General Business

BUS 160. Business Decision Making in Modern Society. 3 credits.
This course introduces the concepts of basic technology literacy, information retrieval via electronic and hard copy; along with critical thinking skills. Basic business principles will be introduced to reinforce these concepts and their relationships. The course provides opportunity for applying the skills of oral and written communication to a variety of learning activities. Open to students who have not completed COB 300.

General Education: The Human Community

AFST 200. Introduction to Africana Studies. 3 credits.
An introductory survey of basic theoretical concepts to analyze the Black experience, with special focus on the general historical process common to Africa and the African Diaspora. May be used for general education credit.

AMST 200. Introduction to American Studies. 3 credits.
This interdisciplinary course will highlight the student's role in interrogating the cultural and political function of representations of America in literature, history, philosophy, religion, popular culture, music and art. Students will gain an understanding of why definitions of American identity matter and learn about the contemporary debates that inform the discipline of American Studies today. Questions about the changing role of national studies in the face of globalization are central. May be used for general education credit.

ANTH 195. Cultural Anthropology. 3 credits.
An introduction to the nature of culture and its relationship to language, economics, politics, kinship and other institutions in diverse cultures. The course also provides an overview of the theories, methods and ethical responsibilities involved in the study of cultural systems and ethnographic writing. May be used for general education credit.

ANTH 196. Biological Anthropology. 3 credits (B,R).
An introduction to the origins, evolution and genetic variability of humans and their relationship to nonhuman primates. Examination of the fossil record, the relationship between biology and culture and human genetics are included. Theories and methods used in the study of biological anthropology are also introduced. May be used for general education credit.

ANTH 205. Buried Cities, Lost Tribes: The Rise and Fall of Early Human Societies. 3 credits.
This course takes an archaeological and comparative perspective on the origins of human institutions, including art, architecture, religion, centralized political formations and urban life. The development and collapse of early societies in multiple world regions, including Mesopotamia, Egypt, the Indus Valley, Mesoamerica and the Andes will be explored. May be used for general education credit.

ART 200. Art in General Culture. 3 credits.
An exploratory course which aims to develop a non-technical, general, cultural understanding of the space arts, such as architecture, painting, sculpture and industrial design. Emphasis is on the contemporary. May be used for general education credit.

ARTH 205. Survey of World Art I: Prehistoric to Renaissance. 3 credits.
An introduction to the art and architecture of the world from cave painting through European pre-Renaissance art. Includes ancient through medieval art in Europe and the Near East as well as Asian and African arts. May be used for general education credit.

ARTH 206. Survey of World Art II: Renaissance to Modern. 3 credits.
An introduction to the art and architecture of the world from the Renaissance through Modern ages. Includes European Renaissance, Baroque, Enlightenment, 19th and 20th centuries as well as Asian and African arts. May be used for general education credit.

ASTR 120. The Solar System. 3 credits.
An introductory course in astronomy, which includes the following topics: motions of celestial objects, eclipses, historical development, the nature of light, telescopes, properties and evolution of the solar system. May be used for general education credit.

ASTR 121. Stars, Galaxies and Cosmology. 3 credits.
An introductory course in astronomy which includes the following topics: the Sun, stellar properties, stellar evolution, black holes, the Milky Way, galactic evolution, quasars and cosmology. May be used for general education credit.

BIO 103. Contemporary Biology (3, O). 3 credits.
An in-depth exploration of selected biological concepts, connected to current, relevant topics and emphasizing an understanding of science as a way of obtaining knowledge. Not available for major or minor credit in biology. May be used for general education credit. May not be used for major credit.

BIO 114. Organisms (3, 3). 4 credits.
An exploration of how diverse life forms carry out fundamental processes that sustain life, including acquiring and using essential molecules, growing and reproducing, responding to environmental stimuli, and maintaining a stable internal environment. Labs will introduce students to the scientific method in a series of investigative lab and field experiences. Biology and biotechnology majors receive registration priority in the fall.

BIO 222. Interdisciplinary Biology for Engineering and Physical Sciences. (3, 0) 3 credits.
Case studies and an issues-based approach will provide a framework to understand the science of biology, to stimulate critical thinking, and to appreciate the interdisciplinary nature of biological investigations. This interdisciplinary biology course is intended for students who have at least sophomore status and who are physical science, engineering or mathematics majors. This course is not available for credit toward the major or minor in biology or biotechnology. Prerequisites: MATH 231 or MATH 235.

BUS 160. Business Decision Making in a Modern Society. 3 credits.
This course introduces the concepts of basic technology literacy, information retrieval via electronic and hard copy; along with critical thinking skills. Basic business principles will be introduced to reinforce these concepts and their relationships. The course provides opportunity for applying the skills of oral and written communication to a variety of learning activities. Open to students who have not completed COB 300.

CHEM 120. Concepts of Chemistry. 3 credits.
A one-semester introduction to the fundamental principles, laws and applications of chemistry. Examples relating to the health sciences are emphasized. Not available for major or minor credit in chemistry. May be used for general education credit.

CHEM 131. General Chemistry I. 3 credits.
The first of a two-course general chemistry sequence for science majors. It is designed to introduce students to basic chemical concepts including atomic structure, periodic properties of the elements, nomenclature, basic stoichiometry, theories related to reactivity and bonding, and the behavior of materials. May be used for general education credit. Corequisite: CHEM 131L or CHEM 135L.

CHEM 131L. General Chemistry Laboratory. 1 credit.
This laboratory course is designed to complement and supplement the CHEM 131 lecture course. The laboratory and lecture portions must be taken concurrently. Chemistry majors are to take CHEM 135L and 135LL. May be used for general education credit.

ECON 200. Introduction to Macroeconomics. 3 credits.
Behavior of systems at the national and international levels. Topics include the methodology of economics as a social science, supply and demand, definition and measurement of important macroeconomic variables, and theoretical models of growth, inflation, interest rates, unemployment, business cycles, stabilization policy, exchange rates and the balance of payments. Not open to students who are enrolled in or who have received credit for ECON 332. May be used for general education credit.

ENG 221. Literature, Culture, Ideas. 3 credits.
This course will take a thematic approach to literature by examining multiple literary texts that engage with a common course theme concerned with the human experience. Themes address cultural, political, social, religious, or philosophical aspect ideas through literature. Specific topics will vary. May be used for general education credit.

ENG 222. Genre(s). 3 credits.
An examination of representative works in a literary genre, in a set of related literary subgenres, or in both a literary genre and one or more closely connected genres in other humanities disciplines. May be used for general education credit.
and biochemical characteristics of coastal waters will be discussed in
An introduction to the oceanography of coastal environs including
3 credits.
GEOL 211. Introduction to Oceanography.
131 or by permission of the instructor. Corequisites: MATH 205 or MATH
education credit.
Prerequisites: Either PHYS 140 or PHYS 240 or CHEM
processes, such as earth materials, solid earth and surface processes,
will be applied to case studies that address 3D visualization and time-based
earth structure and landforms. Topics include plate tectonics, the genesis/
3 credits.
A problem-based study of earth materials and the processes that affect
earth structure and landforms. Topics include plate tectonics, the genesis/
properties of rocks and minerals, and agents of change that drive surface
processes and landform development. Quantitative problem-solving skills
will be applied to case studies that address 3D visualization and time-based
processes, such as earth materials, solid earth and surface processes,
natural hazards and engineering applications. May be used for general
education credit. Prerequisites: Either PHYS 140 or PHYS 240 or CHEM
131 or by permission of the instructor. Corequisites: MATH 205 or MATH
220 or MATH 235 or by permission of the instructor.
GEOL 211. Introduction to Oceanography.
3 credits.
An introduction to the oceanography of coastal environs including
barrier islands, estuaries and tidal marshes. The physical, geological
and biochemical characteristics of coastal waters will be discussed in
the context of the economic and social pressures brought to bear on
these areas by an increasing global population. May be used for general
education credit.
HIST 101. World History to 1500. 3 credits.
A survey of important historical developments from prehistoric times to
1500. Emphasis is given to the rise and decline of great world civilizations
and their lasting contributions to humanity. May be used for general
education credit.
HIST 102. World History Since 1500. 3 credits.
A survey of important historical developments from 1500 to the present.
Emphasis is given to the growth of nationalism, the development of
colonialism, and to world events, problems, and conflicts of the present
century. May be used for general education credit.
HIST 150. Critical Issues in Recent Global History. 3 credits.
This course examines issues in recent history as a means to introduce,
develop and enhance critical thinking skills and to supplement writing,
oral communication, library and computing skills objectives for General
Education Cluster One. A seminar format allows for careful examination
of issues in both oral and written formats. The course emphasizes the
development and articulation of well-reasoned arguments in organized
and grammatically acceptable prose. May be used for general education
credit. May not be used for major credit.
HIST 225. U.S. History. 4 credits.
A survey of U.S. history from the Colonial period to the present, emphasizing
the development of American civic life, the involvement of the U.S. in
world affairs and the cultural richness of the American people. This course
stresses the analysis and interpretation of primary sources. May be used
for general education credit.
HTH 100. Personal Wellness. 3 credits.
Emphasizes lifestyle behaviors contributing to health promotion and disease
prevention. General areas affecting health status are identified. Suggestions
are made as to how health-related behaviors, self-care and individual
decisions contribute to health and influence dimensions of wellness.
May be used for general education credit.
HUM 102. God, Meaning and Morality. 3 credits.
A study of the ways in which various communities perceive and understand
the basis of knowledge, reality, meaning and purpose, ethics, and
aesthetics. Students will explore religious and nonreligious approaches
to these issues. May be used for general education credit.
HUM 200. Great Works. 3 credits.
An intensive examination of great literary works that focus on key issues
of knowledge and reality, meaning and purpose, ethics, and aesthetics.
Discussion, analysis and intensive writing are required. Texts will vary by
section and instructor. May be used for general education credit.
HUM 250. Foundations of Western Culture. 3 credits.
This course is a study of the roots of our Western tradition in Greek, Roman,
Medieval or Renaissance culture. Students examine the interrelationships
among history and literary works; the fine arts; philosophical and religious
thought and intellectual contexts. Content will vary depending on section
and instructor. May be used for general education credit.
HUM 251. Modern Perspectives. 3 credits.
An interdisciplinary study within the modern period of arts and humanities.
Students will examine the interrelationships among history and the arts,
philosophy, religion and the intellectual ideas of the time. Topics will vary
by section. May be used for general education credit.
HUM 252. Cross-Cultural Perspectives. 3 credits.
This course is a cross disciplinary study of a non-Western culture. Students
examine the ways people have responded to the human condition from
different historical, religious and philosophical positions, and with their
own artistic, musical and theatrical expressions. Sections, which vary by
instructor, include East-Asian experiences and West-African humanities.
May be used for general education credit.
ISAT 100. Environmental and Energy Sustainability. 3 credits.
This course explores scientific and technical issues important to
environmental and energy sustainability. Students study fundamental
chemistry and physics and then apply this knowledge to better understand
air quality, water quality, and conventional and alternative energy processes.
The class also explores the societal impacts of our energy choices and the
potential impact we as individuals can have through personal initiative.
May be used for general education credit.
http://www.jmu.edu/catalog/15
ISCI 104. Scientific Perspectives. 4 credits.
This course integrates the study of biology, chemistry and statistics within the context of environmental issues that include ozone depletion, acid rain, global warming, waste management and biodiversity. May be used for general education credit.

ISCI 112. Environmental Issues in Science and Technology (2, 3). 4 credits.
This course integrates the study of biology, chemistry and statistics within the context of environmental issues that include ozone depletion, acid rain, global warming, waste management and biodiversity. May be used for general education credit.

ISCI 113. Biotechnology Issues in Science and Technology: (2, 2). 4 credits.
This course introduces current topics in the life science technologies through lecture and laboratory exercises. Topics include advances in genetic engineering, the hierarchy of life and the rise of infectious diseases. May be used for general education credit.

ISCI 151. Topics in Applied Calculus in ISAT. 4 credits.
This course introduces the concepts of differential and integral calculus and ordinary differential equations to model real-world applications in science, business, technology and economics. This course includes a computer laboratory component emphasizing modeling and numerical methods. Course assumes familiarity with algebra and trigonometry. May be used for general education credit.

ISCI 160. Problem Solving Approaches in Science and Technology. 4 credits.
This course examines issues in modern science and technology as a means to introduce, develop and enhance critical thinking and problem solving skills. Current scientific and technological research and applications will be introduced to reinforce problem solving, instruction in systems thinking and critical inquiry. The course provides opportunities for using both oral and written communication in a variety of learning activities. May be used for general education credit.

ISCI 251. Topics in Applied Statistics in ISAT. 3 credits.
This course introduces statistical thinking – the discipline and methods for collecting, analyzing, and interpreting data for making decisions, doing science, and understanding our world. Topics covered include an introduction to data analysis methods, probability and chance, statistical reasoning and inference, and experimental design. The course includes a laboratory component emphasizing hands-on analysis of data taken from a variety of applications in ISAT. May be used for general education credit. Prerequisite: Sophomore standing or permission of the instructor.

ISCI 101. Physics, Chemistry and the Human Experience. 3 credits.
A survey of the fundamental concepts, principles and ideas of chemistry and physics. Particular emphasis is placed on understanding the development of the principles and their application in understanding the world around us. May be used for general education credit. Prerequisite or corequisite: One of the following: MATH 103, MATH 107, MATH 205, MATH 220, MATH 231 or MATH 235.

ISCI 104. Scientific Perspectives. 1 credit.
A study of topics selected to allow students to participate in mathematical and scientific problem solving approaches to knowledge. May be used for general education credit. Prerequisite or corequisite as indicated on MyMadison.

ISCI 171. Earth and Planetary Science for Teachers. 3 credits.
This course provides university-level foundations of earth and planetary science for future pk-8 teachers. Content aligns with various teacher competencies, and includes such topics as the formation and evolution of the earth and the earth’s solar system, the characteristics of stars, planets, asteroids, and comets, and how earth and planetary science knowledge and technologies function with social context. Hands-on, experiential inquiry will be integrated into the course, as will an exploration of such methods as observation, classification, comparison, measurement, data interpretation, mathematical analysis, inference, prediction and hypothesis testing. Normally open to IDLS majors only, but other students may request admission by special permission. May be used for general education credit.

ISCI 173. Life and Environmental Science for Teachers. 3 credits.
This course provides university-level foundations of physical science for future pk-8 teachers. Content aligns with various teacher competencies, and includes such topics as energy, environment, ecological succession, biological diversity and evolution, life systems and systems feedback, air and water quality, resource use and conservation, and how life and environmental science knowledge and technologies function with social context. Hands-on, experiential inquiry will be integrated into the course, as will an exploration of such methods as observation, classification, comparison, measurement, data interpretation, mathematical analysis, inference, prediction, and hypothesis testing. Normally open to IDLS majors only, but other students may request admission by special permission. May be used for general education credit.

JUST 225. Justice and American Society. 4 credits.
This course introduces the student to the concept and reality of justice in America. It is a broad-based, interdisciplinary consideration of justice: What it is, what it means, and how it intersects with society and social institutions in American. Philosophical and theoretical underpinnings of the notion of justice and the historical context of justice in American society will be considered. May be used for general education credit. May not be used for major credit.

KIN 100. Lifetime Fitness and Wellness (2, 2). 3 credits.
This course is designed to help students adopt and maintain the behaviors associated with an active and healthy lifestyle. Through this course students will learn the importance of maintaining wellness through a physically active lifestyle. Through lectures and labs, students study and develop the behavioral patterns consistent with the current knowledge base in fitness and wellness. May be used for general education credit.

MATH 103. The Nature of Mathematics. 3 credits.
Topics such as geometry, computing, algebra, number theory, history of mathematics, logic, probability, statistics, modeling and problem solving intended to give students insight into what mathematics is, what it attempts to accomplish and how mathematicians think. May be used for general education credit.

MATH 105. Quantitative Literacy and Reasoning. 3 credits. Offered fall and spring.
Applications and interpretation of numerical information in context. Selection and use of appropriate tools: scientific notation, percentages, descriptive summaries, absolute and relative changes, graphs, normal and exponential population models, and interpretations of bivariate models. Making informed decisions and effectively communicating them. Identifying limitations of information sources, assessing reasonableness of results, and basic concepts of confidence amid uncertainty. Not open to majors in mathematics or statistics. May be used for general education credit.

MATH 107-108. Fundamentals of Mathematics I-II. 3 credits each semester.
These courses, along with MATH 207, form a sequence that covers the topics of sets, logic, numeration systems, development of real numbers, number operations, number theory, geometry, measurement, algebra, functions, probability and data analysis. Sequence is required for early childhood, elementary, or middle school teacher licensure. May be used for general education credit. Prerequisite for MATH 107: MATH 155, MATH 156 or sufficient score on the Mathematics Placement Exam. Prerequisite for MATH 108: MATH 107.

MATH 220. Elementary Statistics. 3 credits.
Descriptive statistics, frequency distributions, sampling, estimation and testing of hypotheses, regression, correlation and an introduction to statistical analysis using computers. May be used for general education credit. Prerequisite: MATH 105 or sufficient score on the Mathematics Placement Exam.

MATH 231. Calculus with Functions I. 3 credits.
MATH 231 and MATH 232 form a sequence that combines first-semester calculus with algebra and trigonometry. The sequence is designed for students whose pre-calculus skills are not strong enough for MATH 235. Calculus material in MATH 231 includes limits and derivatives of algebraic functions and their applications. May be used for general education credit. Prerequisite: MATH 155, MATH 156 or sufficient score on the Mathematics Placement Exam. NOTE: MATH 231-232 together are equivalent to MATH 235 for all prerequisites. Not open to students who have already earned credit in MATH 235.
PHYS 215. Energy and the Environment. 3 credits.
Energy use, sources and trends; fossil fuels, heat-work conversions, thermodynamic restrictions and electric power production; nuclear fission reactors and fusion energy; solar energy and technologies; alternative energy sources; energy storage; energy conservation; issues of waste and safety. Environmental, social and economic aspects will be discussed. Not open to ISAT majors scheduled to take ISAT 212 as part of their degree requirements. May be used for general education credit. Prerequisite or corequisite for PHYS 240L: PHYS 140 or PHYS 240.

PHYS 240. University Physics I. 3 credits.
Kinematics, dynamics, energy and momentum conservation, oscillatory motion, fluid mechanics and waves. May be used for general education credit. Prerequisite or corequisite: MATH 232 or MATH 235.
Geographic Science

GEOG 161. Geospatial Tools and Techniques. 1-6 credits, variable. An introduction to the use of geospatial tools, such as geographic information systems (GIS), global positioning systems (GPS) and remote sensing, applied to a variety of areas, including cultural geography, environmental science, ecology, geology and public planning.

GEOG 200. Geography: The Global Dimension. 3 credits. This course promotes global understanding through the study of humans, their institutions and processes, and the resulting interactions between humans and the environment. The course will include the study of Western and non-Western peoples and their social, cultural, political and economic relationships. May be used for general education credit.

GEOG 210. Physical Geography (2, 2). 4 credits. This introductory course is an examination of systems and processes that influence patterns of Earth's atmosphere, biotic communities, soils and landforms at multiple spatial and temporal scales. Included are classroom and laboratory experiences that are geared toward investigating interrelationships among atmospheric conditions, Earth's natural surface characteristics and human-induced modifications of Earth's features.

GEOG 215. Cartography and GIS. 3 credits. An introduction to cartography and geographic information systems (GIS). Basic concepts will be illustrated with examples from a variety of application areas including cultural geography, environmental science, land use and planning and business.

GEOG 216. Earth Observation and GPS. 3 credits. An introduction to remote sensing, global positioning system (GPS) and computer fundamentals in Geographic Science. Basic concepts will be illustrated with practical applications, including hands-on work collecting data with GPS units and exploring remote sensing images from a variety of different instruments. Environmental applications will be featured.

GEOG 230. Spatial Thinking and Problem Solving. 3 credits. An introduction to the critical thinking skills associated with problems with inherent spatial components. Identification of the spatial elements of a given problem, the data requirements for addressing that problem, collections/acquisitions and organization of data, and use of geographic information systems to explore spatial patterns relevant to the problem of interest. Prerequisite: GEOG 215 with a "C" or better, GEOG 216 with a "C" or better and an introductory course in statistics (ISAT 251 or equivalent) or permission of instructor.

GEOG 260. Selected Topics in Geography. 3 credits. Exploration of geographic topics, tools or techniques of current interest. Can be repeated as course content changes.

GEOG 280. Human Geography: The Cultural Landscape. 3 credits. The course themes are human culture, cultural variations over the face of the Earth and how these variations are related to selected global issues. Topics covered include world demographics, world religions and languages, patterns of human migration, political systems and human conflict, agricultural systems and impact on the physical world.

GEOG 290. Human-Environment Interaction. 3 credits. This course evaluates human-environment interactions from a holistic point of view. It incorporates geographic perspectives of these interactions, which include political, cultural, social, economic, and ethical factors that influence how people perceive, impact, and manage the natural world. The course will emphasize geographic theories of resource use, humans as part of the landscape and human vulnerability to environmental changes. Prerequisites: GEOG 210 with a "C" or better and GEOG 280 with a "C" or better.

GEOG 300. Population Geography. 3 credits. An introduction to population measurement, sources of population data and current population problems. Topics include distribution, the changing age structure and migration issues affecting the U.S. At the global scale, topics include distribution, global migration patterns, the refugee crisis and prospects for feeding the rapidly increasing human population.

GEOG/HUMN 301. Introduction to Natural Disasters. 3 credits. This course is designed to give students an overview of the various types of natural disasters, a look at the world regions that are most vulnerable to each type of disaster, and, a preview of disaster planning, management, relief and response as related to natural disasters.

GEOG 305. History and Philosophy of Geography. 3 credits. Topics from the classical period to the modern period include 20th century theories and paradigm shifts involving cultural geography, physical geography, human-environment traditions, regional geographies and modeling. Diverse philosophies such as quantitative/positivist, qualitative/humanistic, social theory, and GIS are viewed for their contributions to the discipline of geography. Prerequisites: A grade of "C" or better in GEOG 210 and GEOG 280, and junior standing or permission of the instructor.

GEOG/GEOL 310. Environmental Issues. 1-4 repeatable credits, no limit. Courses cover environmental issues such as air pollution, forest and wildlife management, water, resource management, soils and land use, and energy and the environment (among other topics). Courses examine the interface between humans and environmental systems while addressing the impact of social, economic and political systems and activities on the environment. May be repeated as course content changes.

GEOG 311. Endangered Environments. 3 credits. In this course an investigation is made of a selected number of environmental problem areas around the world. Some examples include the temperate rainforest of Valdivia, South America, the tropical rainforests of Borneo and the Aral Sea of Eastern Europe. In the course, students will explore physical aspects of each environment and explore human impact and potential solutions to the problems.

GEOG 315. Field Studies in Geography. 3 credits. This course exposes students to the methods and techniques commonly used by geographers while conducting fieldwork. The course will cover identifying and defining a researchable project, designing and testing data collection methods, and different methods of collecting, recording and presenting data. Students will also become familiar with various types of field equipment.

GEOG 320. Human Dimensions of Global Change. 3 credits. This course addresses global change and human development. Conservation, sustainability and development are core themes that will be related to current changes occurring on a global scale. Global changes to be discussed in the course relate to the climate, biodiversity, natural resources and human populations. Sustainability will be introduced as a dimension of human development. Prerequisite: GEOG 290 with a "C" or better.

GEOG 322. Agricultural Systems. 3 credits. This course covers four distinct areas: the foundation of agriculture, the nature and distribution of soils on a global basis; the history of agriculture from the original selection of domestic crops to the 20th century; modern industrial agriculture and trade; and alternatives to chemical and energy intensive agriculture in the 21st century. Prerequisite: GEOG 290 with a "C" or better or permission of instructor.