

Course Code	Title	Undergraduate	Graduate	e	Description
ACCT					
3705	Volunteer Income Tax Assistance	X		LSB	Provides volunteer experience preparing tax returns for low and moderate income Duluth residents through both classroom and hands-on training.
4510	Fund and Not-For-Profit Accounting	X		LSB	Accounting concepts and processes applied to government, hospital, education, charity, and other not-for-profit entities.
AMIN					
*2015	Ojibwe History and Culture	X		CLA	Anishnabe, Ojibwe, and Chippewa. Origins and lifestyle: relationship between traditional and contemporary times. Emphasis on Minnesota. Through spring 2015 this course will carry Liberal Education Cultural Diversity credit and effective fall 2015 it will carry Liberal Education Sustainability credit.
3410	Fur Trade in Canada and America	X		CLA	Historical review and analysis of Canadian and U.S. Indians in the fur trades.
ANTH					
3200	Exploring Sustainability & Culture - Study Abroad	X		CLA	Taught on site at selected country. Introduces students to fieldwork based experiences in sustainability and community engaged scholarship. Course generally involves travel outside of the classroom work, and a service learning component with post project reflection. This course takes a cross-cultural and interdisciplinary view of energy. It examines the history of energy generation and use in the US with attention to economic and ecological systems as well as cultural assumptions asking how did the US grow to be the largest consumer of energy in the history of the world? By studying case studies of electrification in the global north and south, post- Fukushima nuclear energy politics in Japan and Germany; the impact of global gas and oil markets on local US communities, and the growth of renewable energy, this course aims to give students methods, tools and perspectives to understand, critique, and ultimately influence (personal and societal) assumptions, policies, economics, and technical systems surrounding energy generation and use.
3300	Energy, Culture and Society	X		CLA	Survey of historically and archaeologically documented urban case studies and thematic concepts, e.g., the use of space, political and economic implications of living in a city, abandonment of cities, and the impact of cities on the environment. Liberal Education sustainability credit will be effective fall 2015.
*3640	What is a City?: Archeological Perspectives on Urbanism	X		CLA	Advanced survey and comparative study of the relationship between food and culture in the past and present. Topics include the prehistoric, biological, and cultural aspects of the collection, production, distribution, preparation, and consumption of food, and an analysis of its social, cultural, political, and economic significance.
*3888	Anthropology of Food	X		CLA	This course examines efforts and provides skills to manage water, climate, wildlife, and internet, cultural heritage and other key pieces of ecosystem and community infrastructure at global and local levels as "commons," shared resources governed by culturally diverse, engaged communities for present and future generations.
*4500	The New Commons: Governing Shared Resources for Present and Future Generations	X		CLA	Cultural roots of such interrelated contemporary human problems as over-population, food production and distribution, health and nutrition, social and ecological disorders. Review of alternative solutions to such problems as suggested by anthropological study and analyses.
4623	Anthropology and Contemporary Human Problems	X		CLA	In-depth study of some of the methods and concepts concerning the interrelations of certain human populations with their environments in diverse natural, cultural, historical, and evolutionary settings.
*4631	Anthropology and the Environment	X		CLA	Cross-cultural examination of concepts related to landscape and space. Topics include culturally constructed landscapes, notions of belonging, memory, pilgrimage, commemoration, and ways of gaining food and resources. Theoretical background and analytical examples drawn from the four subfields of anthropology: cultural, physical, linguistic, and archaeological. Liberal Education sustainability credit will be effective fall 2015.
*4632	Anthropology of Landscapes	X		CLA	Advanced survey and study of interrelations between humans and plants, including material, symbolic, ritualistic and other aspects of human-plant interactions. Combines cultural anthropology and botany to investigate the roles of plants as food, medicine, natural resources and/or gateways to culturally sanctioned religious experiences.
*4633	Ethnobotany	X		CLA	Combines cultural anthropology and botany to investigate the roles of plants as food, medicine, natural resources and/or gateways to culturally sanctioned religious experiences.
4653	Senior Seminar	X		CLA	Contemporary topics in selected branches of anthropology. Active participation in group research project to develop and enhance anthropological research skills.
ART					
					The course examines art and design practices worldwide that are responding to current sustainability challenges and offering transformative solutions. We will explore definitions, principles and goals of sustainability and identify current global challenges, including water protection and land use, energy and waste, ecosystems and habitat, ecological debt and social inequity, framed within the intersection of class, gender and race. Within a participatory, interactive learning environment, we will analyze the work of artists and designers that are creating strategies to transition to live within planetary boundaries. Case studies of participatory and ecological art, cradle-to-cradle design and other practices that will be introduced, discussed and critiqued. Through active learning methods, including journaling, collaging, photography and working in pairs and groups, participants will explore their own relationship to sustainable ways of living.
*1004	Sustainable Visual Practices	X		SFA	A survey of the historical and contemporary uses of printed material to engage communities in political, cultural, and ethical conversation.
1303	Social Multiples: Availability and Circulation	X		SFA	Within a studio-based context, this course examines the potential of art and design to address issues of sustainability. Drawing from historical and contemporary precedents, students will explore and analyze solutions to the interdependence and growing incongruity between the natural environment and societal demands. As a combined media course, students will use a range of technical and conceptual methods, synthesizing previously learned studio experience and skills, examining the potential of found, ready made, and/or recycled materials to fulfill sustainable challenges.
*3305	Sustainability Studio: Theory and Practice	X		SFA	The city as a work of art and center of culture. A study of artistic representations combined with references to primary texts. Use of case studies of particular urban centers to explore the rise of the city and the history of urban planning around the globe.
ARTH					
2300	The City as a Work of Art	X		SFA	Students are informed about the regional-historical, socio-cultural, philosophical and scientific-technical foundations of Turtle Island (American Indian) Indigenous astronomy in several contextual settings well enough to understand in a generalized manner, how to approach and address contemporary issues such as star knowledge preservation and transmission protocols, indigenous language and sacred site preservation, light pollution and dark sky preservation, telescope construction ethics and the implications for establishing and maintaining place-based, indigenous education standards in mainstream science at schools, universities, museums and parks.
AST					
1050	Native Skywatchers: Indigenous Ethno-and Archaeo Astronomy	X		SCSE	
BIOL					
*1001	Biology and Society	X		SCSE	This course covers basic biology as it pertains to contemporary issues. Biology coverage includes cell biology, genetics, evolution and ecology. In addition to helping students understand biology, students will learn to more critically evaluate science that is presented in the media.
1010	Home Horticulture	X		SCSE	Concepts of basic biology, plant identification, growth and culture with practical application to sustainable landscaping, vegetable gardening, fruit culture, house plants and flower garden design. Labs include plant propagation, grafting, seed propagation, and an experiment using the scientific method, there will be a lab report, a paper, a class presentation, a design project and two field trips.
*1012	Gen Bio II	X		SCSE	Fundamental concepts, classification and diversity of life, anatomy, physiology, and development of prokaryotes, protists, fungi, animals, and plants; behavior, population, community, and ecosystem ecology.
*2001	Our Food: Science and Production	X		SCSE	This course will examine 3 large aspects of the food we eat: food science, human nutrition, and agricultural production methods. We will look at the main components of food, and how manipulation of food molecules creates different flavors, textures, and structures. We will then focus on the relative nutritional value of different foods and their effects on the human body, including illnesses related to poor nutrition. Finally, we will explore modern agricultural practices and discuss ways to enhance stability and sustainability in our food supply.
3401	Evolution	X		SCSE	Origin, history, opposition, and evidence supporting evolutionary ideas. Basic concepts: origin of life, phylogeny, biological history, mechanisms of evolutionary change, population genetics, speciation, tempo of evolution, macroevolution, extinction, biogeography, evolution of social systems, altruism.
3760	Marine Biology	X		SCSE	A multidisciplinary approach will be used to explore the diverse ecosystems of the marine realm. Emphasis will be on the ecological and physiological adaptations that have allowed animals to colonize habitats ranging from the intertidal zone to the abyss.
3761	Field Studies in Marine Biology	X		SCSE	Introduction to the marine environment by visiting either US (e. Friday Harbor, WA) or IML, Woods Hole, MA) or International (e. Leigh, New Zealand) marine lab and conducting both laboratory and field research. Topics include ecology, animal physiology, animal behavior, ichthyology and fisheries biology. Lectures will precede daily field trips where students will make in situ measurements and/or bring specimens back to the laboratory for study.
4804	Methods in Forest Ecology	X		SCSE	Project based course that delves into methods for studying plant populations, succession, demographics and forest stand dynamics. Large portion of the class is field-based and will involve surveying vegetation, establishing and monitoring long-term plots and developing a management plan for selected field sites.
4818	Biotic Response to Climate Change	X		SCSE	Many species are already responding to climate change, as evidenced by earlier budburst, flowering, and arrival of insect and bird pollinators. In only a few cases can we distinguish between phenotypic responses to longer growing seasons and warmer temperatures (plasticity) and evolutionary change in response to altered patterns of natural selection. Climate change will pose strong evolutionary challenges to native populations. In this course we will explore the fundamental response of the biota to these changes: extinction, migration, and adaptation.
4830	Coral Reef Field Studies	X		SCSE	Field study on San Salvador, Bahamas focusing on the biological and geological studies of the coral reef complex and associated habitats of the Caribbean. We will examine the ecology and taxonomy of associated biota as well as the physical, chemical and sedimentary processes in coral reef environments.
4850	Food and Humans	X		SCSE	In this course we will examine the evolutionary genetics underlying the process of plant and animal domestication, and the evolution of weeds and insect pests in the new environment provided by human-initiated agriculture. Classical readings on the origin of agriculture and agricultural pests (weeds and insects) and the latest findings in this constantly changing field will be examined. Students will learn key concepts regarding the response of plants and animals to natural and artificial selection, and the application of population genetics, phylogenetics, quantitative genetics, and genetic mapping to major questions in agriculture. Past and current challenges in agricultural productivity and sustainability will be addressed throughout the course.
4861	Lake Ecology	X		SCSE	This course offers a hands-on introduction to the ecology of lake ecosystems with a focus on lakes of the temperate and boreal regions, particularly Minnesota. We explore how factors including temperature, light, water chemistry, water motion, nutrients, and organisms interact in aquatic environments to determine the distribution, abundance, and behavior of aquatic biota. Laboratory exercises reinforce and expand on lecture materials and include the identification of fish, zooplankton, benthos, and phytoplankton as well as field excursions to area lakes.
4863	Ecosystems Ecology and Biogeochemistry	X		SCSE	Ecosystems ecology is the integrated study of the flows of materials and energy through ecosystems, which includes both the living (biotic) and non-living (abiotic) components. Biogeochemistry is a major subfield of ecosystems ecology, and deals with the cycling of nutrients through ecosystems. In this class, we will discuss the integration of ecosystems and biogeochemistry in terrestrial environments, specifically focusing on how human activities influence ecological systems and vice versa. It is my hope that you walk away from this course with a better understanding of how large environmental issues such as climate change and invasive species affect ecological systems.
5240	Ecological Genetics	X		SCSE	Examines basic concepts in population and quantitative genetics. Focus is on techniques that reveal the genetic structure and adaptive value of ecologically important traits.
5801	Microbial Ecology	X		SCSE	Microorganisms in natural environments: diversity, distribution, energetics, and growth of heterotrophic and autotrophic microbes in oxic and anoxic habitats. Roles of microbial populations and communities in biogeochemical cycling, ecosystem functioning, landscapes, and industrial, agricultural, and environmental applications.
5805	Fisheries Ecology and Management	X		SCSE	Lectures, readings and computer exercises relating to current issues in fisheries ecology. Computer exercises will emphasize techniques used by scientists working in the field and prepares the student for the use of quantitative research tools for independent research.
5807	Mathematical Ecology	X		SCSE	Development and use of mathematical models to describe ecological patterns and processes.
5808	Landscape Ecology: Theory and Application	X		SCSE	Key issues in landscape ecology including scale, measuring landscape patterns, mechanisms shaping landscapes, implications of landscape patterns on plant and animal populations, communities, and ecosystems, and conservation and resource management.
5818	Biotic Response to Climate Change	X		SCSE	Many species are already responding to climate change, as evidenced by earlier budburst, flowering, and arrival of insects and bird pollinators. In only a few cases can we distinguish between phenotypic responses to longer growing seasons and warmer temperatures (plasticity) and evolutionary change in response to altered patterns of natural selection. Climate change will pose strong evolutionary challenges to native populations. In this course, we will explore the fundamental response of the biota to these changes: extinction, migration, and adaptation.
5833	Stream Ecology	X		SCSE	Studies of stream communities and ecosystems as influenced by biological interactions and physical factors. Emphasis on North Shore streams.
5861	Lake Ecology	X		SCSE	This course offers a hands-on introduction to the ecology of lake ecosystems with a focus on lakes of the temperate and boreal regions, particularly Minnesota. We explore how factors including temperature, light, water chemistry, water motion, nutrients, and organisms interact in aquatic environments to determine the distribution, abundance, and behavior of aquatic biota. Laboratory exercises reinforce and expand on lecture materials and include the identification of fish, zooplankton, benthos, and phytoplankton as well as field excursions to area lakes.
5863	Ecosystems Ecology	X		SCSE	Survey of terrestrial and aquatic ecosystems, emphasizing current literature on ecosystem processes.
5865	Conservation Biology	X		SCSE	Introduction to science of species, habitat, and ecosystem conservation and management.
5870	Wetland Ecology	X		SCSE	Hydrology, nutrient cycling, and productivity of wetland ecosystems and the adaptations and interactions of resident biota; assessment, management, conservation, restoration, and creation of wetlands. Two daylong weekend field trips required.
5899	Seminars in Ecology	X		SCSE	In-depth analyses of topics in ecology.
CE					
1025	Introduction to Civil Engineering	X		SCSE	Introduction to transportation, water resources, structures, and geotechnical design. Introduction to ethics, professionalism, globalization, and contemporary issues in civil engineering. Introduction to the design process.
*3025	Environmental Engineering	X		SCSE	Introduction to environmental engineering systems and infrastructure. Fundamentals including application of mass/energy balances and equilibrium to environmental systems. These concepts applied to environmental topics: risk assessment, water quality modeling, water/wastewater treatment, air quality modeling, municipal/hazardous solid waste management.
3026	Project Management	X		SCSE	Study of basic concepts and models for successful management of projects in engineering. Topics discussed include: engineering economics, project delivery process, bid development, cost estimation, life cycle cost evaluation, contract structure, scheduling, resource allocation and LEED requirements.
3225	Hydraulics and Hydrology	X		SCSE	Introduction to hydrologic analysis including precipitation, infiltration, hydrology analysis, stream routing, groundwater, and well hydrology. Fundamentals of hydraulic analysis, types of flow hydraulic devices, pipe, and open channel flow, uniform and varied flow.
4228	Watershed Engineering	X		SCSE	Basic principles in hydrologic modeling and concepts of watershed delineation, land use change impact, case studies, and modeling tools are discussed and applied to natural and urban watersheds. The course will utilize hydrologic and hydrologic models and GIS tools for engineering design.
4237	Water Quality Engineering	X		SCSE	Applied analysis of water quality in natural systems. Review of mass-transport processes and approaches for solving water quality problems in lakes, estuaries, rivers, groundwater, and soil-sediment with TMDL (Total Maximum Daily Load) and remediation design applications. Applications in water and wastewater treatment.
4246	Environmental Remediation Technologies	X		SCSE	The course examines the principal applications and limitations of technologies designed for source control and removal of contaminants from soil, groundwater, and surface water. Topics include: introduction to hazardous waste, contaminant characteristics, a review of mass transport, partitioning and fate of contaminants, site characterization/assessment, regulatory requirements, the design and operation of current remediation technologies, advances in technological design, and emerging remediation technologies including biotechnology and nanotechnology.
4256	Design of Water and Waste Water Treatment Plants	X		SCSE	Introduction to design of municipal water and wastewater treatment plants. Unit operations approach sets the foundation by presenting conventional classic treatment trains. Hybrid systems, small community, and onsite systems will also be presented.
4257	Municipal Solid Waste Management and Hazardous Waste Systems	X		SCSE	The class is an introduction to design solid waste management. Specific topics covered include: waste characterization, route planning, collection technologies, resource recovery systems (recycling), energy recovery (refuse derive fuel), landfill design (staging, leachate management, landfill gas management), and cover system design. An overview of soil and groundwater remediation technologies will also be provided.
*4515	Sustainable Design	X		SCSE	Introduction to sustainable design and construction including LEED, materials, construction/transportation/production, life-cycle/service, rating systems, codes, regulations, economical issues and social issues.
5201	Water Policy	X		SCSE	Socio-cultural, legal, and economic factors that affect water resources management. Historical trends in water policy, resulting water laws in the United States. Federal, state and local institutional structures for water management.
5203	Stream Crossing and Culvert Design	X		SCSE	Overview of road-stream crossing design with emphasis on stream simulation for aquatic organism passage. Includes field data collection, analysis, and design of road-stream crossings, and traditional culvert hydraulic analysis and design. Meets concurrently with 2 cr. GEOL course (GEOL 5603) that excludes culvert hydraulic analysis and design.
5226	Water Resources Engineering	X		SCSE	Application of engineering economics, risk analysis, and operations research to the planning and management of water systems; major topics include flood control, hydroelectric power, water supply, multiobjective planning, sustainability and climate change.
5237	Water Quality Engineering	X		SCSE	Applied analysis of water quality in natural systems. Review of mass-transport processes and approaches for solving water quality problems in lakes, estuaries, rivers, groundwater, and soil-sediment with TMDL (Total Maximum Daily Load) and remediation design applications. Applications in water and wastewater treatment

5241	Water Chemistry		X	SCSE	Water is critical component of environmental systems, and the chemistry that occurs in water is a rich subject. This class focuses on water chemistry in both natural and engineered systems. Topics include a review of thermodynamics and equilibrium, acids and bases, titrations, the carbonate system, solubility of minerals, metal ion complexation, oxidation-reduction chemistry, and descriptions of adsorption. Principles are applied to chemistry in water treatment, nutrient cycling, organic matter, and organic pollutants. Both chemical equilibrium and chemical kinetics are explored. Students will be introduced to software that can be used to solve water chemistry problems.
5246	Environmental Remediation Technologies		X	SCSE	The course examines the principal applications and limitations of technologies designed for source control and removal of contaminants from soil, groundwater, and surface water. Topics include: introduction to hazardous waste, contaminant characteristics, a review of mass transport, partitioning and fate of contaminants, site characterization/assessment, regulatory requirement, the design and operation of current remediation technologies, advances in technological design, and emerging remediation technologies including biotechnology and nanotechnology.
*5515	Sustainable Design and Construction		X	SCSE	Introduction to sustainable design and construction including LEED, materials, construction/transportation/production, life-cycle/service, rating systems, codes, regulations, economical issues and social issues.
5525	Decision, Risk, and Reliability		X	SCSE	An introduction to modeling uncertainty in engineering applications. Tools for risk-based design and decision-making including uncertainty modeling and decision analysis applied to civil engineering systems
<b>CHE</b>					
1020	Sustainable Engineered Systems		X	SCSE	Explore the engineered world using basic conservation tools (mass, momentum and energy balances). Use concepts from pollution control, unsustainable and sustainable systems, economics, history, and political contexts to understand what a sustainable future may look like. Develop problem solving skills and creativity.
1090	Chocolate in Trinidad		X	SCSE	Production of chocolate from the starting raw materials collected from a cocoa tree plantation, sugar cane plantation, and milk from dairy farm. Follow progress from raw agricultural products to finished chocolate using the unit operation concepts of fermentation, air drying, roasting, grinding, winnowing, refining, conching, tempering, flavoring, and molding. Complete class having produced real chocolate from the basic raw materials. This class will also explore the impact and meaning that chocolate has had on cultures around the world. Historical perspectives will include readings about Olmec and Aztec civilizations, Colonization, Industrial revolution, Globalization and Commodification, and the environmental labor focused Direct Trade production. Cultural perspectives will include how different groups of people have experienced chocolate from religious, medicinal, political, and gender/labor based perspectives. Technological perspectives will look at the various practices associated with raw material production (farming), trade and transportation, refining as a drink and as a luxury commodity, and onto mass production. Course will also explore the impact of current trends on the future of chocolate, including climate change, demographic shifts in raw material producers, and new consumer attitudes for socially responsible and sustainable consumption.
*2001	Introduction to Environmental Engineering		X	SCSE	Comprehensive survey of environmental engineering. Fundamental science and engineering principles as basis for analyzing environmental issues. Federal laws on air pollution, wastewater discharge, and hazardous waste. Wastewater treatment, air pollution control, waste minimization, resource recovery, and recycling.
4141	Material and Mineral Processing		X	SCSE	Flow sheets and unit operations of processes for the separation of commercially valuable minerals from their ores: particle characterization, comminution, concentration, flotation, separation, environment, introduction to pyro and hydrometallurgy.
4501	Chemical Engineering Design 1		X	SCSE	Preliminary design of chemical processing of hazardous waste treatment plant. Use of engineering economics and calculation of rate return and hazardous waste management as applied to chemical plants. Market survey, flow sheet preparation, material and energy balances.
4502	Chemical Engineering Design 2		X	SCSE	Continuation of CHE 4501. Equipment design, instrumentation, process control, hazardous waste management plan, plant safety, economic feasibility, and institute analysis for process changes.
*4603	Bioresnewable Resources		X	SCSE	Comprehensive investigation of the engineering systems involved in the sustainable production of fuels, chemicals, and materials from bioresources.
4613	Air Pollution Control		X	SCSE	Analysis of what air pollution is, where it comes from and where it goes on the local, regional and global scales. Discussion of the regulatory apparatus concerning air quality. Design of air pollution control equipment.
5101	Mining Policy		X	SCSE	Socioeconomic, cultural, and legal frameworks that affect mineral resources management specific to the mining industry. Historical and contemporary trends in mining policy and practice, resulting public and private governance in the United States with federal, state and local institutional structures for minerals resource management.
5610	Recycling Processes Engineering		X	SCSE	Investigation into the best available current technology for recycling processes. Processes used to recycle materials such as metals, oils plastics, cardboard, and white-goods will be investigated. Identification of current regulations and state of the art processes. Comparison of recycled vs. raw chemical property characteristics.
5612	Hazardous Waste Process Engineering		X	SCSE	Identification of hazardous substances and their effects. Federal, State and International regulations. Green Engineering - modification of processes to avoid hazardous waste formation. Life Cycle Management of hazardous substances. Design of waste treatment processes.
5642	Mining and Environmental Quality		X	SCSE	Design of environmental engineering controls used in and discussion of environmental issues associated with mining and mineral processing activities. Includes mining industry regulatory/public policy issues.
<b>CHIN</b>					
3042	Aspects of Chinese Cultures: Interface between Traditions and Contemporary Values		X	CLA	Survey of aspects of Chinese civilization and cultures. Students will examine diverse cultural values in the international community and work toward a sense of culturally responsive citizenship in the current global society. Taught in English.
<b>CHEM</b>					
*1103	Aspects of Chemistry		X	SCSE	Topics in general, organic, and biological chemistry using sustainability as the underlying theme. Study of chemical principles, their application, and their impact on daily life. Independent unit in contrast to CHEM 1113, 1151, 1153 or 1161. CHEM 1103 alone satisfies the requirements in liberal education categories Natural Sciences and Sustainability. Alternatively, the combination of CHEM 1103 and CHEM 1104 meets liberal education category requirements for Natural Sciences with lab.
*1105	From the Industrial Revolution to Green Chemistry		X	SCSE	The study of the chemistry associated with scientific and technological discoveries made during the Industrial Revolution in England from 1750-1850. Twenty-first Century "green chemistry" solutions to reduce detrimental impacts of industrialization such as those that occurred during the Industrial Revolution. The study of the lives of selected chemists and natural scientists whose work was located in the Midlands of England.
*2212	Environmental Chemistry		X	SCSE	Study of chemical processes in natural air, water, soil and sediment environments. Sources, reaction, transport, effects, and fates of natural and anthropogenic chemical species will be covered. Methods of analysis of environmental samples, with emphasis on quantitative treatment of data.
*2901	Principles of Green Chemistry		X	SCSE	Survey of the principles of green chemistry emphasizing basic toxicology, the evolution of waste production and environmental performance, catalysts and organic solvents, renewable resources and intentional design of green reactions and processes.
<b>COMM</b>					
3405	Health Campaigns		X	CLA	Survey course examines how individual and community models of health behavior change are used to design, implement, and evaluate campaigns that promote healthy behaviors and reduce high-risk health behaviors.
*3620	Controversy in the Boundary Waters		X	CLA	Considers the rhetorical and political processes continuing the debate over the Boundary Waters Canoe Area's wilderness designation. Culminates in a class field trip to the BWCA, and a group project pertaining to an advanced seminar on the dynamic relationship between ecology and communication. This course considers the impact that human communication has on ecological systems as well as the implications of ecological thinking for the study of human communication, explore human and other-than-human modes of communication, and provides opportunities to interrogate ecological communication practices in northeastern Minnesota.
4100	Ecological Communication		X	CLA	This course is an introduction to the history, development and contemporary scope of the culture industry and creative economy. In the past, the United States and the global economy heavily relied on industrial production, yet today a disastrous shift to a creative economy is evident from its contribution to the world economy and sustainable development. Creative economy thrives at the intersection of culture, technology, business and innovation. It is a worldwide phenomenon catalyzing change, building more inclusive, connected and collaborative societies. It has the power to influence and inspire present and future generations, to protect our planet, people, cultures and natural resources and therefore contribute to a more sustainable development path. Students in this course examine how cultural, financial, social and human capital can be organized to enhance livelihoods, and create economic and cultural value on a local and global scale. The course is open to all students and fulfill UM-D's Global Perspective Lib Ed requirement.
1001	Culture Industry and Creative Economy		X	CLA	The word "design" has traditionally been used to describe the visual aesthetics of objects such as books, products, architecture and fashion. Yet increasingly design as a discipline is expanding to include not just the shaping of artifacts but also people interact with systems, services and organizations. As a result, the challenges and opportunities facing our society become more complex, an approach known as "design thinking" is playing a greater role in finding innovative solutions for virtually any type of organizational and societal challenge. In this course students become familiar with design thinking concepts, the process and a toolkit. Students work in multi-disciplinary teams to solve complex, whole-to-part, real-world problems.
3101	Introduction to Design Thinking and Conceptual Competencies		X	CLA	Culture and creative organizations constitute the creative economy. Unlike development that is based in industrial production, creative industries offer an approach to development that is more inclusive and sustainable. The leadership and management principles to operate, scale and sustain creative and cultural organizations differs from that of purely commercial organizations. This course introduces students to the theories, methods, and practices for managing culture and creative organizations, with a focus on designing and assessing their various components such as vision, mission, values, the logic model for change, strategic planning, marketing and financing.
4002	Managing Cultural Organizations		X	CLA	This course provides students with the knowledge and skills needed to play a leadership role in a cultural organization. Using case methodology students will know theories, methods, and practices for managing cultural organizations, gain the skills to participate strategically in the governance of such organizations and be able to design and assess the effectiveness of governance models, volunteer programs, organizational capacity, and inter-organizational relationships. Student will also know the legal requirements affecting cultural organizations and approaches to finance the programming and operations, pre-req: graduate student
5002	Managing Cultural Organizations		X	CLA	
<b>ECON</b>					
3721	Natural Resources and Energy Economics		X	LSBE	Microeconomic analysis of natural resource and energy markets. Role of these resources in production processes and waste generation, use and pricing of nonrenewable and renewable resources over time, resource availability, sustainable development, and ecological economics.
3771	Environmental Economics		X	LSBE	Microeconomic analysis of environmental quality as an economic good. Pollution control, benefit-cost analysis, valuation methodologies and their application to air and water quality, hazardous waste management, preservation, and global pollutants.
<b>EDUC</b>					
*1201	Managing Planet Earth		X	CEHSP	Environmental education; exploration of key concepts and principles that govern how nature works; potential solutions to environmental and resource problems.
4110	Advanced Earth Science for Teachers		X	CEHSP	Investigative approach to secondary school teaching of modern earth science curricula, including aspects of astronomy, meteorology, oceanography, and geology, the latter with an emphasis on plate tectonics.
*4234	Science, Technology, and Society		X	CEHSP	Nontechnical study of historical and cultural impact of natural science and technology on the earth and its inhabitants.
5230	Indigenous Peoples and the Environment		X	CEHSP	This course will examine the intersection of Indigenous peoples, traditional and contemporary practices of sustainability, planetary ecological issues, the impact on Indigenous peoples and the possibilities provided by Indigenous place-based/environmental education. Indigenous peoples cultural relationship to place will also be explored along with a critical examination of the impact of colonization, patriarchy and capitalism has had on Indigenous homelands and centers of power. Attention will be given to Indigenous initiatives that are working toward the healing of their homelands and the planet.
5501	Energy Conservation System		X	SCSE	Theory, design and operation of conventional and alternative electrical energy conversion systems. Carbon dioxide cycle, Earth/Sun radiation balance, and environmental impacts. Power delivery systems and integration of conversion systems with the grid. Development of generation protocols. Impact of energy policies and current energy issues. Case studies.
<b>ENED</b>					
3330	Outdoor Recreation		X	CEHSP	Examination of outdoor recreation as a part of natural resource-based agencies as well as in nature centers, commercial operations, and in municipal settings. This course will focus on outdoor recreation uses in northeastern Minnesota.
4163	Outdoor Education Methods		X	CEHSP	Methods and theoretical basis for teaching outdoor education. Emphasis on application at outdoor sites. Weekend experience at a regional nature center required.
4315	Operations and Management		X	CEHSP	Methods and practice of administrative processes of personnel, fiscal, and facility management. Field study and presentation of a management plan.
4555	Foundations of Environmental Education		X	CEHSP	Provides a background of skills and understanding of environmental education delivery in various educational settings, with emphasis on formal classroom audience.
*4565	Young Children, Nature, and Sustainability		X	CEHSP	Focus on education for sustainability in an early childhood (infant-preschool age) context. Study of rational for merging education for sustainability and early childhood education, as well as recommended practices and possibilities for doing so. Also emphasized are skills for developing and implementing developmentally appropriate learning experience that support health development of young children and further education for sustainability goals.
4601	Wilderness Philosophy		X	CEHSP	People and social forces that have influenced land-use related to designated wilderness, philosophical and historical basis for wilderness management.
4800	North Karelia: Outdoor Education and National Parks in Eastern Finland		X	CEHSP	This is a Study Abroad Program in the country of Finland in the Karelia region. Karelia is a magnificent area of lakes and forests in Eastern Finland. You will learn how outdoor education is used to teach about the protected natural areas in the Karelia district, particularly Finnish Wilderness Areas. You will learn basic natural history such as plants, trees, birds, and wildlife. You will explore how the Finnish "Everyman's Right" applies to sustainable use and management of Protected Nature Areas. From your experiences in Finland you will compare cross-cultural nature experiences in Finnish and U.S. protected areas, particularly those in Minnesota such as the Boundary Waters Canoe Area Wilderness (BWCAW), which is very similar to the Finnish Karelia Region. Courses will be a short-term study abroad to Cuba with a focus on ecological sustainability, education, health and culture. Over the past two decades, Cuba has turned toward sustainable agricultural and environmental sustainability against the backdrop of scarce fossil fuel resources. They learned how to produce nearly 100% of their fruits and vegetables by organic means while building a more cohesive community. These efforts build upon the larger success of the Cuban literacy and health care campaign which, have been exported to the poorest communities around the world. In preparation for travel to Cuba, students will be given background readings prior to departure; the week prior to departure we will hold 3 face-to-face meetings to discuss Cuba's history, education, health and environmental sustainability. While in Cuba, students will engage in an in-depth study by visiting multiple sites of relevance and importance. Site may include: the Cuban Literacy Museum, organic farms, Museum of the Revolution, artists community, Latin American Medical School, an eco biosphere reserve and meet with Cuban citizens, leaders, workers and scholars.
4805	Environmental Sustainability, Education and Culture in Cuba		X	CEHSP	Methods and theoretical basis for teaching outdoor education. Emphasis on application at outdoor sites. Weekend experience at a regional nature center required pre-req: MEI candidate or instructor consent
5163	Outdoor Education Methods		X	CEHSP	The study of resolving environmental problems that affect sustainability. This includes issue identification; building an effective team of investigators; and, study of the issue to the point of making recommendations to resolve the issue of sustainability management and education.
5325	Sustainability Issues Investigation		X	CEHSP	Examines research literature and related issues pertinent to outdoor education including disciplines of science, environmental experiential, and adventure education. Trends in research, teaching, plus research design and methods.
5500	Current Research and Issues		X	CEHSP	Focus on education for sustainability in an early childhood (infant-preschool age) context. Study of rational for merging education for sustainability and early childhood education, as well as recommended practices and possibilities for doing so. Also emphasized are skills for developing and implementing developmentally appropriate learning experience that support health development of young children and further education for sustainability goals.
5555	Young Children, Nature, and Sustainability		X	CEHSP	Methods and lesson strategies connected to current definitions, theories, and practices of teaching sustainability practices and management. Sustainability of the natural environment from the effects of outdoor education and nature-based tourism is an underestimated aspect of sustainability practices. Pedagogical approaches to teach sustainable practices for the natural environment will be the primary focus of this course. Students will be able to apply this course to other sustainability practices such as sustainable energy or food practices.
5800	Sustainability Education: Methods and Strategies		X	CEHSP	
<b>ENGL</b>					
1582	Introduction to World Literatures		X	CLA	Sampling of literary works mainly from Middle East, Africa, Far East, and South America.
1583	Introductory Study of Major Topics in Contemporary African Literature		X	CLA	Introductory study of the major topics in Contemporary African Literature. Draws on literary texts and films to broaden students' understanding of Africa's cultural, social, economic, and political challenges from colonization to globalization.
1585	Australian and New Zealand Literature and Culture		X	CLA	Introduces students to the literature and cultures of Australia and New Zealand, focusing on the formation of national identity, both countries' relationship to Great Britain and the U.S., conventions like "mateship" and "the cultural politics," and the natural politics and the cultural politics of aboriginal peoples.
2535	The Bible in Literature, Art and History		X	CLA	Study of how scripture has shaped literature and art, and how they have responded to scripture, with consideration of a range of historical, philosophical social and culture context—ancient, medieval, and contemporary. Readings and discussions about art and literature representing a variety of literary genres (e.g. poetry, drama, musical theatre, novel, graphic novel) that primarily address the Judeo-Christian tradition, but also offer comparisons with other cultural traditions.

	2571	Contemporary Literature	X	CLA	Readings in world literature since 1945. Close attention to literary texts from Americas, Europe, Africa, and Asia in their various aesthetic, historical, and cultural contexts. Topics of discussion might include the literary/aesthetic implications of post-colonialism, globalization, the Cold War and its aftermath, and technological developments. Liberal Education global perspectives credit will be effective fall 2015.
	2800	Nature Writing	X	CLA	This course introduces students to the practices and conventions of nature writing. Students learn to write creatively about the natural world and to read literary works that engage with it. Students produce creative work in a variety of forms and submit two of their productions for review by the class. The class also conducts numerous field trips to local natural settings, such as the Trestle Creek and the Logan Farm, where they engage in nature writing directly and discuss relevant texts. By the end of the semester, students can expect to have a richer understanding of environmental literature, the ethical debates surrounding it, and the craft behind it, as well as, hopefully, a deeper appreciation for nature.
ES	3563	American Literature I	X	CLA	Historical survey of important authors, movements, conventions, genres, and themes: origins to Civil War.
	*2005	Environment & Sustainability	X	CLA	This course will cover human impacts on their natural environments (resource depletion and pollution) and the complex notion of Sustainable Development. Students will analyze resource depletion (i.e. fossil fuels, forests, fisheries, water and soil) and pollution (i.e., climate change, ocean acidification, and oceanic garbage patches and dead zones) trends over the past century to better understand our growing impacts on the natural environment. Students will also analyze a wide variety of solutions (i.e., local food systems, renewable energy systems and water systems) from the emerging field of Sustainable Development aimed at mitigating these alarming resource depletion and pollution trends. Finally, students will be introduced to policy considerations regarding the implementation of these solutions and new economic approaches to help transition from economic growth to Sustainable Development.
	2095	Special Topics	X	CLA	Special topics in Environment and Sustainability.
	*2803	Issues in Global Ecology	X	CLA	An examination of our most pressing global environmental problems and their most promising solutions.
	*3100	Sustainable Food Systems	X	CLA	Historical and contemporary food systems within sustainability framework. Understands food within social, political, economic and environmental contexts. Looks at sustainable production, consumption and processing issues.
	3200	Environmental and Ecological Justice	X	CLA	Integrated study of justice issues as it relates to both the distribution of pollution and related negative impacts of contemporary society and of the natural world and non-human life. Emphasis on identifying how fairness is imagined, debated, determined via structure and/or legislated.
	3300	Anthropocene Stories: Geology, Human Histories and Possible Solutions	X	CLA	Study of Anthropocene discourse and social ecological reality from scientific, social science and humanities point of view. Explore this rupture in geological history that collective and cumulative human activity has created, contemporary social and political movements that has arisen to meet the challenges this unprecedented reality, and possible futures that it may bring. Focus on comparing the assumptions and implications of these.
	3500	Ecological Economics	X	CLA	Examine the basic principles and assumptions of Micro and Macro Economics, and their relevance in our modern global economic system. Examine the environmental/social consequences of deviations from these assumptions, and alternative economic models/analyses and policies consistent with sustainable development.
	4005	Environmental Policy	X	CLA	This course explores the creation and implementation of environmental policy in the United States. Major environmental policies and laws at the federal and state level. Particular attention will be paid to air and water pollution, climate change, and natural resource use.
	4010	Seminar	X	CLA	Compare and contrast global free market capitalism and democratic socialism. Identify political and economic barriers to achieving the goal of sustainable development. Examine the recent history of the move towards global free market capitalism around the world and its implications for sustainable development. Develop sustainable development projects and write proposals to targeted funders.
	4090	Internship Prep	X	CLA	Various employers and members of environmental organizations in the Duluth region, and in Minnesota will speak to the class each week to describe what they do in their respective fields of environment and sustainability. Students will be placed with environmental work, producing reports on prominent fields and directions in environmental work. Students will be placed with perspective internship experiences at the end of the semester.
	4097	Internship	X	CLA	Experience in the field of environment and sustainability with direct supervision in public agencies or relevant private firms.
	4612	Field Techniques and Research Design	X	CLA	This course is an introduction to quantitative research methods in environmental sustainability, and is designed to equip students to plan, analyze, and present original research. Students will follow the complete research design process, including funding and grant proposals internal review board applications, and how to use these leverage employment and graduate school applications. Specifically, students will learn to collect data through interviews, focus groups, textual analysis, and participant observation; how to analyze data through these techniques; and how to prepare sound scientific arguments based on these analyses. Based on the collection of data throughout the semester students will present their research findings to be presented to the public.
	4910	Teaching Assistantship in Environment and Sustainability	X	CLA	Practical experience in teaching beginning courses in the department. Students serve as intern teachers assisting the instructor in administration of the course.
ESCI	4999	Honors Project in Environment and Sustainability	X	CLA	Advanced individual project in any area of Environment and Sustainability demonstrating sound theoretical and research foundations and resulting in a written report or other expression of scholarly production.
	2010	Surface Processes	X	SCSE	Study of Earth surface processes emphasizing the origin and evolution of the earth's response of the physical environment to anthropogenic perturbations, climate change, and tectonic events; and application of physical, chemical, and mathematical principles to the study and interpretation of the environment. Surface processes will be explored through field and lab exercises designed to give the student hands-on experience in environmental characterization and monitoring.
	3201	Mineral Resources	X	SCSE	An introduction to the geology, extraction, processing, and disposal of mineral deposits, including major metal deposits (Fe, Al, Pb, Zn, Cu), scarce metals (high-technology metals, rare earth metals), non-metal deposits (salt, fertilizers, chemicals) as well as industrial minerals and resources (stone, sand/clay). Also, includes topics related to the environmental footprint of resource mining and the impact of technological and societal development.
	3202	Energy Resources	X	SCSE	Geologic principles of carbon-based energy resources, with emphasis on coal and conventional and unconventional (e.g. shale oil, oil-sands, ultra-heavy crude oil) petroleum and gas; fundamentals of nuclear energy; introduction to technologies associated with the extraction, production, refinement, consumption, and byproduct treatment/disposal of carbon-based and nuclear energy resources. Importance of carbon-based energy in global industrialization and associated population growth; limits of population growth imposed by energy requirements; principles and associated technologies of renewable energy and energy conversion, with focus on solar (direct and indirect), geothermal, tidal, and biofuel energy resources.
	3203	Surface water and Groundwater Interaction	X	SCSE	Water at the Earth's surface is constantly exchanged between wetlands, streams, lakes and shallow groundwater reservoirs. Human activities alter drainage patterns and impact surface water, runoff, and infiltration. Drainage of wetlands and construction of impervious surfaces increases the rate of storm water runoff and can lead to increases in flood frequency. Agricultural activities introduce fertilizers and pesticides into the soil, which can then contaminate surface water and groundwater reservoirs. Surface water is intimately connected to ground water through complex hydraulic interactions that are difficult to observe and measure and therefore are often ignored in water management policy implementation. This course examines the natural processes of groundwater and surface water interaction, classification of lakes, streams, and wetlands; sources, measurement and interpretation of hydrologic and geochemical data; and, through numerous case studies, the impacts of human activities on surface water and groundwater.
	3296	Internship in Environmental Science	X	SCSE	Practical work experience with an employer closely associated with student's academic area. Arranged by mutual agreement between student, department, and employer. Written report and assessment by non-academic supervisor at the end of the work experience.
	4102	Environmental Assessment	X	SCSE	Environmental issues identification and investigation. Review of case studies of environmental investigations and the components of environmental impact statements. Selection of local or regional environmental issues and evaluation of the environmental problems from a multidisciplinary perspective. Preparation of draft Environmental Impact Statement (EIS).
	4201	Introduction to Watershed Hydrology	X	SCSE	This course provides an introduction to the hydrologic cycle and water processes in the context of watershed watersheds. The course will cover the major components of the hydrologic cycle, including precipitation, canopy interception, evapotranspiration, infiltration, soil water storage, runoff, streamflow, and groundwater flow. The impacts of watershed management on water quantity and quality will be discussed using regional, national, and global examples, with emphasis on solving real-world problems using hydrologic datasets.
	4663	Ecosystems Ecology and Biogeochemistry	X	SCSE	Ecosystems ecology is the integrated study of the flows of materials and energy through ecosystems, which includes both the living (biotic) and non-living (abiotic) components. Biogeochemistry is a major subfield of ecosystems ecology, and deals with the cycling of nutrients through ecosystems. In this class, we will discuss the integration of ecosystems and biogeochemistry in terrestrial environments, specifically focusing on how human activities influence ecological systems and vice versa. It is my hope that you walk away from this course with a better understanding of how large environmental issues such as climate change and invasive species affect ecological systems.
	5201	Introduction to Watershed Hydrology	X	SCSE	This course provides an introduction to the hydrologic cycle and water processes in the context of watershed watersheds. The course will cover the major components of the hydrologic cycle, including precipitation, canopy interception, evapotranspiration, infiltration, soil water storage, runoff, streamflow, and groundwater flow. The impacts of watershed management on water quantity and quality will be discussed using regional, national, and global examples, with an emphasis on solving real-world problems using hydrologic datasets.
	5863	Ecosystems Ecology and Biogeochemistry	X	SCSE	Ecosystems ecology is the integrated study of the flows of materials and energy through ecosystems, which includes both the living (biotic) and non-living (abiotic) components. Biogeochemistry is a major subfield of ecosystems ecology, and deals with the cycling of nutrients through ecosystems. In this class, we will discuss the integration of ecosystems and biogeochemistry in terrestrial environments, specifically focusing on how human activities influence ecological systems and vice versa. It is my hope that you walk away from this course with a better understanding of how large environmental issues such as climate change and invasive species affect ecological systems.
GEOL	1202	World Regional Geography	X	CLA	Principles of renewable energy, energy conversion, irreversible thermodynamics and thermodynamic engines, thermoelectric generators, turbines, photovoltaic conversion, electrochemical conversion, fuel cells, pumping efficiency, wind energy, conversion of wave energy, heat pumps, ecosystems and biomass energy, and energy transmission and storage.
	1205	Our Globalizing World	X	CLA	This course analyzes the relationship between the environment, economic development, culture, and politics by examining human geography in the context of global regions. This course introduces core concepts in human geography such as space, place, and scale, and globalization, and applies those concepts to understand the diversity of our globalizing world. Topics from the impact of climate change, to colonialism, the geography of agriculture, urbanization, geopolitics, and ethnic and national identities are explored.
	*1414	Physical Geography	X	CLA	Earth-sun relations; maps and globes, and major factors of the natural environment, including water resources, landforms, weather and climate, natural vegetation, and soils.
	*2306	Environmental Conservation	X	CLA	In order to adapt to and mitigate environmental challenges that are predicted to occur in the future, we must have a clear understanding of the physical, ecological, social, and political contexts that brought us to the present. This course examines the complexity of coupled social-ecological systems and the role that humans have played in changing the face of the Earth.
	2313	Economic Geography	X	CLA	Contemporary geographic pattern analysis of production, distribution, and consumption of goods and services. Development of geographic theories and models that attempt to explain spatial economic activities such as agriculture, manufacturing, and trades and services.
	3335	Urban Planning	X	CLA	Urban planning explores the purpose, practice, and theories of modern community planning for the promotion of social and economic well-being. The causes of urban problems, and the tools planners can use to solve them will be investigated. Special focus will be paid to citizen participation and how the voices of community members can be heard in the planning process.
	3370	Geographies of Development	X	CLA	This class examines the global geography of wealth and poverty, i.e., why some places are very rich while others are very poor. The impacts of colonialism, the Cold War, globalization, overpopulation, and ecological and climate change are explained, and the prospects for a more just future are considered.
	3401	Weather and Climate	X	CLA	Weather and climate are critical to both Earth systems and human societies, yet they are frequently misunderstood. The goal of this course is to develop a scientific understanding of atmospheric processes and how they are responsible for weather events and climatic patterns. Atmospheric composition, structure, and motion are studied, along with precipitation processes, air masses, fronts, cyclonic storms, and the distribution and classification of climates.
	3411	Human Environment Interactions	X	CLA	This course examines the interactions between humans and their physical environments. Topics covered include the physical components of the natural environment, human population growth and movement, natural resource use, and human impact upon vegetation, soil, water, landforms and climate.
	3422	Natural Hazards	X	CLA	Geography of natural hazards such as earthquakes, volcanoes, tsunamis, hurricanes, floods, and droughts; human-environment interactions under extreme geophysical conditions; causes, characteristics, and consequences of natural hazards; human adjustment to natural hazards.
	*3461	Geography of Global Resources	X	CLA	Spatial distribution and uses of global natural resources addressed through models of resource management, focusing on energy, non-fuel minerals, population, food, and technology. Theoretical approach and political perspective applied to trade, international economic development, and environmental issues.
	3481	Urban Ecology	X	CLA	Introduction to theoretical, practical and policy aspects of urban ecology. Discusses methods of sustainable cities and ecologically responsible planning. Includes study of relevant field techniques and policy issues, including public participation in planning process and development of sustainable growth strategies.
	4401	Climate Science	X	CLA	This course examines the complex relationship between the atmosphere, oceans, and the biosphere over space and time, and how they relate to Earth's climate. Specifically, this course will study the basic forces that drive Earth's climate systems, how climate differs between the equator and the poles and between oceans and continents, and how these difference results in variations in Earth's climate. In addition, we will explore the global balance and distribution of energy and the transfer of that energy throughout the atmosphere, the role of land and ocean surfaces in climate forcing, how global atmospheric and oceanic circulation patterns are related, and examine long-term climate forcing (ENSO, MJO, etc.). Lastly, we will understand how these processes have varied in the past, and how current variations are leading to fundamental changes to our climate system.
	4466	Water Processes and Management	X	CLA	Introduction to the surface water processes and water resources management, including precipitation, runoff generation, channel processes, spatial and temporal variations in water distribution, aspects of water quantity and quality, and watershed management problems.
	4451	Geography of Soils	X	CLA	This course gives students a fundamental understanding of the soil as a living resource. The course covers basic soil science and the critical need for sustainable soil management in the context of current agricultural and climate change. The course includes outdoor field excursions, hands-on soil study both in the field and in the lab. Course includes a weekend field trip.
	5101	Water Policy	X	CLA	Socio-cultural, legal, and economic factors that affect water resources management. Historical trends in water policy; resulting water laws in the United States. Federal, state and local institutional structures for water management.
GEOL	*1110	Geology and Earth Systems	X	CLA	Earth systems science is an interdisciplinary approach to understanding the processes operating within and the interactions between the geosphere, hydrosphere, atmosphere, and biosphere. In this course we investigate the changing nature of the Earth, its composition, architecture, and antiquity; the internal and external processes that shape it through time; cycles of energy and matter; the development of life and impact of human activity; and both local environmental issues and global change.
	*1610	Oceanography	X	CLA	Origin and history of ocean basins, sea floor morphology, chemistry of sea water, currents, waves, tides, life in the sea, primary productivity, nutrient dynamics, human impact.
	2010	Surface Processes	X	SCSE	Study of Earth surface processes emphasizing the origin and evolution of the earth's response of the physical environment to anthropogenic perturbations, climate change, and tectonic events; and application of physical, chemical, and mathematical principles to the study and interpretation of the environment. Surface processes will be explored through field and lab exercises designed to give the student hands-on experience in environmental characterization and monitoring.
	2110	Earth History	X	SCSE	The historical development of the science of geology, nature of the geologic record, fossils, the geologic time scale, and tectonic evolution of continents and ocean basins. Concepts presented are developed within the framework of the theory of plate tectonics.
	3100	Earth's Climate and Environment: Past and Future	X	CLA	Exploration of the processes that control Earth's climate and affect the environment on timescales of 100's of millions to 10's of years. Discussions will include how and why the dinosaur's environment was different from today's environment and concerns about future global warming.
	4201	Introduction to Watershed Hydrology	X	CLA	This course provides an introduction to the hydrologic cycle and water processes in the context of watershed watersheds. The course will cover the major components of the hydrologic cycle, including precipitation, canopy interception, evapotranspiration, infiltration, soil water storage, runoff, streamflow, and groundwater flow. The impacts of watershed management on water quantity and quality will be discussed using regional, national, and global examples, with emphasis on solving real-world problems using hydrologic datasets.
	4839	Coral Reef Geology	X	CLA	Field study on San Salvador, Bahamas focusing on the biological and geological studies of the coral reef complex and associated habitats of the Caribbean. We will examine the ecology and taxonomy of associated biota as well as the physical, chemical and sedimentary processes in coral reef environments.
	5201	Introduction to Watershed Hydrology	X	CLA	This course provides an introduction to the hydrologic cycle and water processes in the context of watershed watersheds. The course will cover the major components of the hydrologic cycle, including precipitation, canopy interception, evapotranspiration, infiltration, soil water storage, runoff, streamflow, and groundwater flow. The impacts of watershed management on water quantity and quality will be discussed using regional, national, and global examples, with an emphasis on solving real-world problems using hydrologic datasets.
	5250	Hydrogeology	X	CLA	A quantitative introduction to hydrogeology and aquifer mechanics with emphasis on environmental applications, including, unconfined flow, interaction between surface water and groundwater, wetland protection, well hydraulics, inverse methods, and solute transport. Offered alternate years.

	5601	Introduction to Stream Restoration		X	CLA	This course provides an interdisciplinary overview of the background science essential to participate in a stream restoration project. Students will learn how to assimilate geologic, hydrologic, and ecological data at the watershed and research scales to plan a restoration project and evaluate/critique existing stream restoration projects.
	8200	Professional Issues in Earth and Environmental Science		X	CLA	Introduces the incoming graduate student in geological sciences to professional practice, standards and ethics, including peer review, proving writing, ethical problems, the purpose of a university.
	8602	Stream Restoration Practice		X	CLA	Practicum course provides the capstone for the Stream Restoration Science & Engineering post-baccalaureate certificate program. Students synthesize previous
GER						coursework on stream restoration, apply basic hydraulic and geomorphic analyses on a reach of a stream, and complete a group design for a stream restoration site.
	*3407	Sustainability in German-Speaking Cultures		X	CLA	This course offers the opportunity to learn about the discourses and cultures of sustainability in German-speaking countries. In this course you will be able to study several examples of successful sustainable development. Successful development in German-speaking countries has been possible due to several factors, including the coordination of economic strategies, grass roots community-based support, and dexterity in governmental organization. While the conditions of these successes are still being studied, this course engages students by exploring lessons learned from German-speaking countries and their approaches to sustainability. The answers to the questions we ask in this course will contribute to the discourse on sustainable development for years to come. You will also have the opportunity to familiarize yourself with relevant vocabulary and communication strategies, learn how policymaking in German-speaking countries balances the interests of several stakeholders, and reflect on the larger cultural background of valuable sustainable practices.
GIS						This advanced course provides students with an opportunity to explore the many applications of geographic information systems in local government, transportation development, and sustainable community planning. Students learn how GIS can be used to effectively carry out urban and regional planning tasks and gain a basic understanding of GIS project planning and data management. Labs focus on land use planning, transportation development, green infrastructure, and population dynamics from across the globe, with a particular focus on the Duluth area. Software used will be ESRI ArcGIS.
	5571	GIS in Urban Analysis		X	CLA	Explore GIS applications to the environmental issues such as natural hazards, forest management, contaminated sites, soil erosion, habitat assessment, and regional planning.
	5572	Environmental Application of GIS		X	CLA	This course provides students with an opportunity to explore the many applications of geographic information science in environmental and societal sustainability, renewable energy, and community planning. This course is based on the idea that in order to successfully transition toward sustainability, a better understanding of coupled human and natural systems is critical, and that because of the unique challenges and conflicts present within northern Minnesota between humans and natural systems, it is an ideal location to attempt to mitigate these challenges through the use of Geographic Information Science. Labs focus on current topics relevant to the region including energy use calculations, food deserts, LEED certification, water pollution, and transit planning. Software used will be ESRI ArcGIS.
HCM	5573	GIScience in Regional Sustainable Applications		X	CLA	
HIST	4510	Medical Sociology		X	LSBE	Introduction to common theoretical and empirical approaches used by sociologists to study health and illness. Social inequalities in health and illness and the social processes that shape these experiences are the themes of the course.
	1310	Minnesota History		X	CLA	This course examines Minnesota's history from the pre-historic and Native American periods through European discovery and American settlement to the present. Topics include: geographic aspects of Minnesota; Native American groups in Minnesota; European exploration and the fur trade; initial American settlement; slavery; the Dakota conflict; the Civil War; the connection between Minnesotans and the natural environment; the Progressive Era and the 1920's; the Depression and World War II; and the states economic, cultural, and political history since 1945. This course is unique in its joint appeal to students of history and student of biology, as well students from other related fields in the humanities and the sciences. Students will be exposed to cutting-edge research linking the study of early American history, American Indian history, the history of American ecology, modern nutritional science, and the development of immunity to disease. Students will be required to understand the ways in which published scientific data and research can inform historical case studies of the encounter between colonial Americans, American Indians, and European from the fifteenth century to the twentieth century – and vice versa. Students will be introduced to contemporary debates on the relationship between nutritional science and human immunity, using the text to understand the history of colonial American and American Indian health, farming, hunting, and ecology following European contact. These histories, in turn, will illuminate their reading of scientific papers and research.
	*2350	Nutrition and American History		X	CLA	Taught abroad. Surfing is one of the world's most popular cultural phenomena. Students will explore the intersections of surfing, war, and tourism, addressing how a pastime commonly associated with mindless pleasure has in fact been implicated in some of the major global developments of the last two hundred years. These include empire-building and the "civilizing mission" in nineteenth- and early-twentieth-century Hawaii, modernization and economic development in the so-called Third World, the growth of international tourism following the Second World War, political mass movements and the anti-apartheid struggle, American foreign relations and Cold War cultural diplomacy, and the surf industry and corporate globalization. As a class taught in another country, the course will also cover the history of U.S. foreign policy in that region. And it has an experiential component: to develop an appreciation for the subject and for why millions of people have planned their lives around the sport, students will learn to surf. The course will thus combine academic instruction with outdoor education.
HLTH	3313	Global Surf Culture		X	CLA	
	*1100	Health and Wellness Strategies for Life		X	CEHSP	A lecture series introducing students to health and wellness encompassing nutritional, physical, emotional and spiritual aspects of health and well-being with emphasis on behavioral, environmental and social influences on developing a satisfying and productive lifestyle in our society.
	3101	Community Health		X	CEHSP	Emphasis on health determinants across the lifespan and their impact on well-being and disease in communities and populations. Topics include public health history, health and the healthcare system in the U.S., health disparities, and disease prevention/control. Exploration of community-based organizations involved in health promotion efforts to address mental health, alcohol/drug abuse, environmental health and safety, and other issues affecting our communities.
IKYS	3500	Environmental Health		X	CEHSP	Biological, ecological, and physical aspects of the environment; concurrent effects on health of the community; examination of environmental health policies; and possible solutions to environmental problems.
IS	1010	Introduction to International Studies		X	CLA	Introduction to the field of International Studies, examination of the implications of our global world, and analysis of a selection of issues in contemporary international affairs.
IBS	*2001	Sustainability Across Disciplines		X	CLA	An introduction to academic disciplines and interdisciplinary inquiry, with an emphasis on integrative, sustainable thinking. Includes case studies of real-world sustainable problem-solving, visits from disciplinary experts, and student-led design of interdisciplinary projects that focus on sustainability.
	8011	Integrated Biological Systems I		X	SCSE	This course introduces the students to integrating principles in biology to develop the type of integrated thinking expected in their thesis. Integrating principles to be covered include energy flow, information, stoichiometry, and feedback loops. It will prepare the student for IBS 8013, an extension of this course in spring semester. In IBS 8013, the class will explore applications of these principles to complex problems and themes that cut across biological sciences and the applications of these principles to their thesis problem. It will cover topics related to sustainability, such as central principles of ecology and evolution.
	8012	Integrated Evolutionary Processes		X	SCSE	Review of advanced topics in evolutionary biology, including coevolution, evolution of disease organisms, ecosystem consequences of evolution, evolutionary stable strategies, and game theory. Required for all IBS students. This course follows IBS 8011. In IBS 8011, the students were introduced to principles of integrative thinking in biology that apply to all levels of biological organization. IBS 8013 will apply integrating principles to various themes and problems in biology which cut across all levels of biological organization. Such themes include but are not limited to metabolism, disease, and movement of materials across boundaries. The course will emphasize readings and discussion of the primary literature, student led discussions, student presentations of how the integrating principles apply to their thesis research, and the preparation of a paper demonstrating this application. The papers will be handled in a mock peer-review as if they were submitted to one of the Trends journals (Trends in Ecology and Evolution, Trends in Biochemistry, etc.)
	8013	Integrated Biological Systems II		X	SCSE	In depth survey of advanced topics in ecological processes, including allometry and scaling, animal behavior, food webs, and energy and material flows through organisms and ecosystems.
	8201	Ecological Processes		X	SCSE	The IBS Seminar course will emphasize topics that cross multiple disciplines in both Ecology, Organismal and Population (EOP), Cell, Molecular and Physiology (CMP) emphases, and Chemical Biology (CB). Example of topics include the following: human health implications of ecological change, cell and molecular techniques in ecology, impact of infectious diseases on populations; community ecology, and host defense against disease.
JOUR	8993	Integrated Biosciences Graduate Seminar		X	SCSE	
	4021	Outdoor and Environmental Journalism		X	CLA	Covers the basics of outdoor and environmental journalism as it pertains to newspapers, magazine, television and online. Read and critique examples and produce work in this genre.
LIM						
	5010	Integrated Approaches to the Study of Inland Waters		X	SCSE	An interdisciplinary introduction to the science of Limnology taught at the beginning graduate student level. The science of inland waters, Limnology, is built on Geology, Chemistry, Biology, and Physics and increasingly includes Social Sciences. In this course, students will experience an in-depth, integrated approach to Limnology. Lake systems are emphasized but wetland and running water systems are discussed. The course includes significant out-of-class time reviewing on-line modules and other materials. In-class time is devoted mainly to group work, problem solving, and student-led discussions and presentations. An optional companion laboratory and practice course (LIM 5011) is associated with this course where additional foundational and fundamental limnological techniques are taught.
	5011	Laboratory and Discussion in Integrated Approaches to the Study of Inland Waters		X	SCSE	A graduate-level laboratory and discussion course with an interdisciplinary introduction to Limnology. This class will introduce students to laboratory, field, data collection, and data analysis techniques in the study of limnology. Introductory coding will be covered. Oral and written communication skills and problem solving skills will also be developed. This course is designed to be taken in conjunction with LIM 5010. Limnology
	5012	Integrated Approaches to the Study of Inland Waters II		X	SCSE	Continuing from LIM 5010, this is the second semester of an interdisciplinary introduction to the science of Limnology taught at the beginning graduate student level. The science of inland waters, Limnology, is built on Geology, Chemistry, Biology, and Physics and increasingly includes Social Sciences. Students will experience an in-depth, integrated approach to Limnology. Lake systems are emphasized but wetland and running water systems are discussed. The course includes significant out-of-class time reviewing on-line modules and other materials. In-class time is devoted mainly to group work, problem solving, and student-led discussions and presentations. An optional companion laboratory and practice course (LIM 5013) is associated with this course where additional foundational and fundamental limnological techniques are taught.
	5013	Laboratory and Discussion in Integrated Approaches to the Study of Inland Waters II		X	SCSE	A second semester of the graduate-level laboratory and discussion course with an interdisciplinary introduction to Limnology. This class will introduce students to laboratory, field, data collection, and data analysis techniques in the study of limnology. Introductory coding will be covered. Oral and written communication skills and problem solving skills will also be developed. The second half of this semester will be spent working with industry and non-profit community partners on a capstone project, emphasizing the use of newly acquired skills and knowledge in a non-academic setting. This course is designed to be taken in conjunction with LIM 5012, Limnology II.
	5101	Physical Limnology		X	SCSE	Organic and inorganic chemistry of natural waters, major and minor ions, pH-Eh relationships, carbon and nutrient cycles, pore water chemistry, sediment chemistry, microbial geochemistry. Offered alternate years.
	5102	Chemical Limnology		X	SCSE	Geological aspects of freshwater systems: origins, tectonic and climatic settings of lakes, geophysical mapping, physical sedimentary processes, sedimentary geochemistry, and neotectonics. Particular focus on paleolimnology, the analysis of lake sediment to reconstruct past climate and environment
	5103	Geological Paleolimnology		X	SCSE	The course covers the geochemical, physical, biogeochemical, and biological processes in the upper meters of aquatic sediments. Topics include biogeochemical cycles of C, N, P, S, sediment-water exchanges of nutrients, metals, and pollutants; pathways and rates of microbially catalyzed reactions; bioturbation and biomineralization; measurement techniques and reaction-transport modeling.
	5104	Geochemical, Physical, and Biological processes in Aquatic Sediments		X	SCSE	An interdisciplinary graduate seminar with dual goal of reviewing most significant current developments in limnological science and helping students identify most significant knowledge gaps in their disciplinary research fields. The course involves guest lectures, student presentations and discussions. It aims to provide students with guidance on choosing research directions to achieve an optimal balance between difficulty and scientific payoff.
WATH	5105	Research Frontiers and New Directions in Limnology and Environmental Science		X	SCSE	
	4180	Solving Industrial Mathematics Research Problems		X	SCSE	This course is intended for mathematics or statistics majors. The focus of the course is solving industrial mathematics research problems. Students will work in teams of three to five on a semester-long research problem from business, industry or government. Students will acquire specialized mathematical knowledge specific to the research problems posed for the semester. In addition, students will develop problem solving, teamwork, and communication skills as they design and implement a solution strategy for one of the research problems. A business, industry or government partner will serve as a liaison for project teams. Presentation to professional partners will occur throughout the semester. A final solution product will include oral, written and video presentations.
ME	*2211	Thermodynamics		X	SCSE	Thermodynamics, thermodynamic properties of liquids and gases, 1st and 2nd laws of thermodynamics, irreversibility and entropy, Carnot systems, work producing systems, combustion engine cycles, work absorbing systems, refrigeration cycles, psychrometrics.
	4255	Multidisciplinary Senior Design		X	SCSE	Capstone design course in mechanical engineering. Project Management, problem definition, root cause analysis, baseline analysis, alternative solutions, analysis, reporting, societal, economic, ethical, environmental, political considerations. Oral and written reports. Work is in teams focused on industrial, research or competition-based projects.
MGTS	5325	Sustainable Energy System		X	SCSE	A comparison of different energy systems will be made in terms of economic, environmental and political implications. Specific energy alternatives will include coal, oil, geothermal, bioenergy, solar, wind, fission, fusion, hydrogen, fuel cell
	4463	Foundations of Sustainable Management		X	LSBE	This course will introduce students to the concepts of sustainability in a managerial context. This course introduces students to the field of social entrepreneurship, the practice of identifying, designing, starting and growing successful mission-driven for profit and nonprofit ventures. These include non-profit enterprises designed to respond to a special social, need, as well as more traditional ventures working to incorporate socially-responsible practices into their business models. The course provides an overview of the processes, challenges, and demands associated with creating ventures that seek to integrate financial and social/environmental benchmarks of success. This course is designed to appeal to those who want to learn more about enterprise in business and social contexts.
	4941	Social Entrepreneurship		X	LSBE	This course introduces students to the field of environmental entrepreneurship. Students will have the opportunity to learn about the screening and surveillance approach to the market, using the available resources, realizing ideas that are based on solving an environmental problem, and how to introduce successful solutions that will create financial turnover and influence market structures and even creative destruction leading to a more sustainable future. The course provides an overview of the processes, challenges, and demands associated with creating ventures that seek to integrate financial and environmental benchmarks of success. Additionally, the course introduces students to potential opportunities for environmentally related products, services, and markets. This course is designed to appeal to those who want to learn more about enterprises in business and environmental contexts.
WKTG	4951	Environmental Entrepreneurship		X	LSBE	
	5463	Foundations of Sustainable Management		X	LSBE	This course will introduce students to the concepts of sustainability in a managerial context.
	3710	Green Marketing		X	LSBE	This course provides an overview of the role of green marketing and sustainability in marketing strategy. The course adopts the triple bottom line perspective to case sustainability as the simultaneous pursuit of financial, social/relational, and environmental performance. It provides an assessment of current efforts to pursue sustainability with a primary focus on the interaction of the marketing organization with the environment. The course focuses on examining specific marketing tactics employed by firms seeking to maximize triple bottom line performance, and subsequently address consumption processes in the household, industrial, services, and transportation sectors of the economy.
	3751	Marketing Ethics		X	LSBE	Introduces a broad range of ethical issues encountered by marketing practitioners, and helps discover, develop, and test personal sets of guidelines for making judgments when such issues arise.
	4710	Marketing for Non-Profits		X	LSBE	This course will introduce students to the dynamic world of non-profits with an emphasis placed on key marketing strategies and tactics that successful non-profits use to fulfill their mission. This course will provide an overview of various aspects and special issues related to non-profit marketing including: (1) the focus of non-profit on social impact versus maximizing profits; (2) the marketing of social services; (3) marketing's role in fundraising; (4) the challenges of integrating marketing efforts among diverse stakeholders; and (5) external economic, legal and political factors that impact marketing of non-profit services.
	4731	Consumer Behavior		X	LSBE	Buyer behavior and implications for marketing strategy. Emphasis on information processing concepts, influences on behavior, and decision-making processes from both conceptual and pragmatic perspectives. Students requiring graduate credit must complete additional coursework.

	5710	Marketing for Non-Profits		X	LSBE	This course will introduce students to the dynamic world of non-profits with an emphasis placed on key marketing strategies and tactics that successful non-profits use to fulfill their mission. This course will provide an overview of various aspects and special issues related to non-profit marketing including: (1) the focus of non-profit on social impact versus maximizing profits; (2) the marketing of social services; (3) marketing's role in fundraising; (4) challenges of integrating marketing efforts among diverse stakeholders; and (5) external economic, legal and political factors that impact marketing of non-profit services. pre-req: MBA student or department consent		
PHIL	5731	Consumer Behavior		X	LSBE	Buyer behavior and implications for marketing strategy. Emphasis on information processing concepts, influences on behavior, and decision-making processes from both conceptual and pragmatic perspectives. Students requiring graduate credit must complete additional coursework. pre-req: MBA student or department consent		
	3242	Values and Technology		X	CLA	Problems related to science and technology. Application of moral theory to issues raised by technology, such as distribution of power, effects on environment, labor and social life, privacy, intellectual property rights, product liability, and professional codes of ethics.		
PHYS	*3325	Environmental Ethics		X	CLA	Moral dimension of relationship between humans and earth's natural environment. Pollution, energy policy, economics, law, and environment; endangered species; rights of nonhumans; preservation and conservation, obligations toward future generations; ethical theory and environment.		
POL	*1035	Energy		X	SCSE	Energy as a fundamental topic for understanding both the natural and man-made world. Will discuss concepts of human production, transmission, storage, and utilization of energy, as well as how these processes interact with natural pathways of energy such as the carbon cycle.		
SOC	3530	Comparative Constitutional Law and Judicial Politics		X	CLA	A cross-national examination of the intersection of law and politics in the development of constitutional law, especially in newly emerging democracies. Includes an investigation of the relationship between globalization and constitutional development and the role that law plays in social control, dispute resolution, protection of minority rights, social change, and economic development.		
SAFE	*4860	Environmental Sociology		X	CLA	Examines the relationship between humans and the natural environment, including the role of science, technology, economics, religion, and culture. Emphasis on the social justice implications of environmental issues and contemporary topics, such as global warming and sustainable agriculture and energy. Considers the diverse positions and actions of environmental movements and possible solutions to environmental problems.		
SPAN	6401	Environmental Safety and Legal Implications		X	SCSE	Federal, state, and local laws and judicial interpretations that have applications to environmental health and safety programs. Corporate responsibility regarding environment, employee, and product.		
SW	*2550	Globalization and Sustainability in Latin America		X	CLA	The study of Latin America's natural resources, their cultural meaning and management across time and recent environmental movements in the region. Special focus on the indigenous practices that promote environmental, economic, political, social and cultural sustainability. The course may focus on Central America, the Caribbean, and Andes, the Southern Cone, the Amazon or any other geocultural region in Latin America. The course is open to all students and will be taught in English.		
	1210	Global Issues		X	CEHSP	Global problems of war, peace, national security; population, food, hunger, environmental concerns, global resources, economic and social development; human rights. Examines issues from a global problem-solving perspective. Value, race, class, gender differences.		
TRES	1212	Honors Seminar: Global Issues		X	CEHSP	Focus on global problems of war, peace, and national security; population, food, and hunger; environmental concerns and global resources; economic and social development; human rights. Examination of issues from systems, problem solving, and futurist perspectives in honors seminar format.		
	5100	Foundations of Indigenous Environmental Systems and WorldViews (Bioregionalism)		X	CLA	This introductory course explores environmental resources, practices, and stewardship from tribal perspectives. A variety of instructional experiences including sharing circles, guest lectures and field study introduce students to related Indigenous knowledge, management systems and stewardship practices. The current needs of tribal communities are examined through studying the idea of Native scholars, traditional teachers and environmental activists.		
	5101	Tribal Natural Resource Program Management 1		X	CLA	This course is the first in a series of two that will examine topics and issues that a natural resource manager will face in the day-to-day operation of a comprehensive tribal natural resource and environmental management program in Indian Country. These courses will provide an overview of a tribal natural resources director's basic functions and responsibilities, the types of programs and projects that tribal natural resources department might implement, the agencies and other sources that provide funding and the knowledge and skills that a director will need to operate an overall successful program. These courses will be taught from a practical, on-the-ground perspective to facilitate an understanding of the realities and typical circumstances that a tribal natural resource program director encounters.		
	5102	Tribal Natural Resource Program Management 2		X	CLA	This second course in tribal natural resource management will delve into greater detail on many of the topics covered in the first course and focus on case studies and evaluation of day operation of a comprehensive tribal natural resource and environmental management program in Indian Country. This course will address aspects of intergovernmental relations with other tribes and with federal, state, local and other agencies.		
	5201	Integrated Ecosystems Stewardship 1		X	CLA	This course is the first in a series of two that will provide the student with the understanding of the biological, chemical, and physical processes necessary to support Native American ways of life in balance with pressures of economic development. The course emphasizes practices that will provide sustainable subsistence foods and medicines for tribal member harvest and to support cultural activities. An integrated natural resource management approach will be used to discuss the reasons why clean air, water, and land are required to support a health environment, which in turn supports a health human population. Specific topics in this course may include geological setting, surface water and groundwater interaction, physical environment of lakes and streams, aquatic food webs, biodiversity, fisheries management, wild rice management, assessment of water quality trends, carrying capacity, environmental regulations and standards. Concepts of mineral stewardship on tribal lands will also be explored. This includes principles of the occurrence, extraction, and processing.		
	5202	Integrated Ecosystems Stewardship 2		X	CLA	This course is the second in a series of two that will provide the student with the understanding of the biological, chemical, and physical processes necessary to support Native American ways of life in balance with pressures of economic development. Specific topics in this course may include wildlife management, range management, land use planning, terrestrial food webs, sustainable agriculture/forestry practices, assessment of air quality, biodiversity, and land use planning. Concept so energy stewardship on tribal lands will be explored. Carbon-based energy resources, with emphasis on coal and petroleum/gas, fundamentals of nuclear energy, technology of extraction, production, refinement, consumption, and byproduct treatment/disposal; importance of carbon-based energy in global industrialization; limits of population growth imposed by energy requirements? principles and associated technologies of renewable energy and energy conversion, with focus on solar, geothermal, tidal, and biotuel energy resources.		
URS	5301	Tribal Natural Resources Economics		X	CLA	Through consideration of multiple perspectives regarding value and exchange, this course pursues micro- and macroeconomic analyses of natural resources under tribal stewardship. Key topics can include modes of valuation, resource markets, sustainability, pollution control, benefit-cost analysis, air and water quality, waste management, and conservation.		
	4001	Citizens and Citizenship		X	CLA	This course explores the relationship between urbanization and democracy by examining how urban policy is created in cities around the world. The course examines the questions given the increasing pace of urban growth and the growing multiculturalism in cities around the world, how are cities responding, and how are community voices being included in the decision making process? Particular attention will be paid to infrastructure, transportation, participatory democracy, sustainability and urban resiliency, urban activism, tensions between the urban, national, and global scales, multiculturalism, and modernization.		
WRS	5101	Water Policy		X	SCSE	Socio-cultural, legal, and economic factors that affect water resources management. Historical trends in water policy, resulting water laws in the United States. Federal state and local institutional structures for water management.		
	8100	Interdisciplinary Seminar in Water Resources		X	SCSE	Interdisciplinary seminar in water resources science.		
WS	8581	Research and Professional Ethics in Water Resources and Environmental Science		X	SCSE	Ethics of water resources science and environmental engineering research/practice. Societal responsibility, plagiarism, record-keeping, authorship, confidentiality, conflicts of interest, professional relationships, fraud, reporting misconduct.		
	*3600	Ecofeminism: Theories and Sustainable Practices		X	CLA	In-depth study of ecofeminist theories that explore the interlocking oppressions of women, the earth/nature/other animals, and colonized Others. Scientific, economic, religious, philosophical issues examined. Applied ecofeminist analysis of individual, local, regional, national and transnational ethical, social and environmental issues, such as food and farming, animals, toxins, birthing and reproductive technologies, water quality, and privatization, etc.		
	*3775	Gender, Globalization and Food		X	CLA	This course offers a critical feminist examination of the impact of globalization and economic restructuring on the tangled roots and route of women's work in the food chain in both the First World and Global South. The course also offers firsthand experiences by visiting origins of food, small and large-scale farms, community gardens, organic food stores and large corporate food chain stores as well as preparing meals from ingredients that students select based on tastes and affordability. Additionally, the course brings globalization to our doorsteps through meals that students prepare and serve by answering the question "What is on your plate for dinner, lunch, or breakfast, and from what countries and whose labor? Finally, the course offers in-depth analysis of the processes through which current corporate industrial mega farms lead to hunger and water famine, environmental degradation and poor health, not only the Third World but also in the First World.		
		Sustainability related courses	158	79				
		Sustainability-focused courses	47	1				
		*Courses with asterisk are Lib-Ed Sustainability Courses						