, sponsors special programs and speakers.
- The Communication Association sponsors speakers and communication-related events on campus.
- Involvement with the campus newspaper, radio station, literary magazine, yearbook, or College's Communications Office.
- Internships, whereby students earn academic credit for work done in conjunction with a professional organization related to communication (e.g., local newspaper, radio, or television station). See the course description for Communication 480.

Course Requirements for a minor in Communication Studies (18 hours)

Communication Studies Core (6 hours):

Communication 104 or 109 (total of 3 hours).

One theory course from Communication 207, 212, 222, 305, or 350.

Communication Studies Electives (12 hours):

Choose 12 hours from any courses with COMM prefix. Business 420 and Entrepreneurship 459 may also count as Communication Studies electives. The one credit course, Theatre 259, may be repeated, and a maximum of three hours may count toward the minor. A Communication Internship (Communication 480) may not count as an elective course toward the minor.

Minor in Theatre (24 hours)

See the Department of English section.

COMMUNICATION STUDIES (COMM)

COMM 104. PUBLIC SPEAKING AND RHETORIC. Introduces students to the preparation and presentation of material for a variety of public speaking situations. This performance-oriented class offers instruction in the theory of rhetoric, material development, and delivery techniques. Students will review the historical importance of oral communication and the role it plays in society. This course fulfills the Speaking Intensive (SI) and part of the Information Literacy (IL) requirement for Communication Studies majors. *Semester course, three hours.*

COMM 109. FORENSICS. A skills-based course designed to improve students' ability to analyze ideas, advocate ideas in individual debate, and to prepare and deliver oral communications. Students will develop and refine their ability to research, organize, and present orally ideas in the form of informative, critical, and persuasive speeches, Lincoln-Douglas style debates, or individual performances of literature in the form of oral interpretation of literature. Co-requisite: participation with the intercollegiate forensics (speech & debate) team, or consent of the instructor. May be taken up to three times. *Semester course, one hour.*

COMM 135. WRITING FOR THE MEDIA. Provides an introduction to the substance, structure, and style of multiple forms of non-narrative mass media including print, broadcast, film, and the Internet. It is required for the Communication Studies major. *Semester course, three hours.*

COMM 207. THEORIES OF COMMUNICATION. Focuses on the history of communication, including rhetorical and communication theory from the classics to modern times. Students are introduced to the body of communication literature through article analysis and literature review exercises. Students study the theoretical underpinnings of the practice of communication in its various settings: public, relationships, small groups, organizations, mass media, and intercultural. The course examines the functions, structures, and processes of communication in a variety of contexts. This course, along with Communication 104, 212, 305, and 427, fulfills the Information Literacy (IL) requirement for Communication Studies majors. *Semester course, three hours.*

COMM 212. RESEARCH METHODS IN COMMUNICATION. Examines the fundamentals of research approaches and methods in communication studies, both qualitative and quantitative. The course also examines a variety of actual communication research studies across the breadth of the field from interpersonal to mass communication. Students will learn questionnaire design and interviewing techniques. This course, along with Communication 427, fulfills the Writing Intensive (WI) requirement, and along with Communication 104, 207, 305 and 427, fulfills the Information Literacy (IL) requirement for Communication Studies majors. *Semester course, three hours.*

COMM 222. FILM HISTORY AND THEORY. Encompasses the history of the motion picture from its invention in 1895 to the present day, focusing on American film. Introduction to film theories and criticism including principles of aesthetics and the art of how a film is created, from concept to completion. *Fall semester only, three hours.*

COMM 224. MEDIA, RELIGION AND DEMOCRACY. Explores a variety of questions and problems related to the mass media in a democracy. Questions related to media control, government regulation of media, political economy, journalistic "objectivity," and the advertising-editorial dichotomy are included. Christian reactions and religious activism related to the media are discussed. Chomsky, Herman, McChesney, Postman and other critical theorists are studied. Prerequisite: none.
Offered alternate years, Fall semester only, three hours.

COMM 225. INTERCULTURAL COMMUNICATION. Provides an overview of the study of communication and culture. Course content focuses primarily on the theory and practice of communication in intercultural contexts. Students will examine cross-cultural communication (communication across cultures) and intercultural communication (communication between members of different cultures). This course is especially suited to students whose future careers may involve travel overseas or business with non-native Americans. *Spring semester only, three hours.*

COMM 235. JOURNALISM. Reviews a variety of print and broadcast media, exploring editorial style and slant. Fundamental newsgathering and news writing skills will be studied and practiced. Students will gather information from campus, community, and research sources in order to develop hard news, feature, and in-depth stories. Ethical and legal issues will be explored as well as the role of print media in shaping current events. *Semester course, three hours.*

COMM 245. PHOTOGRAPHY. Emphasizes use of the 35mm single-lens reflex (SLR) camera, the aesthetics of photography, black and white film development, and darkroom techniques. Students are required to have a 35mm camera with internal metering and a manual control override mode. An additional fee is charged for this course. *Semester course, three hours.*

COMM 260. INDEPENDENT STUDY. Individual study of specialized topics in Communication. Sophomore standing and permission of the department chair and a faculty sponsor are required. Semester course, one, two or three hours.

COMM 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Communication. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMM 277. AUDIO PRODUCTION. Reviews the basics of audio production for recording. A particular emphasis is placed on the medium of radio including web casting. Consideration will be given to the history of radio broadcasting; properties of sound; microphone types; recording and control room techniques; and computerized editing of audio materials. Students will undertake a variety of practical projects in public affairs, news, sports, remote, music, and drama programming with opportunity for airing quality work on the College radio station. *Fall Semester only, three hours.*

COMM 290. STUDIES IN COMMUNICATION. Intensive examination of area of communication not fully covered by regular departmental offerings. Subject matter varies each semester.
Offered periodically, semester course, one, two or three hours.

COMM 300. PUBLIC RELATIONS. Focuses on public relations theory, strategy, and techniques. The course emphasizes writing and developing public relations campaigns; theories of public persuasion; legal and ethical considerations; and crisis management and related issues. Students will develop a portfolio for a campus or community organization which will include: an overall campaign plan, news releases, a brochure, a speech, a print advertisement, a radio advertisement, and a final campaign presentation. Prerequisite: Communication 135 or 235 recommended.
Semester course, three hours.

COMM 303. PROFESSIONAL COMMUNICATION. Focuses on speaking and writing tools most often used by business professionals. Presentational speaking, personal communicative development, professional communication, and interviewing will be emphasized. Issues that relate to professional success will be explored. Must have junior or senior standing. *Semester course, three hours.*

COMM 305. PERSUASION THEORY. Explores a variety of media to ascertain the persuasive messages inherent in each genre. The course will familiarize the students with the processes of persuasion, methods of studying persuasion, the theories of persuasion, and ethical concerns about persuasion. The perspectives and tools developed should enable the student to develop effective message strategies in both professional and personal life. An excellent course for pre-professional majors and students involved in speech and debate. This course, along with Communication 104, 207, 212, and 427, fulfills the Information Literacy (IL) requirement for Communication Studies majors. Prerequisite: Communication 207 or consent of the instructor.

Fall semester only, three hours.

COMM 350. MASS MEDIA AND SOCIETY. Surveys the major media of mass communication - print, Internet, broadcast, film, and music - and the historical, ethical, and social issues in their use. Students will study the effect of these media on society and the individual.Offered alternate years, Fall semester only, three hours.

COMM 352. CHRISTIAN FAITH AND CINEMA. A survey of films, both the decidedly Christian and decidedly secular. The student will consider the importance of a film's theme in deciding its worth, criteria by which they can choose valuable films to watch, and will evaluate secular films through a Christian perspective. The student will also learn what it means to possess a Biblical worldview and how "other" worldviews permeate popular cinema.

Offered alternate years, Spring semester only, three hours.

COMM 360. INDEPENDENT STUDY. Opportunities for students with extensive background in communication to do intensive independent study or research on specialized topics. Prerequisite: Sophomore status or higher and permission of the department chair.

Semester course, one, two or three hours.

COMM 362. MEDIA LAW AND ETHICS. Reviews relevant communication and media law and addresses a variety of communication-related ethical issues such as: libel, privacy, copyright, news-gathering rights, etc. Prerequisite: junior status.

Offered alternate years, Spring semester only, three hours.

COMM 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Communication. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMM 376. EDITING AND DESIGN. Knowledge and skills related to the fundamentals of editing for publication. Principles of editing for newspapers, magazines, and web-based media are included. In addition to practicing these basic skills, students will be introduced to the elements of design for the print media. *Semester course, three hours.*

COMM 378. VIDEO PRODUCTION. An introduction to broadcasting history, media aesthetics, and the technology and practice of television production. Lectures, programmed self-instruction, CD-ROM, and hands-on experience with cameras, microphones, lighting, and computer-based video editing will provide the basis for further study and internships in this influential medium of mass communication. Applications include broadcast television, cable, satellite, and computer-mediated delivery systems such as CD-ROM. *Spring semester only, three hours.*

COMM 388. DOCUMENTARY FILM. Encompasses the history and theory of the documentary film genre in motion pictures and television, from the earliest cinematic experiments to the present. The course examines various roles the documentary plays, such as explorer, reporter, painter, advocate, poet, catalyst, and guerrilla. Students will learn basics of visual literacy and will storyboard and shoot their own video taped documentary using computerized video editing systems.

Fall semester only, three hours.

COMM 390. STUDIES IN COMMUNICATION. Intensive examination of areas of communication not fully covered by regular departmental offerings. Subject matter varies each semester.

Offered periodically, semester course, one, two, or three hours.

COMM 427. RHETORICAL THEORY AND CRITICISM. This capstone course is required for Communication Studies majors. It includes an in-depth study of selected figures in rhetorical and communication theory from the classical, medieval, and contemporary periods. Students apply the theories studied, engage in rhetorical criticism, and prepare a significant, original research paper. This course, along with Communication 212, fulfills the Writing Intensive (WI) requirement, and along with Communication 104, 207, 212, and 305, fulfills the Information Literacy (IL) requirement for Communication Studies majors. Prerequisite: Communication 207, senior status or permission of the instructor. *Semester course, three hours.*

COMM 444. ADVANCED FILM THEORY. A deeper look at the medium of motion pictures from the point of view of film theorists including semiotics; realism; expressionism; auteur theory; cinema as art; montage; film as narrative; literature and adaptations to the screen; documentary and propaganda approaches; genre conventions; psychology; sociology; mythology; and ideology. Prerequisite: Communication 222. *Spring semester only, three hours.*

COMM 450. MEDIA AND THE HUMANE ENVIRONMENT: SEMINAR IN MEDIA ECOLOGY. This course provides an historical survey of how human media shape the social environment and structure human thought. Taught as a seminar, students read and discuss Plato, Ong, Postman, McLuhan, and others who have contributed to understanding of orality, literacy, image, and electronic media. *Semester course, three hours.*

COMM 459. ORGANIZATIONAL COMMUNICATION. Provides a critical exploration of organizational communication theory, research, and application. This course examines the factors involved in the functioning and analysis of complex organizations, particularly the direct and indirect ways in which communication processes and social dynamics affect organizations and employee interaction. Prerequisite: junior or senior status. *Offered alternate years, semester course, three hours.*

COMM 460. INDEPENDENT STUDY. Opportunities for students with extensive background in communication to do intensive independent study or research on specialized topics. Prerequisite: Sophomore status or higher and permission of the department chair. *Semester course, one, two or three hours.*

COMM 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Communication. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMM 480. INTERNSHIP IN COMMUNICATION. Students may, with consent of the department, earn academic credit for work done in a communication-related organization (e.g., newspaper; radio or television station; public relations office; business; etc.). Students must arrange for a faculty advisor, contact the organization where work will be done, keep a daily log of activities, and write a final paper summarizing the internship. Students must work 60 contact hours for each academic credit earned. Prerequisite: Sophomore status or higher and permission of the department internship coordinator. *Semester course, one to six hours.*

COMM 488. SEMINAR. An advanced course for junior and senior Communication Studies majors to concentrate on specific subject matter to be determined by the instructor. Individual research and extensive oral and written reports are required. *Semester course, three hours.*

COMM 499. HONORS IN COMMUNICATION. The student who chooses to pursue work beyond the basic requirements may do extensive reading in one of the following areas: media studies; organizational communication; public relations; audio and video production; filmmaking; oral interpretation; public address; group communication; and rhetorical or communication theory. Extensive research paper and independent reading required. Prerequisites: Senior status and consent of the department. *Semester course, one, two or three hours.*

DEPARTMENT OF COMPUTER SCIENCE

Dr. W. Birmingham, Chair; Dr. Adams, Dr. C. Gribble, Dr. Jenny, Dr. D. Yeager. Part-time: Dr. Madison, Dr. Mueller.

The Computer Science Department seeks to provide its students with a solid foundation in the field of computing in order to prepare them for employment in a demanding and highly competitive industry, or for advanced studies in top-ranked graduate schools. This foundation is built on knowledge of mathematics; programming languages; algorithms and data structures; and theory. Moreover, students explore advanced topics, research projects, and technology projects.

The Department believes that it must transmit more than technical expertise to its students: whenever possible, the curriculum emphasizes the need for students to understand their responsibilities to society and to behave ethically, as well as to strengthen and live their Christian faith and witness to the professional community.

Students who complete one of the Department's three Bachelor of Science majors – Computer Science, Computer Information Systems, or Applied Physics/Computer – are prepared to use their skills in computing in application areas that are demanding and rewarding. Broadly educated persons with computing skills are in great demand.

No matter what career majors pursue, they must possess the ability to locate, evaluate and use information. In addition they must be able to communicate their ideas and conclusions clearly and coherently through the written and spoken word. In the course sequence Computer Science 451 and 452 required for Computer Science majors and in the course Computer Science 341 required for Computer Information Systems majors, instruction and experience is provided in these skills—Writing Intensive (WI), Speaking Intensive (SI), and partial instruction in Information Literacy (IL). One of the significant problems in the computer field today is that of ethics. For this reason all computer majors are required to take Computer Science 305, Ethics in the Computer Profession. For both majors, the Information Literacy requirement is also met through taking this course.

The Computer Science Department has formulated the following objectives and specific outcomes to guide us in directing and evaluating our program.

Program Objectives

1. To prepare students with the technical abilities required for successful employment as a computer scientist or participation in computer-science graduate studies, or both.
2. To enable students through a Christian worldview to understand their ethical and professional obligations to society, and to encourage the growth of Christian attitudes and moral convictions.
3. To encourage initiative and creative thinking and an understanding of the importance of life-long learning that will enable graduates to grow in their effectiveness throughout their professional careers.

Program Outcomes

1. An ability to apply knowledge of computing and mathematics appropriate to the discipline;
2. An ability to analyze a problem and identify and define the computing requirements appropriate to its solution;
3. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs;

4. An ability to function effectively as a member of a team to accomplish a common goal;
5. An understanding of professional, ethical, legal, security, and social responsibilities that is integrally bound to the understanding of professional and ethical responsibility in a Christian context;
6. An ability to communicate effectively with a range of audience, such as professional colleagues and the scientific community;
7. An ability to analyze the local and global impact of computing on individuals, organizations, and society\ builds on the following liberal-arts areas important in giving the Christian student a background for making judgments concerning computing solutions: history of civilization, Biblical revelation, philosophy, literature, visual art, music, and modern civilization in international perspective;
8. Recognition of the need for, and an ability to engage in, continuing professional development; and
9. An ability to use current techniques, skills and tools necessary for computing practice.

Computing Facility

The Computer Science Lab is housed in the Technological Learning Center and is equipped for use by students enrolled in the Department's courses. This lab contains state-of-the-are hardware and software systems that complement the TabletPC and software each student receives. The lab's facilities include a variety of high-performance workstations and blades with high resolution-screens and high-performance graphics hardware. In addition, the lab houses advanced hardware and software to support development of computer games for PCs, consoles, and mobile devices. The Microsoft Developer Network software is available for all department majors, and includes many software products (e.g., professional versions of Visual Studio and the Office Suite). A flatbed color scanner and a slide and film scanner are available. Software supporting an Intranet WWW server and video editing are available. The lab is home to a state-of-the-art amateur radio station (K3GCC), with specialized support for software-defined radio projects.

The Technological Learning Center also houses public access Windows based computers with Microsoft Office and other applications.

Course Requirements for Bachelor of Science Degree in Computer Science (99 hours) (CSCI)

Computer Science Core Requirements (30 hours):

Computer Science 141, 155, 220, 222, 244, 252, 314, 322, 342.

Engineering 402.

Advanced Core Requirements (26 hours):

Computer Science 305, 340, 361, 422, 442, 443, 448, 450, 451, and 452.

Computer Science Electives (12 hours):

Choose four of the following courses:

Computer Science 341, 410, 411, 441, 446 and 447.

Math/Science Core Requirements: (31 hours):

Chemistry 105.

Engineering 274.

Mathematics 161, 162, 213, and 261.

Physics 101 and 102.

Courses that count in the CSCI major quality point average (MQPA):

All courses with "COMP" prefix, MATH 213, excluding COMP 102 and COM2P 204. A minimum MQPA of 2.00 is required to graduate.

COMPUTER SCIENCE (CSCI) MAJOR FOUR-YEAR PLAN

FRESHMAN YEAR	Fall	Spring
Mathematics 161-162	4	4
Physics 101-102	4	4
Computer Science 155	3	-
Computer Science 141	-	3
Humanities 101-102	3	3
Physical Education 101-102 (M) or 111-112 (W)	1	1
	15	15

SOPHOMORE YEAR	Fall	Spring
Mathematics 261	4	-
Engineering 274	-	3
Computer Science 220-222	3	3
Mathematics 213	4	-
Computer Science 244	3	-
Chemistry 105	-	4
Humanities 201-202	3	3
Computer Science 252	-	3
	17	16

JUNIOR YEAR		
Computer Science 305	-	2
Computer Science 314	-	3
Computer Science 322	3	-
Computer Science 340	-	3
Computer Science 342	3	-
Computer Science 361	-	3
Computer Science 450	-	3
Computer Science Elective	3	-
Humanities 301-302	3	3
Studies in Sci, Faith, Tech (SSFT)	3	-
	15	17

SENIOR YEAR		
Computer Science 422	3	-
Computer Science 451-452	1	2
Computer Science 442	-	3
Computer Science 443	-	3
Computer Science 448	3	-
Computer Science Electives	3	3
Engineering 402	-	3
Humanities 302	3	-
Social Science/Gen. Elective	3	3
	16	17

Note: Students wishing to take all three game courses (Comp 441, Comp 446, and Comp 447) must take Comp 441 in their fall, junior term.

Course Requirements for Bachelor of Science Degree in Computer Information Systems (CIS) (66 hours)

This interdisciplinary program is to prepare the student to facilitate the development of computer utilization, databases and information systems to satisfy the requirements and needs of organizational management.

Computer Core Requirements (32 hours):

Computer Science 102, 220, 222, 244, 252, 305, 340, 341, 342, and 450.

One 300 or 400-level Computer course.

Business Core Requirements (21 hours):

Accounting 201, 202, and Engineering 402.

Business 201, 203, 301, and 307.

Business/Computer electives (6 hours):

Select two courses from Business 204, 302; Computer Science 318, 451, 452; Entrepreneurship 309; or 400-level Computer Science elective.

Major-Related Requirements (7 hours):

Economics 101.

Mathematics 141.

Courses that count in the CIS major quality point average (MQPA):

All courses with "ACCT," "BUSA," and "COMP" prefixes, excluding BUSA 205 and BUSA 206. A minimum MQPA of 2.00 is required to graduate.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

Course Requirements for Applied Physics/Computer Major

These major requirements may be found in the Department of Physics.

Course Requirements for a minor in Computer Science (21 hours):

Computer Science 141, 314, 220, and 222.

Select nine hours of Computer Science courses 200-level and above.

Note: Students pursuing one of the six Business majors or Applied Physics as a first major might prefer Computer Information Systems or Applied Physics/Computer as the first major rather than this minor.

COMPUTER SCIENCE (COMP)

COMP 102. INTRODUCTION TO PRODUCTIVITY SOFTWARE. This course is designed to familiarize students with the use of a personal computer. The course involves no programming and does not assume the student has had programming experience. The course includes terminology for hardware, software, telecommunications, and applications. Hands on applications include Microsoft Office (Word, Excel, Access, Power Point), One Note Microsoft Publisher, and Internet Explorer. *Semester course, three hours.*

COMP 141. COMPUTER PROGRAMMING I. This course provides the student with an understanding of hardware and software concepts, structured program design, and programming using C++ in an integrated development environment. Topics include Boolean expressions, iteration, standard library functions, programmer-defined functions, arrays, searching and sorting, multidimensional arrays, string class, vector class, pointers and dynamic memory allocation, programmer-defined classes, and abstract data types. This course, along with Math 161 and 488, fulfills the Information Literacy (IL) requirement for the Mathematics major. *Semester course, three hours.*

COMP 155. INTRODUCTION TO COMPUTER SCIENCE. This course provides an introduction to the field of Computer Science. Topics include data representation, gates and circuits, algorithm design, programming languages, abstract data types, operating systems, information systems, artificial intelligence, networks, and the World Wide Web. The course is intended to prepare students for further study in the field and is also appropriate for non-major students who wish to become familiar with computer science. *Fall semester only, three hours.*

COMP 204. THE TECHNOLOGIES OF INSTRUCTION. An introduction to educational media with an emphasis on applications of computer technology in education; general models for computer usage in education and educational institutions; and case studies of specific projects in terms of approach, effectiveness, and implications for the future. Emphasis will be on the application of educational media within the K-12 school curriculum. Prerequisite: For education majors only. *Semester course, three hours.*

COMP 220. COMPUTER PROGRAMMING II. This is a second course in the C++ language: a review of essential language concepts, structured programming, and top-down design. Object oriented program design principles including inheritance, abstract base classes, virtual functions, and polymorphism are covered. Other topics include operator overloading, templates, linked data structures, and exception handling. Prerequisite: Computer Science 141. *Fall semester only, three hours.*

COMP 222. INTRODUCTION TO DATA STRUCTURES AND ALGORITHMS. An advanced course in programming the computer utilizing C++ including the run-time behavior of programs; the design and structure of programs; linear data structures; recursion; binary search trees; Heapsort; and Hash technique for searching. Prerequisite: Computer Science 220. *Semester course, three hours.*

COMP 244. DATABASE MANAGEMENT SYSTEMS. An introduction to database management systems emphasizing the relational model. Topics include data manipulation languages (SQL, QBE); database design (intuitive design, normalization, and E-R design model); three-tier and multi-tier architecture; database security; and database integrity. Prerequisite: Computer Science 141 or knowledge of its content. *Fall semester only, three hours.*

COMP 252. COMPUTER ARCHITECTURE AND ORGANIZATION. Organization, elementary architectural design and computer instruction sets are examined and used via programming in an assembly language. Students are given an introduction to the manner in which digital computers actually work. Prerequisite: Computer Science 141 or knowledge of its content.
Spring semester course, three hours.

COMP 260. INDEPENDENT STUDY. Individual study of specialized topics in Computer Science. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

COMP 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Computer Science. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMP 305. ETHICS IN THE COMPUTING PROFESSION. This course is an overview of ethical systems and copyright and intellectual property laws, an examination of IEEE and ACM ethical codes, ethical problem-solving techniques and an examination of ethical cases. This course partially fulfills the Information Literacy (IL) requirement for Computer Science and Computer Information Systems majors. *Spring semester only, two hours.*

COMP 314. Foundations of Computer Science. This course is an introduction to computation theory including the topics: finite automata, regular languages, pushdown automata, context-free languages, Turing machines, recursive languages and functions, and computational complexity. Prerequisite: Computer Science 141, Math 213. *Spring semester only, three hours.*

COMP 318. HIGH-TECHNOLOGY VENTURES. The purpose of this course is three-fold: to introduce students to the process of technological innovation within a business; to learn to work effectively within a multidisciplinary team; and, to design and prototype a product working with a local company. Students experience what it takes to bring a product (or prototype) from concept to market. The class is centered on product development and writing a business plan to support the product. Students will spend time in lecture and laboratory and will make off-site visits to the partner company. The final outcome will be a prototype and a business plan. Prerequisite: junior or senior standing and instructor approval. *Spring semester only, three hours.*

COMP 322. OBJECT ORIENTED AND ADVANCED PROGRAMMING. Topics include: programming techniques in Standard C++ for large-scale, complex, or high-performance software; encapsulation; automatic memory management; exceptions; generic programming with templates and function objects; standard library algorithms and containers; using single and multiple inheritance and polymorphism for code reuse and extensibility; basic design idioms, patterns, and notation. Prerequisite: Computer Science 222. *Fall semester only, three hours.*

COMP 340. OPERATING SYSTEMS. A study of the basic principles of operating system design and implementation including types of computer systems, general architecture of several representative computer systems, security, run-time systems, and performance measurement and evaluation. Prerequisite: Computer Science 222. *Spring semester only, three hours.*

COMP 341. SYSTEMS ANALYSIS. An introduction to the application of the systems development life cycle (SDLC) as applied to a variety of practical software systems. Special emphasis is given to systems requirements determination and analysis of systems by means of team-based projects. This course fulfills the Writing Intensive (WI), Speaking Intensive (SI), and partially fulfills the Information Literacy (IL) requirements for the Computer Information Systems major. Prerequisite: Computer Science 102 or 141, and 244. *Fall semester only, three hours.*

COMP 342. DATA COMMUNICATION AND NETWORKING. An introduction to the concepts of data communications used in information networks including equipment utilization in information networks; techniques utilized to transmit signals (e.g., modulation, multiplexing, error detection, and correction); methods of message handling; network configuration; and software utilized in implementing networks. Prerequisite: Computer Science 141. *Fall semester only, three hours.*

COMP 360. INDEPENDENT STUDY. An advanced course for qualified students that provides an opportunity for further computer programming and analysis experience on an individual basis. Prerequisite: Permission of the department. *Semester course, one, two or three hours.*

COMP 361. INTRODUCTION TO COMPUTER GRAPHICS. A comprehensive introduction to the field of computer graphics. Extensive programming in C++ facilitates knowledge development in the core areas, which include human perception, illumination and shading models, object representation and modeling, classical and current rendering algorithms, and the physical and mathematical foundations of the dominant models and methods. Efficient implementations of these techniques are developed from scratch in parallel with an exploration of application programming interfaces for manipulating dedicated graphics hardware. Prerequisites: Computer Science 222, Engineering 274, and Mathematics 213. *Spring semester only, three hours.*

COMP 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Computer Science. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMP 390. SELECTED TOPICS IN COMPUTER SCIENCE. An examination of areas of computer systems not fully covered by regular departmental offerings. Subject matter varies each semester. Prerequisite: Computer Science 220 and permission of the department.
Semester course, two or three hours.

COMP 410. SIGNALS AND SYSTEMS. This course covers signal and system concepts, continuous and discrete Fourier analysis, sampling and reconstruction of signals, and analog and digital communication systems overview. Prerequisite: Mathematics 261. *Fall semester only, three hours.*

COMP 411. INTRODUCTION TO SOFTWARE DEFINED RADIO. An introduction to digital communication techniques via software applications. Topics include modulation, filtering, sampling, handling nonlinearities, and adaptive techniques. Prerequisite: Computer 410.
Spring semester only, three hours.

COMP 422. INTRODUCTION TO ALGORITHMS. Topics include: fundamental techniques for designing efficient algorithms and basic mathematical methods for analyzing their performance; paradigms for algorithm design; divide-and-conquer, greedy methods, graph search techniques, dynamic programming; design of efficient data structures, and analysis of the running time and space requirements of algorithms in the worst and average cases. Prerequisite: Computer Science 222 and 314.
Fall semester only, three hours.

COMP 441. COMPUTER GAME DESIGN AND DEVELOPMENT. This course covers concepts and methods for the design and development of computer games. Topics include: graphics and animation, sprites, software design, game design, user interfaces, game development environments. Prerequisite: Computer Science 222. *Alternate years, Fall semester only, three hours.*

COMP 442. WEB PROGRAMMING TECHNOLOGIES. This course prepares students with the fundamentals needed to program on the Internet. It offers a survey of programming concepts that yield visible or audible results in Web pages and Web-based applications. The course covers effective Webpage design, various markup languages, several scripting languages, Web servers, and databases to provide all the skills and tools needed to create dynamic Web-based applications. Prerequisite: Computer Science 244. *Alternate years, spring semester only, three hours.*

COMP 443. OBJECT-ORIENTED PROGRAMMING LANGUAGES (OOPL) AND EVENT-DRIVEN PROGRAMMING. In this course detailed case studies of object-oriented programming languages such as Java, C++, Smalltalk, and C#, and of event-driven programming environments built around those languages are investigated. Examples are the Java Swing library, MFC library, Visual Studio Net, and the original Smalltalk environment. Study of component-based programming using Java beans and/or COM-based models is also included. Prerequisite: Computer Science 222.
Spring semester only, three hours.

COMP 444. INTRODUCTION TO INFORMATION RETRIEVAL. The technological underpinnings of search engines is explored in this class. Topics covered include organizing and accessing information, metrics of performance (relevance and precision), query methods, multimedia retrieval, and digital libraries. Prerequisite: Computer Science 222. *Alternate years, three hours.*

COMP 445. INTRODUCTION TO ARTIFICIAL INTELLIGENCE. Artificial intelligence topics included in this class are: predicate calculus, state space search, knowledge representation, expert systems, reasoning in uncertain situations, and machine learning. Prerequisite: Computer Science 222.
Alternate years, fall semester only, three hours.

COMP 446. ADVANCED COMPUTER GAME DESIGN AND DEVELOPMENT. This course is a continuation of Computer Science 441 and is focused on the development of 3D games and other advanced game programming techniques. Prerequisite: Computer Science 441.
Alternate years, spring only, three hours.

COMP 447. CONSOLE GAME DESIGN AND DEVELOPMENT. This course is a continuation of Computer Science 441 and is focused on the development of console games, with emphasis on both hardware and software design issues. The course will explore sophisticated programming techniques and advanced algorithms. Prerequisites: Computer science 441, 446, and permission of instructor.
Alternate years, fall only, three hours.

COMP 448. COMPUTER SECURITY. A study of the basic principles of computer security, including the goals of secure computing; elementary cryptography; program, system, and network security. Practical application of these ideas is provided by an investigation of secure systems administration by means of team-based security projects. Various legal and ethical issues in the field are also considered. Prerequisites: Computer Science 305, 340, and 342. *Fall semester only, three hours.*

COMP 450. SOFTWARE ENGINEERING. This course introduces software-engineering methodology, covering such topics as development cycles, testing, design, requirements gathering and analysis, and project management. Students work in teams on a semester-long project. Software Engineering is designed to fulfill the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for the Computer Information Systems major. Prerequisite: Junior standing.
Spring semester only, three hours.

COMP 451. SENIOR PROJECT I. This course is part of the capstone design experience, and is based on applying software engineering to a two-semester long project. This course focuses on requirements gathering, early prototyping, and design. Students will write reports and make presentations. This course fulfills the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for the Computer Science major. Prerequisite: Computer Science 450.
Fall semester only, one hour.

COMP 452. SENIOR PROJECT II. This course is a continuation of Computer 451 and is focused on the development of a working, tested system delivered to a customer. Students will write reports, make presentations, and deliver a working software system. This course fulfills the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for the Computer Science major. Prerequisite: Computer Science 451. *Spring semester only, two hours.*

COMP 460. INDEPENDENT STUDY. An advanced course for qualified students that provides an opportunity for further computer programming and analysis experience on an individual basis. Prerequisite: Permission of the department. *Semester course, one, two or three hours.*

COMP 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Computer Science. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMP 480. INTERNSHIP IN COMPUTER SCIENCE. Students earn academic credit for field experience that allows them to use their computer skills under the supervision of a cooperating entity. A maximum of six credit hours may be applied toward the major. Prerequisites: Junior standing and consent of the department chairman. *Semester course, one to six hours.*

COMP 499. HONORS IN COMPUTER SCIENCE. A course for qualified junior or senior students who are interested in advanced systems and programming experience. Practical programming assignments are based on the student's interest. Prerequisite: Permission of the department.
Semester course, one, two or three hours.

DEPARTMENT OF ECONOMICS

Dr. Herbener, Chair; Dr. T. Miller, Dr. Ritenour. Part-Time: Dr. Hendrickson.

Course Requirements for a Bachelor of Arts Degree in Economics (ECON)

Major Requirements (36 hours):

Economics 101, 102, 120, 301, 302, 420 and 442.

Fifteen hours of electives in Economics.

Major-Related Courses (19 hours - do not count toward major QPA):

Philosophy 161 and 211.

Business 201 and 304.

Mathematics 141*.

Social science elective:

One course from: History 120, Political Science 101, Psychology 101, or Sociology 101.

Courses that count in the ECON major quality point average (MQPA):

All courses with "ECON" prefix. A minimum of 2.00 MQPA is required to graduate.

Course Requirements for a Bachelor of Science Degree in Business Economics (BECO)

Business Core (39 hours):

Accounting 201-202; Business 201, 203, 204, 207, 301, 303, 304, 305, and 486.

Six additional hours in Business or Accounting**.

Economics Core (24 hours):

Economics 101, 102, 120, 209 and 401.

Nine additional hours in Economics.

Major-related courses (10 hours):

Mathematics 141*

Philosophy 161 and 201.

** Mathematics 141 prepares students in the business applications of calculus but Mathematics 161 must be taken as a prerequisite for Mathematics 162 and 261.*

***A Business Economics degree candidate will not be permitted to take Accounting, Business or Entrepreneurship courses as electives beyond these 6 hours unless the College's 128-credit hour requirement for graduation has been satisfied. Up to three semester hours of internship credit will be permitted as non-business elective hours.*

Students completing a major in Business Economics are eligible to pursue a second major or a minor, if offered, in the related Departments of Accounting, Business or Entrepreneurship but must complete the hours required for the second major or a minor beyond the 128 hours required for the Business Economics major .

Courses that count in the BECO major quality point average (MQPA):

All courses with "ACCT," "BUSA," and "ECON" prefix, excluding BUSA 205 and BUSA 206. A minimum MQPA of 2.00 is required to graduate.

Students who have completed a major in Economics should be able to perform and present economic analysis and understand and critique the economic analysis of others. To attain these ends, they need to develop skills in locating, evaluating, and using information and proficiency in writing and speaking. The Department of Economics requires Economics 420 as a Writing Intensive (WI), Speaking Intensive (SI) and Information Literacy (IL) course to give students a forum to demonstrate their mastery of these skills.

Course Requirements for a minor in Economics (21 hours)

A minor in Economics consists of Economics 101, 102, 120, and twelve additional hours in economics.

ECONOMICS (ECON)

ECON 101. PRINCIPLES OF ECONOMICS (MICRO) I. An examination of the fundamental principles of human action and the laws of the market economy. Focus will be on exchange, prices, production, costs, entrepreneurship, and government intervention. *Semester course, three hours.*

ECON 102. PRINCIPLES OF ECONOMICS (MACRO) II. An examination of the fundamental principles of human action and the laws of the market economy. Focus will be on money, inflation, credit, interest, capital, economic progress, and business cycles. *Semester course, three hours.*

ECON 120. FOUNDATIONS OF ECONOMICS. An investigation of the theological, philosophical and epistemological foundations of economics. The nature of man and the created world, laws of action and interaction, and the good society will be explored. *Semester course, three hours.*

ECON 202. ECONOMIC EXPANSION AND DEVELOPMENT. A study of economic progress with emphasis on the developing world. Topics include wealth, poverty, capital accumulation, and foreign aid. *Alternate Spring semesters, three hours.*

ECON 204. ENVIRONMENTAL ECONOMICS. An investigation of environmental, conservation, and population issues. Pollution, natural resource use, demographic changes, and technology will be studied. *Alternate Spring semesters, three hours.*

ECON 206. COMPARATIVE ECONOMIC SYSTEMS. An analysis of different economic systems. The command economy, various forms of the mixed economy, different types of interventionism, and the market economy will be compared and contrasted.*Alternate Fall semesters, three hours.*

ECON 207. LABOR ECONOMICS. An analysis of the working of labor markets. Labor unions and labor legislation and regulation will be examined. *Alternate Fall semesters, three hours.*

ECON 209. ENTREPRENEURSHIP AND ENTERPRISE. An examination of entrepreneurship and its role in society. The contribution of creativity, foresight, and other attributes of entrepreneurs to the working of both for-profit and not-for profit enterprises will be explores.
Spring semester only, three hours.

ECON 213. AMERICAN ECONOMIC HISTORY TO 1860. A survey of the American economy from colonial days to the Civil War. Economic progress and business cycles will be examined with emphasis on how the market economy was developed by entrepreneurs hampered by politicians.
Alternate Fall semesters, three hours.

ECON 214. AMERICAN ECONOMIC HISTORY SINCE 1860. A survey of the American economy from the Civil War to the present. Economic growth and business cycles will be examined with emphasis on how the market economy was developed by entrepreneurs and hampered by politicians.
Alternate Spring semesters, three hours.

ECON 260. INDEPENDENT STUDY. Individual study of specialized topics in Economics. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ECON 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Economics. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ECON 301. INTERMEDIATE MICROECONOMICS. A study of prices and production. Utility, costs, competition, and equilibrium will be examined. Prerequisites: Economics 101 and 102.
Fall Semester only, three hours.

ECON 302. INTERMEDIATE MACROECONOMICS. A study of economic progress and business cycles. Keynesian, Monetarist, Austrian, and other views will be examined. Prerequisites: Economics 101 and 102. *Spring semester only, three hours.*

ECON 303. INTERNATIONAL ECONOMICS. An examination of the worldwide market economy. The movement of goods, people, capital, and money across political borders and political interference with the market will be investigated. Prerequisites: Economics 101 and 102.
Fall semester only, three hours.

ECON 306. AUSTRIAN ECONOMICS. An examination of the lives and thoughts of Austrian school economists. Contributions in monetary, capital, and business cycle theory, methodology, economic calculation, entrepreneurship, and other areas will be highlighted.
Alternate Spring semesters, three hours.

ECON 309. PUBLIC POLICY. An analysis of current public policy. Topics include labor and antitrust regulations, education and energy policies, welfare programs, and price and wage control.
Alternate Fall semesters, three hours.

ECON 360. INDEPENDENT STUDY. Individual study of special topics in economics. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ECON 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Economics. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ECON 390. STUDIES IN ECONOMICS. Studies in areas of economics not covered by regular departmental offerings. *Semester course, three hours.*

ECON 401. MONEY AND BANKING. A study of money and credit. Inflation, interest rates, and various monetary and banking regimes will be investigated. Prerequisites: Economics 101 and 102.
Fall semester only, three hours.

ECON 404. PUBLIC FINANCE. An examination of the types of and justifications for government activity. Taxation, expenditures, debt, and monetary inflation will be explored. Prerequisites: Economics 101 and 102. *Alternate Fall semesters, three hours.*

ECON 407. HISTORY OF ECONOMIC THOUGHT TO 1870. A study of the prominent figures in the development of economic thought and the major schools of economic thought from Aristotle through the British classical school. Insights into current debates about economic theory will be highlighted. *Alternate Fall semesters, three hours.*

ECON 408. HISTORY OF ECONOMIC THOUGHT SINCE 1870. A study of the prominent figures in the development of economic thought and the major schools of economic thought from the beginning of the marginalist revolution to the present. Insights into current debates about economic theory will be highlighted. *Alternate Spring semesters, three hours.*

ECON 420. ECONOMICS COLLOQUIUM. An immersion into the activities of scholars: writing, presenting, critiquing, and debating. Students will lead and participate in discussions of articles and books, write and present their own research, and critique the research of other students. This course satisfies the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for the Economics major. Prerequisites: Senior standing or permission of department chairman. *Fall semester only, three hours.*

ECON 442. QUANTITATIVE ANALYSIS. This course provides advanced training in statistical methods for economists, financial analysts, and social scientists. Students will use calculus and matrix algebra to develop, apply, and interpret statistical tests. Prerequisite: Business 201 and Mathematics 141. *Spring semester only, three hours.*

ECON 456. FUTURES TRADING. A study of futures markets. Topics include foreign currency and commodity trading and the use of futures markets by entrepreneurs, producers, importers and exporters and speculators. *Alternate Spring semester, three hours.*

ECON 460. INDEPENDENT STUDY. Individual study of special topics in economics. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ECON 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Economics. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ECON 480. INTERNSHIP IN ECONOMICS. Practical experience in applied economics. Prerequisite: Permission of department chairman. *Semester course, one to six hours.*

ECON 488. SEMINAR IN ECONOMICS. An advanced course for juniors and seniors who desire in-depth exploration of a specific topic in economics using research, discussion, oral reports and written essays. Prerequisite: Permission of department chairman. *Semester course, one, two or three hours.*

ECON 499. HONORS IN ECONOMICS. Advanced research in economics by senior who have shown unusual aptitude in economics. Prerequisite: Permission of department chairman. *Semester course, three hours.*

DEPARTMENT OF EDUCATION

Dr. Nichols, Chair; Dr. Blackburn, Dr. Genareo, Associate Chair; Dr. Culbertson, Dr. Edwards, Dr. Jenny, Dr. Johnson, Dr. Mackey, Dr. Scheffler, Dr. Stephens. Part-Time: Mrs. Amodei, Mr. Anastasi, Mrs. Bodamer, Dr. Connelly, Mrs. Dreves, Mr. Foster, Mrs. C. Patterson, Mrs. S. Potter, Mr. Shaffer, Mr. Skibinski. Staff: Mrs. D. Mincey, Mrs. Snyder.

The Education Department of Grove City College embraces the mission, goals, and objectives of the College while implementing standards established for teacher education by the state of Pennsylvania and as recommended by research in the field of education. The faculty of the Education Department supports these objectives and standards and seeks to provide the specialized knowledge required by the education profession. Department faculty and staff members dedicate themselves to assist Grove City College pre-service teachers gain an understanding of the craft while supplying them with ample field experiences to practice the art of teaching.

Pedagogical, intellectual, and professional knowledge represent the tools of the teaching craft. These tools are selected so that our pre-service teachers possess the skills they need to plan, assess, and adapt instruction to various ethnicities, socio-economic groups, learning styles, and learning capabilities. We are united in our commitment to supply our

pre-service teachers with the necessary capabilities to be successful in teaching to the whole person when they leave our mentoring and enter their own classrooms.

Education majors who are planning to become teachers or to pursue graduate studies following graduation should strive to be good writers and speakers and to know how to find, analyze, and use information. To that end, Education 488 is a Writing Intensive (WI) and Speaking Intensive (SI) course. Education 201, 202, 488 and Psychology 102 are Information Literacy (IL) courses designed to provide the necessary skills for Education majors to use electronic information technology and resources and explore scholarly research within the field of education.

CERTIFICATION OF TEACHERS

Grove City College is approved by the Pennsylvania Department of Education in the areas of early childhood, elementary, and secondary school education. Teachers are prepared for careers in public, private, and Christian education. Secondary certification fields include Biology, Chemistry, English (also with communications), Foreign Language (French and Spanish), Mathematics, Music, Physics, Social Sciences, along with the interdisciplinary fields of General Science - Biology, Biology/Environmental Education, Chemistry, and Physics. Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major and also the professional education course requirement.

The Instructional I Certificate is issued by the Pennsylvania Department of Education to those Grove City College graduates who have completed an approved college program, successfully fulfilled Pennsylvania Teacher Certification requirements (including required testing, Act 33, Act 34, Act 114 clearances and other state requirements), and have been recommended by the College for certification.

It should be noted that graduation and certification are not synonymous terms. All students seeking certification must apply to the Department of Education for admission to the certification program. Admission, retention, and recommendation for certification are contingent upon the approval of the Department of Education and the faculty of the student's area of certification.

Changes in state licensure requirements may necessitate changes in course requirements for students, particularly for those students who extend their studies beyond the typical four-year sequence. Careful attention to Education Department recommendations for course scheduling is important for staying current with certification requirements.

SCHOLASTIC REQUIREMENTS, ADMISSION AND RETENTION

All students wishing to enter the teacher education program must make formal application for admittance and receive acceptance in accordance with admission requirements. **Students seeking admission as credential candidates should make formal application by November 1 of the sophomore year.** Non-traditional (returning) students are advised on an individual basis (see Student Life section).

All students will be required to have a 3.00 Career Quality Point Average (CQPA) to be certified by the Commonwealth of Pennsylvania. This requirement reflects provisions as stated by Chapter 354, passed by the Pennsylvania State Board of Education in May 2000.

In order that students may meet the above standard, the Education Department monitors progress. Students must maintain a minimal CQPA and MQPA as they advance through each academic year. These QPA requirements are detailed in the Education Department Handbook. Students are, therefore, advised to reference this source for further information.

POLICY GOVERNING COURSE REQUIREMENTS FOR CERTIFICATION ONLY TEACHER CANDIDATES

For those teacher candidates who are already certified in some area and seek certification at Grove City College in an additional area, the following guidelines are to be followed:

- Candidates who have already taken courses in the area in which they seek certification must take at least 50% of the courses required for this certification at Grove City College.
- Candidates who start with no hours in the additional area of certification may only transfer six hours to Grove City College without special advance permission from the department head in their new area of certification.
- Candidates seeking certification must have a minimum career QPA of 3.00 and a minimum major QPA of 2.75 to enter the Grove City College program.

For candidates who have no certification but have a degree from a regionally accredited college or university, these guidelines are to be followed:

- Candidates who have had the required hours in their major (as shown on their status sheet) but require education courses for certification must take all of their education courses at Grove City College. (Under certain conditions up to six hours may be taken elsewhere with prior approval.) Candidates who have the required hours in their major may, however, be required to take up to fifteen additional hours in their subject area at the discretion of their subject area advisor.
- Candidates who have had their hours in education (as shown on their status sheet) but have not had the required subject area courses must take all of their subject area courses at Grove City College. (Under certain conditions up to six hours may be taken elsewhere with prior approval.)
- Candidates who have not had the required education and subject area courses will follow both of the above guidelines.
- Candidates must have completed the teacher education core curriculum courses.
- Candidates who have already earned an undergraduate degree must have a minimum career QPA of 3.00 and a minimum major QPA of 2.75 to enter the Grove City College program.
- Additional requirements for certification may include passing scores on the Praxis exam.

REQUIREMENTS FOR TEACHING IN OTHER STATES

Students seeking certification in states other than Pennsylvania should consult the credential officer in the Department of Education and research licensure requirements through specific state department/offices/bureaus of education.

TEACHER'S EXAMINATIONS

Credential Candidates must successfully complete the appropriate sections of the National Teachers Examination for certification in Pennsylvania or other states. Test advisement, applications and schedules for examinations are available in the Department of Education.

EARLY CHILDHOOD PROGRAM

Students completing this program may be required to complete more than the standard 128 hours required to graduate from Grove City College and may also incur additional tuition charges. Students applying for dual certification in Elementary Education and Early

Childhood Education may have the option to request a primary student teaching assignment at the early childhood level. Program requirements and other specific details are available in the Education Department Office.

Course Requirements for Bachelor of Science Degree in Elementary Education (ELES)

Major Field Requirements (57 hours):

Education 103, 201, 202, 203, 303, 315, 321, 323, 324, 325, 326, 327, 328, 381, 382, 383, 441, 443, and 488; Psychology 209.

Major-Related Requirements (30 hours):

Computer Science 204; History 141*, 251, and 252.

Mathematics 151 and 152.

Science 201 and 203 and either Science 202 or 204.

*Elementary Education and Early Childhood majors who must take 12 hours of foreign language for language proficiency are not required to take History 141 whether the 12 credits were taken at Grove City College or at another institution from which the credits were transferred.

Area of Emphasis - select one from the following six areas (12 hours):

Environmental Science: Science 204; Biology 231 and either Biology 320 or 421.

French: French 201, 202, 305, and one course from French 307, 308, 309, 312, 320, 321, or 340. (NOTE: Students who are already competent at the intermediate level will substitute two upper level courses for French 201 and 202.)

German: Choose four courses from the following choices: German 201, 202, 301, 302, 310, 316, 330, or 334.

Science/Math: Science: 3-8 hours; Math: 4-9 hours from Mathematics 111; 141 or 161; 231 or other approved Mathematics courses; Psychology 203 or Business 201.

Social Studies/English: One course from Political Science 101 or 204; one course from Sociology 101, 103, 201, or History 357; Two courses from English 203, 204, 205, 206, 220, 230, 242, 246, 250, 252, 260, 351, 352, 355, 371, 381, 402, Education 330, or Communication 104.

Spanish: Spanish 201, 202, 303, and one course from Spanish 300 or 324.

(NOTE: Students who are already competent at the intermediate level will substitute two upper level courses for Spanish 201 and 202.)

Courses that count in the ELES major quality point average (MQPA):

All courses with "EDUC" prefix and PSYC 209. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Science Degree in Early Childhood Education (EACH)

Major Field and Major-Related Requirements:

Same as Elementary Education requirements.

Area of Emphasis (12 hours):

Same as Elementary Education requirements.

Early Childhood Education Requirements (29-30 hours):

Education 340, 341, 343, 384, 430 and 443; Education 441 or 445; Psychology 209.

Courses that count in the EACH major quality point average (MQPA):

All courses with "EDUC" prefix and PSYC 209. A minimum MQPA of 2.00 is required to graduate.

EDUCATION (EDUC)

EDUC 103. EDUCATIONAL PSYCHOLOGY. A consideration of those aspects of psychology which form the basis for educational methods and their application in the school curriculum, including student characteristics, group and individual differences, cognitive and personality development, learning theory, measurement, and evaluation. This course satisfies the Information Literacy (IL) requirement for all education majors. *Semester course, three hours.*

EDUC 201. FOUNDATIONS OF EDUCATION I. A survey analysis of the historical, philosophical, and sociological foundations of education from origin to the present day. Application of the past to the present and implications for the future will be highlighted. This course satisfies the Information Literacy (IL) requirement for Elementary Education and Early Childhood Education majors.
Fall semester only, three hours.

EDUC 202. FOUNDATIONS OF EDUCATION II. Analysis of political, financial, legal, organizational, pedagogical, and reform issues related to American education with emphasis upon understanding the contributions of Western Civilization, the impact of American institutions on current conditions, the influence of current research, and the direction in which current reform movements are influencing change. This course satisfies the Information Literacy (IL) requirement for Elementary Education and Early Childhood Education majors Prerequisite: Education 201.
Spring semester only, three hours.

EDUC 203. CULTURALLY RELEVANT PEDAGOGY. A study of the characteristics and educational needs of learners from diverse cultural backgrounds. The course is designed to equip educators with methods to address the educational needs of culturally diverse groups and students from limited English backgrounds. Prerequisites: Education 103, 201 and 202. Education majors only.
Semester course, three hours.

EDUC 260. INDEPENDENT STUDY. Individual study of specialized topics in Education. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

EDUC 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Education. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

EDUC 303. EXCEPTIONAL LEARNERS. A study of the characteristics, causes, and psychological and educational needs of learners in need of special education and implications for educators. Prerequisites: Education 103, 201 and 202. Education majors only. *Semester course, three hours.*

EDUC 305. BASIC PRINCIPLES OF CURRICULUM AND INSTRUCTION. This course is divided into sections by specific secondary certification areas. The course is designed to prepare secondary credential candidates with the ability to apply basic concepts of curriculum and instruction in their specific discipline and to use a wide variety of strategies for planning, conducting, and evaluating units of instruction. The course places emphasis on the materials being used in the secondary classrooms and includes classroom management; instructional materials selection; reading in the content areas; lesson presentation and critique; and conferencing techniques. This course is limited to students who have been admitted to and are in good standing in the credentials program. This course is to be taken the semester before the actual student teaching experience, and taken concurrently with specific methods courses (Education 306-310). *Semester course, three hours.*

EDUC 306. FIELD EXPERIENCE/METHODS OF TEACHING MATHEMATICS. A study of the methods, materials, organization of subject matter, and professional perspective of mathematics instruction in the secondary schools. Designed to complement and expand upon the skills developed in curriculum and instruction. Taken concurrently with Education 305. An extensive clinical field experience is a required part of this course. Prerequisite: junior or senior standing.
Semester course, two hours.

EDUC 307. METHODS OF TEACHING MODERN LANGUAGES. A course designed to familiarize students with both theoretical and practical aspects of teaching foreign languages: listening, speaking, reading, writing, and culture. In addition, the history of foreign language teaching in the U.S. and of American attitudes toward foreign languages, peoples, and cultures will be presented along with an in-depth study of the various methods used to teach foreign languages in the U.S.
Fall semester of junior year, two hours.

EDUC 308. FIELD EXPERIENCE/METHODS OF TEACHING ENGLISH AND COMMUNICATION. A study of the methods, materials, organization of subject matter, and professional perspective of English and communication instruction in the secondary schools. Designed to complement and expand upon the skills developed in curriculum and instruction. Taken concurrently with Education 305. An extensive clinical field experience is a required part of this course.
Semester course, two hours.

EDUC 309. FIELD EXPERIENCE/METHODS OF TEACHING SCIENCE. A study of the methods, materials, organization of subject matter, and professional perspective of science instruction in the secondary schools. Designed to complement and expand upon skills developed in curriculum and instruction. Taken concurrently with Education 305. An extensive clinical field experience is a required part of this course. *Semester course, two hours.*

EDUC 310. FIELD EXPERIENCE/METHODS OF TEACHING THE SOCIAL SCIENCES. A study of the methods, materials, organization of subject matter, and professional perspective of social science instruction in the secondary schools. Designed to complement and expand upon skills developed in curriculum and instruction. Taken concurrently with Education 305. An extensive clinical field experience is a required part of this course. *Semester course, two hours.*

EDUC 311. ELEMENTARY MUSIC METHODS (MUSIC EDUCATION). A study of music materials, methods, and applications for elementary and/or preschool instruction.
Fall semester only, three hours.

EDUC 312. SECONDARY MUSIC METHODS (MUSIC EDUCATION). A study and comprehensive survey of music materials, methods, and applications for junior and senior high school music instruction. *Spring semester only, three hours.*

EDUC 315. MUSIC METHODS FOR ELEMENTARY TEACHERS. A study of music materials and teaching methods designed to prepare the elementary and preschool teacher to engage students in musical learning experiences. Prerequisite: sophomore standing and completion of Education 327.
Semester course, one hour.

EDUC 321. TEACHING ELEMENTARY ART. A study of materials and methods of instruction in art for the elementary and preschool including topics in the theory and practice of teaching art. Prerequisite: sophomore standing and completion of Education 327.
Semester course, one hour.

EDUC 323. TEACHING PRIMARY AND ELEMENTARY LITERACY. A course designed to acquaint future elementary and early childhood teachers with strategies for developing emergent literacy in reading and the integrated language arts. Topics include methods to develop print awareness, decoding ability, and reading extended text The course will also explore the developmental continuum of language and literacy, including writing, speaking, listening, visualizing and viewing. Direct field experience is required in the elementary school where students will utilize assessment techniques, plan lessons, and use a variety of approaches and materials in instructing students. Prerequisites: junior or senior standing and completion of Education 103, 201, 202, and 327. Elementary Education majors only.
Fall semester only, three hours.

EDUC 324. TEACHING ELEMENTARY SOCIAL SCIENCES. A study of resources and methods of teaching elementary and preschool social studies including geography. Also emphasizes the development of competencies associated with the use of audio-visual equipment and materials. Directed field experience in the elementary schools is required. It is strongly recommended that this course be taken after completing Education 327. Prerequisite: junior or senior standing.
Semester course, three hours.

EDUC 325. TEACHING ELEMENTARY SCIENCE AND HEALTH. A course of instruction in methods of teaching elementary and preschool science, health, and physical education. Includes development of competencies in the planning and use of hands-on materials and application in classroom instruction. Directed field experience in the elementary schools is required. It is strongly recommended that this course be taken after completing Science 201, 202 or 203. Prerequisite: junior standing and completion of Education 327. *Semester course, three hours.*

EDUC 326. TEACHING UPPER ELEMENTARY/MIDDLE LITERACY. A course designed to acquaint elementary, early childhood, and English education majors about methods to teach literacy (reading and the integrated language arts) to upper elementary and middle school level students. Topics include methods to develop vocabulary knowledge, comprehension, expressive writing, and content area reading. Direct field experience in elementary or middle schools is required. Prerequisites: junior or senior standing; elementary and early childhood majors must have completed Education 103, 201, 202, 323 and 327; English majors must have completed Education 103, 201 and 202. Restricted to elementary education, early childhood, and English with English Education certification majors only. *Spring semester only, three hours.*

EDUC 327. TEACHING ELEMENTARY MATHEMATICS. Elementary mathematics concepts and pedagogy will be introduced within the framework of the curriculum and evaluation standards recommended by the National Council of Teachers of Mathematics. Mathematical strands to be explored include: geometry; measurement; number sense; whole number operations; patterns and functions; fraction and decimal operations; graphing; statistics; and probability. A strong emphasis will be placed on problem solving as a skill needed to make informed decisions about life. All concepts will be taught with a dependence on manipulative activities. The scope of the course goes from early childhood to adolescence. A structured field experience is embedded within the course. It is strongly recommended that this course be completed before taking additional three-credit elementary methods courses. Prerequisite: sophomore standing. *Semester course, three hours.*

EDUC 328. CHILDREN'S LITERATURE. A survey of children's literature for early childhood, intermediate, and middle grades with an extensive representation of books from classic and contemporary authors and illustrators. Major literary genres are studied, story-telling techniques are discussed, and issues in literature for children are explored. A developmental perspective to selecting quality books is emphasized. Open to elementary and early childhood majors only. Junior or senior level course. *Semester course, two hours.*

EDUC 330. LITERATURE AND WRITING FOR THE SECONDARY CLASSROOM. A course designed to familiarize the student with both theoretical and practical aspects of teaching literature and writing used at the secondary level. Included will be a discussion of literature selection, treatment of the material, and writing assessment procedures. Traditional works will be emphasized.
Spring semester only, three hours.

EDUC 340. EARLY CHILDHOOD FOUNDATIONS. This course provides an introduction to the history, philosophy, and goals essential to educating children from birth through age eight. Classical and contemporary early childhood program models are examined, a framework for a developmentally appropriate environment is established, and the role of the early childhood practitioner is emphasized. Observations of classrooms are integral to the course. It is recommended that this course be taken concurrently with Education 384. Sophomore or junior level course. Typically offered Fall semester.
Semester course, three hours.

EDUC 341. EARLY CHILDHOOD CURRICULUM AND INSTRUCTION. This course provides an overview of all curriculum components essential for operating an early childhood classroom with a focus on preschool and primary environments. Major curriculum approaches explored and implemented in early childhood settings include a traditional structured approach, a thematic approach, and the project approach. An awareness of learning styles, diversity, and special needs are integral to effective planning. The role of assessment in the curriculum sequence is included. Students are required to implement curriculum approaches in selected sites. Sophomore or junior level course. Prerequisites: Education 340 and 384. Typically offered Spring semester. *Semester course, three hours.*

EDUC 343. TRENDS AND ISSUES IN EARLY CHILDHOOD EDUCATION. This course examines contemporary trends and issues surrounding early childhood education discussing sociological, psychological, political, and economic forces shaping contemporary families, children, and schooling. Current educational practices, curriculum, and administration of programs are integral topics included in this study. Junior or senior level course. Prerequisites: Education 340, 341, and 384.
Semester course, three hours.

EDUC 360. INDEPENDENT STUDY. A course designed to permit students to do advanced study or to participate in educational experiences that provide an opportunity for professional and/or educational self-improvement. Prerequisite: Consent of the department.
Semester course, one, two or seven hours.

EDUC 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Education. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

EDUC 371. SECONDARY FIELD EXPERIENCE (FIRST LEVEL). An internship course designed to permit students to engage in five full days of observational field experience in a public secondary school as approved by the instructor. *Semester course, one hour.*

EDUC 372. SECONDARY FIELD EXPERIENCE (SECOND LEVEL). An internship course designed to permit secondary language majors and K-12 Music majors to engage in an observational and participatory field experience as approved by the instructor. Prerequisite: Education 371.
Semester course, one hour.

EDUC 373. SECONDARY FIELD EXPERIENCE (THIRD LEVEL). An internship course designed to permit secondary language majors and K-12 Music majors to engage in pre-student teaching. Participatory field experience approved by the instructor. Prerequisite: Education 371.
Semester course, one hour.

EDUC 381. ELEMENTARY FIELD EXPERIENCE (FIRST LEVEL). An internship course designed to permit students to engage in a thirty to forty-hour entry-level field experience in an elementary school. Field experience interns observe experienced teachers in classroom settings noting organizational structures, curriculum issues, and students' development. Diverse educational settings are strongly encouraged. *Semester course, one hour.*

EDUC 382. ELEMENTARY FIELD EXPERIENCE (SECOND LEVEL). An internship course designed to permit students to engage in thirty to forty hours of observational and participatory field experience in an elementary school. Field experience interns observe teachers in classroom settings and assume some level of teaching responsibility. Diverse educational settings are strongly recommended. This field experience should be taken concurrently with Education 323. Prerequisite: Education 381. *Semester course, one hour.*

EDUC 383. ELEMENTARY FIELD EXPERIENCE (THIRD LEVEL). An internship course designed to permit students to engage in thirty to forty hours of observational and participatory field experience in an elementary school. Field experience interns observe teachers in classroom settings and assume some level of teaching responsibility. Diverse educational settings are strongly recommended. This field experience should be taken concurrently with Education 326. Prerequisite: Education 381. *Semester course, one hour.*

EDUC 384. EARLY CHILDHOOD FIELD EXPERIENCE (FIRST LEVEL). This one-credit field experience is an internship course designed to permit beginning level early education students to engage in a semester-long field experience in the Early Education Center. This course is required for Early Childhood certification. Freshman or sophomore level course. *Semester course, one hour.*

EDUC 385. EARLY CHILDHOOD FIELD EXPERIENCE (SECOND LEVEL). This one-credit second field experience is an internship course designed to permit students who desire to gain additional experience working with young children to engage in a semester-long field experience in the Early Education Center. Sophomore or junior level course. Prerequisite: Education 384.
Semester course, one hour.

EDUC 386. EARLY CHILDHOOD FIELD EXPERIENCE (THIRD LEVEL). This two-credit third field experience is an internship course designed to permit students more in-depth experience in studying and teaching young children. Students may choose between Education 385 and 386 for a second field experience in early childhood. Sophomore or junior level course. Prerequisite: Education 384 and 385. *Semester course, two hours.*

EDUC 390. STUDIES: SPECIAL TOPICS MINI-COURSE. This course is taught by a visiting scholar from the field of education. The topic for each course will vary from year to year. The course will consist of a minimum of two two-hour lectures on the topic plus a paper of specified length related to the topic. Registration is limited to junior and senior education students.
Semester course, one, two or three hours.

EDUC 430. EARLY CHILDHOOD STUDENT TEACHING. This field-based course may be taken during a semester for two or three days per week in an early childhood setting or during an intersession. Classroom observation and teaching in a preschool, childcare, or Head Start setting under the supervision of Early Childhood faculty with specified seminars are required. Prerequisites: Education 340, 341, and 384. Junior or senior level status. An additional fee is charged for this course.
Semester course, two or three hours.

EDUC 431. STUDENT TEACHING, SECONDARY. Secondary credential candidates (seniors) student teach at the junior/middle school and/or high school levels in the public secondary schools five days per week for one semester and attend one practicum session per week.
Semester course, fourteen hours.

EDUC 432. STUDENT TEACHING, SECONDARY. Secondary credential candidates (seniors) student teach at the junior/middle school and/or high school levels in the public secondary schools five days per week for one half of a semester and attend one practicum session per week. Deparmental permission required. *One-half semester course, seven hours.*

EDUC 435. STUDENT TEACHING, ELEMENTARY MUSIC. Senior level Music Education credential candidates student teach in elementary public schools an equivalency of five days per week for seven weeks and attend one practicum session per week. Co-requisite: Education 437.
One-half semester course, seven hours.

EDUC 437. STUDENT TEACHING, SECONDARY MUSIC. Senior level Music Education credential candidates student teach at the junior/middle school and/or high school levels in the public secondary schools an equivalency of five days per week for seven weeks and attend one practicum session per week. Co-requisite: Education 435. *One-half semester course, seven hours.*

EDUC 441. ELEMENTARY STUDENT TEACHING, PRIMARY GRADES. Senior level Elementary Education candidates student teach full time in the elementary public schools for seven weeks in a primary classroom (kindergarten, first, second, or third grade) and attend one practicum session per week. *One-half semester course, seven hours.*

EDUC 443. ELEMENTARY STUDENT TEACHING, INTERMEDIATE GRADES. Senior level Elementary Education credential candidates student teach full time in the elementary public schools for seven weeks in an intermediate classroom (fourth, fifth, or sixth grade) and attend one practicum session per week. *One-half semester course, seven hours.*

EDUC 445. EARLY CHILDHOOD STUDENT TEACHING. Senior level Early Childhood credential candidates student teach full time for seven weeks in an early childhood classroom (child-care or preschool) as an alternative to Elementary Student Teaching, Primary Grades (Education 441) and attend one practicum session per week. *One-half semester course, seven hours.*

EDUC 460. INDEPENDENT STUDY. A course designed to permit students to do advanced study or to participate in educational experiences that provide an opportunity for professional and/or educational self-improvement. Prerequisite: Consent of the department.
Semester course, one, two or seven hours.

EDUC 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Education. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

EDUC 480. INTERNSHIP IN EDUCATION. An opportunity for junior or senior level education majors to participate in approved experiences that provide extraordinary leadership roles in applying educational theory to practice, under the supervision of an on-site manager and a department faculty member. Products of the internship include a log, evaluation by the on-site manager, and all other requirements established within the faculty approved Contract of Expected Responsibilities and Outcomes. Prerequisites: Acceptable standing within the Education Department and permission of the Chair or Associate Chair of the Education Department. *Semester course, one to six hours.*

EDUC 488. SEMINAR: ISSUES IN EDUCATION/COMPARATIVE EDUCATION. A capstone course for senior credential candidates that re-examines the major philosophical, historical, social, political, and psychological issues as they impact the teaching profession. Successful educational practices from various countries of the world will be studied as the student considers possible solutions to the crisis facing American education today. This course satisfies the Writing Intensive (WI), Speaking Intensive (SI) and Information Literacy (IL) requirement for Elementary Education and Early Childhood Education majors. *Semester course, three hours.*

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Dr. Bright, Chair; Dr. W. Birmingham, Dr. Cavicchi, Dr. Christman, Dr. Duda, Dr. Fair, Dr. Mohr.

Electrical and Computer Engineering Department Mission Statement, Objectives, and Outcomes

Electrical and Computer Engineering (ECE) is the analysis, design, and application of devices and systems for conversion, processing, and transmission of electrical energy and information. Electrical and Computer Engineering at Grove City College now covers such basic topics as electric circuits, electronics, electrical machines and power distribution, and digital systems; as well as advanced topics in communication systems, computer systems, and control systems. Electrical and computer engineers practice in the field in a variety of professional duties including research, design and development, management, sales, field service, testing, manufacturing, and education.

The Electrical and Computer Engineering Department at Grove City College offers a program leading to the Bachelor of Science in Electrical Engineering (BSEE) degree. The Electrical Engineering program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET), 111 Market Place, Suite 1050, Baltimore, Maryland 21202-4012, telephone: 410-347-7700.

Proficiency in writing and speaking skills is essential to a productive career in any branch of Electrical and Computer Engineering. To that end, all majors take Electrical Engineering 401 (Introduction to Design), as a Writing Intensive (WI) and Speaking Intensive (SI) course. In addition, all graduates need to know how to obtain, evaluate, and use technical information related to the field of Electrical and Computer Engineering. Instruction and practice in these Information Literacy (IL) skills is provided in the combination of the following required courses: Electrical Engineering 201, 202, 204, 251, 351, 401, 451, and 452.

Electrical Engineering Program Educational Objectives

1. Consistent with their God-given calling, graduates will be active in the electrical engineering profession or an alternative field. Many of our graduates will assume leadership roles as a result of having demonstrated strong technical abilities as well as communication and team skills.

2. Graduates will set career goals and engage in continued professional growth through self-study, continuing education courses, and/or formal graduate education in order to reach those goals.
3. Graduates will demonstrate ethical behavior in the workplace and will carry out their professional duties in a manner that is consistent with a Christian life perspective.

ECE Program Outcomes

To ensure fulfillment of the ECE Department objectives, graduates of the EE program shall demonstrate:

a) An ability to apply knowledge of mathematics, science, and engineering.
b) An ability to design and conduct experiments as well as to analyze and interpret data.
c) An ability to design a system, component, or process to meet desired needs.
d) An ability to function on multi-disciplinary teams.
e) An ability to identify, formulate, and solve engineering problems.
f) An understanding of professional and ethical responsibility in a Christian context including recognition of the fundamental worth of individuals as creations of God, resulting in a consistent commitment to the safety and health of individuals, honesty, and impartiality in all affairs and faithfulness in serving both employers and clients.
g) An ability to communicate effectively. This outcome includes the ability to write clearly and cohesively about technical subjects, communicate mathematical analyses in a comprehensible form, and orally communicate on technical subjects with people at all different levels of technical ability.
h) The broad education necessary to understand the impact of engineering solutions in a global and societal context. The following liberal arts areas are considered important in giving the Christian student a background for making judgments concerning engineering solutions: history of civilization, Biblical revelation, philosophy, literature, visual art, music, and modern civilization in international perspective.
i) Recognition of the need for and an ability to engage in life-long learning.
j) Knowledge of contemporary issues including both social and engineering issues.
k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
l) An understanding of the character qualities needed to conduct oneself honorably and with distinction in a professional career. Character qualities of particular interest include personal integrity; honesty; strong work ethic; self-driven motivation with an enthusiasm to tackle challenges; persistence; endurance; and versatility.

Inherent in the ECE curriculum at Grove City College is the inculcation of design experience. Engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision-making process applying basic science, mathematics, and engineering science to use available resources to optimally meet stated objectives. In the EE program, engineering design is assured via design problems and projects integrated throughout the ECE curriculum.

Freshman Year – The Introduction to Engineering (ENGR 156) course introduces the profession of engineering and the design process. Students work in teams on a design project and present results in written and oral reports.

Sophomore and Junior Years – ECE students are afforded additional opportunities to solve relevant design problems through homework and group design projects in various courses in the sophomore and junior years. Design projects that incorporate course-specific topics along with techniques introduced in the freshman Introduction to Engineering course are assigned in Digital Logic Design (ELEE 204) in the sophomore year, Electric Machines (ELEE 303), and Embedded Systems (ELEE 310) in the junior year, and other courses as appropriate. These projects are presented in written and/or oral reports.

Senior Year – The integrated design experience in ECE at Grove City College culminates in the senior year with the Senior Experience in Electrical Design (SEED). The SEED program is a capstone design experience comprised of a combination of research and proposal writing in Electrical Engineering Design (ELEE 401) in the fall semester of the senior year and hands-on implementation and documentation of that design in Experimental Electrical Engineering (ELEE 452) in the spring semester. The project must incorporate one or more advanced topics chosen from the senior-level stem sequences in Communication Systems, Computer Systems, or Control Systems (students choosing the CE concentration must include the Computer Systems Sequence). Since stem courses build on fundamentals presented in previous ECE courses, the SEED program assures that all ECE graduates complete a major design experience drawing on fundamental concepts as well as advanced ECE topics. While seniors are asked to present various oral and written updates throughout the SEED experience, the climax of SEED comes in the second semester of the senior year when students present oral and written reports to engineering professionals from nearby industries who judge the teams on various aspects of their designs.

Course Requirements for Bachelor of Science Degree in Electrical Engineering (ELEE)

Electrical Engineering/Computer Core (28 hours)

Computer Science 141.

Electrical Engineering 201, 204, 238, 251, 252, 301, 321, 351, 401, 451, and 452.

Engineering Core (5 hours)

Engineering 156 and 402.

Math/Science Core (33 hours)

Chemistry 105.

Mathematics 161, 162, 261, and 262.

Engineering 274*.

Physics 101 and 102.

Math/science elective—choose one course from the following:

Biology 101, 102; Chemistry 227, 241, 345; Mathematics 213**, 222, 331; Physics 232, 234; Astronomy 206, 207.

**Students who take Mathematics 213 and also Mathematics 222 and 331, are exempt from the Engineering 274 requirement.*

*** Students cannot receive credit for both Math 211 and Math 213.*

Concentration Area (37 hours) —choose one:

Electrical Engineering Concentration (EEEE)

Electrical Engineering 202, 302, 303, 304, and 352 (13 hours).

Intermediate electives (6 hours):**

Choose two courses from Computer Science 220, 222, 342, 450, Electrical Engineering 306, 310, 390, Engineering 390, or choose one course from this list and one additional course from the math/science electives.

Advanced electives (18 hours):**

Eight hours from Electrical Engineering 422, 432, or 442.

Ten hours from Electrical Engineering 390, 404, 421, 431, 441, 499,

or Engineering 390.

***No course can be used to satisfy both the intermediate and advanced elective requirements.*

Computer Engineering Concentration (EECE)

Electrical Engineering 306, 310, 441, 442, and Computer Science 220, 222, 340, and 450.

Intermediate elective (3 hours):

Choose one course from Computer Science 244, 314, 318, 322, 342, 361, 390, 422, 446, 447; Electrical Engineering 302, 390; or Engineering 390.

Three hours from Electrical Engineering 421 or 431.

Four hours from Electrical Engineering 422 or 432.

Mathematics 213 must be taken as the Math/Science elective.

Courses that count in the ELEE major quality point average (MQPA):

All courses with "ELEE" prefix; ENGR 390; COMP 141, 220, 222, 340, and 450. A minimum MQPA of 2.00 is required to graduate.

ELECTRICAL ENGINEERING (ELEE) MAJOR

FOUR-YEAR PLAN for ELECTRICAL ENGINEERING CONCENTRATION

FRESHMAN YEAR	**Fall**	**Spring**
Mathematics 161-162	4	4
Chemistry 105	4	-
Physics 101-102	4	4
Computer Science 141	-	3
Engineering 156	-	2
Humanities 101-102	3	3
Physical Education	1	1
	16	17

SOPHOMORE YEAR	**Fall**	**Spring**
Mathematics 261-262	4	3
Electrical Engineering 201-202	4	2
Electrical Engineering 251-252	1	1
Electrical Engineering 204	-	3
Electrical Engineering 238	2	-
Math-Science Elective*	-	3
Free Elective*	3	-
Humanities 201-202	3	3
	17	15

JUNIOR YEAR		
Electrical Engineering 301	3	-
Elec. Eng. 302	-	3
Elec. Eng. 303	3	-
Elec. Eng. 304	-	4
Electrical Engineering 321	4	-
Electrical Engr. 351-352	1	1
Intermediate Electives	3	3
Foun.Social Science/SSFT	3	3
Engineering 274	-	3
	17	17

SENIOR YEAR		
Advanced Electives	10	8
Electrical Engineering 401	3	-
Engineering 402	-	3
Electrical Engineering 451-452	1	2
Humanities 301-302	3	3
	17	16

**The free elective and the Math-Science elective can be taken in either semester.*

FOUR-YEAR PLAN for COMPUTER ENGINEERING CONCENTRATION

FRESHMAN YEAR	**Fall**	**Spring**
Mathematics 161-162	4	4
Chemistry 105	4	-
Physics 101-102	4	4
Computer Science 141	-	3
Engineering 156	-	2
Humanities 101-102	3	3
Physical Education	1	1
	16	17

SOPHOMORE YEAR	**Fall**	**Spring**
Mathematics 261-262	4	3
Electrical Engineering 201	4	-
Electrical Engineering 251-252	1	1
Computer Science 220	3	-
Electrical Engineering 204	-	3
Electrical Engineering 238	2	-
Foundations of Social Science	-	3
Humanities 201-202	3	3
Engineering 274	-	3
	17	16

JUNIOR YEAR		
Electrical Engineering 301	3	-
Elec. Eng. 306	-	3
Comp. Sci. 222	3	-
Computer Science 340	-	3
Computer Science 450	-	3
Electrical Engineering 310	-	4
Electrical Engineering 321	4	-
Elec. Electrical Engineering 351	1	-
Mathematics 213	4	-
Intermediate electives	-	3
SSFT	3	-
	18	16

SENIOR YEAR		
Elec. Eng. 441-442	3	4
Advanced Electives	3	4
Electrical Engineering 401	3	-
Engineering 402	-	3
Electrical Engineering 451-452	1	2
Humanities 301-302	3	3
Free Elective*	3	-
	16	16

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

ENGINEERING CORE COURSES (ENGR)

ENGR 156. INTRODUCTION TO ENGINEERING. Introduces students to the engineering profession and the design process. Course lectures and assignments include the design process; problem definition and solution; oral and written communications; group dynamics; public responsibility; current global engineering challenges; and engineering ethics. A group design project is required. For electrical engineering students, this course is taken concurrently with Computer Science 141. For mechanical engineering students, this course is taken concurrently with Mechanical Engineering 120. *Semester course, two hours.*

ENGR 274. MATHEMATICAL METHODS IN ENGINEERING. A course for engineering and science majors covering selected topics in probability and statistics, linear algebra, discrete mathematics, and numerical methods as applied to the solution of problems in engineering and science. Students who receive credit for Mathematics 213, 222, and 331 may not receive credit for Engineering 274. Prerequisite: Mathematics 261. S*emester course, three hours.*

ENGR 390. SPECIAL ENGINEERING TOPICS. Special topics in the areas of new engineering development based on student demand and faculty interest. Specific subject matter varies each semester with prerequisites and credit hours announced in advance of registration. *Semester course, one, two, three or four hours.*

ENGR 402. BUSINESS FOR TECHNICAL PROFESSIONALS. Principles and methods for analyzing the economical feasibility of engineering projects including interest, depreciation, rate-of-return, economic life, replacement costs, and comparison of alternative designs. Key business and financial concepts and how they relate to engineering will also be presented. Topics to be discussed include basic accounting principles, an introduction to common financial statements, cash flow issues, an overview of commonly used business performance measures, a discussion of variable and fixed costs, and management of working capital. Prerequisite: Mathematics 141 or 161; junior or senior standing. *Spring semester only, three hours.*

ELECTRICAL ENGINEERING (ELEE)

ELEE 201. LINEAR CIRCUITS I. An introduction to the analysis and design of electrical circuits composed of linear elements. The course begins with time domain analysis of the steady state and transient behavior of linear circuits and progresses to sinusoidal steady state analysis using the phasor method. Computers are introduced as an aid to analysis and design of circuits via the use of circuit simulation software. Prerequisites: Physics 102 and Mathematics 162. *Fall semester only, four hours.*

ELEE 202. LINEAR CIRCUITS II. Continued study in techniques for analyzing and designing circuits composed of linear elements, including the Laplace Transform, convolution, and Fourier analysis methods. Applications of linear circuits to electric power systems and frequency selective systems are examined. Computers are used as an aid to analysis and design via the use of circuit simulation software. Prerequisites: Electrical Engineering 201. *Spring semester only, two hours.*

ELEE 204. DIGITAL LOGIC DESIGN. An introduction to digital circuit analysis and design methods. Combinational circuit topics include the use of Boolean algebra, map minimization methods, and circuit implementation with logic gates and standard integrated circuits. Sequential circuit design is explored, and implementation with flip-flops and standard integrated circuits is investigated. Programmable logic implementation of both combinational and sequential circuits is introduced. A group design project is required. *Spring semester only, three hours.*

ELEE 210. ELECTRICAL ENGINEERING. A survey for non-electrical engineering majors covering the basic principles of circuit analysis, electronics, instrumentation, and electromechanical energy conversion, with computer applications. Prerequisites: Mathematics 162, Physics 102, and Mechanical Engineering 120 or Computer Science 141. *Spring semester only, three hours.*

ELEE 238. NUMERICAL METHODS FOR ENGINEERS. An introduction to MATLAB computer programming with an emphasis on numerical methods common to electrical engineering applications. Prerequisite: Computer Science 141. Corequisite: Electrical Engineering 201. *Fall semester only, two hours.*

ELEE 251. LINEAR CIRCUITS LABORATORY. A laboratory course intended to acquaint the student with basic techniques of instrumentation, measurement, design, and troubleshooting for linear analog circuits. Laboratory investigation of basic Electrical Engineering concepts is integrated with design and implementation of practical circuits to meet specifications. Corequisite: Electrical Engineering 201. *Fall semester only, one hour.*

ELEE 252. DIGITAL CIRCUITS LABORATORY. A laboratory course intended to acquaint the student with hardware and software tools used for the design and implementation of digital circuits. A variety of digital design techniques are investigated, including gate-level circuits, programmable FPGA devices, and hardware definition languages (VHDL). CAD software, a hardware target system, and lab equipment are used to design, simulate, program, and verify the operation of digital circuits. Computers are used to design and simulate circuits and to program digital devices to implement those designs. Corequisite: Electrical Engineering 204. *Spring semester only, one hour.*

ELEE 260. INDEPENDENT STUDY. Individual study of specialized topics in Electrical Engineering. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ELEE 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Electrical Engineering. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ELEE 301. ELECTRONICS I. A study of semiconductor device characteristics, diodes, bipolar junction transistors (BJTs), field-effect transistors (FETs), BJT and FET amplifier circuits, bias stability, and DC power supplies. Prerequisites: Electrical Engineering 202 and Mathematics 262. *Fall semester only, three hours.*

ELEE 302. ELECTRONICS II. A study of the frequency response characteristics of transistor amplifiers, integrated-circuit operational amplifiers, fundamentals of feedback and stability, oscillators, active filters, quasi-linear circuits, pulsed waveforms and timing circuits. Prerequisites: Electrical Engineering 301. *Spring semester only, three hours.*

ELEE 303. ELECTRICAL MACHINES. Theories of transformers, DC machines, induction motors, synchronous motors and generators, stepping motors, and single-phase motors are developed and applications are explored. Prerequisite: Electrical Engineering 202. *Fall semester only, three hours.*

ELEE 304. ELECTROMAGNETIC THEORY. Fundamentals of electromagnetic theory, including static electric fields; dielectrics; energy and forces in the electric field; magnetic fields in free space and in magnetic materials; time-varying fields; and Maxwell's equations with applications. Computer techniques are used to solve a problem involving Laplace's Equation. Prerequisites: Electrical Engineering 202; Mathematics 262. *Spring semester only, four hours.*

ELEE 306. DIGITAL ELECTRONICS. A study of semiconductor devices and their use in digital integrated circuits. Characteristics of semiconductor devices will be explored followed by an investigation of their application to the design of digital logic circuits and systems. Prerequisite: Electrical Engineering 204 and 301. *Spring semester only, three hours.*

ELEE 310. EMBEDDED SYSTEMS. An introduction to the skills required to design and program systems that incorporate embedded microprocessors or microcontrollers. Topics include microprocessor circuitry and architecture, programming using assembly and higher-level languages, and interfacing the microprocessor with external devices. Three lectures and one lab per week. Prerequisites: Electrical Engineering 201 or 210, and Electrical Engineering 204. *Spring semester only, four hours.*

ELEE 321. SIGNAL ANALYSIS. The mathematical representation of continuous and discrete systems including Fourier Series and transforms; Laplace transforms; z-transforms; continuous and discrete convolution; and digital computer techniques such as FFT's and digital filtering. Prerequisite: Electrical Engineering 201; Mathematics 262. *Fall semester only, four hours.*

ELEE 333. SYSTEM SOFTWARE. A study of the basic principles of operating system design and implementation, focused on the Linux environment and an overview of compiler and database management system principles. Operating system features include memory management, process management, file management, basic Linux commands and shell scripts. Compiler features include basic processing flow and optimization techniques. Database features include relational design and table manipulation. Prerequisite: Computer Science 220. Corequisite: Computer Science 222. *Fall semester only, three hours.*

ELEE 351. INTERMEDIATE LABORATORY I. A hands-on experience in the use of electronic devices including discrete active and passive components and sub-assemblies; test equipment; and instrumentation. Assignments are oriented toward the analysis and design of analog electronic circuits and systems. Computer software is used for circuit simulation and analysis. Familiarization with the technical resources available in the library is also provided. Corequisite: Electrical Engineering 301. *Fall semester only, one hour.*

ELEE 352. INTERMEDIATE LABORATORY II. A hands-on experience in the use of electronic and electrical devices including transformers, motors, and generators as well as discrete active and passive components, test equipment, and instrumentation. Assignments are oriented toward the analysis and design of analog electronic circuits, networks, and electrical machines. Computer software is used for circuit simulation and analysis. Prerequisite: Electrical Engineering 301 and 351. Corequisites: Electrical Engineering 302 and 303. *Spring semester only, one hour.*

ELEE 353. INTERMEDIATE DIGITAL LABORATORY. A hands-on experience in the use of electronic devices including discrete active and passive components, integrated circuits, test equipment, and instrumentation. Assignments are oriented toward the analysis and design of digital electronic circuits and networks. Computer software is used for circuit simulation and analysis. Prerequisites: Electrical Engineering 204, 301, and 351. Corequisite: Electrical Engineering 306. *Spring semester only, one hour.*

ELEE 360. INDEPENDENT STUDY. Individual study of specialized topics in Electrical Engineering. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ELEE 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Electrical Engineering. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ELEE 390. SPECIAL TOPICS IN ELECTRICAL ENGINEERING. Special topics, based on student demand and faculty interest, in the areas of new electrical engineering development. Specific subject matter varies each semester. Prerequisites and credit hours announced in advance of registration. *Semester course, one, two, three, or four hours.*

ELEE 401. ELECTRICAL/COMPUTER ENGINEERING DESIGN. A study of the principles and methods of designing electrical/computer engineering systems in today's society. The early stages of the design process are emphasized, including identifying needs, requirements specification, planning and evaluating design alternatives. Engineering ethics, including intellectual property, are a significant focus. The senior design project is initiated, defined and documented. Extensive technical writing and oral presentation skills are employed. Electrical Engineering 401 is designed to fulfill the requirements for both a Writing Intensive (WI) and a Speaking Intensive (SI) course in the Electrical Computer Engineering curriculum. Prerequisite: Senior standing in electrical engineering (either electrical or computer concentration). *Fall semester only, three hours.*

ELEE 404. ELECTROMAGNETIC ENERGY TRANSMISSION. The analysis of the transmission of electromagnetic energy including radiation in free space and in various media, guided waves in transmission lines, and antennas. Each student completes an antenna design project as part of this course. Prerequisite: Electrical Engineering 304. *Fall semester only, four hours.*

ELEE 421. CONTROL THEORY. A study of the analysis and design of feedback control systems. Topics include: modeling of dynamic systems, linearization, transducers, parameterization of step responses, reduction of multiple subsystems, steady-state error, brief overview of root locus, Bode analysis/stability margins, Bode compensator design, programmable logic controllers (including RSLogix500; RSView32 software and SLC-500 hardware and projects controlling actual hardware), state-space representation, solution of state equations, review of z-transform, and sampling. Extensive Matlab/Simulink simulations. Prerequisite: Electrical Engineering 321.
Fall semester only, four hours.

ELEE 422. DESIGN OF CONTROL SYSTEMS. Analysis and design of primarily digital control systems. Topics include: relation of z-transform to Laplace transform under sampling; more PLC projects; sampled-data closed-loop systems/effects of sampling; system reduction using Mason's gain rule; discrete-time state equations/their solution; digital filter realizations in software and ICs; steady-state error for sampled-data control systems; frequency domain techniques for digital control system compensator design; state/output feedback/observer theory for digital control systems; optimal control (theory behind and examples of linear quadratic regulators including incorporation of nonzero setpoint); and fuzzy logic controllers. Extensive Matlab/Simulink simulations. Prerequisites: Electrical Engineering 401 and 421. *Spring semester only, four hours.*

ELEE 431. COMMUNICATION SYSTEMS I. Fundamentals of digital communication systems including signals/systems review; correlations/PSD; channel capacity; EbN0; baseband systems (PCM/companding, DPCM, source coding, scrambling, intersymbol interference/RRC, bit synchronization, and TDM); brief introductions to xDSL, N/B-ISDN, ATM, Ethernet, SONET; antennas and propagation/signal degradation; frequency allocations; link budget analysis; complex envelope; PSD of bandpass signals; circuits for communication systems (filters, amplifier types, oscillators, nonlinear analysis/THD, mixers, and phase-locked loops/frequency synthesizers); superheterodyne systems; digital television; and binary bandpass signaling. Extensive Matlab/Simulink simulations. Optional accompanying digital communication labs distinct from Electrical Engineering 451. Prerequisites: Electrical Engineering 321; Mathematics 262. *Fall semester only, three hours.*

ELEE 432. COMMUNICATION SYSTEMS II. Binary bandpass signaling continued (ASK, BPSK, DPSK, BFSK, QPSK, p/4 DQPSK, MPSK, QAM, and MSK/GMSK); vector-space signal representation; orthogonal signaling; probability/random process review; bandpass random processes; noise temperature/figure; PSD of digital stochastic signals; matched filters; probability of error for digital communication systems; block FEC coding (through BCH/Reed-Solomon codes and Berlekamp decoding algorithm); and introduction to spread spectrum/cellular systems. Extensive Matlab/Simulink simulations. Optional accompanying digital communication labs distinct from Electrical Engineering 451. Prerequisites: Electrical Engineering 401 and 431.
Spring semester only, four hours.

ELEE 441. COMPUTER I. An advanced study of Central Processing Unit (CPU) organization and architecture. The Instruction Set Architecture (ISA) and Instruction Level Parallelism (ILP) are emphasized. The organization and importance of the memory hierarchy, particularly cache memory, are introduced. Modern CPU architectures, such as the Intel IA-32 architecture, are used as practical examples of theoretical concepts. A design project is required. Prerequisite: Electrical Engineering 310.
Fall semester only, three hours.

ELEE 442. COMPUTER II. An advanced study of multiprocessor architectures. Different approaches to memory, interconnection network and CPU design are explored. The nature and limitations of massively parallel applications are explored. Design of large-scale storage systems is introduced. Selected topics in leading-edge computer system design are explored, such as quantum computing or wireless sensor networks. Students are required to research selected topics in the academic literature. Prerequisite: Electrical Engineering 441. *Spring semester only, four hours.*

ELEE 451. EXPERIMENTAL ELECTRICAL ENGINEERING I. Advanced senior-level laboratories involving the investigation of application areas of electrical and computer engineering, as well as the initial work period on the senior design projects. For the first two five-week segments, students form small groups and select prescribed laboratory sequences in the following areas: microprocessors, signal processing, digital control systems, digital communication systems (both baseband and bandpass), microwave measurements, and analog communication processing systems. The last five-week period involves implementation of experimental procedures proposed in Electrical Engineering 401 that address the quantitative study, design, implementation, and teamwork aspects of the senior design projects. Prerequisite: Senior standing in electrical engineering (either electrical or computer concentration).
Fall semester only, one hour.

ELEE 452. ELECTRICAL/COMPUTER DESIGN LAB II. This senior-level laboratory involves continuation of work on the senior design projects. Components of the course include completion of quantitative study, design, implementation, and teamwork aspects of the senior design projects, attention to task scheduling, budget, detailed technical report writing, development of team website, and public oral presentation of the project. Prerequisites: Electrical Engineering 451; Senior standing.
Spring semester only, two hours.

ELEE 460. INDEPENDENT STUDY. Individual study of specialized topics in Electrical Engineering. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ELEE 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Electrical Engineering. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

ELEE 499. HONORS IN ELECTRICAL ENGINEERING. Seniors who have shown special aptitude in electrical engineering may, with consent of the department, undertake special research problems. Not to exceed three hours each semester. *Semester course, one, two or three hours.*

DEPARTMENT OF ENGLISH

Dr. J. Dixon, Chair; Dr. J. Brown, Mrs. Craig, Dr. D. Dixon, Dr. Harvey, Dr. Messer, Dr. E. Potter. Part-time: Mrs. K. Anderson, Dr. Barbour.

Course Requirements for a Bachelor of Arts Degree in English (36 hours) (ENGL)

English Core Requirements (21 hours):

English 201-202, 203-204.

One Shakespeare course: either English 351 or 352.

One writing course: either English 371 or 381.

One theory course from either English 402 or 450.

Genre literature course (3 hours):

Choose one from English 222, 230, 242, 243, 245, 246, 250, 252, 261, or 262. English 290 may also count with department approval.

Period courses (12 hours):

Choose four from English 205, 206, 242, 243, 245, 246, 302, 304, 306, 308, 312, 314, 318, 324, 325, 327, 351, or 352. English 290 or 390 studies courses may also count with department approval.

Courses that count in the ENGL major quality point average (MQPA):

All courses with "ENGL" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for English Major leading to (7-12) teaching certification in English (ESED)

Core Requirements (33 hours):

English 201-202, 203-204, 205 or 206, and 402.

Shakespeare course: either English 351 or 352.

English 371 or 381.

One period course: choose from English 205, 206, 242, 243, 245, 246, 302, 304, 306, 308, 312, 314, 318, 324, 325, 327, 351, or 352. English 290 or 390 studies courses may also count with department approval.

One Genre course: choose from English 222, 230, 242, 243, 246, 250*, 252, 261, or 262. English 290 may also count with department approval.

English Electives (3 hours):

Choose one course from courses with ENGL prefix.

Education Core (50 hours):

Education 103, 201, 202, 203, 303, 305, 308, 326, 330, 361, 371, 431, and 488.

Communication 104.

Computer Science 204.

Course Requirements for English Major leading to (7-12) teaching certification in English and Communication (ECED)

All courses required for above English Major leading to (7-12) teaching certification in English, plus the following:

Communication Core (6 hours):

Six (6) credits from any one of the following three areas:

Speech: Communication 109 (3 hours), 207, 303; Theatre 251, or 255.

Media: Communication 222, 235, 350, or 378.

Theatre*: Theatre 251, 259 (one credit course must be taken three times), 261, 262, 320; or English 252.

**Students who elect the "Theatre" option must take English 250 to fulfill the Genre requirement*.*

Advanced Placement credits in English do not count toward English major requirements. They do, however, count as elective credits toward graduation.

Students are expected to contact their advisor for a detailed schedule of courses recommended to meet requirements for a major.

The Department of English sets high standards for its students in the development of composition and research skills necessary for writing clear, well-supported research papers in MLA format for each literature course in the program. To this end, all freshman English majors take English 201: English Literature Survey I as the foundational Writing Intensive (WI) and Information Literacy (IL) course in the major. Oral communication skills are essential to success in graduate school as well as in careers related to English, and English 351 or 352: Shakespeare serves as the required Speaking Intensive (SI) course in the department.

SUPPORTING ACTIVITIES

The Department of English offers students significant co-curricular activities, including:

- A highly acclaimed theatre program, including two main stage productions and numerous student productions during the academic year.

- Lamda Iota Tau (LIT), the literary honor society on campus, sponsors special speakers and poetry readings.
- Tau Alpha Pi (TAP), the theatre honorary, sponsors a One-Act Play Festival each semester.
- Involvement with the campus newspaper, radio station, literary magazine, yearbook, or College's public relations offices.
- Internships, whereby students earn academic credit for work done in conjunction with a professional organization related to English. See the course description for English 480.

Course Requirements for a minor in English (18 hours)

A minor in English will consist of any six three-credit courses in literature, excluding English 102, 355, 371, 381 and 401. Advanced Placement credits will not count toward the 18 hours.

Course Requirements for a minor in Theatre (24 hours)

This minor is open to all students with a love for theatre and an interest in supplementing their academic major with a program that will develop appreciation of dramatic literature and skills in the various arts and crafts of the theatre. Twenty-four hours are required, including:

Theatre Core (12 hours):

English 250, Theatre 251, and 261.

Theatre 259—this one-credit course must be taken at least three times.

Elective options (12 hours) Choose twelve hours from the following:

English 252, 302, 351, or 352; Theatre 255, 262, 320, or 351.

English or Theatre 260, 290, 360, 390, 460 or 480 courses may also count as elective options but must be pre-approved by the department chair and must relate directly to theatre studies.

Course Requirements for a minor in Interdisciplinary Classics

Consult the Department of Religion for the 21-hour requirements.

ENGLISH (ENGL)

ENGL 102. EFFECTIVE WRITING. A basic college level review course for students referred by instructors and/or advisors, and for non-English majors seeking to polish their writing skills. Major emphasis is on grammar review and polishing skills of effective expository writing. Provision is made for individual conferences. *Semester course, three hours.*

ENGL 201. ENGLISH LITERATURE SURVEY I. The first semester of the two-semester survey of English literature focuses on the major authors and representative works of each period from the early Middle Ages (*Beowulf)* to the 18th century. This course also fulfills the Writing Intensive (WI) and Information Literacy (IL) requirements for the English major. As such, it is the foundational course for the English major and should be taken in the first semester of the program.
Fall semester only, three hours.

ENGL 202. ENGLISH LITERATURE SURVEY II. The second semester of the two-semester survey of English literature focuses on the major authors and representative works of each period from the late 18th century to the modern era. Prerequisite: English 201. *Spring semester only, three hours.*

ENGL 203. AMERICAN LITERATURE SURVEY I. The first semester of the two-semester survey of American literature focuses on representative works from the time of the discovery of America to the Civil War. Attention is concentrated on major writers and their works in each period with some consideration given to all genres except drama. English majors are strongly encouraged to take 203 before 204. *Fall semester only, three hours.*

ENGL 204. AMERICAN LITERATURE SURVEY II. The second semester of the two-semester survey of American literature focuses on representative works from post-Civil War to the late 20th century. Attention is concentrated on major writers and their works in each period with some consideration given to all genres except drama. Non-English majors may enroll in 204 without having taken 203, but English majors are strongly encouraged to take 203 before 204.
Spring semester only, three hours.

ENGL 205. WORLD LITERATURE SURVEY: ASIA. A survey of representative authors and works of Asia, with a special focus on the literature of China, India, and Japan. The 205-206 survey is designed to include works of cultures and regions not covered by the English and American literature surveys or the classical and European literature in the required Humanities 202: Civilization & Literature. Students may take either or both courses, in either sequence.
Fall semester only, three hours.

ENGL 206. WORLD LITERATURE SURVEY: AFRICA AND LATIN AMERICA. A survey of representative authors and literary works of Africa and Latin America, including the Caribbean. The 205-206 survey is designed to include works of cultures and regions not covered by the English and American literature surveys or the classical and European literature in the required Humanities 202: Civilization & Literature. Students may take either or both courses, in either sequence.
Spring semester only, three hours.

ENGL 222. FANTASY LITERATURE. This course is designed to introduce students to the major features that characterize fantasy as a literary genre. Students will read 16-18 fantasy novels, including authors such as C. S. Lewis, J. R. R. Tolkien, Madeleine L'Engle, Ursula LeGuin, and J. K. Rowling. Class time will be spent analyzing these novels and critiquing them as works of literature.
Offered alternate Spring semesters, three hours.

ENGL 230. SHORT STORY. A study of the short story as a literary form, from the beginnings of the form to the present. *Offered alternate years, semester course, three hours.*

ENGL 242. 19th CENTURY ENGLISH NOVEL. A study of major works by authors from the great age of the English novel, including Austen, the Brontes, Dickens, Eliot, Hardy, Conrad, and Wilde. Prerequisite for English majors: English 202. (None for non-English majors.)
Offered alternate Fall semesters, three hours.

ENGL 243. 20th CENTURY ENGLISH NOVEL. A study of the themes and technical developments which emerge in the novels of such authors as Woolf, Forster, Joyce, Waugh, Greene, and selected contemporary authors. *Offered alternate Spring semesters, three hours.*

ENGL 245. 19th CENTURY AMERICAN NOVEL. This course explores the romances of Hawthorne and Melville; the realism of Mark Twain, Henry James, and Chopin; and the naturalism of Dreiser, along with works by other key writers. Prerequisite for English majors: English 203 and 204. (None for non-English majors.) *Offered alternate Fall semesters, three hours.*

ENGL 246. 20th CENTURY AMERICAN NOVEL. This course gives students experience with the long fiction of such writers as Cather, Hemingway, Faulkner, Fitzgerald, Ellison, Morrison, Percy, and others. Prerequisite for English majors: English 204. (None for non-English majors.)
Offered alternate Spring semesters, three hours.

ENGL 250. WORLD DRAMA. An introduction to the great playwrights and representative plays of world drama from the Greeks to the present. Students study elements of plot, characterization, and idea in each of the plays studied. The course also focuses on the theatrical and historical context of each play and playwright. *Fall semester only, three hours.*

ENGL 252. MODERN DRAMA. A study of major plays and playwrights of the late nineteenth and twentieth centuries, including Ibsen, Chekhov, Shaw, O'Neill, Beckett, Stoppard, and recent American and British playwrights. *Offered alternate Spring semesters, three hours.*

ENGL 254. THEATRE AND THEOLOGY. A study of current Broadway and off-Broadway theatre productions in New York City. Students see five productions, normally in the first or second week of January and meet every morning to discuss the theological and theatrical implications of these productions. Students must write a ten-page paper in response to these issues. This course may be repeated. *Intersession course, one hour.*

ENGL 260. INDEPENDENT STUDY. Individual study of specialized topics in English. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ENGL 261. POETRY. This course explores a wide range of traditional and contemporary poetry; gives insight into ways poets use imagery, rhyme, meter, persona, and sound qualities to create meaning in poetry; provides experience with prosody, and offers in-depth experience with the work of selected poets. *Fall semester only, three hours.*

ENGL 262. MODERN POETRY. This course provides a more intensive examination of the poets and poetry of the 20th century. Students will examine the most significant movements in poetry of this period, including Modernism in the first half of the century and post-modern experiments of recent decades. *Offered alternate Spring semesters, three hours.*

ENGL 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in English. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ENGL 290. STUDIES IN LITERATURE. Subject matter varies each semester, to allow an in-depth study of authors and works of literature not covered in as much detail in other courses. *Semester course, three hours.*

ENGL 302. CLASSICAL LITERATURE IN TRANSLATION. A study of the major works of ancient Greek and Roman literature with particular emphasis on the epic and tragedy and on the influence of classical literature on later Western literature. *Offered alternate years, semester course, three hours.*

ENGL 304. CHAUCER AND THE MIDDLE AGES. An introduction to the literature and art of the Middle Ages, from Beowulf, through Sir Gawain and the Green Knight and The Canterbury Tales, to the religious drama of the later Middle Ages. Prerequisite: English 201. *Offered alternate years, semester course, three hours.*

ENGL 306. ENGLISH RENAISSANCE: SPENSER TO MILTON. A survey of major English writers of the sixteenth and seventeenth centuries from Spenser, Donne, and Jonson to John Milton. Prerequisite for English majors: English 201. (None for non-English majors.) *Offered alternate years, semester course, three hours.*

ENGL 308. RESTORATION AND 18th CENTURY LITERATURE. An introduction to the works of principle authors from 1660 to 1750 such as Dryden, Pope, Swift, and Johnson. The simultaneous codification of rules and outbreak of the Romantic temper will be traced. Prerequisite: English 201. *Offered alternate years, semester course, three hours.*

ENGL 312. ROMANTIC LITERATURE. An intensive examination of the poetry of the six major English Romantic poets of the early nineteenth century: Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats. Students also read major critical prose by and about these poets. Prerequisite for English majors: English 202. (None for non-English majors.) *Offered alternate years, semester course, three hours.*

ENGL 314. VICTORIAN LITERATURE. A study of the major British writers of the period from 1837 to 1900, focusing particularly on Tennyson, Robert Browning, Christina Rossetti, Gerard Manley Hopkins, and Oscar Wilde. Prerequisite: English 202. *Offered alternate years, semester course, three hours.*

ENGL 318. AMERICAN RENAISSANCE. An opportunity for students to explore an unusually productive phase in the history of ideas in America through literature of outstanding quality including works of Emerson, Thoreau, Hawthorne, Melville, and Whitman. The dynamics of interaction among members of that group will be studied. Prerequisite for English majors: English 203. (None for non-English majors.) *Offered alternate years, semester course, three hours.*

ENGL 324. EUROPEAN LITERATURE. A study of European fiction in translation, with major emphasis on the novel, highlighting the work of writers such as Flaubert, Tolstoy, Dostoevsky, and Mann. *Offered alternate years, semester course, three hours.*

ENGL 325. CONTEMPORARY LITERATURE. A study of American, European and world literature of the last three decades, with particular emphasis on Nobel and other award-winning authors. *Offered alternate years, semester course, three hours.*

ENGL 327. MODERN CHRISTIAN WRITERS. This course acquaints students with a wide variety of writers from the mid nineteenth century to the end of the twentieth century whose works express Christianity in significant ways. It examines the question of how a Christian world view impacts the way a writer functions as an artist. Operating on the premise that there is a place for many kinds of literary genius in the kingdom of God, this course challenges students intellectually and spiritually. *Offered alternate Fall semesters, three hours.*

ENGL 351. SHAKESPEARE I. One of two courses which together examine 20 of the 37 plays of William Shakespeare. Each semester begins with a study of the sonnets and then focuses on ten of the major plays, selected from the comedies, histories, tragedies and romances. Class discussion is supplemented with a required lab session for the viewing and discussion of performances of the plays under study. Either Shakespeare course will satisfy the Speaking Intensive (SI) requirements for the English major. Plays for the fall semester usually include: Richard III, Taming of the Shrew, Merchant of Venice, A Midsummer Night's Dream, Romeo and Juliet, Much Ado About Nothing, Henry V, Julius Caesar, Othello, and The Winter's Tale. Students may take either or both courses, in either sequence. *Fall semester only, three hours.*

ENGL 352. SHAKESPEARE II. One of two courses which together examine 20 of the 37 plays of William Shakespeare. Each semester begins with a study of the sonnets and then focuses on ten of the major plays, selected from the comedies, histories, tragedies and romances. Class discussion is supplemented with a required lab session for the viewing and discussion of performances of the plays under study. Either Shakespeare course will satisfy the Speaking Intensive (SI) requirements for the English major. Plays for the spring semester usually include: As You Like It, Twelfth Night, Richard II, 1 Henry IV, Measure for Measure, Hamlet, Macbeth, King Lear, Cymbeline, The Tempest. Students may take either or both courses, in either sequence. *Spring semester only, three hours.*

ENGL 360. INDEPENDENT STUDY. An opportunity for students with extensive background in literature to do intensive independent study or research on specialized topics. Prerequisite: junior English major and permission of the instructor. Application deadline: end of the semester preceding the proposed study. *Semester course, one, two or three hours.*

ENGL 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in English. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ENGL 371. CREATIVE WRITING. An exploration of the elements and techniques of writing short fiction and poetry. Informal lectures and discussions focus on student writing. *Semester course, three hours.*

ENGL 381. CREATIVE NON-FICTION. An exploration of the elements and techniques of writing creative nonfiction, including such forms as personal essays, memoirs, travel writing, biography, literary journalism, book reviews, and lyric essays. Informal lectures and discussions focus on student writing. *Semester course, three hours.*

ENGL 390. STUDIES IN LITERATURE. Subject matter varies each semester, to allow an in-depth study of authors and works of literature not covered in as much detail in other courses. *Semester course, three hours.*

ENGL 402. GRAMMAR AND HISTORY OF ENGLISH. Required of English majors seeking secondary certification in English, this course offers an introduction to the history of the English language, a review of traditional grammar, and presentation of a working knowledge of modern grammar.
Semester course, three hours.

ENGL 450. LITERARY CRITICISM AND THEORY. A detailed examination of the major literary critics and theorists of Western civilization. Part one is devoted to key figures of the Classical tradition; Part two uses basic tenets of that tradition to critique the "new wave" of 20th and 21st century critical theory. The class employs a seminar format; students lead discussion on a rotating basis and are expected to contribute significantly to every discussion. Essential for all students considering graduate study in English. Prerequisite: English 201, 202, 203, and 204, and junior or senior English major.
Fall semester only, three hours.

ENGL 460. INDEPENDENT STUDY. An opportunity for students with extensive background in literature to do intensive independent study or research on specialized topics. Prerequisite: senior English major and permission of the instructor. Application deadline: end of the semester preceding the proposed study. *Semester course, one, two or three hours.*

ENGL 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in English. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

ENGL 480. INTERNSHIP IN ENGLISH. Students majoring in English may, with prior consent of the department, earn academic credit for work done (normally off campus) under the direct supervision of a professional in an English-related field. This includes but is not limited to such fields as publishing, library science, journalism, technical writing, and script writing. Students must keep a daily log of activities and submit an academic paper summarizing the experience. A maximum of six credits of internship may apply toward graduation. *Semester course, one to six hours.*

ENGL 488. HONORS SEMINAR. Junior and senior English majors who have demonstrated a special aptitude for literary theory and criticism may, with the consent of the department chair, participate in this advanced seminar experience. Each student will undertake an advanced independent study project, keep a research journal, report weekly on research progress, present a finished 35-50-page paper to the English faculty, and provide a public presentation and defense of the research project. Prerequisite: English 450. *Spring semester only, three hours.*

ENGL 499. HONORS IN ENGLISH. Seniors who have shown special aptitude in literature may, with consent of the department, undertake this course on an individual basis. The format is similar to that of the independent study, but students must also submit their papers to the entire English faculty and provide an oral presentation and defense of their research.
Semester course, one, two or three hours.

THEATRE (THEA)

THEA 251. ACTING. Practice in preparing a dramatic role for performance. Exercises will focus on freeing the actor's voice and body for maximum expressiveness. Students will prepare and perform monologues, short scenes, and a single extended scene.
Fall semester only, three hours.

THEA 255. ORAL INTERPRETATION OF LITERATURE. Study and practice of the techniques of reading literature aloud to enhance audience appreciation and enjoyment. Oral readings are given in the areas of fiction, poetry and drama. Each student also prepares and performs a final ten-minute recital. *Fall semester only, three hours.*

THEA 259. THEATRE PRACTICUM. Students may receive one credit for a minimum of 40 hours of supervised technical theatre work directly related to a main-stage theatre production. Students must keep an ongoing record of the dates and times of their work, and the student's supervisor must sign each entry. These records are due by Study Day of the semester enrolled. This course is repeatable, but no more than three hours may count toward the Theatre minor. It will count as a general elective if taken more than three times. *Semester course, one hour.*

THEA 260. INDEPENDENT STUDY. An opportunity for students with extensive background in Theatre to do intensive independent study or research on specialized topics. Prerequisite: sophomore standing, Theatre minor and permission of the instructor. Application deadline: end of the semester preceding the proposed study. *Semester course, one, two or three hours.*

THEA 261. STAGECRAFT. This course covers the technical work of set-design, lighting, sound design, and stage rigging as well as administrative/budgetary management of technical theater. A practical course taught both in the classroom and in hands-on settings. Students will be required to assist in various productions and live performances throughout the semester.
Semester course, three hours.

THEA 262. DESIGN FOR THE THEATRE. Provides practical experience for the student in the various aspects of set design and lighting design for the theatre. Students will study principles of play analysis for design and will engage in the following design activities and projects: For set design - thumbnail sketches, ground plans, section views, color renderings, and front and rear construction elevations; For lighting design - light plots, instrument schedules, channel and dimmer hookups, and color schedules. S*emester course, three hours.*

THEA 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Theatre. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

THEA 290/390. STUDIES IN THEATRE. Subject matter varies each semester, to allow an in-depth study of aspects of theatre not covered in as much detail in other courses.
Semester course, three hours.

THEA 320. STAGE DIRECTION. Theories and techniques of directing plays for the stage. Principles of play analysis, blocking, characterization, and rhythm are studied. The student will direct laboratory scenes, prepare production scripts, do script analyzes, and produce an extended scene. Prerequisite: Theatre 251. *Fall semester only, three hours.*

THEA 351. ADVANCED ACTING. Study and practice of advanced techniques of acting. Students will also focus on vocal production, movement, and elements of style related to the performance of plays from various periods of theatre history. Prerequisite: Theatre 251.
Semester course, three hours.

THEA 360. INDEPENDENT STUDY. An opportunity for students with extensive background in Theatre to do intensive independent study or research on specialized topics. Prerequisite: junior standing, Theatre minor and permission of the instructor. Application deadline: end of the semester preceding the proposed study. *Semester course, one, two or three hours.*

THEA 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Theatre. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

THEA 460. INDEPENDENT STUDY. An opportunity for students with extensive background in Theatre to do intensive independent study or research on specialized topics. Prerequisite: senior standing, Theatre minor and permission of the instructor. Application deadline: end of the semester preceding the proposed study. *Semester course, one, two or three hours.*

THEA 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Theatre. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

THEA 480. INTERNSHIP IN THEATRE. Students pursuing a minor in Theatre may, with prior consent of the Department, earn academic credit for work done (normally off campus) under the direct supervision of a professional in a theatre-related field. Students must keep a daily log of activities and submit an academic paper summarizing the experience. A maximum of six credits of internship may apply toward graduation. *Semester course, one to six hours.*

DEPARTMENT OF ENTREPRENEURSHIP

Dr. Columbus, Executive Director and Chair of Entrepreneurship Program; Mr. Cicero, Entrepreneur in Residence; Dr. Christie, Dr. Dupree, Dr. Mech. Part-Time: Mr. Howley, Mr. Sweet.

Students completing a major in Entrepreneurship may not complete a second major or a minor in the related Departments of Accounting or Business.

Course Requirements for a Bachelor of Science Degree in Entrepreneurship (ENTR)—68 hours

Students who elect the Entrepreneurship program are required to complete the following courses:

Entrepreneurship/Business Core Requirements (21hours):

Accounting 201-202; Business 201, 204, 301, and 305.

Business 303 or 304.

Entrepreneurial Core (22 hours):

Entrepreneurship 101, 102 and 103

Entrepreneurship 306, 312, 430, 459, and 466.

Entrepreneurship 480 Internship (2 hours).

Entrepreneurial Electives – 12 hours from these choices:

Business 311, 414, Entrepreneurship 307, 309, 318, 390, 407, 409, 420, 423, 488, or any two courses from any 300- or 400-level Accounting, Business, or Entrepreneurship offerings not listed.*

Major-Related Courses (13 hours):

Economics 101, 102, and 209; Mathematics 141.

Courses that count in the ENTR major quality point average (MQPA):

All courses with "ACCT," "BUSA," and "ENTR" prefix, ECON 209, excluding BUSA 205, and 206. A minimum MQPA of 2.00 is required to graduate.

**An Entrepreneurship degree candidate will not be permitted to take Accounting, Business or Entrepreneurship courses as electives beyond these 12 hours unless the College's 128-credit hour requirement for graduation has been satisfied. Up to three semester hours of internship credit will be permitted as non-business elective hours.*

It is essential for students pursuing the Entrepreneurship major to possess strong writing, speaking, and information literacy skills in preparation for future careers in business. Three courses are required to equip majors with these skills: Entrepreneurship 101, The Entrepreneurial Mind, is designated to enhance Writing Intensive (WI) skills; Entrepreneurship 102, Technology for the Entrepreneur, for Information Literacy (IL) skills; and Entrepreneurship 306, Business Ethics, for Speaking Intensive (SI) skills.

The Entrepreneurship Department offers one minor. Both the Business and Entrepreneurship minors may not be completed by students completing a major within the Departments of Accounting, Business, or Entrepreneurship.

Course Requirements for a minor in Entrepreneurship (24 hours)

Accounting 201; Business 301, 303; Economics 209; Entrepreneurship 101, 312; plus six hours from the following: Business 414, Entrepreneurship 307, 309, 407, 409, 420, 423, 430, 466 or 488.

ENTREPRENEURSHIP (ENTR)

ENTR 101. THE ENTREPRENEURIAL MIND. This course introduces the student to entrepreneurial thought and practice. Taken in conjunction with Entrepreneurship 102 and 103, students begin to develop their own entrepreneurial mindset and the business skills essential to the entrepreneurial experience. Students are introduced to the basics of business and challenged to think creatively about solving customer problems in the commercial and social arenas. Through experiential learning, business writing assignments, and creative thinking exercises, students will build new dreams about their life passion in the context of starting and running their own enterprise. This course satisfies the Writing Intensive (WI) requirement for Entrepreneurship majors. Corequisites: Entrepreneurship 102 and 103. *Fall semester only, three hours.*

ENTR 102. TECHNOLOGY FOR THE ENTREPRENEUR. Students learn to use business technology in coordination with assignments in Entrepreneurship 101, including how to use business information technology, spreadsheets, virtual meetings, key Internet skills such as social networking, and personal information management. This course satisfies the Information Literacy (IL) requirement for Entrepreneurship majors. Taken concurrently with Entrepreneurship 101 and 103. *Fall semester only, one hour.*

ENTR 103. THE ENTREPRENEURIAL EXPERIENCE. A lab course which uses selected business instruments and experiential learning exercises assisting students to apply content learned in Entrepreneurship 101 and 102, including spreadsheets, virtual meetings, key Internet skills such as social networking, and personal information management. The instructional process models entrepreneurial thought and practice. Students move progressively and incrementally from safe, grade-oriented behavior to moderate risk-taking; application-oriented learning behavior culminating in an adventure experience. This course satisfies the Information Literacy (IL) requirement for Entrepreneurship majors. Taken concurrently with Entrepreneurship 101 and 102. *Fall semester only, one hour.*

ENTR 260. INDEPENDENT STUDY. Individual study of specialized topics in Entrepreneurship. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ENTR 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Entrepreneurship. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ENTR 306. BUSINESS ETHICS. Students study the ethical decisions business professionals face in small, family, and corporate business settings. Using a case study format this speaking-intensive course requires students to individually analyze selected case studies and then present and discuss their analysis, with the class. Students will interact with business professionals as they study and analyze "living" cases in which one or more of the parties interacts with the class. Through these discussions students will come to understand what constitutes an ethical issue and the different philosophical, theological, and practical perspectives from which individuals may approach an ethical decision. Students are challenged to begin thinking through and developing their own ethical framework as well as to realize the implications of Christian faith in making ethical business decisions. This course satisfies the Speaking-Intensive (SI) requirement for Entrepreneurship majors. *Fall semester only, three hours.*

ENTR 307. SOCIAL ENTREPRENEURSHIP. How might one "do good while doing well?" Social (non-profit) entrepreneurship is an accelerating field of study and practice in today's world of shrinking governmental services. Students study highly effective non-profit social enterprises to learn the basics of non-profit entrepreneurship and learn how to integrate entrepreneurial thought and practice into the non-profit world. Students individually develop an elevator pitch and a feasibility study for a non-profit enterprise of their choice. The best feasibility study(ies) may be selected and completed as a full-fledged business plan(s) by a team. Practitioners of existing successful social enterprises act as guest lecturers and coaches on these plans. *Fall semester only, three hours.*

ENTR 309. E-COMMERCE. This course will provide a foundation for understanding the essential components of a successful e-commerce system, including e-commerce strategy, target market analysis, search engine optimization, integrated marketing, web usability, payment processing, security, cur-

rent technologies, data management and fulfillment systems. Case studies and actual business scenarios will be examined in detail, and students will have the opportunity to explore practical applications in the marketplace. *Fall semester only, three hours.*

ENTR 312. ENTREPRENEURSHIP. This course builds on the entrepreneurial process introduced in Entrepreneurship 101. Its focus is on commercial enterprise. (Students interested in social or non-profit enterprise should choose Entrepreneurship 307.) While the course is open to non-entrepreneurship, business, and accounting majors, it presupposes a basic understanding of business functions and language. The course is designed to further develop students' entrepreneurial mindset, to recognize opportunities, assess risk, develop resources, and implement a course of action to exploit the opportunity. Students will conduct a SWOT analysis of entrepreneurial endeavors and small business and present that profile to the class. Students will hear from and interact with practicing entrepreneurs who have agreed to visit classes and share their insights. Students prepare a feasibility study for a commercial business enterprise of their choice. *Fall semester only, three hours.*

ENTR 318. HIGH-TECHNOLOGY VENTURES. The purpose of this course is three-fold: to introduce students to the process of technological innovation within a business; to learn to work effectively within a multidisciplinary team; and, to design and prototype a product working with a local company. Students experience what it takes to bring a product (or prototype) from concept to market. The class is centered on product development and writing a business plan to support the product. Students will spend time in lecture and laboratory and will make off-site visits to the partner company. The final outcome will be a prototype and a business plan. Prerequisite: junior or senior standing and instructor approval. *Semester course, three hours.*

ENTR 360. INDEPENDENT STUDY. Individual study of specialized topics in Entrepreneurship. Prerequisites: Junior standing and permission of the department chairman.
Semester course, one, two or three hours.

ENTR 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Entrepreneurship. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ENTR 390. STUDIES IN ENTREPRENEURSHIP. Studies in areas of entrepreneurship not fully covered by regular departmental offerings. *Semester course, three hours.*

ENTR 407. ENTREPRENEURIAL SOLUTIONS TO WORLD POVERTY. Students will learn about factors that contribute to business development in low-income nations and explore various ways that entrepreneurs and business people can create jobs and reduce poverty. Special focus will be given to opportunities for businesses to earn profits while providing goods and services that improve the lives of the poor. In addition, students will have the opportunity to analyze specific businesses and not-for-profits that have successfully implemented entrepreneurial approaches to poverty reduction and to collaborate on their own projects that alleviate poverty. Prerequisite: sophomore standing or permission of the instructor. *Fall semester course, three hours.*

ENTR 409. INTERNET ENTREPRENEURSHIP. This course will explore the foundational principles and essential components for launching a successful entrepreneurial endeavor on the Internet. The course will cover important topics related to Internet Entrepreneurship, including key entrepreneurial models, business concept development, opportunity analysis, advanced search marketing techniques, understanding user behavior, and creating a viable Internet model for Digital Entrepreneurial endeavors. Case studies and existing businesses will be examined in detail. Students will have the opportunity to study the journeys of successful Internet Entrepreneurs, to hear from experts in the field, and to create an original Internet Business Plan in a team with other students. Prerequisite: Entrepreneurship 309 or permission of the instructor. *Spring semester course, three hours.*

ENTR 420. MENTORING. An advanced course for junior and senior Entrepreneurship majors and open to any upper-division non-majors, pending space available, interested in an entrepreneurial career. The seminar consists of two dimensions: classroom study and mentor meetings. Students learn how to identify and work with a mentor, to develop professional networks, and to determine the purpose and value of social capital in the world of the entrepreneur. They are then matched to a mentor based on their career interest. Students and mentors work together for one semester, meeting regularly, com-

pleting a number of tailored assignments designed to foster the relationship. Students may choose to continue the mentoring relationship beyond the semester but not for additional credit. Prerequisite: permission of the instructor. *Semester course, one hour.*

ENTR 423. FAMILY BUSINESS MANAGEMENT. An upper-level course that will focus on the dynamic of the family-owned and operated business. Appropriate for students of family businesses or students anticipating working for a family business. Students explore the key management issues facing the family business today—interpersonal relations, succession, business functions of marketing, sales, financial management, etc., in the special context of the unique challenges and opportunities of the family-owned business. Students will hear from and interact with small and family business owners who have agreed to visit classes and share their experiences. Prerequisites: junior or senior standing or instructor's permission. *Spring semester only, three hours.*

ENTR 430. ENTREPRENEURIAL FINANCE AND VENTURE CAPITAL. This course covers financial skills used by entrepreneurs and venture capitalists from the startup of a venture through its harvest. This includes a wide variety of topics including the financial elements of a business plan, the evaluation of new business opportunities, financial planning, sources of financing at different stages, valuation methods, essentials of security law, and methods of harvesting an investment. Prerequisite: Business 301. *Fall semester only, three hours.*

ENTR 459. ORGANIZATIONAL CHANGE AND CONSULTING. This course focuses on organizational creation, growth, and change. Students learn how to function as an internal change agent or consultant and how to choose and manage external consultants. Using lecture and case discussion, students apply business problem diagnosis and problem solving skills in the context of small, medium, and large organizations. Students may work in teams. Concluding project is the creation of a "living" case study by studying an existing company and writing a case analysis of a selected problem, complete with recommendations for action. Students conclude the class by presenting their case findings and recommendations to the client company. Prerequisite: Business 203 or Entrepreneurship 101, 102, and 103 or instructor permission and junior status. *Spring semester only, three hours.*

ENTR 460. INDEPENDENT STUDY. Individual study of specialized topics in Entrepreneurship. Prerequisites: Senior standing and permission of the department chairman.
Semester course, one, two or three hours.

ENTR 466. BUSINESS PLANNING. This course provides students from all majors a vehicle for turning their business and non-profit dreams into concrete viable business plans. Either as individuals or as teams, students research, create, and present a plan for a viable business or non-profit organization. They are coached by the instructor and may also be matched to an appropriate mentor with experience in their area of interest. Successful completion of this seminar qualifies students to participate in the campus-wide business plan competition held during the spring semester. Students without basic business background may be assigned some preliminary reading in preparation for the class. Prerequisite: a business or non-profit idea. *Fall semester only, three hours.*

ENTR 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Entrepreneurship. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ENTR 480. INTERNSHIP IN ENTREPRENEURSHIP. An opportunity for juniors and seniors with a minimum of fifteen hours in their major to participate in individual job experiences, domestic and international, under the supervision of an on-site manager and a department faculty member. Internship must be within an entrepreneurial organization. Products of the internship will include an evaluation by the on-site manager, a log of the internship experience, and a paper describing the experience. A comparison-contrast between academic learning and the internship experience will be conducted. Prerequisite: minimum grade point, permission of department coordinator, and an appropriate job site.
Semester course, one to six hours.

ENTR 488. SEMINAR IN ENTREPRENEURSHIP. An advanced course for junior and senior Entrepreneurship majors to concentrate on specific subject matter to be determined by the instructor. Individual research and extensive oral and written reports are required.
Semester course; one, two, or three hours.

DEPARTMENT OF HISTORY

Dr. G. Smith, Chair; Dr. Graham, Dr. Harp, Dr. Mitchell, Dr. Wyneken. Part-Time: Dr. Cameron, Mr. C. Smith.

Course Requirements for Bachelor of Arts Degree in History (HIST) (39 hours)

History Core Requirements (30 hours):

History 143, 144, 201, 283, 285, and 400 (18 hours).

One course from: History 336, 349, 350, 357, or 379 (3 hours).

One course from: History 223 or 231 (3 hours).

Two courses from: History 207, 208, 209, or 212 (6 hours).

History Electives (9 hours):

Three additional courses from 300 or 400-level History electives.

Courses that count in the HIST major quality point average (MQPA):

All courses with "HIST" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for History Major leading to (7-12) certification in Secondary Education Social Studies (SESS) (89 hours)

History Core Requirements (30 hours):

History 141, 143, 144, 201, 209, 212, 283, 285, and 357 (27 hours).

One 300- or 400-level History elective (3 hours).

Major-Related Requirements (18 hours):

Economics 101 and 102 (6 hours).

Political Science 201 and 204 (6 hours).

Sociology 103 and 201 (6 hours).

Professional Education Requirements (41 hours):

Computer Science 204 (3 hours).

Education 103, 201, 202, 203, 303, 305, 310, 371, 431, and 488 (38 hours).

History majors are strongly encouraged to take courses in languages, philosophy, logic, computer systems, and statistics in their programs if they plan to attend graduate school in history.

Courses at the 200 and 300 levels are open to all students.

Students should contact their advisors for a detailed schedule of courses recommended to meet requirements for these majors.

The History Department seeks to equip their students with skills in professional writing, speaking and information literacy. History 143 is designated as Information Literacy (IL) course, and History 201 and 400 are designated as Writing Intensive (WI) and Speaking Intensive (SI), and IL courses. Information literacy instruction includes defining and framing significant historical research questions; distinguishing different types of sources; using databases to find relevant sources; critically evaluating www sites; citing sources correctly, respecting intellectual property and avoiding plagiarism; and synthesizing material from a range of electronic and traditional sources and presenting it in a cogent manner.

Course Requirements for a minor in History (18 hours)

Choose six hours from each of the three following areas:

American History: History 283, 285, 336, 349, 350, 357, or 379.

European History: History 208, 209, 212, 261, 262, 271, or 272.

Other History Electives: History 143, 144, 207, 223, 231, 260, 270, 317, 318, 336, 341, 346, 349, 350, 357, 360, 370, 375, 376, 379, 390, 400, 460, 470, 480, or 488.

Course Requirements for a minor in Interdisciplinary Classics

Consult the Philosophy section in the Department of Religion for the 21-hour requirements.

HISTORY (HIST)

HIST 120. FOUNDATIONS OF HISTORY. An introduction to the principal theories, ideas, concepts, methods, and debates that have shaped the discipline of history. The course examines competing perspectives of history, human nature, and providence. It analyzes how historians use and evaluate evidence and provides Christian perspectives on history. *Semester course, three hours.*

HIST 141. WORLD GEOGRAPHY. An exploration of the physical and human geography of the globe. *Semester course, three hours.*

HIST 143. WORLD HISTORY I. A survey of the basic history of world societies from the earliest recorded development of human civilizations to the early modern period. As an Information Literacy (IL) course, it emphasizes designing historical research questions; finding, evaluating, and using primary and secondary sources; citing sources properly; and writing a cogent paper.
Fall semester only, three hours.

HIST 144. WORLD HISTORY II. A survey of the history of world societies from the early modern period to the present. Special emphasis is given to the interrelationship between the Western world and the non-Western world. *Spring semester only, three hours.*

HIST 201. HISTORIOGRAPHY. An introduction to the art and craft of history. Through readings and discussions, students learn the basics of the discipline of history, focusing on what historians do and have done, the essential concepts and methodologies they use, and the vocabularies they employ. Students sharpen the skills essential for work as a historian: critical reading, effective analysis, and excellent writing. This course fulfills the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for History and SESS majors.
Semester course, three hours.

HIST 207. THE ANCIENT WORLD. A survey of ancient Near Eastern, Mediterranean, and European cultures with emphasis on the formation of empires. The course explores the varied cultural legacies of ancient civilizations. *Offered alternate Falls, semester course, three hours.*

HIST 208. MEDIEVAL EUROPE. A survey of Europe from the end of the Roman Empire to the early fifteenth century that emphasizes the cultural and intellectual legacy of the Middle Ages.
Offered alternate Springs, semester course, three hours.

HIST 209. RENAISSANCE AND EARLY MODERN EUROPE. An examination of the Renaissance, the formation of nation states in the fifteenth century, the Reformation of the sixteenth century, and the political, social, and intellectual origins of modern Europe before the French Revolution. *Fall semester only, three hours.*

HIST 212. MODERN EUROPE. An examination of European states from 1789 to the present, focusing on periods of reaction and revolution, the growth of industrial society, and the global wars of the twentieth century. *Spring semester only, three hours.*

HIST 223. MODERN ASIAN HISTORY. A survey of political, social, economic, and cultural trends in East Asia from 1800 to the present, focusing primarily upon China, Korea, and Japan. It examines the major tenets of East Asian civilization, the course explores the interaction of Asian nations with Western nations in the nineteenth century. The course also examines the political, economic, and military conflicts of the twentieth century and concludes by analyzing the tremendous economic development that has shaped the region in recent decades.
Alternate Fall semesters, three hours.

HIST 231. MODERN LATIN AMERICAN HISTORY. The story of Latin America from the beginning of the colonial period to the present. The class explores the geography and history of those countries colonized by Spain and Portugal in the sixteenth century, which still preserve the influence of Iberian political and social principles today. It also examines the subsequent political, social, and economic development of Latin America, the complicated relationships between individual countries in this region, and the increasing relationships between the region as a whole and the rest of the world. *Alternate Fall semesters, three hours.*

HIST 251. UNITED STATES SURVEY I. A survey of American history from its European origins through Reconstruction. *Fall semester only, three hours.*

HIST 252. UNITED STATES SURVEY II. A survey of American history from the end of Reconstruction until the present. *Spring semester only, three hours.*

HIST 260. INDEPENDENT STUDY. Individual study of specialized topics in History. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

HIST 261. BRITISH HISTORY TO 1781. A survey of British history with special emphasis on the development of the common law, the parliament, and the British constitution. Recommended for pre-law students. *Offered alternate years, semester course, three hours.*

HIST 262. BRITISH HISTORY SINCE 1781. A survey of British history with special emphasis on Britain as an imperial power and on political, social, and cultural developments at home. *Offered alternate years, semester course, three hours.*

HIST 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in History. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

HIST 271. HISTORY OF RUSSIA. A study of the social, economic, and political institutions from the Kievan state through tsarist Russia. *Fall semester only, three hours.*

HIST 272. 20TH CENTURY RUSSIA: THE RISE AND FALL OF THE SOVIET UNION. A study of the social, economic, and political institutions of Russia from late tsarist Russia through revolutionary Russia and the rise and fall of the Soviet Union. *Spring semester only, three hours.*

HIST 283. HISTORY OF THE UNITED STATES TO 1865. An introductory survey of American history from its colonial origins until the end of Reconstruction. The course examines political, social, economic, religious, and cultural developments. *Fall semester only, three hours.*

HIST 285. HISTORY OF THE UNITED STATES SINCE 1865. An introductory survey of American history from the end of Reconstruction to the present. The course examines political, social, economic, religious, and cultural developments. *Spring semester only, three hours.*

HIST 317. CONSTITUTIONAL HISTORY OF THE UNITED STATES I. A study of the development of the United States Constitution through use of the case study method. This course especially focuses on the constitutional powers of the three branches of government, the relationship between state and federal governmental powers, and property rights and economic liberties. *Fall semester only, three hours.*

HIST 318. CONSTITUTIONAL HISTORY OF THE UNITED STATES II. A study of the development of the United States Constitution through the use of the case study method. This course especially focuses on the idea of equality and the equal protection clause, due process, privacy and liberty rights, freedom of speech, press and religion and other Bill of Rights issues. *Spring semester only, three hours.*

HIST 336. UNITED STATES MILITARY HISTORY. A study of the socio-political, economic, technological and human aspects of war that traces the development of "the America art of war" from the early colonial period to the present. *Alternate Spring semesters, three hours.*

HIST 341. THE RISE OF CHRISTIANITY. This course analyzes Christianity as it grew from an obscure movement into a dynamic force which swamps the pagan cults of the Roman Empire. Major topics include Roman paganism, Roman religious policy, the growth and persecution of Christianity, tensions between Christianity and classical culture, and the development of early medieval Europe and Byzantium. *Offered alternate years, semester course, three hours.*

HIST 346. BYZANTIUM AND ISLAM. A thematic overview of the pre-modern Byzantine and Islamic worlds, from their common roots in the Mediterranean world of Late Antiquity to the establishment of the Islamic Empires and Kingdoms of the Near East, Asia, and Africa. The course traces the transformation, flourishing, and decline of Byzantium concurrently with the rise of Islam to world dominance. *Alternate Spring semesters, three hours.*

HIST 349. AMERICAN RELIGIOUS HISTORY. An exploration of religion in America that focuses on the various individuals and religious groups, events, ideas, and organizations that have had the most significant impact on American life. *Alternate Spring semesters, three hours.*

HIST 350. SPORTS IN AMERICAN HISTORY. An overview of sports in America from colonial times until the present that focuses especially on the relationship between sports and society and issues of race, class, and gender. *Alternate Spring semesters, three hours.*

HIST 357. MINORITIES IN AMERICAN HISTORY. An examination of the experience of minority groups in America focusing on Native Americans, immigrants, women, African Americans, and Asian Americans. The course analyzes the problems these groups experienced and their contributions to America. *Spring semester only, three hours.*

HIST 360. INDEPENDENT STUDY. An advanced course for students with substantial background in college history courses. Intensive and independent research into a particular historical question. Prerequisite: Permission of the instructor and department chairman.
Semester course, one, two or three hours.

HIST 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in History. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

HIST 375. WORLD WARS I AND II. An exploration of the global impact of the two pivotal events of the twentieth-century world, examining the origins, events and ramifications of World Wars I and II. *Offered alternate years, semester course, three hours.*

HIST 376. ALEXANDER THE GREAT AND THE HELLENISTIC WORLD. An exploration of the life of Alexander the Great and the Hellenistic world created by his conquests. The course analyzes how the traditions of the Greeks were synthesized with the heritage of western Asia and northeast Africa to shape a world stretching from the Balkans to India.
Alternate Spring semesters, three hours.

HIST 379. AMERICAN INTELLECTUAL HISTORY. A study of American thought from the colonial era to the mid twentieth century. This course examines a variety of significant texts and key thinkers, seeking to understand them within their particular cultural contexts.
Alternate Fall semesters, three hours.

HIST 390. STUDIES IN HISTORY. Specialized subject matter that varies each semester depending upon interests of the instructor and students. *Semester course, three hours.*

HIST 400. SENIOR RESEARCH SEMINAR. A seminar designed to take seniors methodically through the process of writing a substantial research paper in history. It includes selecting a topic, conducting research (mostly in primary sources), constructing a detailed outline, writing, and presenting a paper. This course fulfills the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for History majors. *Semester course, three hours.*

HIST 460. INDEPENDENT STUDY. An advanced course for students with substantial background in college history courses. Intensive and independent research into a particular historical question. Prerequisite: Permission of the instructor and department chairman.
Semester course, one, two or three hours.

HIST 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in History. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

HIST 480. HISTORY INTERNSHIP. A semester of intensive study and work, usually off-campus, undertaken by the student with the approval of the faculty of the Department of History. A student must have a minimum QPA of 3.0 and may not have completed an internship in any other department, although exceptions may be made for a GCCI internship. Students are required to keep a journal of weekly activities and complete a project agreed upon with the Department. An internship in history may be taken at any institution that practices Public History. *Semester course, one to six hours.*

HIST 488. SEMINAR IN HISTORY. An advanced course for junior and senior students desiring an in-depth exploration of one historical problem, involving individual research, discussion, oral reports, and written essays. Prerequisite: Permission of the department. *Semester course, one, two or three hours.*

HIST 499. HONORS IN HISTORY. Seniors who have shown special aptitude in history may, upon invitation and permission of the department, undertake special research in history. A written historical essay is required. *Semester course, three hours.*

DEPARTMENT OF MATHEMATICS

Dr. Thompson, Chair; Dr. Allgaier, Dr. Bonomo, Dr. Carlson, Mr. Dean, Dr. Jackson, Dr. McCathern, Dr. McIntyre.

Course Requirements for Bachelor of Science Degree in Mathematics (MATS)

Math Core Requirements (35 hours):

Mathematics 162, 210 or 213, 222, 261, 421, 465, and 488.

At least three hours from Mathematics 303, 365, 422, or 466.

A minimum of seventeen hours from 300 or 400-level Mathematics.

A one-year sequence from Mathematics 325-326, 331-332, 421-422, or 465-466.

Major-Related Requirements (7 hours):

A minimum of three semester hours from Computer 141 or 220.

Physics 101.

Note: Credits in Mathematics 111, 117, 141, 151, 152, 161, 231, 237, 240, 305, 306, and 307 do not apply toward the thirty-five credit hours required for the Mathematics major.

Courses that count in the MATS major quality point average (MQPA):

All courses with "MATH" prefix, with the exception of Mathematics 111, 117, 141, 151, 152, 231, 237, and 240. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Mathematics Major leading to (7-12) certification in Mathematics (MSED)

This program fulfills the requirements of the full mathematics major and the requirements of the Commonwealth of Pennsylvania for secondary mathematics certification.

Math Core Requirements (38 hours):

Mathematics 162, 210 or 213, 222, 240, 261, 303, 331, 421, 465, and 488.

A one-year sequence from Mathematics 325-326, 331-332, 421-422, or 465-466.

Major-Related Requirements (7 hours):

A minimum of three semester hours from Computer Science 141 or 220.

Physics 101.

Professional Education Requirements (41 hours):

Education 103, 201, 202, 203, 303, 305, 306, 371, 431, and 488.

Computer Science 204.

Note: Credits in Mathematics 111, 117, 141, 151, 152, 161, 231, 237, 305, 306, and 307 do not apply toward the thirty-five credit hours required for the Mathematics Secondary Education major.

Courses that count in the major quality point average:

All courses with "MATH" prefix, with the exception of Mathematics 111, 117, 141, 151, 152, 231, 237, and 240. Mathematics Secondary Education majors must have a minimum MQPA of 2.75 in all Mathematics courses excluding Mathematics 111, 117, 141, 151, 152, 231, and 237.

To be successful in post-graduate pursuits, mathematics majors must have the ability to locate, evaluate and use information, possess some basic technical literacy, and display excellent speaking and writing skills. With this in mind, Math 488, Seminar in Mathematics, is designed to give students Writing Intensive (WI) and Speaking Intensive (SI) instruction; and to gain experience in processing Information Literacy (IL) knowledge. Students will gain this experience with a sophisticated computer algebra system in the calculus sequence (Math 161, 162, 261) and a working knowledge of a computer language in Computer 141.

Course Requirements for a minor in Mathematics (22 hours):

A minor in Mathematics will consist of 22 hours including Mathematics 210 or 213 and 222 but excluding Mathematics 111, 117, 151, 152, 231, 237, 240, 305, and 306.

Students interested in graduate school in mathematics are advised to take Mathematics 365, 422, and 466 in addition to the above requirements.

Students who are enrolled in Math 141, Math 161, Math 162, or Math 261 and find that their background is inappropriate for the course may change to another course on or before the sixteenth class meeting. Those in Math 261 may change to Math 162 or 161; those in Math 162 may change to Math 161; and those in Math 161 or Math 141 may switch to Math 111. The student must have the approval of the current instructor and the instructor of the course in which the student intends to enroll. The student must complete and return an Add/Drop Form to the Registrar's Office.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

The normal sequence for students to follow includes the following: Mathematics 162 in the freshman year; 210, 222, and 261 in the sophomore year; 421 and 465 in the junior year; and 488 in the senior year.

College Math Courses Taken in High School

Transfer credit may be awarded for mathematics courses that are equivalent or comparable to those offered by the Grove City College Department of Mathematics and completed with a grade of "C" or better. Any such courses taken before entering Grove City College must be listed in the catalog of the college of transfer as courses offered for degree credit to that college's undergraduates, must be taken in a classroom setting where most of the students are college undergraduates, and must be organized and taught by college faculty.

MATHEMATICS (MATH)

MATH 111. PRE-CALCULUS. Designed to help prepare students for success in Business Calculus or Calculus I, this course offers a thorough treatment of algebra, analytic geometry and exponential and logarithmic functions. Additional topics such as trigonometry and limits may be included. A basic understanding of high school algebra and analytic geometry is presumed.
Semester course, three hours.

MATH 117. FINITE MATHEMATICS. This course will consist of a survey of a number of mathematical ideas on an introductory level. Topics may include: sets and relations, matrices, linear programming, combinatorics, probability, statistics, graph theory, fair-division algorithms, and voting theory.
Semester course, three hours.

MATH 141. BUSINESS CALCULUS. The differential and integral calculus of elementary functions with applications in business and economics. Students may not receive credit for Math 141 and 161. Math 161, not 141, is the prerequisite for 162. *Semester course, four hours.*

MATH 151. SURVEY OF MATHEMATICS I. This course (along with Math 152) is a conceptual exploration of mathematical topics related to elementary school mathematics, and is part of a two-course, six-hour mathematics requirement specifically designed for elementary education and early childhood majors. Content studied includes critical thinking and problem solving, logic, sets, relations and functions, numeration systems and whole-number computation, integers, and elementary number theory. Restricted to elementary education, early childhood education, and music education majors only.
Fall semester only, three hours.

MATH 152. SURVEY OF MATHEMATICS II. This course continues the exploration of selected topics from the elementary school mathematics curriculum, including rational and real numbers, probability, statistics, geometry, and measurement. Prerequisite: Mathematics 151 or permission of instructor.
Spring semester only, three hours.

MATH 161. CALCULUS I. A first course in calculus that assumes no prior study of the subject. Topics include: limits and continuity, differentiation, curve sketching, definite and indefinite integration, and applications. This course, along with Computer 141 and Math 488, fulfills the Information Literacy (IL) requirement for the Mathematics major. Prerequisite: High school mathematics including algebra, analytic geometry, and trigonometry. Students may not receive credit for Math 141 and 161.
Semester course, four hours.

MATH 162. CALCULUS II. A continuation of Math 161 covering the topics: exponential, logarithmic and inverse trigonometric functions, techniques of integration, parametric equations, sequences, infinite series, and Taylor series. This course, along with Computer 141 and Math 488, fulfills the Information Literacy (IL) requirement for the Mathematics major. Prerequisite: Math 161 or permission of instructor. *Semester course, four hours.*

MATH 210. COMBINATORICS. An introduction to the basic principles of combinatorial analysis. Topics will include enumeration techniques, the pigeon-hole principle, partitions, the principle of inclusion-exclusion, recurrence relations, equivalence relations, generating functions and introductory graph theory (trees, connectivity, planarity, colorings, etc.). Additional material will be chosen from topics such as: latin squares, designs, coding theory, Ramsey theory, network algorithms, Polya theory, partially ordered sets, and combinatorial optimization. Corequisite: Mathematics 162.
Fall semester only, three hours.

MATH 213. DISCRETE MATHEMATICS FOR COMPUTER SCIENCE. A study of the foundations of mathematics with an emphasis on concepts related to theoretical mathematical methods and computer science. Topics include mathematical logic, set theory, algorithms, complexity of algorithms, integers, a variety of proof techniques, program correctness, combinatorics, recurrence relations, graphs and digraphs, trees, Boolean functions, languages and grammars, and finite state machines. Corequisite: Mathematics 162. *Fall semester only, four hours.*

MATH 222. LINEAR ALGEBRA. A study of the theory of matrices and their applications including systems of linear equations, determinants, vector spaces, eigenvalues and eigenvectors, linear transformations, diagonalization, and Gram-Schmidt orthogonalization. Prerequisite: Math 162.
Spring semester only, four hours.

MATH 231. STATISTICAL METHODS. An introduction to basic concepts and techniques of statistical inference including descriptive measures, probability distributions, tests of hypotheses, interval estimation, and analysis of variance. Offered periodically. *Semester course, three hours.*

MATH 237. TOPICS FOR ELEMENTARY EDUCATION MAJORS. This course will be taught in an independent format covering mathematical material useful for elementary education majors. Open only to elementary education majors with a science/mathematics concentration. Students may only receive credit for this course once. *Semester course, one hour.*

MATH 240. MATHEMATICS FOR SECONDARY EDUCATION. A course designed for the secondary teacher candidate in mathematics. Topics covered are: history and culture of mathematics; readings in mathematics; problem solving and critical thinking; intuitive geometry; number theory; and other material applicable to secondary teachers of mathematics. Required for mathematics secondary education majors. Open to elementary education majors with mathematics concentration.
Spring semester only, three hours.

MATH 260. INDEPENDENT STUDY. Individual study of specialized topics in Mathematics. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

MATH 261. CALCULUS III. The final course in the three-semester calculus sequence. Students receive instruction in the following topics: polar coordinates, vectors and the geometry of three-dimensional space, vector functions, partial derivatives, multiple integrals and vector calculus. This course, along with Computer 141 and Math 488, fulfills the Information Literacy (IL) requirement for the Mathematics major. Prerequisite: Math 162. *Semester course, four hours.*

MATH 262. DIFFERENTIAL EQUATIONS. A study of the elementary theory and methods for analytic solution of ordinary differential equations, with applications, including first order equations, higher order linear equations, Laplace transform methods, and series solutions. Prerequisite: Math 162.
Spring semester only, three hours.

MATH 263. NUMERICAL DIFFERENTIAL EQUATIONS. The study and application of numerical methods for solving differential equations including Euler's method, Runge-Kutta methods, multistep methods, and solution of systems of equations. Prerequisite/corequisite: Math 262 or permission of the instructor. *Spring semester only, one hour.*

MATH 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Mathematics. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

MATH 303. COLLEGE GEOMETRY I. This course explores various modern geometries from an axiomatic point of view. Topics such as sets of axioms and finite geometries, Euclidean and non-Euclidean geometries, geometric transformations, and possibly neutral geometry will be thoroughly examined. Prerequisite: Math 210 or 213 and 222. *Spring semester only, three hours each semester.*

MATH 305. PUTNAM PROBLEM GROUP. The Putnam Exam is a national mathematics competition consisting of 12 very challenging problems administered on the first Saturday in December. The course will consist of meeting once a week for an hour to work on problems and discuss problem solving strategies. Sophomores, juniors, and seniors are eligible to take the course for 1 credit. Freshmen may only audit this course. Students may take the course up to three times for credit.
Fall semester only, one hour.

MATH 306. ACTUARIAL MATHEMATICS. An in-depth study of calculus-based probability and statistics topics covered by the Society of Actuaries first actuarial exam, Exam P. Topics include general probability, univariate probability distributions, and multivariate probability distributions with applications to risk and insurance. Students taking this course are required to obtain the recommended review manual and to register for and take Exam P. Students may take this course at most twice for credit. Prerequisite: Math 331 and instructor approval. *Semester course, one hour.*

MATH 307. INVESTIGATIONS IN MATHEMATICS RESEARCH. An introduction to mathematics research. Teams of two to four students will investigate mathematical phenomena experimentally, detect patterns, create conjectures, and attempt to prove the conjectures and verify the patterns. Prerequisite: Mathematics 210 or 213. *Spring semester only, one hour.*

MATH 325. NUMERICAL ANALYSIS I. An introductory course in numerical analysis that covers error analysis, computer arithmetic, algorithms, and convergence. Also covered are topics in numerical linear algebra such as direct and iterative methods for solutions of linear systems and numerical calculation of eigenvalues and eigenvectors. Prerequisites: Computer Science 141; Math 222. *Alternate Fall semesters, three hours.*

MATH 326. NUMERICAL ANALYSIS II. A second course in numerical analysis that covers the solution of non-linear equations; interpolation and approximation; numerical differentiation and integration; and solutions of systems of non-linear equations. Prerequisite: Math 162. *Alternate Fall semesters, three hours.*

MATH 331. THEORY OF STATISTICS I. An introduction to probability and mathematical statistics, including counting techniques; probability spaces; independence; conditional probability; distributions of discrete and continuous random variables; expected valued, moments and moment-generating functions; random vectors and their distributions. A computer algebra system is used. Corequisite: Math 261 or permission of instructor. *Fall semester only, three hours.*

MATH 332. THEORY OF STATISTICS II. The continued study of mathematical statistics including transformations of random variables and vectors; sampling distributions; the Central Limit Theorem; properties of point estimates of parameters; maximum-likelihood estimates; confidence intervals; hypothesis testing; contingency tables; simple and linear regression; and one-way analysis of variance. Statistical software and a computer algebra system are used. Prerequisite: Math 331. *Alternate Spring semesters, three hours.*

MATH 360. INDEPENDENT STUDY. An opportunity for junior and senior students, with a minimum of eighteen hours in mathematics, to do intensive independent study of specialized topics. Prerequisite: Junior standing. *Semester course, one, two or three hours.*

MATH 365. COMPLEX VARIABLES. An introduction to the theory of functions of a complex variable including complex numbers; analytic functions; derivatives and integrals of functions of a complex variable; Taylor and Laurent series; and mappings by functions of a complex variable. Prerequisite: Math 261. *Alternate Fall semesters, three hours.*

MATH 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Mathematics. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

MATH 388. TOPICS IN MATHEMATICS. A series of lectures/discussions on topics from such areas as: partial differential equations, numerical analysis, algebra, geometry, statistics, computer applications, analysis, or topology. Prerequisite: Permission of the instructor. *Semester course, one, two or three hours.*

MATH 421. ABSTRACT ALGEBRA. A study of the structure of formal axiomatic systems and the elementary theory of groups and rings. Prerequisite: Math 210 or 213 and 222. *Semester course, three hours.*

MATH 422. NUMBER THEORY. This course is, in part, an application of some of the ideas encountered in Math 421. Various results from the theory of finite groups, particularly results about the structure of finite cyclic groups, will be established and used to prove classical results of elementary number theory such as Euler's Theorem and Wilson's Theorem. The course will also cover modular arithmetic and congruences, arithmetic functions, the structure of Z_n^*, special numbers, and additional topics as time allows. Prerequisite: Math 421. *Alternate Spring semesters, three hours.*

MATH 460. INDEPENDENT STUDY. An opportunity for junior and senior students, with a minimum of eighteen hours in mathematics, to do intensive independent study of specialized topics. Prerequisite: Junior standing. *Semester course, one, two or three hours.*

MATH 465. CLASSICAL ANALYSIS. This course is an introduction to real analysis and includes a rigorous treatment of the structure of the real number system; sequences; limits; continuity; uniform continuity; open and closed sets; compact sets; differentiation; the Riemann integral; infinite series; sequences and series of functions; pointwise and uniform convergence; and possibly generalizations to *n*-dimensional or metric spaces. Prerequisite: Mathematics 210 or 213 and Mathematics 261.
Semester course, three hours.

MATH 466. INTERMEDIATE ANALYSIS. A continuation of the study of real analysis through rigorous treatment of material in several of the following areas: topology; metric spaces and continuity; multivariable calculus; convergence and completeness; extensions of integration; and functional analysis. Prerequisites: Math 222 and 465. *Alternate Spring semesters, three hours.*

MATH 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Mathematics. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

MATH 488. SEMINAR IN MATHEMATICS. A course for seniors that includes independent reading and research, student presentations, preparation for the Graduate Record Exam and Major field test and faculty lectures on advanced topics in mathematics. This course, in part, satisfies the requirements for a Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) course for the mathematics major. Prerequisite: Senior standing. *Semester course, two hours.*

MATH 499. HONORS IN MATHEMATICS. A course available to junior and senior students on an individual basis. Prerequisite: Consent of the department chairman; Junior standing.
Semester course, one, two or three hours.

DEPARTMENT OF MECHANICAL ENGINEERING

Dr. Allison, Chair; Dr. E. Anderson, Dr. Archibald, Dr. Bardy, Dr. S. Birmingham, Dr. Clauss, Dr. Fair, Dr. Reuber, Dr. Ulrich.

MECHANICAL ENGINEERING DEPARTMENT MISSION STATEMENT, OBJECTIVES, AND OUTCOMES

Mechanical Engineering (ME) is the analysis and design of devices and systems that convert energy from one form to another and that perform useful work. It is an engineering specialty that includes such diverse topics as materials science, thermodynamics, solid and fluid mechanics, heat transfer, manufacturing processes, control theory, vibration analysis, and project management. Mechanical engineers enjoy employment in a wide variety of areas including research, design, manufacturing, sales, education, and management.

The ME Department at Grove City College offers a program leading to the Bachelor of Science in Mechanical Engineering (BSME) degree. The program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

Mechanical engineers must be proficient at both oral and written communications to communicate their solutions and designs with other engineers and society in general. Toward that end, the ME curriculum incorporates Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) instruction within the core course requirements.

The mission of our program is to produce graduates who can pursue leadership roles in the mechanical engineering profession. The following program educational objectives enable GCC mechanical engineers to meet this mission in the years following graduation:

1. Graduates will be successfully employed in the mechanical engineering profession or in an alternative field. Many of our graduates will assume leadership roles in these positions and be recognized as effective communicators and team members.

2. Graduates will engage in life-long learning through self-study, employer sponsored continuing education courses or workshops, or through formal graduate level education leading to an advanced degree.
3. Graduates will demonstrate ethical behavior in the workplace and will carry out their professional duties in a manner that is consistent with a Christian worldview.

Our graduates possess the following program outcomes upon graduation:

a) An ability to apply knowledge of mathematics, science, and engineering.
b) An ability to design and conduct experiments as well as to analyze and interpret data.
c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
d) An ability to function on multi-disciplinary teams.
e) An ability to identify, formulate, and solve engineering problems.
f) An understanding of professional and ethical responsibility in a Christian context including recognition of the fundamental worth of individuals as creations of God, resulting in a consistent commitment to the safety and health of individuals, honesty, and impartiality in all affairs and faithfulness in serving both employers and clients.
g) An ability to communicate effectively. This outcome includes the ability to write clearly and cohesively about technical subjects, communicate mathematical analyses in a comprehensible form, and orally communicate on technical subjects with people at different levels of technical ability.
h) The broad education necessary to understand the impact of engineering solutions in a global and societal context. The following liberal arts areas are considered important in giving the Christian student a background for making judgments concerning engineering solutions: history of civilization, Biblical revelation, philosophy, literature, visual art, music, and modern civilization in international perspective.
i) Recognition of the need for and an ability to engage in life-long learning.
j) Knowledge of contemporary issues from a Christian perspective.
k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
l) The ability to apply principles of engineering, basic science, and mathematics (including multivariate calculus, differential equations, statistics, and linear algebra) to model, analyze, design, and realize physical systems, components or processes.
m)The ability to work professionally in both thermal and mechanical systems areas.

These outcomes are met over a 4-year curriculum that starts with an exposure to the fundamentals of science and engineering and culminates in our senior capstone design experience.

Freshman Year – Introduction to the fundamentals of chemistry, physics, calculus, engineering computations, the profession of engineering, and the design process.

Sophomore Year – Emphasis on the analysis of problems in statics/dynamics, materials science, and thermodynamics, and on the design and manufacturing process; students are exposed to modern machine shop practice through the fabrication of their own Stirling engines. They also learn to use Pro/Engineer, a state-of-the-art CAD tool.

Junior Year – Analysis skills are honed in engineering math, circuit analysis, fluid mechanics, heat transfer, and mechanics of materials. Sound experimental and design techniques are reinforced in the required laboratory sequence. Students receive a solid grounding in dynamic systems analysis and simulation, machine design, and stress analysis. Opportunities for international study and travel are offered through our partnership with the engineering school at the University of Nantes, in Nantes, France.

Senior Year – A major, year long capstone design experience includes the design and realization of an engineering product. Extensive computer-aided design and manufacturing includes the use of Pro/Engineer to document, analyze and fabricate designs. Advanced manufacturing techniques covered include conventional and investment casting, injection molding, CNC machining, and TIG/MIG welding. To assure the ability to work professionally in both the thermal and mechanical systems areas, seniors choose a minimum of two electives from each area. At least three of the electives must be 400-level courses.

Thermal Systems electives:

MECE 321 Advanced Thermodynamics
MECE 391 Special Mechanical Engineering Topics
MECE 414 Principles of HVAC
MECE 416 Survey of Alternative Energy Systems
MECE 421 Applied Fluid Mechanics
MECE 499 Honors in Mechanical Engineering

Mechanical Systems electives:

MECE 314 Kinematics and Dynamics of Machinery
MECE 318 High-Technology Ventures
MECE 328 Biomechanics
MECE 390 Special Mechanical Engineering Topics
MECE 407 Control Systems
MECE 408 Mechanical Vibrations
MECE 415 Finite Element Analysis
MECE 417 Design of Optimal Structures
MECE 418 Human-Powered Vehicle Design
MECE 498 Honors in Mechanical Engineering

Thermal Systems or Mechanical Systems electives:**

MECE 260 Independent Study
MECE 360 Independent Study
MECE 460 Independent Study
MECE 270 Independent Research
MECE 370 Independent Research
MECE 470 Independent Research

**Additional electives may be offered at the discretion of the department.*

***A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements.*

Course Requirements for Bachelor of Science Degree in Mechanical Engineering (MECE)

Mechanical Engineering Core (48 hours)

Mechanical Engineering 120, 201, 208, 210, 211, 212, 214, 251, 252, 311, 312, 316, 325, 326, 351, 352, 401, 402, 451, and 452.

Engineering Core (8 hours)

Engineering 156 and 402, Electrical Engineering 210.

Math/Science Core (33 hours)

Chemistry 105.*

Engineering 274.

Mathematics 161, 162, 261, and 262.

Physics 101 and 102.

Math/science elective—choose one course from the following:

Astronomy 206, 207; Biology 101, 102; Chemistry 227, 241, 345; Mathematics 210, 213, 222, 331; Physics 232, 234.

Mechanical Engineering Electives (12 hours)

Choose a minimum of two courses from each of the following areas, for a total of 12 hours. At least three electives must be 400-level courses.

Thermal Systems electives

Mechanical Engineering 321, 391, 414, 416, 421, and 499.

Mechanical Systems electives

Mechanical Engineering 314, 318, 328, 390, 407, 408, 415, 417, 418, and 498.

Thermal Systems or Mechanical Systems electives**

Mechanical Engineering 260, 270, 360, 370, 460, 470.

Courses that count in the MECE major quality point average (MQPA):

All courses with "MECE" prefix; ELEE 210; ENGR 156, 390, and 402. A minimum MQPA of 2.00 is required to graduate.

**Students who take Chemistry 101 and 102 are exempt from the Chemistry 105 requirement.*

***A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements.*

MECHANICAL ENGINEERING (MECE) MAJOR

FOUR-YEAR PLAN

FRESHMAN YEAR	1st Sem.	2nd Sem.	SOPHOMORE YEAR	1st Sem.	2nd Sem.
Mathematics 161-162	4	4	Mathematics 261-262	4	3
Chemistry 105	4	-	Mech. Engineering 211-212	3	3
Physics 101-102	4	4	Mech. Engineering 208-210	3	3
Mech. Engineering 120	-	3	Mech. Engineering 201	3	-
Engineering 156	-	2	Mech. Engineering 214	-	3
Humanities 101-102	3	3	Mech. Engineering 251-252	1	1
Physical Education	1	1	Humanities 201-202	3	3
	16	17		17	16
JUNIOR YEAR			**SENIOR YEAR**		
Mech. Engineering 311-312	3	3	Mech. Engineering Electives	9	3
Mech. Engineering 316	-	3	Mech. Engineering 401-402	3	3
Mech. Engineering 325-326	3	3	Mech. Engineering 451-452	1	1
Mech. Engineering 351-352	1	1	Engineering 402	-	3
SSFT/Social Science	3	3	Humanities 301-302	3	3
Engineering 274	3	-	General Elective	-	3
Elec. Engineering 210	-	3		16	16
Math/Science Elective	3	-			
	16	16			

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

ENGINEERING CORE COURSES (ENGR)

ENGR 156. INTRODUCTION TO ENGINEERING. Introduces students to the engineering profession and the design process. Course lectures and assignments include the design process; problem definition and solution; oral and written communications; group dynamics; public responsibility; current global engineering challenges; and engineering ethics. A group design project is required. For electrical engineering students, this course is taken concurrently with Computer Science 141. For mechanical engineering students, this course is taken concurrently with Mechanical Engineering 120. *Semester course, two hours.*

ENGR 274. MATHEMATICAL METHODS IN ENGINEERING. A course for engineering and science majors covering selected topics in probability and statistics, linear algebra, discrete mathematics, and numerical methods as applied to the solution of problems in engineering and science. Students who receive credit for Mathematics 213, 222, and 331 may not receive credit for Engineering 274. Prerequisite: Mathematics 261. *Semester course, three hours.*

ENGR 390. SPECIAL ENGINEERING TOPICS. Special topics in the areas of new engineering development based on student demand and faculty interest. Specific subject matter varies each semester with prerequisites and credit hours announced in advance of registration. *Semester course, one, two, three or four hours.*

ENGR 402. BUSINESS FOR TECHNICAL PROFESSIONALS. Principles and methods for analyzing the economical feasibility of engineering projects including interest, depreciation, rate-of-return, economic life, replacement costs, and comparison of alternative designs. Key business and financial concepts and how they relate to engineering will also be presented. Topics to be discussed include basic accounting principles, an introduction to common financial statements, cash flow issues, an overview of commonly used business performance measures, a discussion of variable and fixed costs, and management of working capital. Prerequisite: Mathematics 141 or 161; junior or senior standing. *Spring semester only, three hours.*

MECHANICAL ENGINEERING (MECE)

MECE 120. NUMERICAL COMPUTING FOR MECHANICAL ENGINEERS. This course introduces students to applied numerical computation, with an emphasis on solving typical mechanical engineering problems. Sequential logic programming is taught using Matlab. Topics include array and scalar operators, program control elements, graphic and text I/O, internal and user-defined functions. Students are introduced to numerical methods such as root finding, solutions to systems of linear equations, linear regression, and numerical integration and differentiation. Spreadsheet programming is also taught. Prerequisites: Physics 101, Mathematics 161. *Spring semester only, three hours.*

MECE 201. FUNDAMENTALS OF MATERIAL SCIENCE. Models of crystalline and molecular structures are presented to explain the diverse properties of metallic; polymeric and ceramic materials; including atomic bonding and crystal structure; elastic and plastic deformation; phase of equilibria and transformation; thermal processing; and corrosion. Prerequisite: Chemistry 105. *Fall semester only, three hours.*

MECE 208. ENGINEERING GRAPHICS WITH SOLID MODELING. Introduction to engineering graphics including technical sketches and detail drawings. Introduction to mechanical CAD solid modeling using Pro/Engineer software, including basic and advanced geometry creation, assemblies and drawings. Prerequisite: none. *Fall semester only, three hours.*

MECE 210. DESIGN FOR MANUFACTURING. Introduction to manufacturing processes, including part characteristics, economic production quantities, materials, and design recommendations. Emphasis is placed on process and material selection and design for manufacturability. The course includes plant tours. Prerequisite: Mechanical Engineering 201 and 208. *Spring semester only, three hours.*

MECE 211. MECHANICS I. Static equilibrium of particles and rigid bodies; analysis of structures, trusses, and cables; friction; centroids and moments of inertia; methods of virtual work; and energy. Engineering applications. Prerequisites: Mathematics 162, Mechanical Engineering 120.
Fall semester only, three hours.

MECE 212. MECHANICS II. A study of rectilinear and curvilinear motion of particles and rigid bodies; kinetics of particles and rigid bodies; relative motion, work, and energy; impulse and momentum. Engineering applications. Prerequisite: Mechanical Engineering 211.
Spring semester only, three hours.

MECE 214. THERMODYNAMICS. The study of the fundamental principles and some applications of classical thermodynamics. Topics include properties of pure substances; heat, work, and mass transfer; first law of thermodynamics; second law of thermodynamics; entropy; gas power cycles; vapor power cycles; and refrigeration cycles. Prerequisite: Mathematics 261.
Spring semester only, three hours.

MECE 251. MECHANICAL SYSTEMS LABORATORY I. A lab course designed to introduce students to engineering practices including dimensioning, gaging and measuring, machining operations, manufacturing processes, and engineering standards for fasteners, threads, etc. Hands-on application will be taught through fabrication of a model Stirling engine. Mechanical Engineering 251 is designed to fulfill the requirements for an Information Literacy (IL) course in the Mechanical Engineering major. Prerequisite: sophomore mechanical engineering standing.
Fall semester only, one hour.

MECE 252. MECHANICAL SYSTEMS LABORATORY II. A lab course designed to introduce students to engineering experimental techniques, including planning, controls, basic instrumentation, basic data analysis, and report writing. Includes experiments on material science, statics and dynamics. Prerequisite: sophomore mechanical engineering standing. *Spring semester only, one hour.*

MECE 260. INDEPENDENT STUDY. Individual study of specialized topics in Mechanical Engineering. Sophomore standing and permission of the department chair and a faculty sponsor is required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements.
Semester course, one, two or three hours.

MECE 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Mechanical Engineering. Sophomore standing and permission of the department chair and a faculty sponsor is required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements. *Semester course, one, two or three hours.*

MECE 311. MECHANICS OF MATERIALS. Fundamentals of mechanics of materials, including stress and strain; axial loading; Hooke's Law and Poisson's ratio; torsion; bending; transverse loading; stress and strain transformations; beam analysis; and buckling. Prerequisites: Mathematics 262 and Mechanical Engineering 210 and 212. *Fall semester only, three hours.*

MECE 312. STRESS ANALYSIS AND DESIGN OF MACHINE COMPONENTS. Application of stress analysis to static, fatigue, and surface fatigue failures. Design of shafts, including limits and fits and bearing selection. Design and selection of machine elements such as screws, bolted joints, weldments, springs, gears, brakes, etc. Prerequisite: Mechanical Engineering 311.
Spring semester only, three hours.

MECE 314. KINEMATICS AND DYNAMICS OF MACHINERY. Modeling, analysis, and design of linkages, cams, and gear trains, including machine dynamics. Introduction to dynamic systems modeling using computer-aided analysis, including Pro/ENGINEER. Prerequisite: Mechanical Engineering 311. *Offered periodically, semester course, three hours.*

MECE 316. SYSTEM DYNAMICS. Modeling and analysis of dynamic systems consisting of mechanical, electrical, and electromechanical elements. Development of system models using transfer functions, block diagrams, and state variable methods. System analysis in the time and frequency domains. Includes Matlab/Simulink simulations. Prerequisites: Mathematics 262, Mechanical Engineering 212. *Spring semester only, three hours.*

MECE 318. HIGH-TECHNOLOGY VENTURES. The purpose of this course is three fold: to introduce students to the process of technological innovation within a business; to learn to work effectively within a multidisciplinary team; and, to design and prototype a product working with a local company**.** Students experience what it takes to bring a product (or prototype) from concept to market. The class is centered on product development and writing a business plan to support the product. Students will spend time in lecture and laboratory, and will make off-site visits to the partner company. Prerequisites: junior or senior standing and instructor approval.
Spring semester only, three hours.

MECE 321. ADVANCED THERMODYNAMICS. Application of thermodynamic principles. Topics include reviewing equations of state, properties, conservation of mass, conservation of energy, second law of thermodynamics, and cycles; exergy; property relationships; gas and gas-vapor mixtures; air conditioning; chemical reactions; chemical and phase equilibrium; and compressible-fluid flow. Prerequisite: Mechanical Engineering 214. *Fall semester only, three hours.*

MECE 325. FLUID MECHANICS. The study of steady and unsteady flow of mainly incompressible fluids; the application of the conservation laws of mass, momentum, and energy to fluid systems; the control volume approach to distributed systems; and the application of experimental techniques to problems. Prerequisites: Mathematics 262; Mechanical Engineering 120; and Mechanical Engineering 211 or Physics 303. *Fall semester only, three hours.*

MECE 326. HEAT TRANSFER. The fundamentals of heat transfer by conduction, convection, and radiation; application to practical heat transfer devices; engineering analysis of heat exchangers; and design problems solved by analytical, numerical, and computer methods. Prerequisite: Mechanical Engineering 325. *Spring semester only, three hours.*

MECE 328. BIOMECHANICS. The course will explore the key topics within the contemporary field of biomechanics—the application of mechanics to biological systems—with the goal of preparing students for further work in cutting-edge fields such as biomedical engineering, novel propulsion systems, and other biologically-inspired engineering. Topics to be covered include biomaterials, mechanical properties of biological structures, biomimetic robotics, terrestrial locomotion, swimming, flying, prosthetics, external and internal fluid flows, efficiency, blood flow, biomedical instrumentation, experimental techniques, strain gauges, flow visualization, and special topics selected by students.
Spring semester only, 3 hours.

MECE 351. INSTRUMENTATION LABORATORY. A lab course that reinforces the lab techniques introduced in Mechanical Engineering 251-252. Experiments chosen from stress analysis, vibration analysis, and control of mechanical systems. Mechanical Engineering 351 is designed to fulfill the requirements for a Writing Intensive (WI) course in the Mechanical Engineering major. Corequisite: Mechanical Engineering 311. *Fall semester only, one hour.*

MECE 352. THERMAL/FLUIDS LABORATORY. A lab course that reinforces the lab techniques introduced in Mechanical Engineering 251-252. Experiments chosen from thermodynamics, fluid mechanics, and heat transfer. Corequisite: Mechanical Engineering 326.
Spring semester only, one hour.

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MECE 360. INDEPENDENT STUDY. Individual study of specialized topics in Mechanical Engineering. Junior standing and permission of the department chair and a faculty sponsor is required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements.
Semester course, one, two or three hours.

MECE 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Mechanical Engineering. Junior standing and permission of the department chair and a faculty sponsor is required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements. *Semester course, one, two or three hours.*

MECE 390. SPECIAL MECHANICAL ENGINEERING TOPICS. Special topics in mechanical engineering based on student demand and faculty interest. Specific subject matter varies each semester with prerequisites and credit hours announced in advance of registration. This course can be used to satisfy a portion of the mechanical systems elective requirements in Mechanical Engineering. *Semester course, one, two, three or four hours.*

MECE 391. SPECIAL MECHANICAL ENGINEERING TOPICS. Special topics in mechanical engineering based on student demand and faculty interest. Specific subject matter varies each semester with prerequisites and credit hours announced in advance of registration. This course can be used to satisfy a portion of the thermal systems elective requirements in Mechanical Engineering. *Semester course, one, two, three or four hours.*

MECE 401. CAPSTONE DESIGN I. Completion of the senior design project. A study of the principles and methods of designing mechanical engineering systems in today's society, including the design process; decision making in design; engineering economics; analysis and verification of performance; and environmental impact. Corequisite: Mechanical Engineering 451, prerequisite: senior mechanical engineering standing. *Fall semester only, three hours.*

MECE 402. CAPSTONE DESIGN II. Completion of the senior design project. A study of the principles and methods of designing mechanical engineering systems in today's society, including the design process; decision making in design; engineering economics; analysis and verification of performance; and environmental impact. Corequisite: Mechanical Engineering 452, prerequisite: Mechanical Engineering 401. *Spring semester only, three hours.*

MECE 407. CONTROL SYSTEMS. A study of the design and analysis of feedback control systems. Topics include: modeling of dynamic systems (mechanical, electro-mechanical, thermal and fluid), a review of Laplace transform techniques, steady-state error, stability, root locus design methods, Bode analysis/stability margins, and Bode compensator design. Introduction to state-space techniques and the digital implementation of controllers. Includes Matlab/Simulink simulations. Prerequisites: Electrical Engineering 210, Engineering 274, and Mechanical Engineering 316. *Spring semester only, three hours.*

MECE 408. MECHANICAL VIBRATIONS. A study of the dynamic response of lumped parameter systems with one and two degrees of freedom subjected to periodic and non-periodic excitation; applications to the control of undesirable vibrations in machines; theory of seismic instruments; and an introduction to distributed parameter systems. Prerequisites: Mechanical Engineering 311 and 316. *Fall semester only, three hours.*

MECE 414. PRINCIPLES OF HEATING, VENTILATING, AND AIR CONDITIONING. Analysis and design of components and systems used to condition air in buildings. Topics include air-conditioning systems, psychrometrics, conditioning processes, indoor air quality, heat transfer, solar radiation, heating loads, cooling loads, annual energy usage, pumps and piping, fans and ducts, heat exchangers, and refrigeration equipment. Prerequisite: Mechanical Engineering 326. *Fall semester only, three hours.*

MECE 415. FINITE ELEMENT ANALYSIS. A study of the finite element method and its application to mechanical engineering problems. Topics include basic concepts; stiffness matrices; truss structures; flexure elements; method of weighted residuals; interpolation functions; and applications to heat transfer, fluid mechanics, solid mechanics, and structural dynamics. Prerequisites: Engineering 274, Mechanical Engineering 312 and 326. *Fall semester only, three hours.*

MECE 416. SURVEY OF ALTERNATIVE ENERGY SYSTEMS. A study of alternative energy systems including fuel cell technology and heat exchanger design. Topics include modeling and analysis of heat exchangers, fundamentals of fuel cell operation, and a survey of alternative energy technologies. A project is assigned to each topic. Prerequisite: Mechanical Engineering 326. *Spring semester only, three hours.*

MECE 417. DESIGN OF OPTIMAL STRUCTURES. Methods and techniques for designing optimal structures for high-performance applications in which stiffness, strength, and light weight are paramount. Includes load-case analysis, stress visualization and computation, FEM-based structural optimization, and advanced materials and processes. Prerequisites: senior mechanical engineering standing.
Offered periodically, semester course, three hours.

MECE 418. HUMAN-POWERED VEHICLE DESIGN. Computer-aided modeling, analysis, and design of human-powered vehicles for land, water, and air. Includes analysis of vehicle dynamics and handling, performance predictions, and CAD-based design tools integrating dynamic models with Pro/ENGINEER models. Two lectures and one laboratory per week. Prerequisites: Mechanical Engineering 311 and 325. *Fall semester only, three hours.*

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MECE 421. APPLIED FLUID MECHANICS. Advanced treatment and application of the equations and empirical data that describe fluid phenomena in both internal and external fluid systems. Introduction to techniques important to research and design in fluid applications, specifically computational and experimental fluid dynamics. Topics include superposition of potential flows, added mass, hydrodynamic stability, boundary layer flow, bearings, turbomachinery, turbulence, non-Newtonian fluids, compressible flow, and biofluid dynamics. Prerequisite: Mechanical Engineering 326.
Fall semester only, three hours.

MECE 451. CAPSTONE DESIGN LABORATORY I. An advanced lab course requiring the student to complete the senior group design project. Includes 3-D computer-aided design and manufacturing techniques and experiments related to the senior project. Written reports and oral presentations are required. Mechanical Engineering 451 is designed to fulfill the requirements for a Speaking Intensive (SI) course in the Mechanical Engineering major. Prerequisites: senior standing in Mechanical Engineering; Mechanical Engineering 351 and 352. *Fall semester only, one hour.*

MECE 452. CAPSTONE DESIGN LABORATORY II. An advanced lab course requiring the student to complete the senior group design project. Includes 3-D computer-aided design and manufacturing techniques and experiments related to the senior project. Written reports and oral presentations are required. Mechanical Engineering 452 is designed to fulfill the requirements for a Speaking Intensive (SI) course in the Mechanical Engineering major. Prerequisites: senior standing in Mechanical Engineering; Mechanical Engineering 451. *Spring semester only, one hour.*

MECE 460. INDEPENDENT STUDY. Individual study of specialized topics in Mechanical Engineering. Senior standing and permission of the department chair and a faculty sponsor is required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements.
Semester course, one, two or three hours.

MECE 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Mechanical Engineering. Senior standing and permission of the department chair and a faculty sponsor is required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements.
Semester course, one, two or three hours.

MECE 498. HONORS IN MECHANICAL ENGINEERING. Seniors (and in some instances, juniors) who have shown special aptitude in mechanical engineering may, with consent of the department, undertake special research and design problems. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements. Cannot be repeated for more than a total of three credit hours.
Semester course, one, two or three hours.

MECE 499. HONORS IN MECHANICAL ENGINEERING. Seniors (and in some instances, juniors) who have shown special aptitude in mechanical engineering may, with consent of the department, undertake special research and design problems. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements. Cannot be repeated for more than a total of three credit hours.
Semester course, one, two or three hours.

DEPARTMENT OF MODERN LANGUAGES

Dr. Sparks, Acting Chair; Dr. Barber, Mr. Cole, Ms. Forrester, Dr. Leon, Dr. Meng, Dr. Su, Mrs. Tinkey, Dr. C. Trammell, Dr. Wentworth. Part-Time: Mrs. Ligo, Mrs. Rotunno.

Course Requirements for Bachelor of Arts Degree in French (FREN)

Twenty-four semester hours in French beyond the first year sequence (101-102):

French Core Requirements (24 hours):

French 201-202 Intermediate - Students who have completed an equivalent to Intermediate level must substitute six hours of 300-level French.

French 305 Conversation or 340 Advanced Conversation.

French 307 Grammar/Style or 309 Advanced Grammar.

French 308 Phonetics & Linguistics.

French 312 Contemporary France.

Three-hour French literature course.

Three-hour French elective at the 300-level.

Courses that count in the FREN major quality point average (MQPA):

All courses with "FREN" prefix, excluding FREN 101 and FREN 102. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for French Major leading to (K-12) certification in French (FSED)

Course requirements include all the courses required for the French major listed above, plus:

French 362 Aspects of Language Learning.

French 364 Pedagogical Materials.

Education 103, 201, 202, 203, 303, 305, 307, 371, 372, 373, 431, and 488.

Computer Science 204.

Course Requirements for Bachelor of Arts Degree in Spanish (SPAN)

Thirty-three semester hours in Spanish at the 295-level and above:

Spanish Core Requirements (21 hours):

Spanish 295 Transitional Spanish or a 300-level elective.

Spanish 303 Conversation.

Spanish 305 Phonetics & Linguistics.

Spanish 306 Verb Constructs and Usage.

Spanish 340 Advanced Grammar for Proficiency I.

Spanish 341 Advanced Grammar for Proficiency II.

Spanish 424 Hispanics in the United States.

Civilization/Culture Requirements (6 hours):

One course from Spanish 319 or 320.

One course from Spanish 322 or 323.

Literature Requirement: (6 hours):

One course from Spanish 330, 331, or 333.

One course from Spanish 326 or 327.

Courses that count in the SPAN major quality point average (MQPA):

All courses with "SPAN" prefix, excluding SPAN 101, 102, 201 and 202. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Spanish Major leading to (K-12) certification in Spanish (SPED)

Course requirements include all the courses required for the Spanish major listed above, plus:

Spanish 362 Aspects of Language Learning.

Spanish 364 Pedagogical Materials.

Education 103, 201, 202, 203, 303, 305, 307, 371, 372, 373, 431, and 488.

Computer Science 204.

International Business Major

This program leads to a Bachelor of Science degree, combining business and modern language studies. See Department of Business for course plan.

The Department of Modern Languages stresses the acquisition of skills in speaking, writing, and analysis/research. The following courses are designated as Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL): French 307, 309 (WI); French 305, 340 (SI); French 320, 32l, 325, 330, 331, 332 (IL) for the French major; and Spanish 322, 323 (SI); Spanish 301, 326, 327, 330, 331, 333 (WI) and (IL) for the Spanish major.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

Course Requirements for a minor in Chinese (21 hours)

A minor in Chinese will consist of 21 hours of Chinese courses beyond Chinese 101 and 102. 21 hours are required, with a minimum of 12 credits taken from Chinese 201, 202, 301, 302, 401 and 402.

Course Requirements for a minor in French (15 hours)

A minor in French will consist of 15 hours of French courses beyond French 101 and 102.

Course Requirements for a minor in German (15 hours)

A minor in German will consist of 15 hours of German courses beyond German 101 and 102.

Course Requirements for a minor in Japanese (18 hours)

A minor in Japanese will consist of 18 hours of Japanese courses beyond Japanese 101 and 102.

Placement Guidelines

The achievement level at which you should enter the modern, widely-spoken foreign language of your choice will depend upon your experience with that language:

1. If you have studied the same modern, widely-spoken foreign language in high school for less than two years, we recommend the elementary course sequence of 101-102.
2. If you have studied the same modern, widely-spoken foreign language for two years with grades of "B" or better, we recommend the intermediate course sequence of 201-202.
3. If you have studied the same modern, widely-spoken foreign language for three years with grades of "B" or better, we recommend a 200- or 300-level course to be selected with the help of your faculty advisor.

4. If you have studied the same modern, widely-spoken foreign language for four years in high school with grades of "A," we recommend a 300-level course to be selected with the help of your faculty advisor.
5. If it becomes apparent that a student in his/her first term of study of a language at Grove City College has been placed in a class that is inappropriate for his/her abilities, he/she may be placed back or advanced one level at the option of the department. This may be done no later than one week after mid-term grades are issued.

Note: Language study is progressive and sequential. For example, 101 must be followed by 102, 102 by 201, and 201 by 202.

Study Abroad

Study abroad is strongly encouraged for language majors. Selection of a program and of specific courses takes place in consultation with the Office of International Education, the Chair of the Department of Modern Languages, the Coordinator of International Studies, and the Registrar. Detailed information about the Grove City College Study Abroad program is available by accessing www2.gcc.edu/international/index.htm. Language majors seeking assistance regarding program options, transfer of credits, application forms, deadlines, letters of recommendations, and other matters related to study abroad may contact Ms. Cynthia Forrester, the Department Coordinator of International Studies (caforrester@gcc.edu).

CHINESE (CHIN)

CHIN 101. ELEMENTARY CHINESE I. This first-year course is designed to lay a foundation for those who are interested in using Mandarin Chinese as a linguistic tool to communicate and further appreciate the Chinese culture. It aims at developing learners' overall competence in speaking, listening, reading, writing, and culture awareness with special emphasis on oral-aural skills for true beginners. *Fall semester only, three hours.*

CHIN 102. ELEMENTARY CHINESE II. This first-year course is designed to continue to lay the groundwork for the study of modern Chinese. It aims to develop learners' overall Chinese competence in speaking, listening, reading, writing, and intercultural communication with special emphasis on oral-aural skills. Prerequisite: Chinese 101. *Spring semester only, three hours.*

CHIN 105. BUSINESS CHINESE I. A beginning Mandarin Chinese course with special focus on business communication. The first level of a three-level series, the course covers basic daily corporate interactions and business-related social exchanges such as: socializing, establishing and maintaining good relations (guānxì, a key word for doing business in Asia), scheduling meetings, visiting a company, inquiring about products, business etiquette, etc. Christian values will be integrated throughout the course. It is designed for learners with no prior knowledge of the Chinese language and culture. Ample authentic materials are provided for learners to visualize contemporary China. Classes are conducted mainly in Chinese, with clear grammatical and cultural highlighting in English. Students will be assigned to perform simple tasks to enhance language use. Prerequisite: None. *Spring semester only, three hours.*

CHIN 201. INTERMEDIATE CHINESE I. This second-year course is designed to build on the foundation of first year Chinese to help learners achieve greater fluency in the spoken and written use of the Chinese language, as well as to increase vocabulary and familiarity with common sentence patterns. Prerequisite: Chinese 102 or by permission. *Fall semester only, three hours.*

CHIN 202. INTERMEDIATE CHINESE II. This second-year course is designed to further develop learners' overall language proficiency. Students will achieve the following: understand simple paragraph-length utterances and over longer stretches of some connected discourses on a number of topics beyond basic survival needs; handle successfully most communicative tasks and social situations and support one's opinions using simple discourse strategies; read consistently with full understanding simple connected text; write short letters, brief synopses, summaries, biographical data of work and school experience in some details. Prerequisite: Chinese 201 or by permission. *Spring semester only, three hours.*

CHIN 205. BUSINESS CHINESE II. This course is a continuation of Chinese 105 and focuses on practical language skills that are most helpful in actual business interactions with Chinese-speaking communities (i.e. China, Taiwan, Hong Kong, and Singapore). Chinese and Kingdom culture will also be integrated throughout the course. Students will learn business negotiation in international trade, short business letter writing, simple business documents comprehension, business oral presentation, commercial language and word processing. Through intensive practice in the listening, speaking, reading, and writing of the Chinese language for business purposes, students will enhance their cultural awareness and acquire vocabulary, phrases and sentence patterns commonly used in typical Chinese business contexts. Classes are conducted mainly in Chinese. Prerequisite: Chinese 102, 105, or by permission.
Spring semester only, three hours.

CHIN 260. INDEPENDENT STUDY. Individual study of specialized topics in Chinese. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

CHIN 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Chinese. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

CHIN 301. ADVANCED CHINESE I. This third-year course is conducted entirely in Chinese. It seeks to further develop learners' overall language proficiency through extensive reading of modern texts in various styles. Students will have opportunities to narrate personal experience, discuss current social problems, and explore cultural issues at discourse level. Topic includes Chinese food, holidays, education, traditional Chinese medicine, leisure and entertainment. Prerequisite: Chinese 202 or by permission.
Fall semester only, three hours.

CHIN 302. ADVANCED CHINESE II. This third-year course aims to further vocabulary expansion and consolidation of essential sentence structures of contemporary Chinese through extensive reading and related conversation. Students will learn phrases of *written/formal* language (shūmiàn y), which is different from daily *colloquial/informal* language. Learners will discuss in the Chinese language contemporary China social and cultural trends such as: marriage then and now, population, economics policies and reforms, government and politics, and environmental protection. Prerequisite: Chinese 301 or by permission.
Spring semester only, three hours.

CHIN 305. BUSINESS CHINESE III. This course is conducted entirely in Chinese and is designed for students who are interested in international business with Chinese enterprises in Chinese-speaking communities. Students will study business and professional terminology; learn business practices and customs; practice giving formal presentations; read business related articles and statistical information; and review business documents including invoices, shipping documents, bank statements, sales and purchase contract, brochures introducing new products, and other business letters involving import and export trade. Students will write basic business letters and develop the ability to distinguish the stylistic differences between *formal* and *informal* correspondences, *colloquial* and *written* Chinese, and be able to write formal business letters in the appropriate format with the correct register. Students are expected to fully participate in discussions in Mandarin Chinese. Prerequisite: Chinese 205, 301, or by permission.
Spring semester only, three hours.

CHIN 320. INTRODUCTION TO CHINESE CIVILIZATION. A survey of Chinese history and civilization including social, political, economic, and cultural developments. Prerequisite: Chinese 302 or by permission.
Offered periodically, semester course, three hours.

CHIN 321. MODERN CHINA. This course addresses the momentous social and cultural changes that have occurred in China in recent years. In exploring this subject, Chinese culture is systematically examined from different aspects, including but not limited to, Chinese cultural roots, economy, ideology, politics, religion, and education. Some of China's hottest issues, with which Western societies have been concerned in recent years, are discussed; such as the Reform movement, the Tiananmen Square Incident of 1989, human rights, the anti-Falun Gong campaign, peasants' protest, HIV, China's ascension, China-U.S. Taiwan relations, and China's future. Prerequisite: Chinese 302 or by permission.
Offered periodically, semester course, three hours.

CHIN 350. INTRODUCTION TO CHINESE LITERATURE. A study of China's history, society, culture, and philosophies through traditional and modern Chinese literature. Prerequisite: Chinese 302 or by permission.
Offered periodically, semester course, three hours.

CHIN 360. INDEPENDENT STUDY IN CHINESE. Individual study in Chinese directed by a faculty member, with permission of the department chairman.
Semester course, one, two, or three hours.

CHIN 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Chinese. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

CHIN 390. STUDIES IN CHINESE. Readings and discussion of topics in literature or language. Subject matter varies. Prerequisite: Chinese 302 or by permission.
Offered periodically, semester course, three hours.

CHIN 401. ADVANCED CHINESE III. This fourth-year course is designed for learners of Chinese who seek to improve overall language skills and the development of skills to approach authentic written texts. Extensive reading and *colloquial* and *written* usage building are major emphases of the course, while speaking and writing are incorporated in class discussions, oral reports, and essay assignments. Bible reading (in characters) will be used as part of the authentic materials. Prerequisite: Chinese 302 or by permission. *Fall semester only, three hours.*

CHIN 402. ADVANCED CHINESE IV. This fourth-year course is designed for advanced learners of Chinese to improve overall language proficiency through extensive reading of texts in various topics, styles, or genres. Learners will also acquire a deeper understanding of major issues concerning modern Chinese intellectuals as well as a fuller picture of contemporary Chinese life and society. In addition, they will obtain skills needed to be independent and confident learners of Chinese. Unique strategies on how to share the Gospel with Chinese (different from other culture or language speakers) will be introduced. Prerequisite: Chinese 401 or by permission. *Spring semester only, three hours.*

CHIN 403. INTRODUCTION TO CLASSICAL CHINESE I. An introduction to wenyan, the traditional written language of China, through the study of selections from ancient texts. Includes grammatical analysis and translation into baihua (modern Chinese); discussion will be in modern Chinese. Prerequisite: Chinese 302. *Offered periodically, semester course, three hours.*

CHIN 460. INDEPENDENT STUDY IN CHINESE. Individual study directed by a faculty member, with permission of the department chairman. *Semester course, one, two, or three hours.*

CHIN 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Chinese. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

FRENCH (FREN)

FREN 101. ELEMENTARY FRENCH I. This course is intended for students who have not studied French before or who have had very little exposure to the language. Newly acquired vocabulary and grammatical structures will be practiced through general classroom discussions and small group and pair work activities. Homework will require the interactive use of audio and video material(s), as well as regular writing practice. The course will also invite students to explore the francophone world.
Fall semester only, three hours.

FREN 102. ELEMENTARY FRENCH II. Continuation of French 101. Appropriate also for students with one year of high school study with grades of B or better. Beyond the expected acquisition of vocabulary and grammatical structures, students will be introduced to French and francophone culture through authentic materials (simple articles, films, videos, songs, recorded conversations). Lab work is to be completed on-line: it consists of audio, video material(s), and of written practice. Students will continue to explore France and the francophone world. Prerequisite: French 101 or equivalent. *Spring semester only, three hours.*

FREN 201. INTERMEDIATE FRENCH I. This course is appropriate for students who have completed 101 and 102, or 2 years of high school study with grades of B or better. After a review of elementary French, this course proceeds with an intensive study of grammar and vocabulary aimed at developing all four skills: writing, reading, listening, and speaking. Students will read fairly simple his-

torical or literary texts; they will perform small skits, memorize a few poems, and explore cultural contexts of French and francophone communities. Besides laboratory assignments and creative writing activities, students will do written exercises on a daily basis. Prerequisite: French 102 or equivalent.
Fall semester only, three hours.

FREN 202. INTERMEDIATE FRENCH II. Continuation of French 201. Appropriate also for students who have completed 3 years of high school study with grades of B or better. The intermediate sequence is designed to help students attain a level of proficiency that should allow them to function comfortably in a French-speaking environment. This course will build on students' existing skills in French and increase their confidence and ability to read, write, speak and understand French. It will introduce them to more refined lexical items, more complex grammatical structures, and more challenging cultural materials. Language laboratory practice will conclude each unit studied. Written exercises to be done outside of class will be assigned on a daily basis. Students will also write short papers in French. Prerequisite: French 201 or equivalent. *Spring semester only, three hours.*

FREN 260. INDEPENDENT STUDY. Individual study of specialized topics in French. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

FREN 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in French. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

FREN 305. CONVERSATION. Instruction in speaking and understanding French in a variety of social and professional situations. Required of French majors and those desiring teacher certification in French. This course fulfills the Speaking Intensive (SI) requirement for the French major. Prerequisite: French 202 or a 300-level French course, or by permission.
Fall semester only, three hours.

FREN 307. PRINCIPLES OF FRENCH GRAMMAR AND STYLE. This course will help advanced students to further develop linguistic skills and learn to write creatively in the target language. Through challenging exercises, examinations, and the writing of essays – students gain continuous practice in speaking, reading, and writing the target language. Emphasis is placed on the following grammatical topics: parts of speech and grammatical functions, adjectives (descriptive, possessive, demonstrative, and indefinite), pronouns (possessive, demonstrative, indefinite, and relative), tenses of the indicative (present; *passé composé*, and *imparfait*), present participle, compound tenses, pronominal verbs, and agreement of the past participle. This course fulfills the Writing Intensive (WI) requirement for the French major. Prerequisite: French 202 or a 300-level French course, or by permission. *Alternate Fall semesters, three hours.*

FREN 308. PHONETICS AND LINGUISTICS. A systematic study of the sounds and sound patterns of French contrasted with English. Each student's pronunciation in French will be evaluated with exercises assigned to correct and improve it. A theoretical and practical approach to the French phonetic system, this course includes phonetic transcriptions, an introduction to linguistics, and an overview of the history of the French language. Required of French majors and those desiring teacher certification in French. Prerequisites: French 202 or a 300-level French course, or by permission.
Spring semester only, three hours.

FREN 309. ADVANCED GRAMMAR AND COMPOSITION. The goal of this course is to enable advanced students to develop linguistic skills and the ability to write creatively in French. Through challenging exercises, examinations, and the writing of a creative paper, students gain continuous practice in speaking, reading, and writing in the target language. Emphasis is placed on the following aspects of French grammar: nouns, articles, compound tenses (other than those studied in 307), pronominal verbs, negatives, adverbs, passive voice, prepositions, personal pronouns, conditional, subjunctive, and imperative. This course fulfills the Writing Intensive (WI) requirement for the French major. Prerequisite: French 202 or a 300-level French course, or by permission.
Alternate Fall semesters, three hours.

FREN 312. CONTEMPORARY FRANCE. Students enrolled in this course will gain access to contemporary France and to its people through readings and discussions (family, education, the arts, cinema and theater, history, and immigration). Attention to daily life and traditions will foster a greater awareness of the differences and similarities existing between France and the United States. The organization of this course is as follows: Geography, history (from the beginning of the third Republic [1875] to the present), government and institutions, manners and mores. Prerequisite: French 307 or 309, or by permission. *Alternate Fall semesters, three hours.*

FREN 315. BUSINESS FRENCH. Through this course, students acquire the linguistic skills and cultural information they need to prepare for the *Chambre de commerce et d'industrie de Paris* examinations. They familiarize themselves with business practices of the Francophone world. They are exposed to key French business topics and to essential career practices, as well as to cultural concepts particular to French businesses. Areas of concentration are: 1. La correspondance; 2. La micro-informatique, Internet, le courrier électronique; 3. La recherche d'un emploi; 4. La typologie des enterprises; 5. L'organisation des enterprises; 6. Le marketing; 7. La banque et les moyens de paiement; 8. Les transports et le commerce international. Prerequisite: French 307 or 309, or by permission. *Alternate Spring semesters, three hours.*

FREN 320. GENRES OF FRENCH LITERATURE I. A survey of French literature from the beginning, in the eleventh century, to the end of the eighteenth century. A study of French literary history, movements, authors, techniques, and themes, from the *Song of Roland* to *Candide*. Music and art of these periods will illustrate how the literature shares the same ideas and esthetics. This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 202 or a 300-level French course, or by permission. *Offered periodically, semester course, three hours.*

FREN 321. GENRES OF FRENCH LITERATURE II. A survey of French literature of the nineteenth and twentieth centuries, from Romanticism to Duras and Robbe-Grillet. A study of French literary history, movements, authors, techniques, and themes of the last two centuries. Music and art of these periods will illustrate how the literature shares the same ideas and esthetics. It is not necessary to take French 320 before French 321. This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 202 or a 300-level French course, or by permission. *Offered periodically, semester course, three hours.*

FREN 325. MODERN FRENCH THEATRE. A course designed to familiarize students with the major movements and authors of the twentieth and twenty-first centuries, including the avant-garde, surrealism, l'antithéâtre (Theater of the Absurd), and francophone theatre. This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 202 or a 300-level French course, or by permission. *Offered periodically, semester course, three hours.*

FREN 326. LE CINÉMA PAR LA CONVERSATION. This course begins with analyses, commentaries, and discussions of French films with which spectators in non-francophone countries are most likely to be familiar. Progressively, the emphasis shifts to films of the *Occupation* (1940-1944) and of the *Nouvelle Vague* (the 1960s), films which have been held significant in aesthetic, social, or moral terms by prominent critics and historians of French cinema. The materials and strategies used are meant to stimulate interest in the target language, to bridge the gap between "skill" and creative courses, and to develop the language proficiency of advanced students, as well as their ability to express themselves creatively in French. This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 307 or 309, or by permission. *Alternate Fall semesters, three hours.*

FREN 330. WOMEN WRITERS IN FRENCH AND FRANCOPHONE LITERATURE. This course serves to introduce students to the lives and works of francophone female authors from 1800 to the present. Its articulation is as follows: 1. *Prise de conscience*: Madame de Staël (France, Switzerland) and Simone de Beauvoir (France), with a side glance at Virginia Woolf (Great Britain); 2. *Childhood and formation*: Christiane Rochefort (France) and Nathalie Sarraute (France, Russia); 3. *Sexual awakenings and passion*: Colette (France) and Marguerite Duras (France and Indochina); 4. *Matriarchy and exile*: Antonine Maillet (Canada). The last third of the course focuses on the study of texts by the three authors whose work is commonly, albeit somewhat paradoxically, known as "French Feminism": Luce Irigaray (Belgium), Hélène Cixous (Algeria), and Julia Kristeva (Bulgaria). This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 307 or 309, or by permission. *Alternate Spring semesters, three hours.*

FREN 331. POETRY. The goal of this course is to enable students to express themselves in a more sophisticated language than had been hitherto feasible and to become acquainted with "*explication de textes*," this staple of French classical education. Students will become familiar with the autobiographical and literary background of the following nineteenth and twentieth centuries French and francophone poets: Hugo, Nerval, Baudelaire, Mallarmé, Verlaine, Rimbaud, Valéry, Senghor, Césaire. This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 307 or 309, or by permission. *Alternate Spring semesters, three hours.*

FREN 332. LA NOUVELLE FRANCOPHONE. A first goal of this course is to bridge the gap often experienced by students between the basic language work conducted during the first years of foreign language study and the diversified advanced work required of French majors. A second goal is to have students acquire substantive information on francophone countries, as well as on writers of France and the French-speaking world: Maupassant (France), Flaubert (France), Sartre (France), Camus (Algeria), Sarraute (Russia, France), Gabrielle Roy (Canada), Antonine Maillet (Canada), Maryse Condé (Guadeloupe), and Zobel (Martinique). A third goal is to have students analyze short-story fiction (*nouvelle/s*) and demonstrate a greater sophistication and complexity in their manipulation of language skills as they engage with authentic texts. This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 307 or 309, or by permission.
Alternate Spring semesters, three hours.

FREN 340. ADVANCED CONVERSATION AND CONTEMPORARY CULTURE. Practice in expanding skills and vocabulary acquired in French 305 through the discussion of current issues presented in French newspapers and TV5, International French TV. Includes a study of colloquial French and an explanation of French culture and values today. Students are encouraged to consult French news sources on the Internet and to get daily updates. This course fulfills the Speaking Intensive (SI) requirement for the French major. Prerequisites: French 202 or a 300-level French course, or by permission. Strongly recommended: French 305. *Spring semester only, three hours.*

FREN 360. INDEPENDENT STUDY. Individual study directed by a faculty member, with permission of the department chairman. *Semester course, one, two or three hours.*

FREN 362. ASPECTS OF LANGUAGE LEARNING. A course designed to provide opportunities to teach various grammar aspects of the French language, and to examine and implement a variety of technical aspects and resources in the foreign language curriculum in preparation for student teaching. Teacher candidates will regularly reflect on their teaching experiences and will develop a portfolio of materials representing their teaching in the target language. Required of all students desiring teacher certification in a foreign language. Corequisite: French 364.
Spring semester of the sophomore year, two hours.

FREN 364. PEDAGOGICAL MATERIALS. Introduction to the materials and resources of foreign language teaching. Analysis and preparation of instructional and evaluative materials in a specific target language. Required of all students desiring teacher certification in a foreign language. Corequisite: French 362. *Spring semester of the sophomore year, two hours.*

FREN 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in French. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

FREN 390. STUDIES IN FRENCH. Readings and discussion of topics in literature or language. Subject matter varies. *Semester course, one, two or three hours.*

FREN 460. INDEPENDENT STUDY. Individual study directed by a faculty member, with permission of the department chairman. *Semester course, one, two or three hours.*

FREN 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in French. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

GERMAN (GERM)

GERM 101. ELEMENTARY GERMAN I. Intended for students who have not studied German or for those with minimal high-school study: grammar and vocabulary-building fundamentals, and basic conversation. *Fall semester only, three hours.*

GERM 102. ELEMENTARY GERMAN II. Appropriate for students who have studied German 101 or with one year of high-school study with grades of B or better. Continuation of grammar, vocabulary building, and basic conversation and reading. Prerequisite: German 101.
Spring semester only, three hours.

GERM 201. INTERMEDIATE GERMAN I. Appropriate for students who have completed two years of high school study with grades of B or better. Intensive study of grammar and vocabulary in oral and written practice and review of elementary German. Prerequisite: German 102.
Fall semester only, three hours.

GERM 202. INTERMEDIATE GERMAN II. Continuation of German 201. Understanding and speaking, grammar, and readings from selected texts. Prerequisite: German 201.
Spring semester only, three hours.

GERM 260. INDEPENDENT STUDY. Individual study of specialized topics in German. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

GERM 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in German. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

GERM 302. TECHNIQUES OF EFFECTIVE TRANSLATION. Training in effective techniques of translating German journals and books, including a review of grammar. Prerequisite: German 201.
Offered periodically, semester course, three hours.

GERM 316. CONVERSATION. Instruction in speaking and understanding German in a variety of social and professional situations. Acquisition of vocabulary will be emphasized. Prerequisite: German 202 or a 300-level German course, or by permission.
Offered periodically, semester course, three hours.

GERM 330. GERMAN CULTURE. A survey of German history and civilization including studies in geography, major eras of history, customs, and cultural accomplishments. Prerequisite: German 202 or a 300-level German course, or by permission.
Offered periodically, semester course, three hours.

GERM 334. ADVANCED GRAMMAR. A thorough review of the basic elements of German grammar and the study of finer grammatical points commonly omitted in review grammars. Prerequisite: German 202 or a 300-level German course, or by permission.
Offered periodically, semester course, three hours.

GERM 360. INDEPENDENT STUDY. Individual study directed by a faculty member, with permission of the department chairman. *Semester course, one, two or three hours.*

GERM 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in German. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

GERM 390. STUDIES IN GERMAN. Readings and discussion of topics in literature or language. Subject matter varies. *Semester course, two or three hours.*

GERM 460. INDEPENDENT STUDY. Individual study directed by a faculty member with the permission of the department chairman. *Semester course, one, two or three hours.*

GERM 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in German. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

JAPANESE (JAPN)

JAPN 101. ELEMENTARY JAPANESE I. An introduction to Japanese language and culture, stressing both spoken and written language. Prerequisite: none. *Fall semester only, three hours.*

JAPN 102. ELEMENTARY JAPANESE II. A continuation of Japanese 101, combining further study of language and culture with an emphasis on developing proficiency in listening, reading, writing, and speaking. Prerequisite: Japanese 101. *Spring semester only, three hours.*

JAPN 201. INTERMEDIATE JAPANESE I. Further study of the Japanese language and culture with an emphasis on listening, speaking, reading, and writing. Prerequisite: Japanese 102 or equivalent. *Fall semester only, three hours.*

JAPN 202. INTERMEDIATE JAPANESE II. Completion of the study of basic Japanese language with continued emphasis on listening, speaking, reading, writing, and culture. Prerequisite: Japanese 201. *Spring semester only, three hours.*

JAPN 260. INDEPENDENT STUDY. Individual study of specialized topics in Japanese. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

JAPN 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Japanese. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

JAPN 301. ADVANCED JAPANESE I. An in-depth study of the Japanese language with an emphasis on listening, speaking, reading, writing, and culture. Prerequisite: Japanese 202 or a 300-level Japanese course, or by permission. *Fall semester only, three hours.*

JAPN 302. ADVANCED JAPANESE II. Further in-depth study of the Japanese language, with an emphasis on conversational proficiency as well as advanced reading and writing skills. Intensive practice in listening, speaking, reading, and writing. Prerequisite: Japanese 301 or a 300-level Japanese course, or by permission. *Spring semester only, three hours.*

JAPN 303. ADVANCED CONVERSATION. Training in oral expression with extensive vocabulary building and advanced grammatical structures, which is especially required in such circumstances as business in Japanese-speaking communities. Prerequisite: a 300-level Japanese course, or by permission. *Offered periodically, semester course, three hours.*

JAPN 310. BUSINESS JAPANESE. An emphasis on oral and written Japanese as well as cultural awareness in the Japanese business world. Practical language skills helpful in business interaction with Japanese-speaking communities. Intensive practice in speaking and writing for business purposes. Prerequisite: Japanese 202 or a 300-level Japanese course, or by permission. *Offered periodically, semester course, three hours.*

JAPN 320. INTRODUCTION TO JAPANESE CIVILIZATION AND CULTURE. A survey of Japanese history and civilization including social, political, economic, and cultural developments. Prerequisite: Japanese 202 or a 300-level Japanese course, or by permission. *Offered periodically, semester course, three hours.*

JAPN 330. INTRODUCTION TO JAPANESE LITERATURE. A study of the representative works by major authors of the Japanese-speaking world. Prerequisite: Japanese 202 or a 300-level Japanese course, or by permission. *Offered periodically, semester course, three hours.*

JAPN 340. MODERN JAPAN. A study of the events and ideas which have shaped contemporary Japan. Prerequisite: Japanese 202 or a 300-level Japanese course, or by permission. *Offered periodically, semester course, three hours.*

JAPN 360. INDEPENDENT STUDY. Individual study directed by a faculty member, with permission of the department chairman. *Semester course, one, two or three hours.*

JAPN 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Japanese. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

JAPN 390. STUDIES IN JAPANESE. Readings and discussion on topics in literature or language. Subject matter varies. Prerequisite: Japanese 202 or a 300-level Japanese course. *Offered periodically, semester course, three hours.*

JAPN 460. INDEPENDENT STUDY IN JAPANESE. Individual study directed by a faculty member, with permission of the department chairman. *Semester course, one, two, or three hours.*

JAPN 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Japanese. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

SPANISH (SPAN)

SPAN 101. ELEMENTARY SPANISH I. This course is intended for students with no previous study of Spanish or who have had minimal exposure to the language. An introduction to Spanish, stressing the spoken language and giving practice in grammar, reading, and writing. *Fall semester only, three hours.*

SPAN 102. ELEMENTARY SPANISH II. Continuation of Spanish 101. Further development of basic communication skills including listening, speaking, reading, and writing. Prerequisite: Spanish 101. *Spring semester only, three hours.*

SPAN 201. INTERMEDIATE SPANISH I. This course is appropriate for students who have completed Spanish 101 and 102, or 2 years of high school study with grades of B or better. A review of elementary Spanish and an intensive study of grammar and vocabulary in oral and written practice, and readings from selected texts. Prerequisite: Spanish 102 or equivalent. *Fall semester only, three hours.*

SPAN 202. INTERMEDIATE SPANISH II. Continuation of Spanish 201. The intensive study of grammar and vocabulary in oral and written practice, and readings from selected texts. Further development of basic communication skills in listening, speaking, reading, and writing. Prerequisite: Spanish 201. *Spring semester only, three hours.*

SPAN 260. INDEPENDENT STUDY. Individual study of specialized topics in Spanish. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

SPAN 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Spanish. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

SPAN 295. TRANSITIONAL SPANISH. An intermediate-level transitional course designed to help prepare students for advanced-level Spanish courses. This course will review, broaden, and solidify Spanish language proficiency, communication skills, and cultural awareness via increasingly more complex listening, speaking, reading, and writing tasks. Intended for students who have completed Spanish 202 or three years of high school Spanish. *Semester course, three hours.*

SPAN 300. CONTEMPORARY CULTURE. A study of the contemporary Spanish-speaking world: geography, family life, beliefs and customs, educational systems, religious perspectives, social questions, festivals, and holidays. Prerequisite: Spanish 295 or a 300-level Spanish course, or by permission. *Offered periodically, semester course, three hours.*

SPAN 301. INTRODUCTION TO LITERATURE. Introduction to techniques of literary analysis and study of representative works by major authors of the Spanish-speaking world. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: Spanish 306. *Offered periodically, semester course, three hours.*

SPAN 303. CONVERSATION. Training in oral expression with extensive vocabulary building. Study of grammatical structures in conversational and role-playing circumstances. Required of Spanish majors and those desiring teacher certification in Spanish. Prerequisite: Spanish 295 or a 300-level Spanish course, or by permission. *Fall Semester only, three hours.*

SPAN 304. NARRATION. Exploration of the oral traditions of Spanish-speaking regions and practice in storytelling in Spanish with an emphasis on the development of fluency, comprehensibility, intonation, and gesture. Prerequisite: Spanish 295 or a 300-level Spanish course, or by permission. *Offered periodically, semester course, three hours.*

SPAN 305. PHONETICS AND LINGUISTICS. A systematic study of the sounds, sound patterns, and intonations of Spanish as contrasted with English. Training in Spanish pronunciation, with special attention given to the problems teachers encounter in the classroom. Introduction to Spanish linguistic theory and terminology. Required of Spanish majors and those desiring teacher certification in Spanish. Prerequisite: Spanish 295 or a 300-level Spanish course, or by permission. *Spring semester only, three hours.*

SPAN 306. VERB CONSTRUCTS AND USAGE. Exploration of Spanish verbs and their forms, modes and applications. Designed to assist the development of written and oral competencies needed for Spanish 340, for Student Teaching, for graduate studies, and for the professional world. Required of all Spanish majors and of those desiring teacher certification in Spanish. Applicable to the requirements for a Spanish concentration in the Elementary Education major. Prerequisite: Spanish 295 or a 300-level Spanish course, or permission of the instructor. *Spring semester, three hours.*

SPAN 310. COMMERCIAL SPANISH. Preparation for fundamental Spanish communication related to the fields of business and economics: applications, presentations, correspondence, advertising, reports, etc. Prerequisite: Spanish 295 or a 300-level Spanish course, or by permission. *Offered periodically, semester course, three hours.*

SPAN 319. INTRODUCTION TO SPANISH CIVILIZATION. A survey of Spanish history and civilization from pre-Roman times to the present. Through readings, videos, discussions and presentations, students explore the social, political, economic and cultural developments of Spain and its people. Prerequisite: Spanish 295 or a 300-level Spanish course, or by permission. *Offered periodically, semester course, three hours.*

SPAN 320. MODERN SPAIN. A study of the events and ideas which have shaped Spain with an emphasis on the evolution of socioeconomic and political structures, cultural achievements and traditions from the seventeenth century to the present. Through readings, videos, discussions and presentations, students will develop an understanding of how Spain's rich history contributes to the daily life of contemporary Spain (politics, religion, family, social issues and other current topics) and influences the ways in which Spaniards view themselves and the world. Students are required to consult Spanish news sources on the Internet regularly. Prerequisite: Spanish 295 or a 300-level Spanish course, or by permission. *Offered periodically, semester course, three hours.*

SPAN 322. LATIN AMERICAN CIVILIZATION AND CULTURE I. A survey of the twenty-one Latin American republics, their history and civilization, people and society, arts and letters, customs, geography, and cultural accomplishments. This course fulfills the Speaking Intensive (SI) requirement for the Spanish major. Prerequisite: Spanish 295 or a 300-level Spanish course, or by permission. *Offered periodically, semester course, three hours.*

SPAN 323. LATIN AMERICAN CIVILIZATION AND CULTURE II. A cultural understanding of Latin America including identity issues, "mestizaje," socio-political characteristics, and patterns of thought and expression in language, literature, philosophy, and art. The course also examines the effects of the Spanish conquest upon the development of Latin American society. This course fulfills the Speaking Intensive (SI) requirement for the Spanish major. Prerequisite: Spanish 295 or a 300-level Spanish course, or by permission. *Offered periodically, semester course, three hours.*

SPAN 326. TRENDS IN LATIN AMERICAN LITERATURE. A study of the literature of Latin America from the pre-Columbian era to the beginning of the 20th century. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: Spanish 306. *Offered periodically, semester course, three hours.*

SPAN 327. CONTEMPORARY LATIN AMERICAN AUTHORS. A survey with readings from representative works of the most important 20th century authors in Latin American literature. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: Spanish 306. *Offered periodically, semester course, three hours.*

SPAN 330. GENRES OF SPANISH LITERATURE I. A study of representative authors and works of the Middle Ages, Renaissance, and Golden Age with exposure to various approaches to the reading and interpretation of literary works. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: Spanish 306.
Offered periodically, semester course, three hours.

SPAN 331. GENRES OF SPANISH LITERATURE II. A study of the major genres and works from eighteenth- and nineteenth-century Spain. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: Spanish 306.
Offered periodically, semester course, three hours.

SPAN 333. CONTEMPORARY SPANISH AUTHORS. A survey with readings from representative works of the twentieth and twenty-first centuries. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: Spanish 306.
Offered periodically, semester course, three hours.

SPAN 340. ADVANCED GRAMMAR FOR PROFICIENCY I. A thorough review and expansion of the basic elements of Spanish grammar and the study of finer grammatical points, with applications to written and oral proficiency. Required of Spanish majors and those desiring teacher certification in Spanish. Prerequisite: Spanish 306. *Alternate Fall semesters, three hours.*

SPAN 341. ADVANCED GRAMMAR FOR PROFICIENCY II. Continued review and expansion of the basic elements of Spanish grammar and the study of finer grammatical points, with applications to written and oral proficiency. Required of Spanish majors and those desiring teacher certification in Spanish. Prerequisite: Spanish 340. *Alternate Spring semesters, three hours.*

SPAN 360. INDEPENDENT STUDY. Individual study directed by a faculty member, with permission of the department chairman. *Semester course, one, two or three hours.*

SPAN 362. ASPECTS OF LANGUAGE LEARNING. A course designed to provide opportunities to teach various grammar aspects of the Spanish language, and to examine and implement a variety of technical aspects and resources in the foreign language curriculum in preparation for student teaching. Teacher candidates will regularly reflect on their teaching experiences and will develop a portfolio of materials representing their teaching in the target language. Required of all students desiring teacher certification in a foreign language. Corequisite: Spanish 364.
Spring semester of the sophomore year, two hours.

SPAN 364. PEDAGOGICAL MATERIALS. Introduction to the materials and resources of foreign language teaching. Analysis and preparation of instructional and evaluative materials in a specific target language. Required of all students desiring teacher certification in a foreign language. Corequisite: Spanish 362. *Spring semester of the sophomore year, two hours.*

SPAN 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Spanish. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

SPAN 375. SPANISH FOR THE PROFESSIONS. Training in vocabulary, reading comprehension, and oral and written skills for the utilization of Spanish in professions such as communications, social services, business, education, health professions, law, tourism, computer applications, and engineering. Designed for advanced-level students who wish to pursue their study of Spanish in combination with another field. Prerequisite: Spanish 295 or a 300-level Spanish course, or by permission.
Offered periodically, semester course, 3 hours.

SPAN 390. STUDIES IN SPANISH. Readings and discussion of topics in literature or language. Subject matter varies. *Offered periodically, one, two or three hours.*

SPAN 420. WRITTEN TRANSLATION/SIMULTANEOUS ORAL INTERPRETATION. Training and practice in the techniques of translation and interpretation with development of the non-literary vocabulary needed for professional skills. Prerequisite: Spanish 306.
Offered periodically, semester course, three hours.

SPAN 424. HISPANICS IN THE U.S. A study of the life-styles, heritage, influence, thoughts, and experiences of Cuban, Puerto Rican, Mexican American, Dominican, and other Spanish speakers in the United States today. Through extensive reading, videos and discussion, we will explore contemporary issues and topics of interest such as demographics, immigration, discrimination, workers' rights, education, the arts, customs, beliefs and daily life. The course will foster a greater awareness of the similarities and differences existing between these communities, as well as their contributions to American society. Of particular interest to students of sociology and political science. Required of Spanish majors and those desiring teacher certification in Spanish. Prerequisite: Spanish 306.
Alternate Fall semesters, three hours.

SPAN 460. INDEPENDENT STUDY. Individual study directed by a faculty member with permission of the department chairman. *Semester course, one, two or three hours*

SPAN 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Spanish. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

GLOBAL STUDIES (GOBL)

These courses are designed for students who wish to gain familiarity with cultures and literatures other than their own. Prior knowledge of a foreign language is unnecessary. None of the courses below may be counted toward fulfillment of the requirements for a language major.

GOBL 260. INDEPENDENT STUDY. Individual study of specialized topics in Global Studies. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

GOBL 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Global Studies. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

GOBL 290. STUDIES IN MODERN LANGUAGE. Readings and discussion of topics in literature or language. Subject matter varies. *Semester course, one, two or three hours.*

GOBL 300. INTERNATIONAL MANNERS AND MORES. This course deals with foreign cultures, customs, and "how they think." Although it is especially directed at the problems faced by the international businessperson who needs to create trust and understanding in order to function effectively in a foreign culture, the course also has proven to be of value for students in other majors who plan to work, study, and/or travel abroad. *Spring semester only, three hours.*

GOBL 360. INDEPENDENT STUDY. Individual study directed by a faculty member, with permission of the department chairman. *Semester course, one, two or three hours.*

GOBL 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Global Studies. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

GOBL 390. STUDIES IN MODERN LANGUAGE. Readings and discussion of topics in literature or language. Subject matter varies. *Semester course, one, two or three hours.*

GOBL 460. INDEPENDENT STUDY. Individual study directed by a faculty member with permission of the department chairman. *Semester course, one, two or three hours.*

GOBL 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Global Studies. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

DEPARTMENT OF MUSIC AND FINE ARTS

Dr. Arnold, Chair; Dr. Browne, Dr. Carter, Dr. Drake, Dr. Kolm, Dr. Konzen, Dr. Munson, Mrs. Paparone, Dr. Pisano. Part-Time: Mrs. Arnold, Mrs. Barron, Mr. Byo, Mr. Calaboyias, Mr. Churm, Mr. Colella, Mr. Dzugan, Mr. Fennell, Mr. Formeck, Mrs. Gregg, Mr. Heid, Mrs. Huntsman, Ms. Kohanski, Ms. Kubik, Mr. May, Mrs. McFarland, Mrs. Moser, Mrs. Rhoades, Mr. Scanga, Ms. Scott, Mrs. Sopher, Mr. Tessmer, Mrs. Young.

Course Requirements for Bachelor of Music Degree in Music (MUSI)

Music Core (56 hours):

Major Field Requirements (33 hours):

Music 103, 104, 105, 106, 107, 108, 203, 204, 205, 206, 207, 208, 217, 218, 221, 307, 331, 332, and 476; Music 317 or 318.

Applied Music Requirements (12 hours): Students must complete eight (8) semesters of one-credit private lessons and four (4) semesters of one-credit group music classes.

Ensemble (11 hours): Over the four years, students must participate for at least one complete year in each of three ensembles: Music 101 Band, 102 Choir, and 103 Orchestra.

Recital Attendance Requirement: Students must register for Music 199 each semester, which requires attendance at a predetermined number of faculty, senior and student recitals per semester.

Recommended Electives: Music 223, 224, 230, 303, 304, 311, 325, 360, 403, 460, and 488.

Courses that count in the MUSI major quality point average (MQPA):

All courses with "MUSI" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Music Degree in Music Education leading to K-12 certification (MUSE)

The Pennsylvania Department of Education recognizes this major as an approved program for meeting the requirements of the Instructional I (Provisional) teaching certificate. For teacher certification requirements, see the Department of Education section.

Music Core (54 hours):

Major Field Requirements (33 hours):

Music 103, 104, 105, 106, 107, 108, 203, 204, 205, 206, 207, 208, 217, 218, 221, 307, 331, 332, and 476; Music 317 or 318.

Applied Music Requirements (10 hours): Students must complete eight (8) semesters of one-credit private lessons and two (2) semesters of one-credit group music classes.

Ensemble (11 hours): Over the four years, students must participate for at least one complete year in each of three ensembles: Music 101 Band, 102 Choir, and 103 Orchestra.

Recital Attendance Requirement: Students must register for Music 199 each semester, which requires attendance at a predetermined number of faculty, senior and student recitals per semester.

Professional Education Requirements (41 hours): Education 103, 201, 202, 203, 303, 311, 312, 371, 372, 373, 435, 437, and 488.

Courses that count in the MUSE major quality point average (MQPA):

All courses with "MUSI" and "EDUC" prefix. A minimum MQPA of 2.00 is required to graduate.

It is strongly recommended that students in this major take the piano and/or voice proficiency test.

Course Requirements for Bachelor of Music Degree in Music/Business (MUSB)

Music Core (54 hours):

Major Field Requirements (33 hours):

Music 103, 104, 105, 106, 107, 108, 203, 204, 205, 206, 207, 208, 217, 218, 221, 307, 331, 332, and 476; Music 317 or 318.

Applied Music Requirements (10 hours): Students must complete eight (8) semesters of one-credit private lessons and two (2) semesters of one-credit group music classes.

Ensemble (11 hours): Over the four years, students must participate for at least one complete year in each of three ensembles: Music 101 Band, 102 Choir, and 103 Orchestra.

Recital Attendance Requirement: Students must register for Music 199 each semester, which requires attendance at a predetermined number of faculty, senior and student recitals per semester.

Business Requirements (24 hours):

Business 203, 204, 207, 301, and 303;

Accounting 201 and 202; Economics 101.

Courses that count in the MUSB major quality point average (MQPA):

All courses with "MUSI," "ACCT," "BUSA," and "ECON" prefixes, excluding BUSA 205 and 206. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Music Degree in Music/Performing Arts (MUSP)

Music Core (54 hours):

Major Field Requirements (33 hours):

Music 103, 104, 105, 106, 107, 108, 203, 204, 205, 206, 207, 208, 217, 218, 221, 307, 331, 332, and 476; Music 317 or 318.

Applied Music Requirements (10 hours): Students must complete eight (8) semesters of one-credit private lessons and two (2) semesters of one-credit group music classes.

Ensemble (11 hours): Over the four years, students must participate for at least one complete year in each of three ensembles: Music 101 Band, 102 Choir, and 103 Orchestra.

Recital Attendance Requirement: Students must register for Music 199 each semester, which requires attendance at a predetermined number of faculty, senior and student recitals per semester.

Performing Arts Requirements (24 hours): Art 101; Communication 104, 235, 245, 251, 259, 261, and 300; one course from Communication 277 or 378.

Courses that count in the MUSP major quality point average (MQPA):

All courses with "MUSI," "ART," and "COMM" prefixes. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Music Degree in Music/Religion (MUSR)

Music Core (54 hours):

Major Field Requirements (33 hours):

Music 103, 104, 105, 106, 107, 108, 203, 204, 205, 206, 207, 208, 217, 218, 221, 307, 331, 332, and 476; Music 317 or 318.

Applied Music Requirements (10 hours): Students must complete eight (8) semesters of one-credit private lessons and two (2) semesters of one-credit group music classes.

Ensemble (11 hours): Over the four years, students must participate for at least one complete year in each of three ensembles: Music 101 Band, 102 Choir, and 103 Orchestra.

Recital Attendance Requirement: Students must register for Music 199 each semester, which requires attendance at a predetermined number of faculty, senior and student recitals per semester.

Religion Requirements (23 hours):

Music 325; Religion 211, 212, 216, and 246.

One course from Religion 221, 232, 237, or 351.

One course from Religion 261, 341, 342, or 362.

One course from Religion 247, 251, 320, or 330.

Courses that count in the MUSR major quality point average (MQPA):

All courses with "MUSI" and "RELI" prefixes. A minimum MQPA of 2.00 is required to graduate.

Students are expected to contact their advisors for a recommended sequence of courses for the music majors.

Applied Music

Private lessons are offered in piano, organ, voice, strings, brass, woodwinds, guitar, harp, and percussion.

Piano classes offer group instruction in a piano lab to develop skills in playing solo literature, accompaniment, harmonization, and transposition. Classes are available at various levels of proficiency.

Voice classes offering group instruction in the techniques of voice production are available at beginning and intermediate levels.

Guitar classes are available at beginning and intermediate levels.

Ensemble

Credit may be earned for membership in performing organizations during each semester. Ensembles offered for credit include Band, Chapel Choir, and Orchestra. Other ensembles are available on a non-credit basis.

The Music Department has designated courses within the Bachelor of Music degree as Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL). These courses provide the necessary skills that will be needed by a professional music educator, performer, conductor, composer, or scholar. Music 203, 204, and 208 are designated as SI courses. They provide the music student with skills necessary to speak in front of an audience as part of a performance and to deliver oral presentations in the music content area. Music 331 and 332 are designated as IL and WI courses. They provide the music student with an introduction to music research skills encompassing use of musical scores, recordings, traditional library sources and Internet use. Implementing the IL and WI skills pro-

vides the necessary skills used in all areas of the music profession. Music 221 is also an IL course. This music technology course provides the student with MIDI experience, sound technology, and information access through the Internet.

Course Requirements for a minor in Studio Art (18-19 hours)

Art Core Courses:

Art 101, 103, 112, 122, 201, and 202 (14 hours).

Art Electives:

Two courses from Art 106, 205, 207 or COMM 245 (4-5 hours).

MUSIC (MUSI)

MUSI 100. BAND. Fall Semester: The college marching band begins its year with band camp one week before classes begin in the fall. The band performs at home football games, selected away football games, and high school band festivals. **Spring Semester:** The symphonic band performs all styles of concert literature and performs two concerts during the semester. *Semester course, one hour.*

MUSI 101. CHOIR. College chapel choir members prepare, study, and present choral literature. The choir performs at Sunday vesper services as well as a concert each semester.
Semester course, one hour.

MUSI 102. ORCHESTRA. The college orchestra performs a repertoire of classical as well as modern music. The orchestra performs one concert during the fall semester and two during the spring semester. *Semester course, one hour.*

MUSI 103. BASIC MUSIC. An introduction to harmony, including elements of theory, melody writing, and writing basic four-part harmony. This course includes the opportunity to use computer applications pertinent to the teaching of public school music. *Fall semester only, three hours.*

MUSI 104. FIRST YEAR HARMONY. A beginning course in basic harmony relations, including the theoretical study of harmony. Prerequisite: Music 103. *Spring semester only, two hours.*

MUSI 105. SOLFEGGIO I. An aural skills and sightsinging class including melodic dictation, interval recognition, and chord identification. *Fall semester only, one hour.*

MUSI 106. SOLFEGGIO II. A continuation of Music 105, including all intervals, melodic dictation with large leaps, melodic and harmonic error detection, and chord identification including I, ii, iii, IV, V, and vi triads. Prerequisite: Music 105. *Spring semester only, one hour.*

MUSI 107. BRASS METHODS. Class instruction in the brass instruments with emphasis on development of the instrumental program in the schools. *Fall semester only, one hour.*

MUSI 108. PERCUSSION METHODS. Class instruction in percussion instruments with emphasis on development of the program in the schools. *Spring semester only, one hour.*

MUSI 111. PIANO CLASS. This course seeks to give the non-music major an introduction to basic keyboard skills and musicianship with emphasis upon playing the piano for pleasure. The classes progress from beginning through intermediate. *Fall-Spring, one hour each semester.*

MUSI 114. GROVE CITY COLLEGE WIND ENSEMBLE. The Wind Ensemble is a select group of instrumental music students. This 45 member ensemble performs music of an academic nature including contemporary, classical, and standard wind literature. Enrollment is open to students of all majors by audition. *Semester course, zero hours.*

MUSI 115. GROVE CITY COLLEGE CHAMBER ORCHESTRA. The Chamber Orchestra is a select group of string majors and other qualified students who must audition to join. This ensemble performs more challenging works than those chosen for the string orchestra. The group presents music in each orchestra concert and other selected performances during the academic year.
Semester course, zero hours.

MUSI 116. GROVE CITY COLLEGE TOURING CHOIR. The Touring Choir is comprised of selected vocalists who are committed to striving for excellence in the choral art. The choir sings for campus events, area churches, and takes a ten-day tour during Easter break. Auditions are held at the beginning of the fall semester. *Semester course, zero hours.*

MUSI 117. GROVE CITY COLLEGE JAZZ ENSEMBLE. The Jazz Ensemble is a highly advanced instrumental performing group. This group performs advanced Jazz literature that includes Swing, Bebop, Latin, Fusion, and other of the more modern styles of Jazz literature. Musicians are selected for this group by invitation and/or an audition process and typically required to have been in the Stage Band for at least one year. Improvisational and advanced computing skills are highly desirable for the membership of this ensemble. The Jazz Ensemble typically performs medium-advanced to very-advanced Jazz literature and performs three college concerts per year as well as at some off-campus events. *Semester course, zero hours.*

MUSI 118. GROVE CITY COLLEGE STAGE BAND. The Stage Band is an advanced instrumental performing group. This group performs Jazz literature that focuses primarily on "classic" Jazz Swing (from the 30s and 40s) and Broadway-style, "Show Tune" literature. Musicians are selected for this group by an open-audition process that happens during the 1st and 2nd week of the 1st semester of each college calendar year. While improvisational skills are not necessary for the instrumentalists of this group, they are encouraged. The Stage Band typically performs medium to advanced Jazz literature and performs three college concerts per year. *Semester course, zero hours.*

MUSI 121. PIANO PROFICIENCY CLASS. This is a course of study to prepare music education majors to meet the keyboard standards for successful classroom teaching. The class studies piano repertoire as well as elements of the Piano Proficiency Exam. *Fall-Spring, one hour each semester.*

MUSI 125. INTERMEDIATE PIANO CLASS. This course seeks to give non-music majors, with some degree of previous piano training, continued instruction in the fundamentals of keyboard playing. *Fall-Spring, one hour each semester.*

MUSI 131. ORGAN CLASS. This course is for music as well as non-music majors interested in the organ and its literature. The course also studies the history and design of the organ as well as acoustics and liturgical architecture. *Fall-Spring, one hour each semester.*

MUSI 135. GUITAR CLASS I. This is an introductory course designed to provide the student with a means of self-expression through playing the guitar. *Fall-Spring, one hour each semester.*

MUSI 137. GUITAR CLASS II. This course is for the student who has a basic knowledge of the guitar. This course includes teaching correct methods for learning flamenco techniques, aural and visual analysis, and performance harmonizing. *Fall-Spring, one hour each semester.*

MUSI 141. BEGINNING VOICE CLASS. This course teaches vocal production and song presentation. Individuals demonstrate and perform for class members. *Fall semester only, one hour.*

MUSI 144. INTERMEDIATE VOICE CLASS. This course teaches vocal production and song presentation for students with previous experience. Individuals demonstrate and perform for class members. *Spring semester only, one hour.*

MUSI 151-152. PRIVATE PIANO LESSON. This course consists of one-half hour for one credit (151) or one full hour for two credits (152) of individual instruction at the piano. The level of repertoire will depend upon the technical and musical abilities of the student. *Semester course, one or two hours.*

MUSI 155-156. PRIVATE ORGAN LESSON. This course consists of one-half hour for one credit (155) or one full hour for two credits (156) of individual instruction at the organ. The student will study literature appropriate to the organ and also work on technical development. *Semester course, one or two hours.*

MUSI 161-162. PRIVATE VOICE LESSON. This course consists of one-half hour for one credit (161) or one full hour for two credits (162) of private instruction in voice. Vocal production, language training, and performance skills for the individual singer are taught. *Semester course, one or two hours.*

MUSI 163-164. PRIVATE STRING LESSON - CELLO. This course consists of one-half hour for one credit (163) or one full hour for two credits (164) of individual instruction on the cello. Students will improve technical skill as well as become familiar with string literature for the appropriate instrument. *Semester course, one or two hours.*

MUSI 165-166. PRIVATE STRING LESSON - VIOLIN/VIOLA. This course consists of one-half hour for one credit (165) or one full hour for two credits (166) of individual instruction on the violin or viola. Students will improve technical skill as well as become familiar with string literature for the appropriate instrument. *Semester course, one or two hours.*

MUSI 167-168. PRIVATE BRASS LESSON - FRENCH HORN. This course consists of one-half hour for one credit (167) or one full hour for two credits (168) of individual instruction on French horn. Included in the instruction are techniques for developing embouchure; fingerings and their alternates; and solo repertoire for the French horn. *Semester course, one or two hours.*

MUSI 169-170. PRIVATE BRASS LESSON - TROMBONE. This course consists of one-half hour for one credit (169) or one full hour for two credits (170) of individual instruction on the trombone for the student to develop proficiency on the trombone, with special emphasis on slide positions, embouchure, trigger fingerings, and appropriate repertoire. *Semester course, one or two hours.*

MUSI 171-172. PRIVATE BRASS LESSON - TRUMPET. This course consists of one-half hour for one credit (171) or one full hour for two credits (172) of individual instruction on the trumpet. The student will become familiar with solo repertoire as well as fingerings and their alternates, tone quality, embouchure, and breathing techniques. *Semester course, one or two hours.*

MUSI 173-174. PRIVATE BRASS LESSON - BARITONE/TUBA. This course consists of one-half hour for one credit (173) or one full hour for two credits (174) of individual instruction for the student to develop proficiency on one of the lower brass instruments: baritone/euphonium or tuba. Playing techniques; fingerings and their alternates; tone quality; embouchure; and a variety of appropriate literature for the instrument will be presented. *Semester course, one or two hours.*

MUSI 175-176. PRIVATE BASSOON LESSON. This course consists of one-half hour for one credit (175) or one full hour for two credits (176) of individual instruction on the bassoon to gain mastery of the techniques of performance. The student will become familiar with fingerings, embouchure, reed making, and bassoon literature. *Semester course, one or two hours.*

MUSI 177-178. PRIVATE CLARINET/SAXOPHONE LESSON. This course consists of one-half hour for one credit (177) or one full hour for two credits (178) of individual instruction on the clarinet or saxophone. The student will gain mastery of the basic techniques of performance including literature, intonation, hand position, articulation, fingerings, and embouchure. *Semester course, one or two hours.*

MUSI 179-180. PRIVATE OBOE/ENGLISH HORN LESSON. This course consists of one-half hour for one credit (179) or one full hour for two credits (180) of individual instruction to gain mastery of the techniques of performance on the oboe or English horn. The student will become familiar with uniqueness of each instrument including fingerings, embouchure, reed making and literature. *Semester course, one or two hours.*

MUSI 181-182. PRIVATE PERCUSSION LESSON. This course consists of one-half hour for one credit (181) or one full hour for two credits (182) of individual instruction on all of the percussion instruments. The course teaches playing techniques, fundamentals of each instrument, and literature. *Semester course, one or two hours.*

MUSI 183-184. PRIVATE FLUTE LESSON. This course consists of one-half hour for one credit (183) or one full hour for two credits (184) of individual instruction for the student who is interested in developing knowledge of flute literature; technique; tone quality and vibrato; fingerings; and embouchure. *Semester course, one or two hours.*

MUSI 185-186. PRIVATE GUITAR LESSON. This course consists of one-half hour for one credit (185) or one full hour for two credits (186) of individual instruction for the student wishing to concentrate on techniques and fundamentals of guitar playing. Instruction is given on chords, harmonic structure, scales, and literature. *Semester course, one or two hours.*

MUSI 187-188. PRIVATE HARP LESSON. This course consists of one-half hour for one credit (187) or one full hour for two credits (188) of individual instruction at the harp. *Semester course, one or two hours.*

MUSI 189-190. PRIVATE STRING LESSON - BASS. This course consists of one-half hour for one credit (189) or one full hour for two credits (190) of individual instruction on the string bass. Students will improve technical skill as well as become familiar with string literature for the appropriate instrument. *Semester course, one or two hours.*

MUSI 199. MUSIC RECITAL ATTENDANCE. Students fulfill this requirement by attending a predetermined number of faculty, senior and student recitals each semester. Students majoring in music must register for this course each semester. The student's academic advisor will monitor compliance with this requirement. *Semester course, zero hours.*

MUSI 203. SECOND YEAR HARMONY/FORM AND ANALYSIS I. This course covers topics in late Renaissance Polyphony, 18th century counterpoint, fugue, variation technique, sonata form, and rondo form. In addition the elements of chromatic harmony are studied including borrowed chords, neapolitan sixth chords, and augmented sixth chords. This course meets the Speaking Intensive (SI) requirement for music majors. Prerequisite: Music 103 and 104. *Fall semester only, two hours.*

MUSI 204. SECOND YEAR HARMONY/FORM AND ANALYSIS II. This course covers topics in analysis from the Romantic period, Post-Romantic, Impressionistic, and other related styles. Analysis of the major styles of twentieth century music is also included. Other elements of chromatic harmony are developed including extended harmony, chromatic mediants. Set theory and serialism are also studied. This course meets the Speaking Intensive (SI) requirement for music majors. Prerequisite: Music 203. *Spring semester only, two hours.*

MUSI 205. SOLFEGGIO III. A continuation of Music 106, including harmonic intervals, chord cluster identification, modes, 7th chords, harmonic dictation, and chord identification including inversions. Prerequisites: Music 105 and 106. *Fall semester only, two hours.*

MUSI 206. SOLFEGGIO IV. A continuation of Music 205, including compound intervals, melodic dictation with modulating melodies, and chord identification with all seventh chords and secondary dominants. Prerequisite: Music 205. *Spring semester only, two hours.*

MUSI 207. WOODWIND METHODS. Class instruction in the woodwind instruments with emphasis on the development of the instrumental program in the schools. *Fall semester only, one hour.*

MUSI 208. INSTRUMENTAL PROFICIENCY. Class instruction and review of the brass, woodwind, and percussion instruments with emphasis on repertoire for the development of instrumental programs for the younger student. This course meets the Speaking Intensive (SI) requirement for music majors. Prerequisites: Music 107, 108, and 207. *Spring semester only, one hour.*

MUSI 217. BEGINNING CHORAL CONDUCTING. Techniques of choral conducting with practice in conducting a chorus. *Fall semester only, one hour.*

MUSI 218. BEGINNING INSTRUMENTAL CONDUCTING. Principles and techniques of instrumental conducting, including score reading; characteristics of orchestral and band instruments; and practice in conducting an ensemble. *Spring semester only, one hour.*

MUSI 221. MUSIC TECHNOLOGY. This class will encompass three areas of computer knowledge: computer basics, basic fundamentals of electronic production of music with MIDI (Musical Instrument Digital Interface), and the software needed. Also included will be the instruction of sound principles and acoustics. This course meets the Information Literacy (IL) requirement for music majors. *Semester course, two hours.*

MUSI 223. OPERA WORKSHOP. This course will introduce the student to selected scenes from operas. There will be a focus on scene analysis and character development within the context of an operatic role. Class will encourage singers to integrate the vocal and physical connection of theater with language and music. Course may be repeated. *Semester course, one hour.*

MUSI 224. KEYBOARD TECHNIQUES. Group study of matters common to all keyboard musicians, including practice procedures, accompanying, recital preparation, teaching materials, and methods. *Offered alternate years, Spring semester only, one hour.*

MUSI 230. 20th CENTURY JAZZ HISTORY. A study of the literature and culture of jazz music and jazz musicians throughout the 20th and 21st centuries. The focus of the course will be about the people, history, and compositions related to genre of jazz. Although a background in music is helpful to have for this class, it is not required. *Spring semester only, two hours.*

MUSI 260. INDEPENDENT STUDY. Individual study of specialized topics in Music. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

MUSI 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Music. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

MUSI 302. LITERATURE OF MUSIC. A non-technical survey of the great musical compositions of Western civilization by way of classroom listening. Recommended for non-music majors. *Fall semester only, two hours.*

MUSI 303. COUNTERPOINT. A study of contrapuntal style and practices of Palestrina and other masters of the sixteenth century; compositions of modal counterpoint in two, three and four parts. Prerequisite: Music 203 or 204. *Offered alternate years, Spring semester only, one hour.*

MUSI 304. INSTRUMENTATION. A study of the range, tonal and technical characteristics of the brass, reed, string and percussion choirs, progressing from the scoring for small ensembles through scoring for full band and orchestra. *Offered alternate years, semester course, two hours.*

MUSI 307. STRING METHODS. Class instruction in the string instruments of the orchestra; methods of instruction for younger orchestra, with emphasis on the principles of tone production, intonation, bowing, and phrasing. *Semester course, one hour.*

MUSI 311. KEYBOARD HARMONY. An elective course in harmonic practice at the keyboard. Prerequisite: Music 204. *Offered alternate years, Fall semester only, one hour.*

MUSI 317. ADVANCED CHORAL CONDUCTING. A course for students desiring further experience in conducting advanced choral material. This course meets the Speaking Intensive requirement for music majors. Prerequisite: Music 217. *Spring semester only, two hours.*

MUSI 318. ADVANCED INSTRUMENTAL CONDUCTING. A course for students desiring further experience in conducting advanced instrumental material. Prerequisite: Music 218. *Fall semester only, two hours.*

MUSI 325. CHURCH MUSIC. A practical study of the skills and resources needed for developing and maintaining a current church music program. *Spring semester only, two hours.*

MUSI 331. MUSIC HISTORY I. A survey of music in Western civilization from ancient Greece to 1750. This course, along with Music 221 and 332, meets the Writing Intensive (WI) and Information Literacy (IL) requirements for music majors. Prerequisite: Humanities 301. *Fall semester only, three hours.*

MUSI 332. MUSIC HISTORY II. A survey of music in Western civilization from 1750 to the present. This course, along with Music 221 and 331, meets the Writing Intensive (WI) and Information Literacy (IL) requirements for music majors. Prerequisite: Humanities 301. *Spring semester only, three hours.*

MUSI 360. INDEPENDENT STUDY. Advanced study in an area of music not available through regular course offerings. Prerequisite: Sophomore status or higher and permission of the department chair. *Semester course, one, two or three hours.*

MUSI 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Music. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

MUSI 403. COMPOSITION. An elective course in music composition. Prerequisite: Music 204. *Fall semester only, two hours.*

MUSI 460. INDEPENDENT STUDY. Advanced study in an area of music not available through regular course offerings. Prerequisite: Junior status or higher and permission of the department chair. *Semester course, one, two or three hours.*

MUSI 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Music. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

MUSI 476. SENIOR MUSIC RECITAL. The senior recital is the culmination of study in an area(s) of applied performance. The recitalist demonstrates knowledge of the technique, repertoire, and stylistic interpretation that has been acquired in the applied area(s) during the previous semesters of study. The senior recital is a public performance. *Semester course, one hour.*

MUSI 477. PIANO PROFICIENCY EXAM. The Piano Proficiency Exam is a performance-playing exam given to music majors before a faculty committee. Included in the exam are harmonization of simple melody lines; transpositions; major and minor scales; and sight-reading. A student may pass all or part of the exam. Students may enroll in Piano Proficiency Class to prepare for the piano proficiency exam. *Semester course, zero hours.*

MUSI 478. VOICE PROFICIENCY EXAM. The Voice Proficiency Exam is a performance-singing exam given to music majors before a faculty committee. Included in the exam are an evaluation of vocal production, the singing of major and minor scales, and sight singing. A student may pass all or part of the exam. Students may enroll in Beginning and/or Intermediate Voice Class to prepare for the voice proficiency exam. *Semester course, zero hours.*

MUSI 488. SEMINAR IN MUSIC. Available only by permission of the department and the instructor involved. *Semester course, one, two or three hours.*

MUSI 499. HONORS IN MUSIC. A course beyond the regular requirements for the music major. Available only to students with senior status and on an individual basis. *Semester course, one hour.*

FINE ARTS (ART)

ART 101. DRAWING AND PAINTING. An introduction to a variety of media, including pencil, charcoal, watercolor, and acrylic painting. *Semester course, two hours.*

ART 103. CERAMICS. A studio course, which introduces students to slab, coil, and wheel-thrown pottery. An additional fee is charged for this course. *Semester course, two hours.*

ART 106. ELEMENTS OF DESIGN. A study of design and its applications in our environment. Design principles and color theory are explored through the creation of both two and three-dimensional projects. *Spring semester only, two hours.*

ART 111-112. SCULPTURE. A course presenting both the historical and contemporary techniques of sculpture and a study of materials that will include clay, wood, stone, and plaster. The student will explore various techniques in modeling, carving, and casting. An additional fee is charged for this course. *Semester course, 111 is one hour and 112 is two hours.*

ART 121-122. PRINT MAKING. Introduces the areas of entaglio, drypoint, etching on copper and zinc plates, woodcuts, and silkscreen process. Methods will include introduction to inks, rollers, silk, wood, and metals as applied by manual methods and the use of the printing press. An additional fee is charged for this course. *Semester course, 121 is one hour and 122 is two hours.*

ART 201. HISTORY AND APPRECIATION OF ART I. A survey of the visual arts (including painting, architecture, and sculpture) from prehistory through the High Renaissance, studied through illustrated lectures, readings, and class discussions. Students may take either Art 201 or 202 or both, and may take them in any order. Prerequisite: Humanities 301. *Fall semester only, three hours.*

ART 202. HISTORY AND APPRECIATION OF ART II. A survey of the visual arts (including painting, architecture, and sculpture) from Mannerism through the Twentieth Century, studied through illustrated lectures, readings, and class discussions. Students may take either Art 201 or 202 or both, and may take them in any order. Prerequisite: Humanities 301. *Spring semester only, three hours.*

ART 205. ADVANCED DRAWING AND PAINTING. A continuation of study in the areas of drawing and painting media. Prerequisite: Art 101. *Semester course, two hours.*

ART 207. ADVANCED CERAMICS. This course is a continuation of the beginning ceramics class. An additional fee is charged for this course. Prerequisite: Art 103 and permission of instructor. *Semester course, two hours.*

ART 260. INDEPENDENT STUDY. Individual study of specialized topics in Art. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ART 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Art. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ART 290. STUDIES IN FINE ARTS. Typically offered during May Intersession, this travel course features the culture, music, and art of selected areas of Western Europe and is given as credit for those taking the travel interim who have already received credit for Humanities 301: Civilization and the Arts. Course content includes viewing assigned pre-trip documentaries, attending all trip lectures and visits, completing assigned readings, and keeping a directed journal. Trip fees apply. *Intersession course, three hours.*

ART 360. INDEPENDENT STUDY. Advanced study in an area of art not available through regular course offerings. An independent study form is required to register for this class. An additional fee is charged for this course. Prerequisite: Sophomore status or higher and permission of the department chair. *Semester course, one, two or three hours.*

ART 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Art. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ART 460. INDEPENDENT STUDY. Advanced study in an area of art not available through regular course offerings. An independent study form is required to register for this class. An additional fee is charged for this course. Prerequisite: Junior status or higher and permission of the department chair. *Semester course, one, two or three hours.*

ART 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Art. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ART 488. SEMINAR IN ART. Available only by pre-approved permission of the department chair and the instructor involved. An additional fee is charged for this course. *Semester course, one, two or three hours.*

DEPARTMENT OF PHILOSOPHY

Dr. Spradley, Chair; Mr. DiQuattro, Dr. R. Trammell.

Course Requirements for Bachelor of Arts Degree in Philosophy (PHIL) (30 hours)

Core Requirements: (24 hours)

Philosophy 161, 191, 201, 334, 339, and 380.

Choose one course from: Philosophy 336 or 371.

Choose one course from: Philosophy 361 or 362.

Major Electives: (6 hours) Choose two courses from:

Philosophy 211, 243, 251, 255, 271, 290, 310, 311, 312, 340, 390, Political Science 255, 256, Psychology 220, 320, or Religion 261.

Courses that count in the PHIL major quality point average (MQPA):

All courses with "PHIL" prefix, POLS 255, POLS 256, PSYC 220, PSYC 320, and RELI 261. A minimum MQPA of 2.00 is required to graduate.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

Developing information literacy and writing skills in the study of Philosophy involves gaining proficiency in doing research in great philosophical thinkers and ideas sufficient for the writing of clear, well-supported research and critical analysis papers in the major. To this end, the required course Philosophy 334 Plato and Aristotle will be used as a Writing Intensive and Information Literacy course. Professional speaking skills are also essential in preparing Philosophy students for graduate school and/or a career, and Philosophy 339 Modern Philosophy or Philosophy 371 20th Century Philosophy provide instruction as Speaking Intensive courses.

Course Requirements for a minor in Philosophy (18 hours)

A minor in Philosophy will consist of any eighteen hours of Philosophy courses. A maximum of three credits of independent study in Philosophy may count toward the minor.

Course Requirements for a minor in Political Philosophy and Theology (18 hours)

This minor will focus on topics in political philosophy and theology. The broadest issues explore what is the good society, the good person, and the good life, as well as issues concerning justice and political ethics. These issues quickly lead to a myriad of sub issues, among them our views of human nature, personal freedom, the meaning of life, and what defines a good government.

Core Requirements (12 hours):

Philosophy 310; Political Science 255, 256; and Religion 220.

Elective Requirements (6 hours):

Two courses from: Philosophy 191, 362, 380; Political Science 206, 350, or 354.

PHILOSOPHY (PHIL)

PHIL 161. INTRODUCTION TO PHILOSOPHY. A course designed to acquaint the student with the various fields and problems of philosophy. Primary sources are used.
Semester course, three hours.

PHIL 191. INTRODUCTION TO ETHICS. A study of moral theory and the insight of principal figures whose ideas have shaped ethical understanding. The course begins with Plato and concludes with contemporary twentieth century ethicists. Primary sources are used.
Semester course, three hours.

PHIL 201. SYMBOLIC LOGIC. A study of formal deductive logic with emphasis on testing arguments for validity and translating English statements into symbolic notation. Truth tables, tautologies, contradictions, quantifiers, relations, and identity are included. *Semester course, three hours.*

PHIL 211. GENERAL LOGIC. A study of reasoning in a variety of contexts. Attention is given to both inductive and deductive arguments. Many kinds of fallacies are studied as well as traditional syllogisms and logical puzzles. Diagramming techniques are developed.
Semester course, three hours.

PHIL 243. FOUNDATIONS OF SCIENCE. This course may include such issues as the nature of scientific theories, the nature of scientific explanation and causality, the justification of scientific beliefs, and how to understand scientific revolutions. Some attention may be given to the relationship between science and either metaphysics or religion. Prerequisite: Humanities 201.
Offered alternate years, semester course, two or three hours.

PHIL 251. DEFENDING THE FAITH. This course will investigate evidential, presupposition, postmodern, and other approaches to apologetics. The emphasis will be on the epistemological stance one should take in apologetic encounters. A portion of this course will focus on responses to various objections and concerns that one is likely to face in apologetic encounters. Prerequisite: Humanities 201.
Semester course, three hours.

PHIL 255. LANGUAGE, MIND, AND REALITY. The course is concerned with the semantics (meaning, truth, and reference) of natural languages and the semantic connections of language with the mind and external reality. What are concepts and how they are formed may also be considered.
Offered alternate years, semester course, three hours.

PHIL 260. INDEPENDENT STUDY. Individual study of specialized topics in Philosophy. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

PHIL 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Philosophy. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHIL 271. BIO-MEDICAL ETHICS. An introduction to the ethical issues arising in the field of biomedicine. Topics covered include issues such as abortion, eugenics, euthanasia, organ transplantation, behavior control, the right of a patient to refuse treatment, etc. Sophomore, junior, or senior standing.
Semester course, three hours.

PHIL 290. STUDIES IN PHILOSOPHY. The subject matter for this course will vary each semester to allow for the introduction of new courses in the field of philosophy.
Semester course, three hours.

PHIL 310. POLITICAL PHILOSOPHY AND THEOLOGY. This course will focus on topics in political philosophy and theology. The broadest issues are such things as what is the good society, a good person, and a good life, as well as issues of justice and political ethics. Each of these issues lead to a myriad of sub issues, among them our views of human nature, how much freedom do we give people, the meaning of life, and what is a good government. *Semester course, three hours.*

PHIL 311. METAPHYSICS. Metaphysics examines such basic questions as "What is real?" "What is the nature of basic reality?" and "What is the nature of human beings?" This course will examine some influential discussions of metaphysics arising from these basic questions. Some topics we may discuss include the nature of identity, the relationship between mind and body, free will, and other topics that arise in answering basic metaphysical questions. *Semester course, three hours.*

PHIL 312. EPISTEMOLOGY. Epistemology is the study of the nature and limits of human knowledge, understanding and rationality. Questions covered in this course may include "What is knowledge" "What gives a person a good reason for his/her beliefs?" "What are the limits of human understanding and rationality?" and "What does it mean to achieve excellence in intellectual pursuits?" *Semester course, three hours.*

PHIL 334. PLATO AND ARISTOTLE. A survey of Western philosophy from the early Greeks through Aristotle. Special attention will be given to the philosophies of Aristotle and Plato. Primary sources are used. This course fulfills the Writing Intensive (WI) and Information Literacy (IL) requirement for the Philosophy major. *Offered alternate years, semester course, three hours.*

PHIL 336. AUGUSTINE AND AQUINAS. A study of the thought of prominent philosophers from St. Augustine to Ockham. Primary sources are used. *Offered alternate years, semester course, three hours.*

PHIL 339. MODERN PHILOSOPHY. A survey of Western philosophy from Descartes through Kant. Primary sources are used. This course is one choice that fulfills the Speaking Intensive (SI) requirement for the philosophy major. *Offered alternate years, semester course, three hours.*

PHIL 340. PHILOSOPHY OF LAW. This course commonly examines such topics as the nature of law, the relationship of law to morality, the problem of judicial interpretation, justice, and rights. *Offered alternate years, semester course, three hours.*

PHIL 360. INDEPENDENT STUDY. An opportunity for sophomore and junior students with previous background in philosophy to do intensive independent study of specialized topics. Prerequisite: consent of the department. *Semester course, one, two, or three hours.*

PHIL 361. FAITH AND THE LIBERAL ARTS. The central focus of this course is a study of the relationship between what we learn in the liberal arts and what we learn from scripture focusing specifically on the relation between Christian theology and science and Christian theology and philosophy, although other disciplines may also be considered. *Semester course, three hours.*

PHIL 362. PHILOSOPHY OF RELIGION. This courses addresses issues in theology where philosophical concepts or techniques may prove enlightening, or where theology casts light on the problems of philosophy, or where philosophical theories cast light on theological issues. *Offered alternate years, semester course, three hours.*

PHIL 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Philosophy. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHIL 371. TWENTIETH CENTURY PHILOSOPHY. A study of representative thinkers in twentieth century philosophy including key figures in the analytic and pragmatism movements. Primary sources are used. This course is one choice that fulfills the speaking Intensive (SI) requirement for the Philosophy major. Prerequisite: One course in philosophy or permission of the instructor. *Offered alternate years, semester course, three hours.*

PHIL 380. CURRENT PROBLEMS IN PHILOSOPHY. A study of contemporary issues in philosophy from a variety of fields. This course may be repeated, as topics covered vary per semester. Prerequisite: One course in philosophy or permission of the instructor. *Offered alternate years, semester course, three hours.*

PHIL 390. ADVANCED STUDIES IN PHILOSOPHY. The subject matter for this course will vary each semester to allow for the introduction of new courses in the field of philosophy. *Semester course, three hours.*

PHIL 460. INDEPENDENT STUDY. An opportunity for junior and senior students with previous background in philosophy to do intensive independent study of specialized topics. Prerequisite: Twelve hours of philosophy or consent of the department. *Semester course, three hours.*

PHIL 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Philosophy. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

DEPARTMENT OF PHYSICAL EDUCATION AND ATHLETICS

Dr. Lyle, Chair; Dr. Williams, Associate Chair; Mr. Chinn, Mr. Dreves, Mr. Fritz, Mrs. Fuss, Ms. Harris, Ms. Jacobs, Mrs. Lamie, Mr. Lamie, Mrs. Mitchell-Emigh, Ms. Roberts, Mr. Severson, Mr. Skaricich, Mr. C. Smith, Mr. Walters. Part-Time: Mrs. Gruber, Ms. Sherman. Staff: Mr. Briggs, Mr. Hawke.

The Department of Physical Education and Athletics and Grove City College believe that a Christian liberal arts college should teach the "whole individual," giving careful attention to the development of psychomotor (physical development), cognitive (basic reasoning), and the affective (social, emotional and spiritual) behavioral goals of the student regardless of his/her major.

In an attempt to realize this philosophy, the Department of Physical Education and Athletics and Grove City College present a balanced program that encompasses the many facets of physical education. The specific objectives of the program are to develop a heightened awareness of personal fitness and wellness, to develop neuromuscular skills, to cultivate an interest in recreation, and to encourage desirable social and moral standards.

The required Fitness and Wellness courses for both men and women are designed to give each incoming student an awareness of personal fitness and wellness. The evaluation process for each student is comprised of written examinations, skill tests, special projects, swimming evaluations, and fitness appraisals. The ultimate goal is to provide an opportunity for each student to develop a personal responsibility for his/her own lifestyle.

The program for upperclassmen is strictly on an elective basis with the major emphasis on lifetime carry-over activities. Offerings include: bowling, dance, tennis, ballroom dancing, racquetball, fitness/body conditioning, volleyball, aerobic conditioning, water fitness, and free weights. Red Cross training is also provided for Water Safety Instruction, First Aid/CPR, and Lifeguarding.

POLICIES GOVERNING THE PHYSICAL EDUCATION PROGRAM

All students are required to participate in the Grove City College Fitness and Wellness program by enrolling in Physical Education 101 (men) and Physical Education 111 (women) beginning in the first fall semester attended and continuing with Physical Education 102 (men) and Physical Education 112 (women) during the subsequent spring semester. Fitness and Wellness is a full-year course spread across two semesters, and all students must take the courses during a single academic year. Each class meets twice per week, for one credit hour of coursework per semester. Upon completion of the freshman requirement, a student may choose up to six additional hours of physical education courses with the "PHYE" prefix, but not more than one course per semester. Duplication of courses for credit is prohibited and the Department of Physical Education and Athletics reserves the right to cancel any course based on insufficient enrollment.

Transfer students may receive partial or full credit for Fitness and Wellness based on a comparison of course syllabi. The Department Chairman and Registrar will grant final

approval for all transfer courses. All transfer students will begin the Fitness and Wellness class in the first fall semester they attend, to ensure proper sequencing in the program, unless they have received credit for either Physical Education 101 or 111.

A medical examination is required of all students entering physical education classes. The results of this examination must be on file at the Zerbe Health Center. Students identified with physical limitations will be placed in classes to meet their individual needs.

MEN'S & WOMEN'S ATHLETICS

Director of Athletics: Dr. Donald L. Lyle
Associate Directors: Mr. Joseph Walters and Ms. Susan Roberts.

All students enrolled at Grove City College who meet the requirements of the National Collegiate Athletic Association (NCAA) are eligible to participate in any varsity sport. Varsity sports include: football, soccer, cross-country, basketball, swimming, softball, water polo, baseball, golf, track, and tennis. Grove City College is a member of the National Collegiate Athletic Association (NCAA), the Presidents' Athletic Conference (PAC), and the Eastern College Athletic Conference (ECAC).

Course Requirements for a Minor in Exercise Science (9 hours of prerequisites, 21 hours of required courses)

The Exercise Science minor curriculum has the potential to enrich the academic preparation of students pursuing majors in Biology, Chemistry, Education, and even Business majors with entrepreneurial aspirations in commercial or community-based health, fitness or athletics. The curriculum also provides an opportunity for students to expand on their experiences from Physical Education 102 or 112 Fitness and Wellness, in pursuit of health-related professions which require graduate studies, doctoral research and/or professional training.

Prerequisites (9 hours):

Physical Education 102 or 112; Biology 101 or Science 202; and Chemistry 101 or Science 203. All prerequisite courses must be completed before beginning any required course of the curriculum.

Required courses (21 hours):

Exercise Science 227, 251, 253, 254, 256, 304, 306, and 480.

One course from Psychology 203, Business 201, or Mathematics 231.

Elective course offerings (not required):

Exercise Science 223, 225, 228, 290, 305, and 404.

PHYSICAL EDUCATION (PHYE)

PHYE 101. FITNESS AND WELLNESS I - MEN. Students will be introduced to current concepts and trends of individual fitness and wellness. Each student will be exposed to the following concepts: cardiovascular disease, muscular strength & endurance, aerobic fitness, body composition, flexibility, nutrition, stress management, common injuries, dimensions of wellness, and behavior change modification. *Fall semester only, one hour.*

PHYE 102. FITNESS AND WELLNESS II- MEN. Students will participate in physical activity labs to promote a personal responsibility for ones health and wellness. Each student will complete a personal nutritional analysis in addition to a fitness appraisal targeting overall physical fitness, muscular strength, and flexibility. Prerequisite: Physical Education 101. *Spring semester only, one hour.*

PHYE 111. FITNESS AND WELLNESS I - WOMEN. Students will be introduced to current concepts and trends of individual fitness and wellness. Each student will be exposed to the following concepts: cardiovascular disease, muscular strength & endurance, aerobic fitness, body composition, flexibility, nutrition, stress management, common injuries, dimensions of wellness, and behavior change modification. *Fall semester only, one hour.*

PHYE 112. FITNESS AND WELLNESS II- WOMEN. Students will participate in physical activity labs to promote a personal responsibility for ones health and wellness. Each student will complete a personal nutritional analysis in addition to a fitness appraisal targeting overall physical fitness, muscular strength, and flexibility. Prerequisite: Physical Education 111. *Spring semester only, one hour.*

PHYE 201. RACQUETBALL. Two hours/week. Prerequisite: Physical Education 102 or 112. *Semester course, one hour.*

PHYE 205. FREE WEIGHTS. Two hours/week. Prerequisite: Physical Education 102 or 112. *Semester course, one hour.*

PHYE 207. BEGINNING BOWLING. Two hours/week. Prerequisite: Physical Education 102 or 112. *Semester course, one hour.*

PHYE 209. TENNIS. Two hours/week. Prerequisite: Physical Education 102 or 112. *Semester course, one hour.*

PHYE 210. BALLROOM DANCING. Two hours/week. This course explores the history, rhythm, steps and styles of the Foxtrot, Waltz, Tango, Cha Cha, Rumba and Swing. Students will learn the basic skills and information necessary to develop and continue one's interest in ballroom dancing, in addition to learning the fundamentals of lead/follow technique, dance etiquette, cooperation with a partner, and the ability to identify and distinguish music for each dance. Prerequisite: Physical Education 102 or 112. *Fall semester only, one hour.*

PHYE 211. BEGINNING DANCE. This course explores various movement disciplines including elements of Ballet, Jazz, Modern Dance, Folk Dance, Musical Theater, Lyrical and Hip Hop while investigating the history and cultural value of dance. No prior dance experience is necessary. Two hours/week. Prerequisite: Physical Education 102 or 112. *Fall semester only, one hour.*

PHYE 213. INTERMEDIATE DANCE. This course explores various movement disciplines including elements of Ballet, Jazz, Modern Dance, Musical Theater, Lyrical and Hip Hop while investigating the history and cultural value of dance. This course is more appropriate for the student with previous dance experience. Two hours per week. Prerequisite: Physical Education 102 or 112. *Fall semester only, one hour.*

PHYE 215. ADVANCED DANCE. Two hours/week. Prerequisite: Physical Education 102 or 112. *Fall semester only, one hour.*

PHYE 216. ADVANCED BALLROOM DANCING. This advanced level course continues the exploration of the rhythm, steps and styles of the Foxtrot, Waltz, Tango, Cha Cha, Rumba and Swing. Students will learn more advanced patterns and skills in these dances, in addition to learning the Viennese Waltz and advanced partnering in the Swing. Prerequisite: Physical Education 102, 112, and 210, or permission of the instructor. *Spring semester only, one hour.*

PHYE 217. VOLLEYBALL. Two hours/week. Prerequisite: Physical Education 102 or 112. *Semester course, one hour.*

PHYE 219. ADVANCED AEROBIC CONDITIONING. The purpose of this class is to introduce the student to a variety of aerobic conditioning programs to enhance their knowledge of an exercise program and enable the student to create their own Aerobic Conditioning program. Two hours/week. Prerequisite: Physical Education 102 or 112. *Fall semester only, one hour.*

PHYE 220. STRENGTH AND CONDITIONING. This class will allow students to experience different options for building muscular strength and aerobic conditioning outside of the weight room using plyometrics, agility drills, movement courses, body weight resistance, and functional training. Two hours/week. Prerequisite: Physical Education 102 or 112. *Spring semester, one hour.*

PHYE 221. FITNESS/BODY CONDITIONING. Two hours/week. Prerequisite: Physical Education 102 or 112. *Semester course, one hour.*

PHYE 260. INDEPENDENT STUDY. Individual study of specialized topics in Physical Education. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHYE 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Physical Education. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHYE 290. STUDIES IN PHYSICAL EDUCATION. A course that covers special topics related to athletics and physical education. *Semester course; one, two or three hours.*

EXERCISE SCIENCE (EXER)

EXER 223. RED CROSS LIFEGUARD TRAINING. An additional fee is charged for this course. Two and one-half hours/week. Prerequisite: Physical Education 102 or 112 and consent of the instructor. *Semester course, two hours.*

EXER 225. RED CROSS WATER SAFETY INSTRUCTOR. An additional fee is charged for this course. Two hours/week. Intermediate swimming level. Prerequisite: Physical Education 102 or 112 and consent of the instructor. *Semester course, two hours.*

EXER 227. RED CROSS FIRST AID - CPR. This course includes preparation and testing for the American Red Cross First Aid and CPR certification. The standardized curriculum includes basic first aid, emergency response, adult CPR and infant CPR. Two lectures per week. Prerequisite: Physical Education 102 or 112. *Semester course, one hour.*

EXER 228. PHYSICAL EDUCATION FOR ELEMENTARY EDUCATORS. Principles of physical education instruction for elementary education. One lecture per week. Prerequisite: Physical Education 102 or 112. *Spring semester only, one hour.*

EXER 251. BASIC PRINCIPLES OF ATHLETIC TRAINING. This course focuses on the care and prevention of athletic injuries, rehabilitation of athletic injuries and administrative duties relative to athletic training. Two lectures per week. Prerequisite: Physical Education 102 or 112. *Semester course, two hours.*

EXER 253. EXERCISE SCIENCE ANATOMY AND PHYSIOLOGY. A broad introductory course in human anatomy and physiology with emphasis on the integration of human systems during exercise. Topics include skeletal, muscular, nervous, digestive, endocrine, respiratory, circulatory and immune systems. Three lectures per week. Prerequisites: Physical Education 102 or 112, Biology 101 or Science 202, and Chemistry 101 or Science 203. Equivalent courses: Biology 311 or 312 (Human Anatomy and Physiology I or II) or Biology 429 (Pathophysiology). *Fall semester only, three hours.*

EXER 254. NUTRITION IN SPORTS AND EXERCISE. Using USDA recommendations, this course will explore nutritional strategies for all levels of physical activity and competitive sports. Emphasis will be placed on energy balance, substrate metabolism, hydration, ergogenic aids, nutritional supplementation, and banned substances. Three lectures per week. Prerequisite: Physical Education 102 or 112. *Spring semester only, three hours.*

EXER 256. PHYSIOLOGY OF EXERCISE. This course will survey the acute and chronic effects of exercise on human systems. Students will be introduced to the essentials of human movement, energy metabolism, cardiorespiratory function, and sport performance. Two lectures and one lab per week. Prerequisite: Exercise Science 253 or Biology 311, 312 or 429. *Spring semester only, three hours.*

EXER 260. INDEPENDENT STUDY. Individual study of specialized topics in Exercise Science. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

EXER 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Exercise Science. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

EXER 290. STUDIES IN EXERCISE SCIENCE. A course that covers special topics related to exercise science. *Semester course; one, two or three hours.*

EXER 304. FITNESS TESTING AND EXERCISE PRESCRIPTION. This course will cover non-invasive fitness testing and exercise prescription procedures for healthy and clinical populations. The course will follow the *American College of Sports Medicine Guidelines for Exercise Testing and Prescription*. Balance of lecture and lab. Prerequisites: Exercise Science 256 and Psychology 203. *Spring semester only, three hours.*

EXER 305. BASIC PRINCIPLES OF COACHING. This course will introduce the principles of coaching team and individual sports. The student will be able to identify and demonstrate the personal and professional qualities required to become an effective coach at any level. The student will be able to develop a basic philosophy regarding the ethical and logical decision-making processes involved in coaching sports. Prerequisite: Physical Education 102 or 112. *Semester course, two hours.*

EXER 306. EXERCISE LEADERSHIP. This course will cover the application of basic principles to instructor lead group exercise, such as step aerobics, Hi/Lo, and kickboxing. Two lectures per week. An extra fee of $50 is charged for this course. Prerequisite: Physical Education 102 or 112. *Semester course, one hour.*

EXER 360. INDEPENDENT STUDY. Individual study of specialized topics in Exercise Science. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

EXER 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Exercise Science. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

EXER 404. PROFESSIONAL CERTIFICATION. Instructor-guided preparation for a professional certification exam. There is an additional cost incurred by the student to register for the certification exam and purchase the required study material from the certifying organization. One lecture per week. Prerequisites: Exercise Science 304, 306, and Psychology 203. *Semester course, one hour.*

EXER 460. INDEPENDENT STUDY. Individual study of specialized topics in Exercise Science. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

EXER 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Exercise Science. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

EXER 480. INTERNSHIP. Students will earn academic credit for field experience in areas of applied Exercise Science, such as coaching, community fitness, and cardiac rehabilitation. Students will work under the supervision of a cooperating entity. Grade is dependent upon written evaluation by an on-site supervisor and the submission of the student's written report to the Department of Physical Education. Prerequisite: Exercise Science 256 and 304. *Summer or semester course, one hour.*

DEPARTMENT OF PHYSICS

Dr. Brower Chair; Dr. Fair, Dr. Gonzalez, Dr. Marsch, Dr. Wagner, Dr. Wolinski.

Course Requirements for Bachelor of Science Degree in Applied Physics (PHYA) (81 hours)

Physics Core (32 hours):
Physics 101, 102, 135, 210, 232, 234, 288, 303, 305, 321, and 431.

Physics Electives—choose 12 hours from:
Physics 304, 310, 340, 421, or 442.

Technical Core requirements (26 hours):
Mathematics 161, 162, 261, 262, 263, and Physics 242.
Chemistry 105.
Computer 141.

Technical Electives (11 hours):
Courses must be approved by the department.

Courses that count in the PHYA major quality point average (MQPA):

All courses with "PHYS" and "ASTR" prefixes. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Applied Physics major leading to (7-12) certification in Secondary Physics Education (PSED)

Physics Core (32 hours):
Physics 101, 102, 135, 210, 232, 234, 288, 303, 305, 321, and 431.

Physics Electives—choose 12 hours from:
Physics 304, 310, 340, 421, or 442.

Technical Core requirements (26 hours):
Mathematics 161, 162, 261, 262, 263, and Physics 242.
Chemistry 105.
Computer 141.

Technical Electives (6-8 hours):
Courses must be approved by the department.

Education Requirements (38 hours):
Education 103, 201, 202, 203, 303, 305, 309, 371, 431, 488.

Courses that count in the PSED certification quality point average (MQPA):

All courses with "PHYS" and "ASTR" prefixes. A minimum cumulative quality point average (CQPA) of 3.00 and MQPA of 2.75 is required to be certified.

Course Requirements for Bachelor of Science Degree in Applied Physics/Computer (PCMP)

Physics/Computer Core requirements (40 hours):
Physics 101, 102, 135, 232, 234, 242, 288, 303, 321, and 442.
Computer Science 141, 244, 252, and 342.

Technical Elective (3 hours):
Choose one of the following: Physics 304, 305, 421, or 431.

Technical Core requirements (24 hours):
Chemistry 105.
Mathematics 161, 162, 213, 261, 262, and 263.

Hardware or Software Option (21-22 hours):
Choose one of the following options:

Computer Software option:
Computer Science 220, 222, 340, 341, and 450.
Physics 210.
One of the following:
Electrical Engineering 204; Computer Science 480 or Physics 470 (limit 3 hours); Computer Science 314, 322, or any 400-level computer course; or Mathematics 222*.

Computer Hardware option:
Electrical Engineering 201, 202, 204, 206, 251, 252, 306, and 310.
One of the following:
Computer Science 220, 341, 450, 480; or Mathematics 222*.

Courses that count in the PCMP major quality point average (MQPA):
All courses with "PHYS," "ASTR," "COMP," and "ELEE" prefixes, MATH 222. A minimum MQPA of 2.00 is required to graduate.

** Students who elect Mathematics 222 will also receive a minor in Mathematics.*

Course Requirements for Physics/General Science Secondary Education Major leading to (7-12) certification (PGSE)

Physics Core (25 hours):
Physics 101, 102, 135, 232, 234, 288, 321, and 486.
Astronomy 206 or 207.

Technical Core requirements (32-35 hours):
Chemistry 105.
Computer Science 141.
Geology 201 or Science 204.
Mathematics 161, 162, and 261.
Science 202 or Biology 101.
Technical Electives: 6-8 credit hours approved by the department.

Education requirements (38 hours):
Education 103, 201, 202, 203, 303, 305, 309, 371, 431, and 488.

Courses that count in the PGSE major quality point average (MQPA):
All courses with "PHYS," "ASTR," and "EDUC" prefixes. A minimum cumulative quality point average (CQPA) of 3.00 and MQPA of 2.75 is required to be certified.

Course Requirements for a minor in Applied Physics (20 hours)
Physics 101, 102, 232, and 234 (14 hours).
Two of the following (6 hours):

Physics 303, 305, 310, 431 or 442 (Electrical Engineering majors may not take Physics 305).

Course Requirements for a minor in Astronomy (24 hours)

Physics 101 or 121 (4 hours).

Physics 102 or 122 (4 hours).

Astronomy 206, 207, 301, 310 and 311 (16 hours).

Training in both oral and written communication skills is an oft-neglected part of the undergraduate science curriculum. At the same time, communicating one's ideas and results in a clear and coherent manner is an essential skill for a scientist, requiring clarity of thought and expression. In addition, a scientist must know how to find, analyze, and use information developed by others in their field. To address these concerns, all physics majors are required to take Physics 288 as a Writing Intensive (WI) course and Physics 321 as a Speaking Intensive (SI) and Information Literacy (IL) course. In tandem, these courses provide focused, discipline specific training in the areas of oral and written communications as well as the ability to gather, analyze and use information within the field of physics.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

PHYSICS (PHYS)

PHYS 101. GENERAL PHYSICS I-ENGINEERING. A calculus-based study of mechanics including kinematics, Newton's laws of motion, work, energy, momentum, equilibrium, angular motion, fluids, oscillations, and gravity. Three lectures and one workshop per week. Students may not receive credit for both Physics 101 and 121. Corequisite: Mathematics 161. *Fall semester only, four hours.*

PHYS 102. GENERAL PHYSICS II – ENGINEERING. A survey of the fundamental principles of electricity, magnetism, Maxwell's equations, and circuit theory. Three lectures and one workshop per week. Prerequisite: Physics 101. Corequisite: Mathematics 162.
Spring semester only, four hours.

PHYS 121. COLLEGE PHYSICS I. A study of mechanics at the pre-calculus level with applications to the life sciences. Topics include kinematics, Newton's laws, work, energy, momentum, angular motion, fluids, oscillations, and gravity. Three lectures and one workshop per week. Students may not receive credit for both Physics 101 and 121. *Fall semester only, four hours.*

PHYS 122. COLLEGE PHYSICS II. A study of electricity, magnetism, and modern physics at the pre-calculus level with applications to the life sciences. Topics include electric field and potential, DC circuits, magnetism, induction, geometric and physical optics, relativity, and nuclear physics. Three lectures and one workshop per week. Prerequisite: Physics 121. *Spring semester only, four hours.*

PHYS 135. HORIZONS IN PHYSICS. Discussion of current topics in physics. Since scientific journals will provide much of the content for this course, students will learn how to acquire and interpret articles from scholarly publications. In addition, students will be required to attend presentations by physicists actively engaged in research, as well as field trips to academic and industrial laboratories in the area. This course is open to all students but, in the event that the class becomes full, preference is given to physics majors. *Fall semester only, one hour.*

PHYS 210. ELECTRONICS. An introduction to electronics emphasizing those topics most useful to the experimental physicist. As such, the physics of active and passive devices (resistors, capacitors, inductors, diodes, transistors, sensors, etc.) will be discussed along with practical circuit applications (filters, operational amplifiers, voltage regulators, oscillators, timers, etc.). The bulk of this course is devoted to analog electronics but digital electronics is discussed briefly at the end of the semester. Three hours of lecture and three hours of lab per week. Prerequisite: Physics 102.
Fall semester only, four hours.

PHYS 232. INTERMEDIATE GENERAL PHYSICS. An investigation of the physical laws associated with waves, sound, light, optical devices, thermodynamics, and possibly other selected topics not covered in Physics 101 and 102. Prerequisite: Physics 102. *Fall semester only, three hours.*

PHYS 234. MODERN PHYSICS. An introduction to modern physics, building upon the foundation laid in Physics 232. Two essential areas will be covered: the special theory of relativity and the origins of quantum mechanics. Prerequisite: Physics 201 or 232. *Spring semester only, three hours.*

PHYS 242. INTRODUCTION TO THEORETICAL PHYSICS. An introduction to problem-solving techniques used to describe physical phenomena. Includes topics from complex analysis, probability theory, vector calculus, Fourier series and transforms, matrix algebra, differential equations (ordinary and partial), and special functions. Prerequisite: Mathematics 261 and Physics 102, or by permission. *Spring semester only, three hours.*

PHYS 260. INDEPENDENT STUDY. Individual study of specialized topics in Physics. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHYS 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Physics. Freshman or sophomore standing, permission of the department, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHYS 288. INTERMEDIATE LABORATORY. This course is designed to teach students the *process* of scientific investigation, transitioning them from introductory, cook-book labs to actual experimental design and execution. Experiments cover a variety of topics from classical and modern physics including propagation of error, waves, thermodynamics, optics, spectrophotometry, speed of light, and the photoelectric effect. This course is designed to fulfill the requirements for a Writing Intensive (WI) course in the physics major. Prerequisite: Physics 201 or 232. *Spring semester only, two hours.*

PHYS 303. MECHANICS I. The application of mathematical methods to the study of the general motion of particles; Newtonian and Lagrangian mechanics; Hamilton's equations; oscillations; nonlinear dynamics including chaotic systems; and central force motion. Prerequisite: Physics 101 and either Math 262 or Physics 242, or consent of instructor. *Fall semester only, three hours.*

PHYS 304. MECHANICS II. A continuation of Mechanics I. Topics covered include dynamics of a system of particles, motion in a non-inertial reference frame, dynamics of rigid bodies, coupled oscillations and waves, and statistical mechanics. Prerequisite: Physics 303. *Alternate Spring semesters, three hours.*

PHYS 305. ELECTRICITY AND MAGNETISM. A study of the fundamental principles of electricity and magnetism. Topics covered include vector calculus, electric field and potential, polarization, electric displacement, linear dielectrics, magnetostatics, and electrodynamics. Prerequisite: Physics 102 and Physics 242 or Mathematics 262. *Fall semester only, three hours.*

PHYS 310. OPTICS. A study of electromagnetic waves. Topics covered include the Maxwell equations, geometric optics, interference, diffraction, polarization, coherence, holography, and topics from nonlinear optics. Prerequisite: Physics 201 or 232 and Physics 305 or Electrical Engineering 304. *Spring semester only, three hours.*

PHYS 321. RADIATION LABORATORY. An experimental study of the detection and characteristics of alpha, beta, gamma, and neutron radiation. One lecture and one lab per week. Physics 321 is designed to fulfill the requirements for a Speaking Intensive (SI) and Information Literacy (IL) course in the Physics major. Prerequisite: Physics 201 or 234, or consent of the department. *Spring semester only, two hours.*

PHYS 340. THERMODYNAMICS AND STATISTICAL MECHANICS. A study of thermodynamics and statistical mechanics that includes topics such as heat and work; ideal gases; equipartition of energy, entropy, Boltzmann, Fermi-Dirac, and Bose-Einstein distributions; and applications to heat engines, refrigeration, chemical equilibrium, phase transitions, blackbody radiation, and properties of solids. Students may not receive credit for both Chemistry 346 and Physics 340. Prerequisites: Physics 232, 234, and 242, or permission of the instructor. *Fall semester, three hours.*

PHYS 360. INDEPENDENT STUDY. An opportunity for independent study of specialized topics in Physics. Prerequisite: Junior standing and permission of the department.
Semester course, one, two, or three hours.

PHYS 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Physics. Junior standing, permission of the department, and a faculty sponsor are required.
Semester course, one, two or three hours.

PHYS 390. STUDIES IN PHYSICS. Examination of different areas in the field of physics not offered by regular course work. Subject matter varies each semester. *Semester course, three hours.*

PHYS 421. ADVANCED TOPICS. An in-depth course in an advanced physics topic (or topics) chosen by the instructor. Content can vary from year to year but may be include areas such as general relativity, nuclear physics, elementary particle physics, solid-state physics, nanotechnology, etc. Prerequisites: Physics 234; and Mathematics 262 or Physics 242. *Fall semester only, three hours.*

PHYS 431. QUANTUM MECHANICS. A study of wave-particle duality, the Bohr atom, and the development of quantum mechanics and its application to the periodic table and the nucleus, and solving the Schrödinger equation for several 1D systems and for the Bohr atom. Prerequisite: Physics 234; Physics 303; Mathematics 262 or Physics 242. *Spring semester only, three hours.*

PHYS 442. COMPUTATIONAL METHODS IN PHYSICS. An advanced course in the solution of physics problems using computer programming and numerical techniques for ordinary differential equations, partial differential equations, algebraic equations, spectral analysis, optimization, and numerical integration. Corequisites: Computer 141; Physics 303; and Mathematics 262 or Physics 242.
Alternate Spring semesters, three hours.

PHYS 460. INDEPENDENT STUDY. An opportunity for independent study of specialized topics in Physics. Prerequisite: Senior standing and permission of the department.
Semester course, one, two, or three hours.

PHYS 470. PHYSICS RESEARCH. An opportunity to conduct supervised research in Physics. Senior standing, permission of the department, and a faculty sponsor are required.
Semester course, one, two, or three hours.

PHYS 480. INTERNSHIP IN PHYSICS. Selected students participate in individual field experiences under the supervision of an on-site manager and a department faculty member. Requirements include evaluation by the on-site manager, a journal of the internship experience, a final written paper, and an oral presentation describing the completed work. Prerequisite: Permission of the faculty sponsor and coordination with the internship site. *Semester course, one to six hours.*

PHYS 486. PHYSICS EDUCATION SEMINAR. This seminar assists students in their understanding of the basic principles of physics and helps them to learn teaching methods unique to physics. Students will gain experience in designing and constructing equipment for physics experiments and demonstrations, and will propose and design laboratory experiments suitable for physics labs. Students will also present a lecture to the Science 201 class, and will serve as a tutor to those students. Prerequisite: This seminar is open to physics/education majors only; permission of the instructor is required. *Semester course, three hours.*

PHYS 488. SEMINAR IN PHYSICS. An opportunity for a student to undertake a project in an area of physics of special interest. Project approval and amount of credit to be given requires consent of the department. *Semester course, one, two or three hours.*

PHYS 499. HONORS IN PHYSICS RESEARCH. Seniors who have shown special aptitude in physics may, with the consent of the Department of Physics, undertake supervised physics research. A research paper and a formal presentation are required to receive Honors credit. Not to exceed two hours each semester. *Semester course, one or two hours.*

ASTRONOMY (ASTR)

ASTR 206. INTRODUCTION TO SKY MOTIONS AND PLANETS. An introduction to the motions of the sun, moon and stars in the sky and a survey of the solar system. Three lectures per week with some lectures substituted for by labs. Includes observations with the campus observatory and the Grove City College observatory near Edinboro, Pennsylvania. Open to all students.
Fall semester only, three hours.

ASTR 207. INTRODUCTION TO STARS, GALAXIES, AND COSMOLOGY. A survey of stars, galaxies, and cosmology. Three lectures per week with some lectures substituted for by labs. Includes observations with the Grove City College observatory near Edinboro, Pennsylvania. Open to all students. *Spring semester only, three hours.*

ASTR 260. INDEPENDENT STUDY. Individual study of specialized topics in Astronomy. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

ASTR 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Astronomy. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

ASTR 301. OBSERVATIONAL ASTRONOMY. Methods employed in modern optical observational astronomy. Topics covered include spherical trigonometry, time and coordinate systems, astronomical instruments, photometry, and spectroscopy. Students make extensive use of the campus observatory and the Grove City College observatory near Edinboro, Pennsylvania. Prerequisites: Astronomy 206 and 207. *Fall semester only, four hours.*

ASTR 310. PLANETARY AND STELLAR ASTROPHYSICS. A calculus-based course on modern astrophysics. Topics covered include orbital mechanics, atomic and radiation physics, planetary processes, stellar interiors, and stellar atmospheres and spectra. Prerequisites: Astronomy 206 and 207; and Mathematics 261 or Chemistry 264. *Offered alternate Spring semesters, three hours.*

ASTR 311. GALACTIC AND EXTRAGALACTIC ASTROPHYSICS. A calculus-based course on modern astrophysics. Topics covered include the interstellar medium, the Milky Way, other galaxies, and cosmology. Prerequisites: Astronomy 206 and 207; and Mathematics 261 or Chemistry 264.
Offered alternate Spring semesters, three hours.

ASTR 360. INDEPENDENT STUDY. Individual study of specialized topics in Astronomy. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

ASTR 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Astronomy. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

ASTR 460. INDEPENDENT STUDY. Individual study of specialized topics in Astronomy. Senior standing and permission of the department chair and a faculty sponsor are required.*Semester course, one, two or three hours.*

ASTR 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Astronomy. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

DEPARTMENT OF POLITICAL SCIENCE

Dr. Folkertsma, Chair; Dr. Coulter, Dr. Jewell, Dr. Kengor, Dr. Stanton. Part-Time: Dr. Bonner.

Course Requirements for Bachelor of Arts Degree in Political Science (POLS) (37 hours)

Core Requirements (22 hours):

Political Science 101, 104, 201, 204, and 277.

One course from Political Science 255 or 256.

One course from Political Science 309 or 350.

Political Science Clusters (12 hours):

Choose at least two courses from at least two of the following clusters for a total of 12 hours:

American Politics:

Political Science 304, 305, 306, 308, 309, 319; History 317 or 318.

Comparative/International Relations:

Political Science 301, 302, 303, 323, 333, 341, 342, or 344.

Political Theory: Political Science 206, 255, 256, or 354.

(If both 255 and 256 are taken, only one can count toward this cluster, and the other one will count toward the core requirements.)

Washington Internship Program (Political Science 481):

Summer session for six hours counts as one cluster.

Fall or Spring semester for twelve hours counts for two clusters.

Political Science Electives (3 hours):

Choose three additional hours of Political Science electives.

Courses that count in the POLS major quality point average (MQPA):

All courses with "POLS" prefix, HIST 317, and HIST 318. A minimum MQPA of 2.00 is required to graduate.

Effective communication and research skills are indispensable for career advancement in the variety of fields available to Political Science majors, including law, government at all levels, and business. Thus, the Political Science Department has incorporated Information Literacy (IL) instruction in Political Science 101, and Information Literacy (IL), Speaking Intensive (SI), and Writing Intensive (WI) instruction in Political Science 277, both courses required for all majors.

Recommended electives:

Students planning to do graduate work in Political Science are encouraged to acquire backgrounds in mathematics and statistics. Courses in computer literacy are also recommended. All Ph.D. programs require competency in at least two foreign languages as well. Students seeking law school are advised to take Accounting, Business Law, Constitutional History, and Symbolic Logic. A broad background in the social sciences, history, and the humanities is recommended.

Students are expected to contact their advisor for a detailed schedule of courses to fulfill requirements for a major.

Course Requirements for a minor in Political Science (18 hours)

Political Science Core (15 hours)

Political Science 101, 104, 201, and 204.

One course from Political Science 106, 256, or 350.

Political Science electives (3 hours)

Choose three hours from courses with POLS prefix.

Course Requirements for a minor in National Security Studies (18 hours)

National Security Core (12 hours)

Political Science 302, 303, 335, and History 336.

National Security electives (6 hours)

Choose two courses from Political Science 341, 342, 344, and History 375.

POLITICAL SCIENCE (POLS)

POLS 101. FOUNDATIONS OF POLITICAL SCIENCE. A review of the principal methods of studying politics, the enduring issues of politics, and main institutions of selected governments in the world today. This course fulfills the Information Literacy (IL) requirement for the Political Science major. *Fall semester only, three hours.*

POLS 104. INTERNATIONAL POLITICS. An analysis of the growth of national states and the factors that determine their behavior in international affairs. Particular attention is given to problems of collective security, balance of power, foreign policy, and political economy.
Semester course, three hours.

POLS 201. COMPARATIVE POLITICS. A selective study of major governments of the industrialized and non-industrialized world. Emphasis placed on the tools of comparative analysis and their application to various nations in the developed and developing world.
Spring semester only, three hours.

POLS 204. AMERICAN NATIONAL GOVERNMENT. A survey of national political institutions including Congress, the Supreme Court, the presidency, public bureaucracy, and a review of selected topics in public policy. *Semester course, three hours.*

POLS 206. POLITICAL IDEOLOGIES. A survey of modern ideologies including treatments of liberalism, conservatism, fascism, communism, democratic socialism, and Third World ideologies. Feminism, environmentalism, and related modern ideologies are also covered.
Offered periodically, semester course, three hours.

POLS 255. CLASSICAL POLITICAL THOUGHT. A study of the principle theorists and schools of thought about politics from the Pre-Socratics through the Middle Ages.
Fall semester only, three hours.

POLS 256. MODERN POLITICAL THOUGHT. A survey of the main political thinkers from Machiavelli to the present. The contributions of political theorists to the development of civilization are stressed. *Spring semester only, three hours.*

POLS 260. INDEPENDENT STUDY. Individual study of specialized topics in Political Science. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

POLS 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Political Science. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

POLS 277. RESEARCH METHODS IN POLITICAL SCIENCE. An introduction to approaches and methods of political science research, with an emphasis on research design, data collection, interpretation, and the use of computers in the discipline. This course is taught with a lab. This course fulfills the Writing Intensive (WI), Information Literacy (IL), and Speaking Intensive (SI) requirements for the Political Science major. *Spring semester only, four hours.*

POLS 301. ISSUES IN GLOBAL POLITICS. A study of human rights, diplomacy, and international economic issues. *Spring semester only, three hours.*

POLS 302. NATIONAL SECURITY. A review of American national security policy including coverage of defense policy, military deployments, and threat assessments.
Spring semester only, three hours.

POLS 303. GREAT POWER POLITICS. An examination of Great Power Politics with an emphasis on twentieth century developments. The course covers the sources of national strength, relations of great powers to one another and minor powers, the rise and decline of nations, and the end of the Cold War.
Spring semester only, three hours.

POLS 304. THE AMERICAN PRESIDENCY. A study of the major functions of the Presidency, with an emphasis on the Office's historical development and its role in American national government.
Fall semester only, three hours.

POLS 305. AMERICAN CONGRESS. An examination of the major functions and processes of Congress, with an emphasis on presidential-congressional relationships and the formation of public policy.
Alternate Spring semesters, three hours.

POLS 306. POLITICAL PARTIES AND PRESSURE GROUPS. An overview of the functions of American political parties with special attention to the role of interest groups in the policy process.
Offered periodically, semester course, three hours.

POLS 308. PUBLIC POLICY. A study of the main issues surrounding current topics in public policy, dealing with welfare and poverty, energy, environment, labor, business, agriculture, consumer policies, and selected issues in foreign policy. Variable credit in election years.
Offered periodically, semester course, three hours.

POLS 309. STATE AND LOCAL POLITICS. An examination of state and local governments and public policies. Topics include federalism, state constitutions, governors, legislatures, judiciary, politics of local governments, and policy debates surrounding local concerns as well as unfunded mandates and meeting federal guidelines. *Offered periodically, semester course, three hours.*

POLS 319. PUBLIC ADMINISTRATION. A study of the development, operation, and politics of administrative agencies and the public bureaucracy. *Semester course, three hours.*

POLS 323. LATIN AMERICAN POLITICS. A survey of the major countries of Latin America with special emphasis on cultural and historical factors that explain political developments. Special attention given to Mexican politics and U.S. - Latin American relations.
Offered periodically, semester course, three hours.

POLS 333. MAJOR EUROPEAN GOVERNMENTS. A comparative study of European politics with special emphasis on the major governments of Western Europe and the emerging republics of the former Soviet Union. Problems of European integration and the development of democracy in Eastern Europe are stressed. *Alternate Fall semesters, three hours.*

POLS 335. TERRORISM AND COUNTER-TERRORISM. A survey of terrorism from ancient times to the present with an emphasis on current international groups like al Qaeda, Hezbollah and Hamas, as well as domestic terrorist groups like the Aryan Nations and Ku Klux Klan.
Offered periodically, three semester hours.

POLS 341. AFRICAN POLITICS. A comparative overview of the politics of major African states, with emphases upon the influences of the colonial past, problems of political development, relations with the major powers, the geo-strategic importance of selected countries.
Alternate fall semesters, three hours.

POLS 342. MIDDLE EASTERN POLITICS. A survey of major powers of the Middle East with emphases on problems of the colonial past, political development, tribal and religious influences, regional conflicts, and global strategic significance. *Alternate Fall semesters, three hours.*

POLS 344. ASIAN POLITICS. A study of the major powers of Asia, with special reference to China, Japan and Korea, stressing problems of political and economic development, along with regional conflicts.
Spring semester only, three hours.

POLS 350. AMERICAN POLITICAL THOUGHT. A survey of the foundations of American civilization from the origins of the republic to the present time. Special attention is given to current debates surrounding culture wars and their impact on public policy.
Offered periodically, semester course, three hours.

POLS 354. MARXISM. A study of Marxism from its beginnings to its development into twentieth century totalitarianism by Lenin and his successors.
Offered periodically, semester course, three hours.

POLS 360. INDEPENDENT STUDY. Directed research on an individual basis. Open to majors and non-majors with department approval. *Semester course, one, two or three hours.*

POLS 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Political Science. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

POLS 390. STUDIES IN POLITICS. A focused study of selected topics in politics and political science, the content of which varies each semester. *Semester course, three hours.*

POLS 460. INDEPENDENT STUDY. Directed research on an individual basis. Open to majors and non-majors with department approval. *Semester course, one, two or three hours.*

POLS 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Political Science. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

POLS 480. INTERNSHIP IN POLITICAL SCIENCE. This course offers practical experience in the field of politics and political science. *Semester course, one to six hours.*

POLS 481. WASHINGTON INTERNSHIP. This program allows students to spend a semester in Washington working in a government office or for a private organization that deals regularly with public policy matters. For more information, see the "Internships" section under General Education and Degree Programs or consult Dr. Marvin Folkertsma, Director, Washington Internship Program.
Semester course, six to twelve hours.

POLS 488. SEMINAR IN POLITICAL SCIENCE. Special topics in political science, the content of which varies each semester. Open to majors and nonmajors with department approval.
Semester course, three hours.

POLS 499. HONORS IN POLITICAL SCIENCE. Open only to qualified majors with department approval. *Semester course, one, two or three hours.*

DEPARTMENT OF PSYCHOLOGY

Dr. Seybold, Chair; Dr. Horton, Dr. Throckmorton, Dr. Welton. Part-Time: Dr. K. Homan.

Course Requirements for Bachelor of Arts Degree in Psychology (PSYC) (48 hours)

Core Requirements (26 hours):

Psychology 101, 203, 204, 208, 301, 310, 316, and 404.

Two courses from each of the following clusters (18 hours):

Experimental: Psychology 306, 318, or 403.

Clinical: Psychology 206, 304, or 312.

Developmental: Psychology 209, 211, or 322.

Major-Related Requirements (4 hours):

Biology 101 or Science 202. (If Science 202 is taken, a course from the Biology course offerings will not satisfy the other general education science course that is required.)

Courses that count in the PSYC major quality point average (MQPA):

All courses with "PSYC" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Science Degree in Psychology (53 hours) (PSYS)

Core Requirements (42 hours):

Psychology 101, 203, 204, 208, 301, 310, 316, 318, 319, 403, and 404.

Nine hours of Psychology electives.

Major-Related Requirements (11 hours):

Biology 101, 234; Computer Science 141

Courses that count in the PSYS major quality point average (MQPA):

All courses with "PSYC" prefix. A minimum MQPA of 2.00 is required to graduate.

Courses recommended for psychology majors include Philosophy 161 and 201. Students are encouraged to take an internship. No credit in independent study or internship may be counted toward the major requirements. Those students planning to do graduate work in psychology are encouraged to take Psychology 318, 403; Philosophy 161, and 201.

Psychology majors, regardless of whether they pursue graduate studies or enter the work force immediately following graduation, need to be good writers and speakers and need to know how to find, analyze, and use information. To that end, Psychology 204 and 404 are Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) courses, designed to provide the necessary skills for psychology majors to be good producers and consumers of psychological information as well as effective communicators of that knowledge.

Course Requirements for a minor in Psychology (18 hours)

A minor in Psychology will consist of 18 hours of Psychology courses, including Psychology 101.

Course requirements for a minor in Family Studies (19 hours)

Psychology 203.

Sociology 312.

One course from: Psychology 204, Political Science 277, or Sociology 277.

Three courses from: Psychology 209, 211, 322, or Sociology 251.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

PSYCHOLOGY (PSYC)

PSYC 101. FOUNDATIONS OF PSYCHOLOGICAL SCIENCE. This course is designed to introduce the student to the field of psychology, which is defined as the scientific study of behavior and mental processes. Like other sciences, psychology seeks to explain, predict, and control the events it studies. Students will be exposed to the important theories, methods, and landmark findings that have helped to shape psychology as a field of inquiry. An integral focus of the course will be a consideration of how psychology can contribute to the synthesis of a consistent Christian worldview. *Semester course, three hours.*

PSYC 202. PSYCHOLOGY OF RELIGION. A psychological approach to the understanding of religious life with special emphasis on the Judeo-Christian tradition. In addition to traditional areas in the psychology of religion (e.g., religious development, measurement of religion and spirituality, forgiveness, religious conversion, religious orientation and attitudes, etc.) the course will consider issues surrounding the integration of psychology and theology, the innateness of spirituality, the nature of the soul or self, the neuroscience of religious experience, and the role of religion and spirituality in health. Prerequisite: Psychology 101. *Alternate Spring semesters, three hours.*

PSYC 203. STATISTICAL METHODS. This course will examine the mathematical reasoning and methodology underlying decision-making in the sciences. Students will develop skills in the analysis and interpretation of data from scientific experiments, enabling them to be informed consumers of the professional literature. Topics will include descriptive statistics, probability theory, and inferential statistics. *Semester course, three hours.*

PSYC 204. RESEARCH METHODS. Introduction to laboratory techniques in psychological science. Methods of controlled investigation, use of databases for psychology, evaluation of results using SPSS, and writing reports of experiments using APA format will be emphasized. Three lectures and two hours of lab per week. This course meets the Information Literacy (IL) requirement for the Psychology major. Prerequisites: Psychology 101 and 203. *Spring semester only, four hours.*

PSYC 206. INTRODUCTION TO PROFESSIONAL COUNSELING. An introduction to the theories, practices and ethical issues employed in professional counseling. Prerequisite: Psychology 101. *Semester course, three hours.*

PSYC 208. SOCIAL PSYCHOLOGY. The scientific study of the way individuals think, feel, and behave under the actual, imagined, or implied presence of others. Our study of social psychology will investigate the relationship between attitudes and behavior, attribution theory, cultural influences, conformity, prejudice, aggression, attraction, altruism, conflict, etc. We will concentrate on applying social psychology to real world experiences and will include in-depth analysis of original literature. *Semester course, three hours.*

PSYC 209. CHILD DEVELOPMENT. This course is a survey of the child development field. Students will be encouraged to develop an appreciation for the value of science for understanding children and their development. Key theories and research regarding cognition, language, attachment, moral reasoning, and the effects of family and peers will be considered. This course is required for all Early Childhood and Elementary Education majors. *Semester course, three hours.*

PSYC 211. ADULT DEVELOPMENT AND AGING. Investigation of the psychological, biological, and social aspects of early, middle, and late adult development emphasizing both the opportunities and limitations of aging. S*emester course, three hours.*

PSYC 214. INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY. The psychology of work and organizations. Introduction to the use and application of psychology in the workplace. Prerequisites: Psychology 101 and 208. *Offered periodically, three hours.*

PSYC 220. PHILOSOPHY OF SOCIAL SCIENCE. Fundamental issues facing the social sciences including philosophical issues about human nature, epistemological questions, and implications of social science claims of being scientific. Offered alternate years. Prerequisite: Psychology 101.
Alternate Spring semesters, three hours.

PSYC 260. INDEPENDENT STUDY. Individual study of specialized topics in Psychology. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

PSYC 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Psychology. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

PSYC 301. HISTORY AND SYSTEMS OF PSYCHOLOGY. A study of the philosophical and scientific antecedents and trends that have culminated in contemporary psychological science. Beginning in the Classical world and moving through the Middle Ages, Renaissance, and the scientific revolution of the 16th – 18th centuries, this course will trace how psychology emerged as an independent discipline at the end of the 19th century. Significant questions raised by psychology, changing views of the soul or self, and how American culture in the 21st century has become a psychological society will be considered. Primary works of influential philosophers and scientists will be read. Prerequisite: Twelve hours of psychology. *Fall semester only, three hours.*

PSYC 304. PSYCHOLOGY OF PERSONALITY. A study of the major psychological theories of personality development and their application to applied psychology. Prerequisite: Psychology 101.
Semester course, three hours.

PSYC 306. SENSATION AND PERCEPTION. This course covers the physiological basis of sensation and the psychological aspects of perception. Vision, audition, the chemical and the cutaneous senses are investigated as are the perception of time, music, speech and pain. Prerequisite: Psychology 101. *Alternate Spring semesters, three hours.*

PSYC 310. PSYCHOLOGICAL ASSESSMENT. This course will include a) an analysis of psychometric principles, including reliability, validity, and standardization; b) an analysis of intelligence, personality, and interest testing, including in-depth investigation of various tests; and c) an analysis of current issues including discrimination in testing. Prerequisites: Psychology 101 and 203.
Semester course, three hours.

PSYC 312. ABNORMAL PSYCHOLOGY. This course provides an overview of the various psychological disorders, as well as theoretical, clinical, and experimental perspectives of the study of psychopathology. Emphasis is placed on classification, etiology, assessment and treatment of the major disorders. Prerequisites: Psychology 101 and three hours of psychology.
Semester course, three hours.

PSYC 316. PHYSIOLOGICAL PSYCHOLOGY. A study of the biological bases of behavior. Neuroanatomy and fundamental principles of neurophysiology and neural communication will be covered as will be the physiological mechanisms operating in sensation, emotion, consciousness, ingestive behavior, learning and memory, reinforcement, addiction, and psychiatric disorders such as schizophrenia. Prerequisite: Psychology 101 or permission of the instructor.
Fall semester only, three hours.

PSYC 318. LEARNING AND COGNITION. A study of traditional learning and conditioning as well as the approach to human learning, memory and higher mental processing (language, problem solving, reasoning, etc.) represented by cognitive psychology. Special consideration will be given to a cognitive neuroscience perspective on learning, memory, cognition, and emotion. Prerequisites: Psychology 101, 203 and 204. *Fall semester only, three hours.*

PSYC 319. LEARNING AND COGNITION LABORATORY. Using computer simulations of animal behavior, areas of laboratory investigation include both classical and operant conditioning phenomena (e.g., excitatory and inhibitory conditioning, compound conditioning, higher-order conditioning, shaping, extinction, schedules of reinforcement, and stimulus discrimination and generalization). Prerequisites: Psychology 101, 203 and 204. *Fall semester only, one hour.*

PSYC 320. NATURE OF MIND. A study of such issues as the mind-body problem, the relationship between mind and language; how the mind represents the world; the nature of consciousness; the analogy between mind and computer; science versus folk psychology in describing and explaining the mind; and the nature of mental states such as beliefs, desires, and purposes. Prerequisite: Psychology 101.
Alternate Spring semesters, three hours.

PSYC 322. MARRIAGE & FAMILY: ASSESSMENT AND INTERVENTION. The course examines assessment and intervention in marriage and the family. Topics of focus will include premarital, marital, and parenting skills assessments and interventions. This course will focus on primary sources and scientific understanding rather than on developing counseling skills. In addition, we will consider social entrepreneurship in the context of marital and family situations. Prerequisite: Psychology 203, Business 201 or Mathematics 231. *Semester course, three hours.*

PSYC 360. INDEPENDENT STUDY. Available to junior and senior psychology majors with a minimum of twelve hours in psychology. Prerequisite: Permission of the department chairman.
Semester course, one, two or three hours.

PSYC 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Psychology. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

PSYC 390. STUDIES IN PSYCHOLOGY. This course, which varies each semester, involves the examination of different areas of psychology with a focus on new areas not covered in regular coursework.
Offered periodically, semester course, one, two or three hours.

PSYC 403. ADVANCED STATISTICS. An introduction to multivariate statistics by using computer statistical packages as applied to social science research including such topics as multiple regression, discriminant analysis, factor analysis, multivariate analysis of variance (MANOVA), path analysis, and other frequently used multivariate statistical techniques. Prerequisites: Psychology 101, 203 and 204.
Alternate Fall semesters, three hours.

PSYC 404. ADVANCED RESEARCH METHODS. A study of advanced research methods, including an independent research project. An IRB proposal, data collection, and formal written and oral presentation of the study are required. This course meets the Writing Intensive (WI) and Speaking Intensive (SI) requirements for the psychology major. Prerequisites: Psychology 101, 203 and 204.
Semester course, four hours.

PSYC 460. INDEPENDENT STUDY. Available to junior and senior psychology majors with a minimum of twelve hours in psychology. Prerequisite: Permission of the department chairman.
Semester course, one, two or three hours.

PSYC 470. INDEPENDENT RESEARCH. Available to junior and senior psychology majors with a minimum of twelve hours in psychology. Prerequisite: Permission of the department chairman.
Semester course, one, two or three hours.

PSYC 480. INTERNSHIP IN PSYCHOLOGY. An opportunity for upperclass psychology majors, with a minimum of fifteen hours in psychology, to participate in individual field experiences in clinical or counseling settings under the professional supervision of the staff of cooperating institutions. Prerequisite: Permission of the department chair. *Semester course, one to six hours.*

PSYC 499. HONORS IN PSYCHOLOGY. Open only to senior psychology majors who have honors grades. Application must be made to the department and a proposal for the study approved before registering. The student studies under the guidance of department staff and must submit evidence of superior achievement. *Semester course, one, two or three hours.*

DEPARTMENT OF RELIGION

Dr. Schaefer, Chair; Dr. Bibza, Dr. Campbell, Dr. Duguid, Dr. Gordon, Dr. Kemeny, Dr. Moeller, Dr. Stringer. Part-Time: Mr. Fleming, Dr. Thrasher.

Course Requirements for Bachelor of Arts Degree in Christian Thought (CHRT) (36 hours)

Core Requirements (15 hours)

Religion 211, 212, 213, 214, and 488.

Biblical Studies electives (12 hours)

Choose four courses from: Greek 212; Hebrew 212; Religion 221, 232, 237, or 351. Religion 390 "Travel-Israel" may also count as a Biblical studies elective.

Historical, Theological and Philosophical electives (9 hours)

Choose three courses from: Communication 450; History 341, 349; Philosophy 251, 271, 336, 361, 362; Religion 220, 247, 248, 261, 320, 330, 341, 342, 343, 345, or 362. Religion 390 "Travel-Reformation" may also count as one of these electives. (At least one course must be a Religion course.)

Courses that count in the CHRT major quality point average (MQPA):

All courses with "RELI" prefix, COMM 450; GREK 212; HEBR 212; HIST 341,349; PHIL 251, 271, 336, 361, and 362. A minimum MQPA of 2.00 is required to graduate.

The Department intends that Christian Thought majors develop information literacy as well as speaking and writing skills in order to be best prepared for graduate school and/or a vocation. To this end, all Christian Thought majors will take Religion 488 Senior Seminar during their senior year as a Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) course. This course is designed to help gain proficiency in research as well as clear and well-supported written and oral communication.

The Department offers courses in New Testament Greek and Biblical Hebrew. These courses do not fulfill the College's foreign language requirement.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

Course Requirements for a minor in Religion (18 hours)

A minor in Religion will consist of any eighteen hours of Religion, Greek and Hebrew courses.

Course Requirements for a minor in Christian Ministries (24 hours) - To be taken in conjunction with any major:

The Christian Ministries minor aims to help students prepare for vocational opportunities oriented toward "people-service." The Christian Ministries plan can accompany any college major and requires a specialized group of Christian Ministries courses in addition to those courses required for the major which the student chooses.

Core Requirements: Religion 211, 212, 216, and 480.

Biblical Elective: One course from Religion: 221, 232, 237, 351, or 390.

Ministry Electives: Two courses from: Religion 246, 251, 253, 320, or 330.

Historical Elective: One course from: Religion 247, 248, 341, or 342.

Course Requirements for a minor in Interdisciplinary Classics (21 hours)

A minor in Interdisciplinary Classics will consist of 21 hours from the following courses: English 302; Global Studies 290 "Latin"; Greek 101-102, 211-212; History 207, 341, 376; Philosophy 334; Political Science 255; or a maximum of three credits in Philosophy 460 or Political Science 460.

RELIGION (RELI)

RELI 211. OLD TESTAMENT LITERATURE AND HISTORY. An introduction to the literature, content, and history of the Old Testament. Special attention is given to the historical background, composition, and theological message of the Old Testament. The course further acquaints students with the basic methods of Old Testament studies and the present state of Old Testament research. This course contains the second component of the general education Information Literacy (IL) requirement for students substituting Religion 211 and 212 for the Humanities 102 requirement.
Semester course, three hours.

RELI 212. NEW TESTAMENT LITERATURE AND HISTORY. An introduction to the literature, content, and history of the New Testament. Special attention is given to the historical background, composition, and theological message of the New Testament. The course further acquaints students with the basic methods of New Testament studies and the present state of New Testament research. This course contains the second component of the general education Information Literacy (IL) requirement for students substituting Religion 211 and 212 for the Humanities 102 requirement.
Semester course, three hours.

RELI 213. SYSTEMATIC THEOLOGY I. An introduction to the methods of systematic theology in terms of narrative, covenant, and creed. From this, these central doctrines of historic Christianity will be examined: Revelation and Scripture, the Being and Attributes of God, Humanity before God, and the Person and Work of Christ. *Offered alternate years, fall semester, three hours.*

RELI 214. SYSTEMATIC THEOLOGY II. A continuation of an examination of the central doctrines of historic Christianity. These doctrines comprise the focus for Systematic Theology II: the Person and Work of the Holy Spirit, the Christian Life, the Church and Sacraments, and the Last Things. Religion 213 is not a prerequisite for Religion 214.
Offered alternate years, spring semester, three hours.

RELI 216. INTRODUCTION TO CHRISTIAN MINISTRY. This course exposes students to basic issues, concepts, approaches, and organizations involved in Christian ministry. It covers topics such as leadership, discipleship, evangelism, and pastoral ministry. *Semester course, three hours.*

RELI 220. CHRIST AND THE FUNDAMENTAL QUESTIONS OF LIFE. The course concerns some of the fundamental questions such as: What is a good person? What is a good life? What is a good society? What is/are the human problem(s)? How do we understand human nature? What is the Christian view of justice, right and wrong, good and evil? Not all of these questions will be addressed in every class. Answers to these questions will involve a study of the Christian tradition of politics, including the Bible and contemporary interpreters, although not all of these sources will be utilized in every class. *Offered alternate years, semester course, three hours.*

RELI 221. THE LIFE OF CHRIST. This course aims to give the student a good understanding of the person, work, and teachings of Christ as presented in the Gospels. It also seeks to introduce the student to some of the important literature on the subject.
Offered alternate years, semester course, three hours.

RELI 232. THE LIFE AND WORK OF PAUL. A study of the life and work of the apostle Paul, author of almost one-half of the New Testament. Attention is given to both the descriptive material in the book of Acts and the thematic material from the Pauline Epistles. Students are introduced to current issues in the study of Paul. *Offered alternate years, semester course, three hours.*

RELI 237. BIBLICAL BOOKS. The form and ideas of one Biblical book will be explored in depth. Different books will be studied in different semesters. *Semester course, three hours.*

RELI 246. CHRISTIAN EDUCATION FOR YOUTH AND ADULTS. This course intends to aid persons who plan to lead youth and adults in the Christian education environment. It will include a consideration of objectives; of historical, theological, and psychological background of methods and programming resources; and of techniques for outreach. *Semester course, three hours.*

RELI 247. CONTEMPORARY AMERICAN RELIGION. This course seeks to examine and explore the prominent place of religion in this religiously pluralistic nation by describing and analyzing current American religious developments in historical, sociological, and theological perspective. Institutional and non-institutional developments within and outside the Judeo-Christian tradition will also be examined. *Semester course, three hours.*

RELI 248. WORLD RELIGIONS. An introduction to the major living religions, to the leading problems of religious thought, and to the alternative approaches of world religions to ultimate questions concerning the meaning of human life. *Semester course, three hours.*

RELI 251. MANAGING CHRISTIAN MINISTRIES. This course concentrates on the organization and administration of the programs and activities of the local church and the many "parachurch" organizations. Sound business principles are emphasized in a context of biblical teaching. *Semester course, three hours.*

RELI 253. PHILOSOPHY OF MINISTRY. Scripture, history, culture, and sociology play significant roles in the formulation of a philosophy of ministry. This course seeks to help the student understand how these factors affect the various fields of ministry. *Semester course, three hours.*

RELI 260. INDEPENDENT STUDY. Individual study of specialized topics in Religion. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

RELI 261. C.S. LEWIS: CHRISTIAN APOLOGIST. A study of one of contemporary Christianity's greatest apologists. The primary subject of study is Lewis' unique contributions to apologetics including his epistemology, view of myth, and defense of supernaturalism. Various examples of Lewis' writings are examined from selected essays and theological articles and the *Chronicles of Narnia*. *Offered alternate years, semester course, three hours.*

RELI 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Religion. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

RELI 290. STUDIES IN RELIGION. The subject matter for this course will vary each semester to allow for the introduction of new courses in the field of religion. The aim of such a course is in-depth study of some specific facet of religion with particular emphasis on the relationship of religion and contemporary life. *Semester course, three hours.*

RELI 320. THEOLOGY OF MISSIONS. A survey of the greatest evangelistic and mission movements in history, the Biblical-theological basis for missions, and contemporary developments in mission strategy. *Offered alternate years, semester course, three hours.*

RELI 330. THEOLOGY OF THE SPIRITUAL LIFE. This course examines writings on spiritual formation from an historical, theological, and Biblical perspective. Key topics include the holiness of God, the person and work of the Holy Spirit, prayer, Bible Study, and the discernment of God's will. *Offered alternate years, semester course, three hours.*

RELI 341. CHRISTENDOM AND REFORM. A study of the history of Christianity from the time of Charlemagne until the end of the Religious Wars in 1648, this course will explore Christianity throughout the Medieval Period, as tensions and then schism arose between the Greek and Latin Churches, and then go into the Reformation era with its various callings for reform of the Western Church. Emphasis will be placed on important persons and ideas, movements of significance, and the relationship of the Christian mission to surrounding culture. This is the second of a three-part series on *The History of Christianity,* the other two being History 341 *The Rise of Christianity* and Religion 342 *Christianity and the Modern World*. These courses may be taken in any order; there are no prerequisites. *Offered alternate years, semester course, three hours.*

RELI 342. CHRISTIANITY AND THE MODERN WORLD. A study of the history of Christianity from the beginning of the Enlightenment until the end of the 20th century, this course will explore Christian history in a time of rapid cultural changes enhanced by new thinking about philosophy, society, politics, economics, and science. Questions of how and why Christian churches, as well as Christian thinkers, adapted, fought, or sought some rapprochement with a continued commitment to some form of classic orthodoxy will be examined as the Christian mission continued to seek to reach the surrounding culture. This is the third of a three-part series on *The History of Christianity,* the other two being History 341 *The Rise of Christianity* and Religion 341 *Christendom and Reform*. These courses may be taken in any order; there are no prerequisites.
Offered alternate years, semester course, three hours.

RELI 343. THE SEARCH FOR CHRISTIAN AMERICA. This course examines efforts by American Christians to shape culture and society in accordance with their understanding of the Gospel as well as ways in which cultural, social political, and economic issues have in turn shaped divergent Christian responses to public issues. Beginning in the British North American colonies in the seventeenth century, the course explores the changing nature and role of religion in American public life to the present. *Semester course, three hours.*

RELI 345. LUTHER AND CALVIN. This course focuses on the Reformation leaders whose work and ideas shaped Protestantism. Primary sources will be used.
Offered alternate years, semester course, three hours.

RELI 351. HERMENEUTICS. A study of central issues of Biblical interpretation that bear directly on current concerns of human existence. This course examines the import and implications of the Biblical literature. *Offered alternate years, semester course, three hours.*

RELI 360. INDEPENDENT STUDY. An opportunity for junior and senior students with previous background in religion to do intensive independent study of specialized topics. Prerequisite: Twelve hours of religion or consent of the department. *Semester course, one to three hours.*

RELI 362. CONTEMPORARY THEOLOGY. A study of major themes in contemporary theology including such topics as religious language, views of God, meaning of man and redemption, and the problem of evil. These topics are discussed as they relate to contemporary cultures and worldviews.
Offered alternate years, semester course, three hours.

RELI 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Religion. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

RELI 390. ADVANCED STUDIES IN RELIGION. The subject matter for this course will vary each semester to allow for the introduction of new courses in the field of religion. The aim of such courses is in-depth study of some specific facet of religion with particular emphasis on the relationship of religion and contemporary life. *Semester course, three hours.*

RELI 460. INDEPENDENT STUDY. An opportunity for junior and senior students with previous background in religion to do intensive independent study of specialized topics. Prerequisite: Twelve hours of religion or consent of the department. *Semester course, one to three hours.*

RELI 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Religion. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

RELI 480. INTERNSHIP IN RELIGION. This course offers practical experience appropriate for the Christian Ministries auxiliary field. Prerequisites: Consent of the department chairman.
Semester course, one to six hours.

RELI 488. SENIOR SEMINAR. This course satisfies the Writing Intensive (WI), Speaking Intensive (SI), Information Literacy (IL) requirements for the Christian Thought major, and will be taken in the fall of the senior year. Topics will focus on a major issue in Biblical Studies, Church History, or Systematic Theology. *Offered yearly beginning in 2008, Fall semester, three hours.*

RELI 499. HONORS COURSE IN RELIGION. Work in this area is available to the able student on an individual basis and by prearrangement with the department.
Semester course, one, two or three hours.

GREEK (GREK)

GREK 101. INTRODUCTION TO NEW TESTAMENT GREEK I. A study of the grammar and syntax of New Testament Greek. *Fall semester only, three hours.*

GREK 102. INTRODUCTION TO NEW TESTAMENT GREEK II. Continuation of Greek 101. Prerequisite: Greek 101 or permission of the instructor. *Spring semester only, three hours.*

GREK 211. READINGS IN NEW TESTAMENT GREEK I. Portions of the Gospels will be read. Vocabulary, grammar, and syntax are reviewed. Prerequisite: Greek 101-102 or permission of the instructor. *Fall semester only, three hours.*

GREK 212. READINGS IN NEW TESTAMENT GREEK II. Portions of the Pauline Epistles will be read. Vocabulary, grammar, and syntax are reviewed. Prerequisite: Greek 101-102 and 211 or permission of the instructor. *Spring semester only, three hours.*

GREK 260. INDEPENDENT STUDY. Individual study of specialized topics in Greek. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

GREK 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Greek. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

GREK 360. INDEPENDENT STUDY. An opportunity for third and fourth-year students to do independent projects in basic New Testament exegesis, word study, or classical Greek. Prerequisite: Greek 211-212 or consent of instructor. *Semester course, two or three hours.*

GREK 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Greek. Junior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

GREK 460. INDEPENDENT STUDY. An opportunity for third and fourth-year students to do independent projects in basic New Testament exegesis, word study, or classical Greek. Prerequisite: Greek 211-212 or consent of instructor. *Semester course, two or three hours.*

GREK 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Greek. Senior standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

HEBREW (HEBR)

HEBR 101. INTRODUCTION TO BIBLICAL HEBREW I. A study of the grammar and syntax of the Hebrew Bible. *Fall semester only, three hours.*

HEBR 102. INTRODUCTION TO BIBLICAL HEBREW II. Continuation of Hebrew 101. Prerequisite: Hebrew 101 or permission of the instructor. *Spring semester only, three hours.*

HEBR 211. READINGS IN BIBLICAL HEBREW I. Portions of Narrative Literature will be read. Vocabulary, grammar, and syntax are reviewed. Prerequisite: Hebrew 101-102 or permission of the instructor. *Fall semester only, three hours*

HEBR 212. READINGS IN BIBLICAL HEBREW II. Portions of the Prophets will be read. Vocabulary, grammar, and syntax are reviewed. Prerequisite: Hebrew 101-102 and 211 or permission of the instructor. *Spring semester only, three hours.*

HEBR 260. INDEPENDENT STUDY. Individual study of specialized topics in Hebrew. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

HEBR 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Hebrew. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

HEBR 360. INDEPENDENT STUDY. An opportunity for third and fourth year Hebrew students to do independent projects in basic Old Testament exegesis. Prerequisite: Hebrew 211 and 212 or permission of the instructor. *Semester course, two or three hours.*

HEBR 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Hebrew. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

HEBR 460. INDEPENDENT STUDY. An opportunity for third and fourth year Hebrew students to do independent projects in basic Old Testament exegesis. Prerequisite: Hebrew 211 and 212 or permission of the instructor. *Semester course, two or three hours.*

HEBR 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Hebrew. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

DEPARTMENT OF SOCIOLOGY

Dr. Ayers, Chair; Dr. W. P. Anderson, Dr. Campbell, Dr. S. Jones.

Course requirements for Bachelor of Arts Degree in Sociology (SOCI) (36 hours)

Core Requirements (21 hours):

Sociology 101, 201, 277, 452, 471, and 472.

Psychology 203.

Elective Requirements (15 hours):

Fifteen hours from the following options:

Sociology 103 or 241

Sociology 203, 209, 251, 308, 312, 314, 321, 323, 333, 356, 375, 390, 460, 499 or Psychology 208.

One of the following courses may also count as a Sociology elective: Economics 306, History 357, or Psychology 211.

Courses that count in the SOCI major quality point average (MQPA):

All courses with "SOCI" prefix; ECON 306; HIST 357; PSYC 203, 208 and 211. A minimum MQPA of 2.00 is required to graduate.

A Sociology Internship (SOCI 480) may not be counted as an elective course toward the major, though Sociology 480 grades will be included in the Major Quality Point Average (MQPA) for Sociology majors.

Sociology majors are provided with focused, discipline-specific instruction in professional writing by taking the Writing Intensive (WI) course Sociology 277 "Social Research Methods," and in professional speaking by taking the Speaking Intensive (SI) course Sociology 452 "Sociology Colloquium." Information Literacy (IL) instruction is also incor-

porated in Sociology 277, focusing on knowledge and use of electronic information technology and resources, critically assessing this information, and teaching skills that explore scholarly research and publishing processes within the field of Sociology.

Recommended electives:

Students preparing for careers in criminal justice are encouraged to take the following courses as part of their major: Sociology 203, 314, 333, 356, 480, and Economics 306 or History 357. In addition students should select the following general electives: History 317-318; Political Science 308 and 309; and Psychology 312.

Students preparing for careers in any of the helping professions or in Christian ministry are encouraged to take the following courses as part of their major: Sociology 203, 251, 308, 312, 314, 333, 356, and 480; Psychology 208 or 211, or History 357. In addition, they should consider the following general electives: Religion 216 and Psychology 206, 210, 310, and 312.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

Course requirements for a minor in Sociology (18 hours)

18 hours of Sociology courses are required, including Sociology 471.

Course requirements for a minor in Family Studies (19 hours)

Psychology 203.

Sociology 312.

One course from: Psychology 204, Political Science 277, or Sociology 277.

Three courses from: Psychology 209, 211, 322, or Sociology 251.

SOCIOLOGY (SOCI)

SOCI 101. FOUNDATIONS OF SOCIOLOGY. An introductory study of the major and enduring theoretical ideas, concepts, methods, and debates that have shaped and informed the discipline of Sociology from its inception to the current day. Topics include the origins of the discipline, the social conditions under which humans may thrive, social order, religion, and inequality. Attention is also paid to the ways in which the Christian tradition perceives and in some cases may challenge contemporary social conditions. Recommended to precede all other Sociology courses.
Semester course, three hours.

SOCI 103. INTRODUCTION TO CULTURAL ANTHROPOLOGY. An introduction to the study of culture, its meaning and significance for human beings, and the ways in which man organizes his activities to meet universal human needs, especially in simpler societies.
Fall semester only, three hours.

SOCI 201. SOCIAL PROBLEMS. An analysis of American social problems related to family, sexuality, drugs, crime, health, poverty, race, and global problems related to gender, population, the environment, religion, war and terrorism. *Semester course, three hours.*

SOCI 203. SOCIOLOGY OF DEVIANT BEHAVIOR. A study of the social aspects of personal deviation including consideration of the alcoholic, the drug addict, the suicidal and the sexually maladjusted from the perspective of social background, causative factors, and possible therapy. Prerequisite: Sociology 101 or 201. *Alternate spring semesters, three hours.*

SOCI 209. PRINCIPLES OF SOCIAL WORK. An introduction to the social work profession and to the social welfare field, including historical development, theory, ethics/values, policy, and key aspects of and specialization in practice. Biblical views of, and calling to, the field will be considered. The course will also take a balanced look at private and public, secular and religious, settings and approaches; as well as considering the growing social entrepreneurship movement.
Alternate Fall semesters, three hours.

SOCI 241. MEDICAL ANTHROPOLOGY. A study of the social and cultural aspects of medicine and health, strongly emphasizing the results of cross-cultural and comparative research. Topics include health professionals and services around the world, alternative healers, the demography of health and illness, and privatized versus government-sponsored health care systems.
Alternate Spring semesters, three hours.

SOCI 251. COURTSHIP AND MARRIAGE. A general introduction to marriage and the family emphasizing practical living. Topics include dating, courtship, engagement, marriage, romantic love, and marital adjustment including the roles experienced through life - parenthood and child rearing and divorce. S*emester course, three hours.*

SOCI 260. INDEPENDENT STUDY. Individual study of specialized topics in Sociology. Sophomore standing and permission of the department chair and a faculty sponsor are required.
Semester course, one, two or three hours.

SOCI 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Sociology. Sophomore standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

SOCI 277. SOCIAL RESEARCH METHODS. Research methods in the major phases of sociology investigation: the logic of research, its design and analysis, and specific methods of data collection. Includes training in locating, assessing, importing, modifying and analyzing secondary data; general knowledge of key sociological information sources; basic MicroCase and SPSS statistical software training; and hands-on instruction in all stages of writing professional research reports. This course fulfills the discipline-specific Writing Intensive (WI) and Information Literacy (IL) requirements for Sociology majors. Three lectures and two lab hours per week. Prerequisite: Six hours of sociology including Sociology 101. *Fall semester only, four hours.*

SOCI 308. SOCIOLOGY OF RELIGION. This course will examine religion from a sociological perspective, including such topics as sociological theories about religion, how religion affects individuals and societies, secularization and worldwide religious resurgence, effects of globalization upon religion, America's contemporary religious climate, contemporary American Evangelicalism, and the future of religion. Prerequisite: Sociology 101. *Alternate Fall semesters, three hours.*

SOCI 312. THE FAMILY AS A SOCIAL INSTITUTION. A course that focuses upon the status, development, and future of the modern American family from historical, cross-cultural, and sociological perspectives. Examines contemporary debates over legal definitions of "family," patterns of family structure, families and the elderly, family policy, and reviews non-governmental approaches to strengthening the family. Recommended for those students contemplating careers in teaching, the helping professions, ministry, public policy, and research. *Alternate Spring semesters, three hours.*

SOCI 314. CRIME AND DELINQUENCY. A study of crime and juvenile delinquency in contemporary society. Basic factors in crime, detection, punishment, delinquency, gangs, courts, probation, and the science of criminology are studied. Prerequisite: Sociology 101 or 201.
Alternate Spring semesters, three hours.

SOCI 321. SOCIAL CHANGE. An analysis of patterns, mechanisms and strategies of past and future social change in a rapidly changing world. Social and political movement theory, revolutions, the force of religion in social movement activism, and recent changes in American society are considered. Prerequisite: Sociology 101. *Alternate Spring semesters, three hours.*

SOCI 323. SOCIOLOGY OF CULTURE. An examination of the way meaning and culture are constructed in American life. Particular attention is paid to cultural conflict in American social and political history, from the late 18th century to the present. Also examines how pluralist democracies might mediate cultural conflicts. Open to all sociology majors and others by permission of the instructor. *Alternate Fall semesters, three hours.*

SOCI 333. INTRODUCTION TO CRIMINAL JUSTICE. An overview of every element of the criminal justice system, looking at the process of handling offenders from crime detection through arrest, adjudication, prosecution/defense, sentencing, incarceration, probation, and parole. Issues of criminal law (ethics, philosophy, and basic structure and rules) and policy, defendants, victims, and the roles of different criminal justice agents will also be considered. Biblical perspectives will be examined throughout, as will, where appropriate, private alternatives to response to crime. *Alternate Fall semesters, three hours.*

SOCI 356. POVERTY AND STRATIFICATION. An overview of the nature and extent of poverty and stratification in the United States and the world, including consideration of empirical data, sociological theory, and Christian perspectives. Special attention will be given to private, faith-based solutions to chronic poverty. Prerequisite: Sociology 101 or 201. *Alternate Fall semesters, three hours.*

SOCI 360. INDEPENDENT STUDY. Available to students with a minimum of twelve hours in sociology. Prerequisite: Consent of department chairman. *Semester course, one, two or three hours.*

SOCI 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Sociology. Junior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

SOCI 375. GLOBAL SOCIETY. This course investigates the processes of globalization and their effects upon the political, economic and cultural spheres at the national and international levels. Particular attention is devoted to the implications of culture, including religion, as a moral order for the development of global society. *Alternate Spring semesters, three hours.*

SOCI 390. STUDIES IN SOCIOLOGY. This course, which varies each semester, involves the examination of different areas of sociology with a focus on new areas not covered in regular coursework. *Semester course, three hours.*

SOCI 452. SOCIOLOGY COLLOQUIUM. Guided intensive study of a specific sociological problem or topic under the guidance of one Sociology faculty member, and training in the art of professional speaking in the field. Students will orally present and defend their study proposals and completed final projects before the Sociology faculty and other students in the class. This course fulfills the discipline-specific Speaking Intensive (SI) requirement for Sociology majors. Prerequisite: senior status. *Spring semester only, two hours.*

SOCI 460. INDEPENDENT STUDY. Available to students with a minimum of twelve hours in sociology. Prerequisite: Consent of department chairman. *Semester course, one, two or three hours.*

SOCI 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Sociology. Senior standing and permission of the department chair and a faculty sponsor are required. *Semester course, one, two or three hours.*

SOCI 471. WORLDVIEWS IN CONFLICT I: SOCIAL THINKERS FROM THE REFORMATION TO THE EARLY 20TH CENTURY. A survey of the classical era of sociological theorizing and the 20th Century development of those models. Includes Tocqueville, Comte, Marx, Freud, Weber, Simmel, Durkheim and major schools of thought such as conflict theory and functionalism. Attention is also paid to major themes of sociological theory, including community, authority, secularization, stratification, and alienation. *Fall semester only, three hours.*

SOCI 472. WORLDVIEWS IN CONFLICT II: MODERN SOCIAL THOUGHT. An examination of the competing approaches to social theorizing that have come to prominence since World War II, with particular attention to American social theory. Topics include symbolic interactionism, the Chicago School, rational choice, globalization, ethnography, ethno methodology, phenomenology, world systems, and post-modernity. Prerequisite: Sociology 471. *Spring semester only, three hours.*

SOCI 480. INTERNSHIP IN SOCIOLOGY. This course offers practical experience appropriate for the sociology field. Prerequisite: Consent of department chairman.

Semester course, one to six hours.

SOCI 499. HONORS IN SOCIOLOGY. Open only to seniors who have honors grades and who have completed a minimum of fifteen hours in the department. Application must be made to the department and a proposal for the study must be approved before registering. The student studies under the guidance of department staff. Prerequisite: Fifteen hours in sociology including Sociology 477.

Semester course, one, two or three hours.