SECTION D – Items reported for inclusion in the 2015-16 Undergraduate Catalog by another standing committee of the Undergraduate Coordinating Council

From the General Education Committee, February 19, 2015, minutes received by the Undergraduate Coordinating Council, March 5, 2015

Catalog Language for PLUS general education program—Course placement. The text that is not highlighted is PLUS language that was approved by the GEC at its November 20, 2014 meeting, which has been approved by the UCC as well as the University Council.

University Graduation Requirements

General Education Requirements

The Progressive Learning in Undergraduate Studies (PLUS) General Education Program at Northern … … dynamic career. See: “The Baccalaureate Experience” for a listing of the baccalaureate outcomes.

Framework

The PLUS General Education Program consists of two types of course work.

First, the Foundational Studies courses develop the competencies necessary to succeed academically and personally. They emphasize students’ abilities to: (1) think critically and creatively; (2) reason quantitatively and qualitatively; (3) communicate clearly and effectively; and (4) work collaboratively across disciplines.

Second, Knowledge Domain courses continue to develop foundational competencies, … …; and (4) synthesize knowledge and skills.

Knowledge Domain requirements may optionally be fulfilled by a set of PLUS Pathways courses. A Pathway is … a … collaborating effectively across disciplines.

Foundational Studies

Through Foundational Studies, students will begin to develop the fundamental skills of written communication, … …; and (4) work collaboratively with peers from different backgrounds.

The Foundational Studies general education requirements consist of two courses in Writing Composition, one course in Oral Communication, and one course in Quantitative Literacy. Foundational Studies courses do not count toward general education Knowledge Domain requirements.

All students must satisfy the Foundational Studies … … from the Office of Testing Services.
The specific ways to satisfy the Foundational Studies requirements are listed below.

Foundational Studies Writing Requirement:

100-level Rhetoric and Composition (0-3 semester-hours). Writing and revising argumentative and analytical essays. This requirement can be satisfied by:

- Obtaining a grade of C or better in ENGL 103 or an equivalent course, or
- Obtaining equivalent transfer credit, or
- Passing the Writing Composition Foundational Studies Competency Examination, or
- Obtaining credit for ENGL 103 through examination by credit (Advanced Placement).

200-level Writing in the Domains (3 semester-hours). Writing and revising argumentative and analytical essays; analyze, evaluate, and synthesize material from a variety of sources; incorporate domain-appropriate writing and rhetorical styles as well as documentation styles. This requirement can be satisfied by:

- Obtaining a grade of C or better in ENGL 2xx03, ENGL 2xx04, or an equivalent course, or
- Obtaining equivalent transfer credit, or

Foundational Oral Communication Requirement (0-3 semester hours):

This requirement can be satisfied by:

- Passing COMS 100, or an equivalent course, or
- Obtaining equivalent transfer credit, or
- Passing the Oral Communication Foundational Studies Competency Examination.

Foundational Quantitative Literacy Requirement (0-3 semester hours):

This requirement can be satisfied by:

- Passing MATH 101 or equivalent course, or
- Obtaining a C or better in MATH 155, MATH 201, MATH 206, MATH 210, MATH 211, or MATH 229, or an equivalent course, or
- Obtaining credit for one of the mathematics courses listed above, except MATH 101, through credit by examination (Advanced Placement), or
- Obtaining a grade of C or better in STAT 208, STAT 301, STAT 350, or ISYE 335; and obtaining
  - a grade of C or better in MATH 110, or
  - an ACT mathematics score of at least 24, or
  - an SAT mathematics score of at least 560, or
  - an A- or B-level placement on the mathematics placement examination
- Obtaining equivalent transfer credit, or
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- passing the Mathematics Competency Examination.

Foundational Studies Course Descriptions

LIST all descriptions here in alpha order.

COMS 100. FUNDAMENTALS OF ORAL COMMUNICATION (3). Listening and speaking competencies with focus on skills of invention, organization, language and style, and delivery in public and other settings. Does not count for credit toward the major in communication studies.

ENGL 103. RHETORIC AND COMPOSITION I (3). Writing and revising expressive, expository, and persuasive essays accompanied by the reading of nonfiction prose. Weekly writing assignments. Not used in calculating English major or minor GPA. Grade of C or better required to satisfy English core competency requirement.

ENGL 203. RHETORIC AND COMPOSITION II, RESEARCHED WRITING IN THE DOMAINS (3). Critical reading and research-based writing with emphasis on the writing process and preparing students to participate in professional and academic discussions in the three domains: Creativity and Critical Analysis, Nature and Technology, and Society and Culture. Basic research methodology, source evaluation, and collaborative projects required in all sections. Not used in calculating English major or minor GPA. Grade of C or better required to satisfy English core competency requirement.

203A. Researched Writing across the Three Domains
203B. Researched Writing in Creativity and Critical Analysis
203C. Researched Writing in Nature and Technology
203D. Researched Writing in Society and Culture
PRQ: ENGL 103 with a grade of C or better.

ENGL 204. RHETORIC AND COMPOSITION, ACCELERATED RESEARCHED WRITING IN THE DOMAINS (3). Concentrated rhetorical approach to critical reading and research-based writing with emphasis on the writing process and preparing students to participate in professional and academic discussions in the three domains: Creativity and Critical Analysis, Nature and Technology, and Society and Culture. Basic research methodology, source evaluation, and collaborative projects required in all sections. Students with credit for ENGL 204 may not take ENGL 103 or ENGL 203. Not used in calculating English major or minor GPA. Grade of C or better required to satisfy English core competency requirement. PRQ: Placement only through English Core Competency Examination or a score of 30 or higher on the ACT combined English/Writing Test.

ISYE 335. PROBABILITY AND STATISTICS FOR ENGINEERS (3). Sampling and descriptive statistics; random variables; discrete and continuous probability distributions and its applications to engineering problems; fitting data to distributions; confidence intervals; hypothesis testing using
both nonparametric and parametric methods; and simple regression. Emphasis is given to engineering applications. PRQ: MATH 230.

MATH 101. CORE COMPETENCY IN MATHEMATICS (3). Mastery of elementary skills and facts, understanding of logically correct arguments, abstract thinking, and problem solving ability. Not intended as preparation for MATH 110 or for courses numbered above MATH 110. Not available for credit to students who have previously received credit with a grade of C or better in a MATH course numbered above 110 except MATH 201. Not open for credit toward the major or minor in mathematical sciences. Not used in major or minor GPA calculation for mathematical sciences majors or minors. PRQ: Intermediate algebra and geometry.

MATH 110. COLLEGE ALGEBRA (3). Algebraic and exponential functions, basic linear algebra. Requires skills and knowledge of intermediate algebra and plane geometry. Does not count for credit toward the major or minor in mathematical sciences. Not open for credit to students having credit in MATH 155 or MATH 211 or MATH 229. Not used in major or minor GPA calculation for mathematical sciences majors or minors. PRQ: KCMA 098 with a grade of C or better, or MATH 109 with a grade of C or better, or previous credit in MATH 110, or satisfactory performance on the Mathematics Placement Examination.

MATH 155. TRIGONOMETRY AND ELEMENTARY FUNCTIONS (3). Polynomials and rational functions, review of exponential and logarithmic functions, trigonometry, and complex numbers. Does not count for credit toward the major or minor in mathematical sciences. Not open for credit to students who have obtained a grade of C or better in MATH 229. PRQ: MATH 110 with a grade of C or better, or previous credit in MATH 155, or satisfactory performance on the Mathematics Placement Examination.

MATH 201. FOUNDATIONS OF ELEMENTARY SCHOOL MATHEMATICS (3). Introduction to sets, geometry, measurement, logic, structure of mathematical systems, and the real number system. Open for credit only toward the majors in early childhood studies, elementary education, and special education. Does not count for credit toward the major or minor in mathematical sciences. Not used in major or minor GPA calculation for mathematical sciences majors or minors. PRQ: One year of high school algebra and one year of high school geometry.

MATH 206. INTRODUCTORY DISCRETE MATHEMATICS (3). Introduction to sets, algorithms, induction, recursion, relations, graphs, trees, and algebraic structure, with applications, many of which are in computer science. Not used in major or minor GPA calculation for mathematical sciences majors or minors. PRQ: MATH 110 or satisfactory performance on the Mathematics Placement Examination.

MATH 210. FINITE MATHEMATICS (3). Introduction to mathematical topics with applications to business, social science, and other fields. Includes such topics as functions and graphs, matrix
algebra and solutions of systems of linear equations, inequalities and linear programming, elementary combinatorics, and probability. Not used in major or minor GPA calculation for mathematical sciences majors or minors. Introduction to mathematical topics with applications to business, social science, and other fields. Includes such topics as functions and graphs, matrix algebra and solutions of systems of linear equations, inequalities and linear programming, elementary combinatorics, and probability. Not used in major or minor GPA calculation for mathematical sciences majors or minors.

MATH 211. CALCULUS FOR BUSINESS AND SOCIAL SCIENCE (3). An elementary treatment of topics from differential and integral calculus, with applications in social science and business. Students may receive credit for both MATH 211 and MATH 229, but only one of them will count toward the minimum number of hours required for graduation. Not used in major or minor GPA calculation for mathematical sciences majors or minors. PRQ: MATH 110 with a grade of C or better, or previous credit in MATH 211, or satisfactory performance on the Mathematics Placement Examination.

MATH 229. CALCULUS I (4). A first course in calculus. Students may receive credit for both MATH 211 and MATH 229, but only one of them will count toward the minimum number of hours required for graduation. PRQ: MATH 155 with a grade of C or better or satisfactory performance on the Mathematics Placement Examination.

STAT 208. BASIC STATISTICS (3). Designed to provide students with an understanding of reasoning involved in the statistician's approach to a variety of problems in modern society. Topics include data collection, descriptive statistics, graphical displays of data, the normal distribution, elementary probability, elements of statistical inference, estimation and hypothesis testing, and linear regression. Not open for credit toward the major or minor in mathematical sciences. Not open for credit to students with credit in an upper-division statistics course or in OMIS 324 or UBUS 223. Not used in major or minor GPA calculation for mathematical sciences majors or minors.

STAT 350. INTRODUCTION TO PROBABILITY AND STATISTICS (3). Introduction to the basic ideas and fundamental laws of probability including sample spaces, events, independence, random variables, special probability distributions and elementary statistical inference. PRQ: MATH 230.
resourceful members of society, (2) explore human thought and relations in order to understand and respect cultural heritage, (3) provide an understanding of the scientific method and the application of scientific facts and principles pertaining to the natural and technological worlds, and (4) examine the role of knowledge in promoting human welfare.

The required minimum of 21 semester hours in Knowledge Domain studies cannot include more than two courses in any one department. (A course with an affiliated laboratory course shall be counted as a single course.)

A maximum of two approved general education courses in the student's major department may be used to fulfill Knowledge Domain general education requirements. (A course with an affiliated laboratory course shall be counted as a single course.)

The 21 general education semester hours required in the three Knowledge Domains can be earned by: (1) completion of designated courses; (2) general education credit articulation; (3) transfer articulation; or (4) credit by examination.

Foundational Studies courses do not count toward general education Knowledge Domain requirements. Any single course cannot count towards fulfilling more than one Knowledge Domain requirement.

Creativity and Critical Analysis (a minimum of 6 semester hours)
Courses in Creativity and Critical Analysis will challenge students to develop the skills involved in critical reflection and creative expression. Students will: (1) become acquainted with methods for analyzing primary sources and critically evaluating the ideas, events, traditions, and belief systems that have shaped human experience and expression; (2) explore fundamental modes of aesthetic and creative expression; and (3) understand and evaluate the diversity of humanity's most notable cultural achievements from artistic, historical, linguistic, literary, and philosophical perspectives.

Nature and Technology (a minimum of 6 semester hours)
Courses in Nature and Technology will develop students’ understanding of the role of science, technology, engineering, and mathematics and their relevance to societal issues. This domain encompasses human activities through which we observe, measure, model, and interpret the natural world and physical universe. Courses will explore the process of scientific discovery and how the resulting knowledge is applied to understand technological and societal change. Students will: (1) be able to articulate society's connections to, and responsibility towards, the natural world; and (2) learn to apply the scientific method, including assessing empirical data, investigating the predictions of existing theories, and developing experimentally testable hypotheses.

Society and Culture (a minimum of 6 semester hours)
Courses in Society and Culture will develop understanding of the methods of inquiry used to study
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Elective from any Knowledge Domain (1 course, a minimum of 3 semester hours)

Knowledge Domain Course Descriptions

Creativity and Critical Analysis

ANTH 102. Rise of Civilization (3). Forces leading to the emergence of early civilizations in the Near East, Egypt, China, Mesoamerica, and South America. Aspirations, problems, and needs addressed in the art, literature, history, and other enduring contributions of the civilizations of antiquity. Examination of ancient achievements and values from humanistic and artistic perspectives.

ANTH 210. Exploring Archaeology (3). Survey of the basic concepts and principles employed by archaeologists with illustrations from world prehistory.

ARTH 282. Introduction to World Art (3). A global survey of practices in the visual arts from ancient times to the modern era.

ARTH 292. Art and Design since 1900 (3). Modern and contemporary art and design.


ARTH 340. Studies in Modern and American Art (3).
A. American Art before 1945
B. Modernism in European and American Art
C. Thematic Subjects
History, theory, and criticism of various aspects of modern and American art. May be repeated with different subjects to a maximum of 12 semester hours. Multiple enrollments with different subjects are allowed in the same semester.

A. 1960-1980
B. 1980-present
C. 1960-present
D. Thematic Subjects
History, theory, and criticism of various aspects of contemporary art. May be repeated with different subjects to a maximum of 12 semester hours. Multiple enrollments with different subjects are allowed in the same semester.


COMS 230. Rhetoric and the Media (3). Role of media messages in selecting, structuring, and presenting versions of reality. Effects on individuals and society.

COMS 356. Critical Interpretations of Film/Television (3). Influences of aesthetics, genre, mode of production, visual grammar, and individual artistic vision on the rhetorical interpretation of film. Selected masterpieces viewed and analyzed.

ENGL 110. Transformative Fictions (3). How can reading fiction transform our understanding of reality? Explore novels, short stories, and plays to see how writers convince us to enter the worlds and believe in the characters they create. Survey with selected authors.

ENGL 115. British Identities, British Literature (3). Discover Britain's literary traditions and cultures through novels, poetry, drama, non-fiction, and short stories that have captivated readers from early times to now. Historical survey with selected authors.

ENGL 116. American Identities, American Literature (3). American writers from the nation's beginning have shown the world who Americans are and what shapes their beliefs. Explore fiction, poetry, nonfiction, and dramatic works that have challenged or complicated what it means to be "American." Historical survey with selected authors.

ENGL 310. Uncensored Classics (3). Read translations of epics, treatises on love, myths, novels, essays, and plays--ancient to modern, Eastern and Western. Learn how "classics" are defined and why people find them so provocative. Survey with selected authors.

ENGL 315. Shakespeare for Non-majors (3). The Shakespearean plays and poetry that excite modern audiences the most. Examines "The Bard's" enduring themes of love, political intrigue, and violence. Not available for credit in the major.

ENGL 350. Writing across the Curriculum (3). Practice in writing skills, conventions, organization, and structuring of prose forms appropriate to the humanities, social sciences, and sciences (e.g., proposals, lab reports, case studies, literature reviews, critiques). Open to majors


EPFE 410. Philosophy of Education (3). Differentiates philosophy of education from other basic inquiry into education. Emphasis on standard forms of philosophical reasoning. Exploration of leading writings for their relevance to the improvement of instruction in a sociocultural context.

FLCL 271. Classical Mythology (3). An interdisciplinary approach to Greek and Roman myths, including their historical and contemporary relevance.

FLFR 371. Masterpieces of French Literature in Translation (3). Study of masterpieces of French literature in translation from the Middle Ages to the modern period with emphasis on their social and cultural context; introduction to critical analysis.

FLIT 272. The Italian Renaissance (3). Birth of humanism and its contribution to Western thought through the literature of Italy during the Renaissance. Some attention given to painting, sculpture, and music. No knowledge of Italian required.

FLRU 261. Russian Culture and Literature (3). Comprehensive introduction to ancient and modern Russian culture and literature as a major part of Western civilization. Taught in English.

HIST 110. Western Civilization to 1500 (3). Examination and interpretation of major historical developments in the Ancient Near East, Classical Greece and Rome, and Medieval Europe.

HIST 111. Western Civilization: 1500-1815 (3). Examination and interpretation of the major historical changes which took place in Europe between the time of the Renaissance and the Age of the French Revolution.

HIST 112. Western Civilization since 1815 (3). Examination and interpretation of the European historical developments since the French Revolution which have molded the world as we know it today.

HIST 140. Asia to 1500 (3). Political and cultural history of India, China, and Japan with discussion of the origins, development, and importance of major Asian religions.
HIST 141. Asia since 1500 (3). Major developments in Asia since the arrival of the Europeans, with emphasis on the changes in Asian civilizations resulting from European technology, political ideas, and economic relations.


HIST 171. World History II: Problems in the Human Past (3). Thematic, comparative overview of major problems in human history since ca. 1500. Emphasis varies by instructor.

HIST 260. American History to 1865 (3). Central developments in American history from Old World backgrounds through the Civil War.

HIST 261. American History since 1865 (3). Central developments in the history of the United States since the end of the Civil War.

IDSP 225. Introduction to Medieval Society and Culture (3). Interdisciplinary orientation and introduction to medieval studies including study of different cultural forms (literature, music, art, philosophy, science, and religion) and the "way of life" of different strata of society.

ILAS 100. Introduction to Latin American Civilization (3). Introduction to Latin American civilization with consideration of anthropology, archaeology, art, history, literature, music, politics, international relations, and linkages with Latinos in the United States.

MUHL 220. Introduction to Music (3). To broaden the non-music major's understanding of music as a subject related to other arts and sciences. Classwork is divided broadly into two activities: study of music fundamentals, rhythmic structure, and form; and listening lessons arranged to illustrate the evolution of music. Not open to music majors.

PHIL 101. Introduction to Philosophy (3). Investigation of enduring and fundamental questions about ourselves, the world, and our place in the world, such as: What am I? Do I have a mind or soul that is somehow separate from my body? How should I live? Do I have free will? Does God exist? What is knowledge? What is truth? What is beauty?

PHIL 105. Logic and Critical Reasoning (3). Introduction to basic principles of rational argument evaluation in everyday life. Topics include deductive reasoning, the logic of truth functions and categorical statements, informal fallacies, inductive reasoning, causal inference, and the nature of evidence and proof. Emphasis on sharpening students' abilities to evaluate arguments. Students may not receive credit for both PHIL 103 and PHIL 105.
PHIL 231. Contemporary Moral Issues (3). Consideration of a number of major moral issues such as abortion, animal ethics, capital punishment, civil disobedience, economic justice, environmental ethics, euthanasia, human rights, nationalism, racial or sexual discrimination, sexual conduct, terrorism, and war.

POLS 150. Democracy in America (3). American democracy studied through the speeches and writings of political leaders involved in founding, preserving, and changing American politics and society. Emphasis on both democratic institutions and continuing problems of liberty and equality. *The Federalist Papers* and Tocqueville's *Democracy in America* are standard texts.

POLS 251. Introduction to Political Philosophy (3). Discussion of the permanent questions of importance to political life such as "What is justice?" "What is the relationship between individual and political ethics?" "What is the relationship between political theory and political practice?" Discussion will proceed by studying political thought. Representative political thinkers are Plato, Machiavelli, Locke, Marx, and Dewey.

TH-D 222. Dance and the Fine Arts (3). Aesthetic considerations of dance as a fine art. The study of the theory and philosophy of dance as related to music, theatre and the visual arts. Not open to theatre arts majors or minors.

THEA 203. Introduction to Theatre (3). Role of theatre as a major fine art and a communicator of ideas, human understanding, and cultural values. Contributions of playwright, actor, director, designer, technician, and audience to the theatrical production. Assessment of the principles and functions of theatre arts in its diverse performance media. Theatre attendance required. Not open to theatre arts majors or minors.

WGST 202. Women and Cultural Expression (3). Explores women and their roles as producers of and subjects in various cultural expressions in the U.S. and other societies. Culture includes visual and performing arts, literature, film, and other expressions throughout history.

Nature and Technology


ANTH 103. The Great Apes (3). Introduction to the Great Apes from the perspective of biological anthropology. Review of the anatomy, evolution, taxonomy, social organization, feeding ecology, evidence of culture and tool use, language skills, and conservation status of the chimpanzees, bonobos, gorillas and orangutans.
ANTH 240. General Physical Anthropology (3). Outline of the principles and subject matter of human evolutionary history, biological variation among human populations, genetics, evolutionary theory, and interrelations between cultural and physical anthropology.

BIOS 101. Plant Products and Human Affairs (3). Includes basic botany and the geographic origins of economically important plants which produce products used by various peoples worldwide. Emphasis on plant products having an influence on societies (cereal crops, medicines, drugs, etc.). Not open for credit toward the major in biological sciences.

BIOS 103. General Biology (3). Chemistry of living systems, cell structure and function, energetics, classical and molecular genetics, information flow, reproduction, evolution and diversity of life, and ecology. Not open for credit for majors in biological sciences.

BIOS 105. General Biology Laboratory (1). Optional laboratory designed to accompany BIOS 103. Not open for credit for majors in biological sciences. CRQ: BIOS 103.

BIOS 106. Environmental Biology (3). Biological basis of environmental science and human influence on the ecosystem. Emphasis on the biological relations among natural resources, pollution, and human population dynamics. Not open for credit for majors in biological sciences.

BIOS 107. Evolution for Everyone (3). Beginning with core principles, exploration of evolutionary theory from an integrative and interdisciplinary perspective, with topics ranging from the biological sciences to all aspects of humanity. Not open for credit for majors in the biological sciences.


CHEM 100. Chemistry in Everyday Life (3). The principles of chemistry, with emphasis on the role of chemistry in the modern world. Includes topics such as energy resources, environmental issues, health and nutrition, and modern materials. Three hours of lecture/week.

CHEM 110. Chemistry (3). Development of the fundamental principles and concepts of chemistry by lecture-demonstration, as well as the development of an appreciation of the nature of chemistry as a science. An historical development of the most important concepts and ideas. Methods and limitations of chemistry, its evolution and discussions of the problems currently being solved and created. Three hours of lecture per week. Not available for credit for students with previous credit in CHEM 210.

CHEM 111. Chemistry Laboratory (1). Designed to accompany CHEM 110. One 3-hour period a
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week. CRQ: CHEM 110.

CHEM 210. General Chemistry I (3). Fundamental laws and principles of chemistry; atomic structure and chemical bonding; stoichiometry; kinetic theory; gases; liquids; solids; solutions. Three hours of lectures and one recitation per week. PRQ: MATH 110 or MATH 155 or MATH 229 or satisfactory performance on the Math Placement Examination; and CHEM 110, or satisfactory performance on the Chemistry Placement Examination, or consent of department. CRQ: CHEM 212.

CHEM 211. General Chemistry II (3). Continuation of CHEM 210. Kinetics, equilibria, thermodynamics, electrochemistry; descriptive chemistry of the elements. Three hours of lectures and one recitation per week. PRQ: CHEM 210 and CHEM 212. CRQ: CHEM 213.

CHEM 212. General Chemistry Laboratory I (1). Designed to accompany CHEM 210. One 3-hour period per week. CRQ: CHEM 210.

CHEM 213. General Chemistry Laboratory II (1). Designed to accompany CHEM 211. One 3-hour period per week. CRQ: CHEM 211.

CSCI 205. Introduction to Computing (3). Introduction to computers, computer science, and programming techniques. Not available for credit toward the major in computer science or for students with prior credit in CSCI 210, CSCI 230, CSCI 240, CSCI 250, or OMIS 259. PRQ: MATH 110, MATH 155, MATH 206, MATH 210, MATH 211, or MATH 229, or consent of department.

ELE 100. Elements of Electronics (3). Basic principles used to explain the operation of electrical and electronic devices such as radios, stereos, televisions, radars, computers, microwave ovens, and other common electronic equipment.

FCNS 201. Human Nutrition (3). Role of nutrition in human biological systems: properties of nutrients; interaction with other environmental and genetic factors; quality of the current food supply. Not open for credit to students having previous credit in FCNS 309. PRQ: BIOS 103, BIOS 109, BIOS 208, or equivalent.

GEOG 101. Introduction to Environmental Geography (3). Elements of the physical environment, with emphasis on hydrology, vegetation, landforms, and soils; processes involved in their interactions, their spatial variations, and interrelationships between these elements and humankind. Three hours of lecture.

GEOG 102. Introduction to Environmental Geography Laboratory (1). Selected laboratory experiments to accompany GEOG 101. Two hours of laboratory. CRQ: GEOG 101.
GEOG 105. Introduction to the Atmosphere (3). Introduction to elements of weather and climate with emphasis on the interrelationships between heat, pressure, and moisture including the global radiation balance. Introduction to climate classification, and atmospheric processes that control global climates and climatic change. Three hours of lecture.

GEOG 106. Introduction to the Atmosphere Laboratory (1). Selected laboratory experiments to accompany GEOG 105. Two hours of laboratory. CRQ: GEOG 105.

GEOG 253. Environment and Society (3). Introduction to the study of human-environment interactions from a geographic perspective, with emphasis on the role of humans in changing the face of the earth. Fundamentals of environmental science as well as global and local issues related to human population growth, agriculture, water resources, biodiversity, forest resources, energy use, climate change, and environmental health.

GEOL 103. Planetary and Space Science (3). Exploration of the bodies of our solar system, specifically, what recent probes reveal about the origin, evolution, and interaction of planetary interiors, surfaces, and atmospheres, and their implications for our understanding of the Earth, further space exploration, and the search for extraterrestrial life.

GEOL 104. Introduction to Ocean Science (3). Use of the basic sciences in an examination of the use and abuse of the ocean environment, including food and mineral resource exploitation, pollution, coastal development and global climate change. Evaluation of likely outcomes from human impacts on the ocean environment in the context of a basic understanding of ocean processes.

GEOL 105. Environmental Geology (3). Exploration of both constraints imposed by geology on human activities and human impacts on natural processes. Includes fundamental geologic processes and associated hazards (for example, earthquakes, volcanic eruptions, flooding, landslides); occurrence and availability of geologic resources (energy, minerals, water); and topics such as pollution, waste disposal, and land-use planning viewed from a geologic perspective.

GEOL 120. Introductory Geology (3). Exploration of the diverse processes that continually shape our physical environment. Develops an understanding of earth materials, how the earth works, the causes of natural disasters, and the overriding importance of geologic time. Includes minerals, rocks, volcanoes, radioactive dating, earthquakes, plate tectonics, rivers and floods, ground water resources, and glaciers. For a more comprehensive understanding of the subject, concurrent registration in GEOL 121 is strongly recommended.

GEOL 121. Introductory Geology Laboratory (1). Laboratory experience with individual exploration of topics and subjects best presented in a hands-on environment. CRQ: GEOL 120.
HIST 323. History of Science to Newton (3). Science in the ancient Near East; Hellenic and Hellenistic science; the Arabs; medieval science; the Copernican revolution; the new physics; and the new biology. PRQ: At least sophomore standing.

HIST 377. American Environmental History (3). History of the ecosystems of the United States, 1600 to the present, and of the 20th century conservation and environmental movements. Topics include Indian ecology, farming and ecology, and the urban environment.

ILAS 261. Language, Mind, and Thought (3). Functioning of the human mind from the perspectives of anthropology, computer science, linguistics, neuroscience, philosophy, and psychology. Interdisciplinary consideration of perception, language, reasoning, artificial intelligence, culture, and models of cognition.

ISYE 100. Fundamentals of Manufacturing Systems (3). Basic elements of the entire manufacturing process including product conception, basic manufacturing operations, production processes, computer integration and automation, robotics, materials, planning and control of production systems, human factors, quality control, product support, and environmental aspects. Case studies of modern manufacturing systems emphasizing the latest technology, productivity, design for manufacture, concurrent engineering, and quality. Demonstration of machining processes and a computer-integrated manufacturing (CIM) line.

KNPE 100. Scientific Basis of Human Activity (3). Aspects of physical activity—biological, mechanical, physiological, nutritional, and psychological—with laboratory experiences to further students' understanding of these areas.

MEE 101. Energy and the Environment (3). Development and current status of energy sources, technologies, consumption patterns, conservation, and energy policies. Emphasis on environmental effects of various choices made at each step of the energy cycle, and examination of those choices from technological and socioeconomical points of view.

PHIL 205. Symbolic Logic (3). Introduction to formal logic, including propositional and quantificational logic. Emphasis on formal and semantic proof techniques and their applications to deductive reasoning in natural language. Students may not receive credit for both PHIL 205 and PHIL 302.

PHYS 150. Physics (3). Development of concepts and principles from selected topics in mechanics, electricity, heat, sound, and light. Application to everyday life. Not recommended for students who have had a year of high school physics. Not available for credit to students with credit in PHYS 150A.
PHYS 150A. Physics (4). Development of concepts and principles from selected topics in mechanics, electricity, heat, sound, and light. Application to everyday life. Not recommended for students who have had a year of high school physics. Not available for credit to students with credit in PHYS 150. Three hours of lecture and two hours of laboratory per week.

PHYS 162. Elementary Astronomy (3). Introduction to astronomical science extending from planetary astronomy through the most recent discoveries and speculations of astrophysics, such as pulsars, "black holes," and the latest hypotheses regarding stellar evolution and cosmology.

PHYS 180. Acoustics, Music, and Hearing (3). Elementary study of acoustics designed especially for students with an interest in music, speech and hearing, the theatre, or sound recording. Topics include the waves and vibrations, perception and measurement of sound, acoustics of musical instruments, speech and singing, and the acoustics of rooms.

PHYS 181. Acoustics Laboratory (1). A laboratory course designed to be taken concurrently with PHYS 180. The first part of the semester consists of experiments that provide an introduction to acoustics and acoustical measurements with modern electronic instruments. During the remainder of the course students choose experiments which fit their own particular interests. CRQ: PHYS 180 or consent of the department.

PHYS 210. General Physics I (4). First semester of a two-semester sequence covering mechanics, heat, and sound. Includes lecture and laboratory sessions. Not available for credit to students with credit in PHYS 253. PRQ: MATH 155 or equivalent or CRQ: MATH 229.

PHYS 211. General Physics II (4). Second semester of a two-semester sequence covering electricity and magnetism, light and quantum physics. Includes lecture and laboratory sessions. Not available for credit to students with credit in PHYS 251, PHYS 251A, or PHYS 273. PRQ: PHYS 210 or PHYS 250 or PHYS 250A or PHYS 253.


STAT 301. Elementary Statistics (4). Introduction to basic concepts in statistical methods including probability, theoretical and empirical distributions, estimation, tests of hypotheses, linear
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regression and correlation, and single classification analysis of variance procedures. Not available for credit toward the major in mathematical sciences. Not used in major GPA calculation for mathematical sciences majors. PRQ: MATH 206 or MATH 210 or MATH 211 or MATH 229.

TECH 245. Pollution Prevention and Sustainable Production (3). Study of environmental and occupational health issues related to the design, manufacture, and application of technology. Analysis of case studies to evaluate potentially adverse outcomes and prevention through compliance with environmental regulations and voluntary standards (EPA, OSHA, ISO). Application and implementation of environmentally sustainable design and manufacturing, and pollution prevention practices. Technology majors cannot use TECH 245 for general education credit.

TECH 294. Technology and Cultural Relevance (3). Development and current status of technology with attention given to developing an understanding of technology as it relates to its various settings and assumptions. Critical examination of these assumptions with an effort at organizing facts and developing meanings of technology in a dynamic society. Technology majors cannot use TECH 294 as a TECH elective or for general education credit.

Society and Culture

AHRS 200. Disability in Society (3). Overview of disability from personal, philosophical, sociological, psychological, medical, and legal perspectives. Emphasis on understanding disability within a minority-group model as defined by shared experiences of stigmatization and oppression.

ANTH 120. Anthropology and Human Diversity (3). Survey of human cultural diversity throughout the world. Anthropological approaches to understanding multiculturalism. Examination of factors underlying human diversity.

ANTH 220. Introduction to Cultural Anthropology (3). The concept of culture; its origin, development, and diversity. Culture as an adaptive mechanism. Theory and method of cultural anthropology applied to the analysis of selected cultures.

ANTH 230. Introduction to Linguistic Anthropology (3). Nature and function of language; anthropological motivations for the study of language; contributions of anthropological linguistics; distribution and relationships of languages of the world.

ARTE 109 Strategic Visual Thinking (3). Investigation of the role of visual design in the presentation of quantitative information in order to promote vigorous dialogue around the interactions of complex data streams, and this fosters robust decision-making. Introduction to social science research through data collection, quantitative analysis, and interpretation as students complete their own original survey research.
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ARTH 310. Studies in Ancient Art and Middle Eastern Art (3).
A. Egypt
B. Mesopotamia
C. Aegean Art
D. Archaic and Classical Art
E. Hellenistic Art
F. Etruscan and Early Roman Art
G. Roman Imperial Art
H. Islamic Art
I. Thematic Subjects
   History, theory, and criticism of various aspects of ancient and Middle Eastern art. May be repeated with different subjects to a maximum of 12 semester hours. Multiple enrollments with different subjects are allowed in the same semester.

ARTH 320. Studies in Medieval Art (3).
A. Early Christian and Early Byzantine Art: 330-843
B. Middle and Late Byzantine Art: ca. 843-1543
C. Early Medieval Art: ca. 500-1000
D. Romanesque and Gothic Art: ca. 1000-1400
E. Thematic Subjects
   History, theory, and criticism of various aspects of medieval art. May be repeated with different subjects to a maximum of 12 semester hours. Multiple enrollments with different subjects are allowed in the same semester.

ARTH 330 Studies in Early Modern Art (3).
A. Early Italian Renaissance Art
B. Early Northern Renaissance Art
C. 16th Century Italian Art
D. 16th Century Northern European Art
E. 17th and 18th Century European Art
F. Thematic Subjects
   History, theory, and criticism of various aspects of early modern art. May be repeated with different subjects to a maximum of 12 semester hours. Multiple enrollments with different subjects are allowed in the same semester.

ARTH 360 Studies in Design (3).
A. Modern and Postmodern Architecture
B. From Print Culture to New Media
C. From Craft to Industry
D. Sustainability
E. Thematic Subjects
History, theory, and criticism of various aspects of design from the 19th century to the present. May be repeated with different subjects to a maximum of 12 semester hours. Multiple enrollments with different subjects are allowed in the same semester.

ARTH 370. Studies in Asian Art (3).
A. Chinese Art
B. Japanese Art
C. South and Southeast Asian Art
D. Southeast Asian Art
E. Islamic Art
F. Buddhist Art
G. Thematic Subjects
History, theory, and criticism of various aspects of Asian art. May be repeated with different subjects to a maximum of 12 semester hours. Multiple enrollments with different subjects are allowed in the same semester.

A. Art of Africa, Oceania, and the Americas
B. African Art
C. Pre-Columbian Art
D. Latin American Art
E. Thematic Subjects
History, theory, and criticism of various aspects of African, Oceanian, Native American, Pre-Columbian, and Latin-American art. May be repeated with different subjects to a maximum of 12 semester hours. Multiple enrollments with different subjects are allowed in the same semester.

BKST 200. Racism in American Culture and Society (3). Examination of the forces that consciously and unconsciously engendered racism in American society and the effect of racism not only on the victims but also on those perpetuating it. The social cost of racism and possible solutions.

BKST 211. Educating for Cultural Sensitivity (3). Analytical look at student’s own ethnic and cultural background, and the ethnic and cultural background of others. Emphasis on surveying materials related to life experiences of ethnics in the United States. Systematic look at the education system and how it has responded to the needs of various ethnic groups.

BKST 219. Introduction to African Studies (3). Introduction to the African continent: its art and cultures, social and educational structures, history, economic development, political dynamics, and current crises.
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CLCE 100. Community Leadership and Civic Engagement (3). Introduction to community leadership and civic engagement including avenues for making contributions to community and society. Emphasis placed on nonprofit organizations, public service, volunteering, activism, and philanthropy, locally and globally.

COMS 240. Rhetoric of Interpersonal Communication (3). How interpersonal communication constructs our sense of self, determines the quality of enduring relationships with family, colleagues, and friends, and influences decisions about social responsibility and action.

COMS 410. Communication and Gender (3). Relationships among communication, gender, and culture through a variety of theoretical and critical perspectives. Examination of research on verbal and nonverbal aspects of communication as they interact with gender in contexts such as interpersonal, organizational, political, and media.

ECON 160. Contemporary Economic Issues (3). Economic approach to analysis of problems such as poverty, crime, unemployment, and inflation. Insights and evaluation of policy proposals. Not open for credit toward the major or minor in economics.

ECON 260. Principles of Microeconomics (3). Introductory study of market and nonmarket mechanisms in the allocation of productive resources and in the distribution of income. Includes the study of monopolies, oligopolies, and labor unions as well as applications to selected current economic problems. Sophomore standing recommended unless student is majoring or minoring in economics.

ECON 261. Principles of Macroeconomics (3). Introductory study of factors determining aggregate income, employment, and general price level. Such factors include roles of government, the banking system, and international monetary relations. Sophomore standing recommended unless student is majoring or minoring in economics.

EPFE 201. Education as an Agent for Change (3). Study of the complex problems facing educational and other institutions in our multicultural or pluralistic communities and the role of education as an agent for change.

EPFE 355. Sociology of Schooling (3). Introduction to the sociological study of schooling. Examination of the role of schools in modern society, the organizational features of schools, education as an institution and its relation to other social institutions, and the relationship between schooling and social inequality.

FCNS 207. The Consumer (3). Role of family members as consumers; influence of values and goals upon consumption practices; information and protection for the consumer.


FCNS 406. Global Food and Nutrition Issues (3). Interdisciplinary study of issues related to hunger and malnutrition in the world setting; causes of food crises in less developed nations, as well as in technologically advanced countries. PRQ: BIOS 103 or BIOS 109; and ANTH 120 or SOCI 170 or equivalent.

GEOG 202. World Regional Geography (3). Geographic analysis of the nations and regions of the world, emphasizing their economic, political, and social organization. Attention given to contemporary problems.

GEOG 204. Geography of Economic Activities (3). A global system approach to understanding the economic interdependence among people, regions, and nations.

HIST 381. Colonial Latin America (3). Spanish and Portuguese colonial empires in America from their foundation through the wars for Latin American independence.

HIST 382. Modern Latin America (3). The Latin American states from the wars of independence to the present. Political, economic, and social institutions examined with attention to patterns of Latin American government.

KNPE 111. Sport: Culture and Society (3). Examination of interaction between sport and culture; impact of sport on United States society; and social processes which influence sport.


PHHE 201. Social and Individual Patterns of Drug Use (3). Historic and cross-cultural use of drugs, pharmacology, and the effects of drug use and addiction on individuals and social systems.

PHHE 206. Contemporary Health Concepts (3). Investigation of the complexities of health issues related to lifestyles and the subsequent impact on the family, community, and a pluralistic society at large. Examination of aspects of biomedical and psychosocial theories and practice.

PHHE 295. Introduction to Public Health (3). Presentation of a conceptual model of health
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including psychosocial, socioeconomic, sociocultural, and environmental components. Overview of the U.S. health care system and introduction to concepts of public health promotion.


POLS 210. Introduction to Law and Courts (3). Introduction to the study of law and courts, including legal theory, judicial institutions, legal actors, legal systems and ways in which law is interrelated with politics, public policy and society.

POLS 220. Introduction to Public Policy (3). Crosslisted as PSPA 220X. Factors important in the policy process through an examination of selected issue areas such as health, the environment, energy, and economic regulation. Politics of evaluation and its uses.

POLS 260. Introduction to Comparative Politics (3). Comparative analysis of values, structures, and processes of selected foreign political systems, noting similarities to and differences from those of the United States.

POLS 285. Introduction to International Relations (3). Theories, models, and concepts commonly used to explain international relations with an emphasis on the use of these constructs to analyze contemporary international problems and issues.

PSPA 220X. Introduction to Public Policy (3). Crosslisted as POLS 220. Factors important in the policy process through an examination of selected issue areas such as health, the environment, energy, and economic regulation. Politics of evaluation and its uses.

PSYC 102. Introduction to Psychology (3). Basic psycho-physiological principles of human behavior, including the roles of heredity, maturation, environment, behavioral development, sensory processes, perception, motivation, and emotions.

PSYC 225. Lifespan Development: Childhood through Adulthood (3). Behavioral development from conception through adulthood. Emphasis on biological, motor, cognitive, social, and personality characteristics at various stages of development. PRQ: PSYC 102.

PSYC 245. Thinking (3). The phenomenon of thinking with emphasis on psychological theories and empirical findings related to memory, problem solving, decision making, and reasoning. Classroom demonstrations and exercises to illustrate principles and help students to improve their critical thinking skills. PRQ: PSYC 102.

SEAS 225. Southeast Asia: Crossroads of the World (3). Interdisciplinary introduction to the
varied cultures of Southeast Asia focused on the general theme of unity within diversity. Examination of the linkage of Southeast Asian art, music, dance, literature, and architecture with other segments of the Buddhist, Islamic, Christian, and animistic societies of the region.

SOCI 170. Introduction to Sociology (3). Basic survey of major substantive areas within sociology including key contributions to our understanding of the complex social world. Concepts and methods used by sociologists.

SOCI 250. Contemporary Social Institutions (3). Examination of the continuity, interrelationships, and change in social organization and institutions in American and other societies.

SOCI 260. Introduction to Social Psychology (3). How people are socialized in terms of the norms and values of their societies and how norms and values influence societal change. Introduces students to the basic research and methods of social psychological inquiry.

SOCI 270. Social Problems (3). Why social problems occur and how society can work toward correcting them. Exploration of how different value premises and social theories lead to distinctive ways of addressing social problems. Issues such as poverty, crime, homelessness, intergroup conflicts, and sexual identity discrimination provide case materials for these explorations. Use of this approach to examine underlying structural problems such as economic restructuring, the overall health and aging of the population, and urban change and decline.

WGST 101. Women, Sex and Gender Today (3). Introduction to the study of women, gender, and sexuality in the contemporary U.S., with an emphasis on diversity, feminisms, and social change.

Pathways
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