

## Purdue University - Academic Courses (AC01)

Date: 10/20/2022

Semester Offered	Course	Long Title	Department	Course Level	Sustainability Focused	Sustainability Inclusive	Description	
1	Fall	ABE20100	Thermodynamics In Biological Systems I	Agricultural and Biological Engineering	Undergraduate		✓	Credit Hours: 4.00. Thermodynamic principles associated with biological systems and processing of biological materials. Emphasis on the first law of thermodynamics. Fundamentals of steady-state mass and energy balances for reacting and non-reacting processes including multiple unit operations emphasizing living systems and bioprocessing. Applications of the first law conservation of energy to biological systems, energy conversion systems, and the environmental impacts of energy production. Development of engineering problem solving skills via MathCad and MatLab software. Laboratory emphasizes combining technical engineering skills with professional skill development through computer and laboratory exercises including two extensive projects that result in a biological product design.
2	Fall	ABE32500	Soil And Water Resource Engineering	Agricultural and Biological Engineering	Undergraduate		✓	Credit Hours: 4.00. Interrelationships of the plant-water-air-soil system; hydrologic processes; protection of surface and ground water quality; GIS targeting of soil and water protection measures; and design of subsurface and overland drainage systems, irrigation systems, and soil erosion control practices.
3	Fall	FNR12500	Environmental Science And Conservation	Forestry & Natural Resources	Undergraduate	✓		Credit Hours: 3.00. (AGRY 12500, EAPS 12500, NRES 12500) Introduction to environmental science and conservation includes topics in ecological principles, conservation and natural resource management, human impacts on the environment, toxic waste disposal, climate change, energy, air and water pollution, environmental geology and geologic hazards. Typically offered Fall Spring.
4	Fall	FNR54300	Conservation Biology I	Forestry & Natural Resources	Graduate		✓	Credit Hours: 3.00. Introduction to conservation biology, including population dynamics and genetic structure of rare organisms. Recovery planning, restoration ecology, environmental policy making, and sustainable developments are considered, as is ethics in conservation of biological diversity. Offered in odd-numbered years. Permission of instructor required. Typically offered Summer Fall Spring.
5	Fall	ASM23600	Environmental Systems Management	Agricultural and Biological Engineering	Undergraduate	✓		Credit Hours: 3.00. Analysis of environmental systems with special emphasis on non-urban and agribusiness needs. Technological and sociological solutions to environmental problems. Computer-based tools are used to analyze global environmental issues, chemical use and management, waste disposal and management, water and air quality, soil and water conservation, sustainable agriculture, regulatory and policy issues.
6	Fall	EAPS31500	Biogeochemistry	Earth, Atmospheric and Planetary Sciences	Undergraduate		✓	Credit Hours: 3.00. The course examines the main element cycles of Earth: carbon, oxygen/hydrogen, nitrogen, sulfur, phosphorous, and trace metals, and how they are interconnected from terrestrial, aquatic/ocean, and atmospheric perspectives. General chemistry concepts such as equilibrium, free energy, electrochemistry are used to understand the energetics of the cycles. Connection between the cycles and environmental problems, such as climate change and air pollution will be emphasized.
7	Fall	EAPS37500	Great Issues - Fossil Fuels, Energy And Society	Earth, Atmospheric and Planetary Sciences	Undergraduate	✓		Credit Hours: 3.00. Prosperity of the 20th century was based on abundant and cheap energy; during the 21st century we will be faced with difficult challenges. Our society will face higher energy prices, decline of petroleum based fuels supplies, increased environmental effects of fossil fuels usage, and the challenge of solving the technological problems of developing alternative fuels. This course will review the structure, economics, and geopolitical issues faced by fossil fuel industries and the mitigation strategies that will be needed to change to low fossil fuel use society based on low polluting renewable energy sources. Counts for Great Issues course in College of Science for Juniors and Seniors.
8	Fall	LA16100	Land And Society	Horticulture & Landscape Architecture	Undergraduate		✓	Credit Hours: 1.00. An introduction to human interaction with the landscape with emphasis on the science of ecology and the technological advancements that form the response to contemporary social and environmental issues. Specific topics include: shifting cultural views of nature, climate change, land development patterns, green infrastructure and building technologies, and the role of design in shaping responses. Typically offered Fall.

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9	Fall	CE21101	Thermal And Energy Sciences	Civil Engineering	Undergraduate		✓	Credit Hours: 3.00. This course includes applications of thermal science and energy fundamentals to civil engineering topics. Emphasis is placed on fundamental concepts of properties of materials, work, heat, internal energy, entropy, equilibrium, and relations derived from the first and second laws of thermodynamics. Example applications include: power plants; fluid flow in ducts/pipes; thermal properties of building/construction materials and processes; geothermal systems; heating, ventilation, and air conditioning (HVAC) processes; energy balances in buildings; refrigeration; hydroelectric power; contaminant transport in air, water, and soil; climate change; the urban heat island effect; and energy use in the transportation sector.
10	Fall	CE55700	Air Quality Management	Civil Engineering	Graduate		✓	Credit Hours: 3.00. Discussion of fugitive, mobile, and point sources of air pollution with attendant effects on materials, plants, and humans. Development and status of state and federal regulations with emphasis on the development and use of mathematical dispersion models including meteorological fundamentals and atmospheric transport. Discussion of concepts for ambient air quality control strategies including urban planning and transportation considerations.
11	Spring	AGEC52800	Global Change And The Challenge Of Sustainably Feeding A Growing Planet	Medicinal Chemistry and Molecular Pharmacology	Graduate	✓		Credit Hours: 3.00. This course investigates the major drivers of global agricultural and environmental change associated with the global farm and food system. This includes demography, income growth, biofuels, climate change, environmental and ecosystem services, livestock consumption, food waste and land use change. Weekly modules include a guest lecture, student led discussion of readings and discussion of lab assignments undertaken using the SIMPLE model of global agriculture, environment and food security. The class culminates with a course project which is presented to the class and written up in a term paper.
12	Fall	EAPS22500	Science Of The Atmosphere	Earth, Atmospheric and Planetary Sciences	Undergraduate		✓	Credit Hours: 3.00. An overview of the physics and dynamics of the atmosphere. Quantitative study of the energy balance of the atmosphere, condensation and precipitation processes, atmospheric motion and global circulation, severe storms, atmospheric chemistry. Contemporary issues such as human impact on climate, ozone depletion, numerical weather prediction and climate simulation, and modern measurement systems. Not available to students with credit in EAPS 22100. Intended for Science and Engineering majors only. Prior course work in calculus is required.
13	Fall	EEE35000	Introduction To Environmental And Ecological Engineering	Environmental and Ecological Engineering	Undergraduate		✓	Credit Hours: 3.00. Introduction to water pollution, air pollution, noise, hazardous and solid wastes, and their control. Environmental impact statements and global pollution issues. Field trips required. Typically offered Fall Spring Summer.
14	Fall	ENGL34400	Environmental Ethics, Policy, And Sustainability	English	Undergraduate	✓		Credit Hours: 3.00. Environmental Ethics, Policy and Sustainability is an interdisciplinary course designed to open new pathways into ethical and eco-critical inquiry in the Anthropocene age. The course analyzes disciplinary differences in approaching the ethical, the human, and environmental problems such as sustainability, development, biodiversity, global security, and climate change. Students will explore what it means to be ethical in and through an interrogation of our contemporary conceptions of what it means to be human. These interrogations in turn will prompt us to reconsider human creations such as knowledge, culture, and technology, which will push us to genuinely think how humans as a species situate their creations within the realm of what they call Nature. Students will be introduced to the history of environmental studies in the discipline, to the rise of what is now known as "postcolonial ecocriticism" to theoretical inquiry into modern technology, and to other recent developments in the fields of environmental studies. Typically offered Fall Spring Summer.
15	Fall	FNR48410	Sustainable Wood Products, Furniture Design And Manufacturing	Forestry & Natural Resources	Undergraduate	✓		Credit Hours: 3.00. This project-based course explains principles of product development, furniture construction, strength design, performance testing, and product sustainability (life cycle analysis and end-of-life options). The course familiarizes students with methods such as Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM), Computer Numerical Control (CNC) router operation, rapid prototyping, and basics of secondary wood products manufacturing, to build an actual product. Typically offered Fall.

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16	Fall	FNR58600	Urban Ecology	Forestry & Natural Resources	Graduate	✓	Credit Hours: 3.00. Urbanization is on the rise, transforming natural ecosystems into coupled human-natural ecosystems that encompass complex, novel functional and structural characteristics shaped by people and the inherent environment. Through local field trips and readings of the primary scientific literature, we examine the unique characteristics of coupled human-natural ecosystems. The course is designed to be broadly accessible to students from a variety of backgrounds, interests, and majors who are interested in environmental science and engineering and emphasizes the importance of incorporating an ecological perspective in environmental engineering and natural resource management. This course covers fundamental principles of ecology as applied in urban and other coupled human-natural systems with emphasis on the impact of modern industrial society on ecosystem structure and function. Organizing themes addressed in this class include macroscale processes, systems thinking, and topics related to urban systems. Typically offered Fall.
17	Fall	AD39700	Sustainability In The Built Environment	Patti and Rusty Rueff School of Design, Art and Performance	Undergraduate	✓	Credit Hours: 3.00. The study of philosophical concepts, principles, and theories of sustainability as they pertain to building methods, materials, systems, and occupants. To provide a foundation for evaluation of materials, processes, and applications of design components for environmentally responsible. Field trips will be required.
18	Fall	AGEC40600	Natural Resource And Environmental Economics	Agricultural Economics	Undergraduate	✓	Credit Hours: 3.00. (FNR 40600) Introduction to economic models of renewable and nonrenewable natural resources and the use of these models in the analysis of current resource use and environmental issues.
19	Fall	AGR10800	Agriculture Technology And Innovation	Agronomy	Undergraduate	✓	Credit Hours: 1.00. The course will cover a broad range of innovations and technologies involved in the agricultural industry. The broad topics covered in this class will discuss development of latest technologies assisting in increase in yield, production and efficiency of agricultural systems. This may include, but is not limited to topics regarding environmental protection, plant production, livestock systems, and agricultural machinery.
20	Fall	AGR12200	Introduction To Natural Resources And Environmental Science Academic Programs	Agronomy	Undergraduate	✓	Credit Hours: 0.50. An introduction to the academic programs offered in Pre-Environmental Studies and Natural Resources and Environmental Science. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8.
21	Fall	AGRY45000	Soil Conservation and Water Management	Agronomy	Undergraduate	✓	Credit Hours: 3.00. (NRES 45000) Principles of soil conservation with emphasis on control of soil erosion by wind and water; impact of soil management decisions on environment; soil-water-plant relations, includes agronomic aspects of water management for both irrigation and drainage.
22	Fall	ASEC48500	Environmental Communication	Agricultural Sciences Education and Communication	Undergraduate	✓	Credit Hours: 3.00. This is an interactive learning course in science and environmental communication with a strong emphasis on development of practical writing and communication skills for students who will become professionals in environment or natural resources. The public primarily obtains environmental information through the media, as such, scientists need to develop the understanding and skills necessary to engage with a range of audiences through the design of effective communication products. This course provides a unique balance of communication theory and skills training in which students develop the confidence to meaningfully communicate environmental issues.
23	Fall	BIOL59100	Field Ecology	Biological Sciences	Graduate	✓	Credit Hours: 3.00 (West Lafayette), 4.00 (Fort Wayne, Northwest). A field course in ecology that stresses natural history and testing ecological theory under natural conditions. Group and individual projects include observational and experimental approaches. Emphasis is on the study of plant and animal species interactions in terrestrial (including montane and coastal) and aquatic habitats. Issues in community, population, behavioral, and conservation biology are addressed. Several all-day Saturday and two weekend field trips. Offered in alternate years. Permission of instructor required.
24	Fall	CHM48100	Environmental Chemistry	Biochemistry	Undergraduate	✓	Credit Hours: 3.00. Survey of chemical aspects of environmental problems and the application of chemistry to their solution. Topics will include atmospheric pollution problems, groundwater pollution and waste disposal problems, inorganic water pollutants, and the occurrence and fate of toxic organic compounds and other substances in the environment.

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25	Fall	EAPS10000	Planet Earth	Earth, Atmospheric and Planetary Sciences	Undergraduate	✓	Credit Hours: 3.00. An introduction to the Geosciences-Earth science, oceanography, atmospheric science and astronomy. The course emphasizes topics (earthquakes, volcanoes, ocean pollution, climate change, severe weather, etc.) that are of general interest and relevance, and the interconnections between various Earth processes. CTL:IPS 1730 Earth Science
26	Fall	EAPS10400	Oceanography	Earth, Atmospheric and Planetary Sciences	Undergraduate	✓	Credit Hours: 3.00. Origin of the oceans and marine life. Seafloor spreading and marine geology; currents, waves, and tides; marine organisms and ecology; beaches and nearshore life. Man's use and abuse of the sea, including contemporary problems and future opportunities. The role of oceans in climate and evolution of the biosphere.
27	Fall	EAPS36000	Great Issues In Science And Society	Earth, Atmospheric and Planetary Sciences	Undergraduate	✓	Credit Hours: 3.00. This course develops basic skills and knowledge critical to analyze issues of energy use, climate change, and sustainability that incorporate both societal and scientific perspectives. The goal of this course is not to arrive at particular consensus solutions to the problems associated with these issues but instead to foster an informed (through information literacy) debate that will ultimately be waged as solutions are sought. Working in teams the students work throughout the semester to complete a capstone teamwork project and a group presentation. Counts for Great Issues course in College of Science.
28	Fall	EAPS52100	Atmospheric Chemistry	Earth, Atmospheric and Planetary Sciences	Graduate	✓	Credit Hours: 3.00. An introduction to the chemistry of the earth's atmosphere. Covers evolution of the earth's atmosphere, its physical and chemical structure, its natural chemical composition and oxidative properties, and human impacts, including increasing tropospheric ozone, decreasing stratospheric ozone, climate change, and acidic deposition.
29	Fall	EAPS52600	Introductory Geofluid Dynamics	Earth, Atmospheric and Planetary Sciences	Graduate	✓	Credit Hours: 3.00. Provides a fluid dynamics background for graduate students interested in atmospheric sciences, oceanography, mantle convection, hydrology, turbulence, or pollution. Topics covered include: basic assumptions and deviations of Navier Stokes equations, conservation laws, vorticity, divergence, waves, and applications in atmosphere, ocean, and geophysics.
30	Fall	ECET37600	Electrical Energy Systems	Engineering Technology	Undergraduate	✓	Credit Hours: 3.00. This course is an introduction to a wide range of electrical energy systems technologies. Topics include fundamentals of energy conversion, which includes large- and small-scale generation, energy storage, and end-use. Processes include coal, nuclear, solar, wind, hydro, and biomass and their application in central and distributed power systems. The power grid, micro-grids, and smart grid technologies are also explored. The goal is to introduce students to the breadth of technology in the rapidly growing and changing field of energy systems.
31	Fall	EEE36000	Environmental And Ecological Engineering Laboratory	Environmental and Ecological Engineering	Undergraduate	✓	Credit Hours: 1.00 to 3.00. An introduction to laboratory methods of analysis of Environmental and Ecological Engineering systems. Topics will change from semester to semester and will be announced in advance. The list of possible topics includes experimental design, treatment of data, the analytical determination of chemical and biological constituents in water, soil, and air; analysis of environmental and ecological engineering processes; analysis of life-cycle characteristics and impacts of consumer products and commodities; methods of prevention and remediation of manufacturing waste streams. Typically offered Fall Spring.
32	Fall	EEE56000	Environmental And Ecological Engineering In-Context	Environmental and Ecological Engineering	Graduate	✓	Credit Hours: 0.50 to 3.00. An introduction to current challenges and issues in Environmental and Ecological Engineering (EEE) applications. Topics will change from semester to semester and will be announced in advance. The list of possible topics includes current events, emerging challenges, adaptations to new regulations, innovative environmental and ecological engineering processes, life-cycle impacts of manufactured products, and sustainable management of industrial waste streams. Typically offered Fall Spring.
33	Fall	FNR23000	The World's Forests And Society	Forestry & Natural Resources	Undergraduate	✓	Credit Hours: 3.00. Examination of structure, function, and environmental and cultural significance of forest ecosystems throughout the world. Typically offered Fall.
34	Fall	FNR24000	Wildlife In America	Forestry & Natural Resources	Undergraduate	✓	Credit Hours: 3.00. History of the occurrence, exploitation, and management of North America's wildlife resources. Life histories, habitat relationships, and human impacts on selected species. Current conservation practices and future prospects. Typically offered Fall.

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35	Fall	FNR24150	Ecology And Systematics Of Fishes, Amphibians And Reptiles	Forestry & Natural Resources	Undergraduate	✓	Credit Hours: 3.00. Introduction to the ecology and systematics of Fish, Amphibians and Reptiles. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of fish, amphibians and reptiles. Typically offered Fall.
36	Fall	FNR30110	Sustainable Wood Products Manufacturing	Forestry & Natural Resources	Undergraduate	✓	Credit Hours: 3.00. Sustainable wood processing methods for hardwood and softwood sawmilling; veneering; plywood; pallets; lumber drying; reconstituted products including particleboard, medium density fiberboard, and oriented strand board; wood preservation including lumber, crossies, poles, and piling; secondary products including furniture, cabinets, millwork; and others; wood residues, woody biomass and others as appropriate will be covered. In addition to processing methods, the grading of material, including logs, hardwood and softwood lumber and consideration of applicable standards, and sustainability initiatives will be covered. Typically offered Fall.
37	Fall	FNR35950	Spatial Ecology Laboratory	Forestry & Natural Resources	Undergraduate	✓	Credit Hours: 1.00. The lab will focus on the use and application of spatial databases that are common in natural resource management settings. Introduction to the principles of landscape ecology and biogeography with a laboratory devoted to the analysis of spatial data using geographic information systems and other database tools. Landscape ecology focuses on the important relationships of landscape structure (pattern, heterogeneity) and ecological processes (movement of animals, hydrologic dynamics) and how this information is used for natural resource management. Biogeography examines ecological patterns and processes at larger scales (generally at subcontinental to global) for the purposes of managing plants and animals of global importance. In the last 15 years, tremendous efforts have been made to create spatial databases that help support research and management of natural resources at various scales. Typically offered Fall.
38	Fall	FNR58700	Advanced Spatial Ecology And GIS	Forestry & Natural Resources	Graduate	✓	Credit Hours: 3.00. Introduction to the principles of landscape ecology and biogeography with a laboratory devoted to the analysis of spatial data using geographic information systems and other database tools. Landscape ecology focuses on the important relationships of landscape structure (pattern, heterogeneity) and ecological processes (movement of animals, hydrologic dynamics) and how this information is used for natural resource management. Biogeography examines ecological patterns and processes at larger scales (generally at subcontinental to global) for the purposes of managing plants and animals of global importance. In the last 15 years, tremendous efforts have been made to create spatial databases that help support research and management of natural resources at various scales. The lab will focus on the use and application of these databases that are common in natural resource management settings. Typically offered Fall.
39	Spring	ASEC55100	International Engagement And Development Strategies	Horticulture & Landscape Architecture	Graduate	✓	Credit Hours: 3.00. An overview of cross-disciplinary, cultural, theoretical frameworks, communication tools, and assessment methods applied to international agricultural development and engagement. Lectures, panel discussions, and case studies on appropriate methods of development and engagement, international project planning, intercultural effectiveness, principles of sustainable agricultural, food, community development, and program/project monitoring and evaluation will be the basis of assignments and team work. This eight-week course will provide the theoretical and social frameworks and principles needed to successfully work in multi-agency partnerships on international development projects.
40	Fall	HSCI10100	Introduction to the Health Sciences Professions	Health Sciences	Undergraduate	✓	Credit Hours: 2.00. This course will present an overview of the fields in both the preventive, Public Health, as well as the clinical, Private Health, sides of the Allied Health Science Professions as it presents the holistic nature of health maintenance. Students will have the opportunity to hear from health professionals practicing in the allied health and preprofessional concentrations as well as from School of Health Sciences faculty in their areas of expertise in the fields of industrial hygiene, ergonomics, radiological sciences, toxicology and environmental health science. Typically offered Fall.

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41	Fall	HSCI34500	Introduction To Occupational And Environmental Health Sciences	Health Sciences	Undergraduate	✓	Credit Hours: 3.00. Principles of occupational health (industrial hygiene) and environmental health as related to anticipation, recognition, evaluation, and control of hazards in the workplace and the surrounding community. Emphasis is on hazards of chemicals and their role in occupationally and environmentally related diseases. Historical basis and current legislation are discussed. In addition, the principles of epidemiology, toxicology, exposure standards, and respiratory protection are addressed. Typically offered Fall.
42	Spring	AT64000	Aviation And Aerospace Sustainability	Horticulture & Landscape Architecture	Graduate	✓	Credit Hours: 3.00. This course explores sustainability as applied to aviation and aerospace industries and agencies, both in the private sector and public sector. Emphasis is placed on understanding aviation and aerospace sustainability academic literature and on connecting the global and national policies that lead to the regulations and practices. Aviation sustainability is comprised of multiple areas of impact such as economic, environmental, operational, and social. Students develop an understanding of existing sustainability assessment frameworks such as GRI that have general sustainability assessments along with specialized aviation industry frameworks. Using a multiple attribute analysis approach, students develop metrics and analyze the potential impact of sustainability initiatives in the aviation and aerospace industry. Prerequisites: STAT 30100 or STAT 31100 or STAT 50100 or STAT 51100 or IT 50700 or an instructor-approved statistical foundations course. Proficiency in statistical foundations is required to understand and evaluate environmental, economic and social sustainability data, information and methods presented in this course.
43	Fall	MET42200	Power Plants And Energy Conversion	Engineering Technology	Undergraduate	✓	Credit Hours: 3.00. The theories and skills learned from prerequisite coursework are applied to the analysis and design of power plants and their systems and to selected technologies of energy conversion. Industrial procedures and methods are emphasized. Typically offered Fall Spring Summer.
44	Fall	POL22300	Introduction To Environmental Policy	Political Science	Undergraduate	✓	Credit Hours: 3.00. (FNR 22310) Study of decision making as modern societies attempt to cope with environmental and natural resources problems. Focuses on the American political system, with some attention to the international dimension. Current policies and issues will be examined. Typically offered Fall Spring.
45	Fall	POL32300	Comparative Environmental Policy	Political Science	Undergraduate	✓	Credit Hours: 3.00. Comparative study of environmental policy development and processes in industrialized democracies, former and current communist states, and developing nations. Typically offered Summer Fall Spring.
46	Fall	POL42300	International Environmental Policy	Political Science	Undergraduate	✓	Credit Hours: 3.00. Environmental policy development in the international arena, with attention to international law, international organizations, and transboundary environmental problems. Typically offered Fall Spring Summer.
47	Fall	SFS31200	Urban Agriculture	Horticulture & Landscape Architecture	Undergraduate	✓	Credit Hours: 1.00. Urban agriculture has the potential to address a range of social, economic and environmental issues including food insecurity, energy conservation, and human health and well-being. During this 5-week course, students will learn about the forces driving urban agriculture as well as the political and biophysical factors constraining it by reading articles, reviewing case studies, and visiting urban farms, vertical farm factories, food pantries, and local food advocacy groups. At the end of this course, students will apply the knowledge they've gained by developing a plan to increase urban agriculture in the greater Lafayette metropolitan area. Typically offered Fall.
48	Fall	TLI35560	Employment And Labor Law For The Human Resource Professionals	Technology, Leadership and Innovation	Undergraduate	✓	Credit Hours: 3.00. This course provides a foundation for understanding the impact of labor laws and legal issues in organizations. Topics include corporate social responsibility, employment law, environmental issues, conflict resolution, and global challenges. Typically offered Fall Spring Summer.
49	Fall	ABE48500	Agricultural Engineering Project Management And Design	Agricultural and Biological Engineering	Undergraduate	✓	Credit Hours: 4.00. Team based projects are completed during the semester and documented with a written report and oral presentations. Projects encompass a broad range of topics within agricultural engineering such as the design of environmental systems, machinery, precision agriculture and robotics, and student design competitions.
50	Fall	AD34700	Lighting For Interior Environments	Patti and Rusty Rueff School of Design, Art and Performance	Undergraduate	✓	Credit Hours: 3.00. The study of illuminating principles, design criteria, specifications and environmental systems applied to architectural interiors in public and private spaces. Permission of department required.
51	Fall	AD60500	Problems In Industrial Design	Patti and Rusty Rueff School of Design, Art and Performance	Graduate	✓	Credit Hours: 3.00. Problems in product innovation, product design, product development, and environmental design. Emphasis is placed on the development of working prototypes.

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52	Fall	AGEC52500	Environmental Policy Analysis	Agricultural Economics	Graduate		✓	Credit Hours: 3.00. Designed to assist in understanding how environmental information and knowledge are produced, disseminated, and utilized in a variety of institutional contexts. Readings are selected to promote discussion and interaction concerning alternative mechanisms for protecting environmental resources. Prerequisite: introductory microeconomics course suggested.
53	Fall	AGEC61800	Applied General Equilibrium Analysis	Agricultural Economics	Graduate		✓	Credit Hours: 3.00. Theory and empirical techniques behind numerical general equilibrium analysis. The course is divided into two parts: 1) development of the basic analytical framework and model properties, and 2) in-depth study of selected applications in international trade, price analysis, and resource and environmental economics. Homework assignments involve a mix of qualitative analysis and microcomputer-based computational exercises. Prerequisite: AGECE 60400; Prerequisite: ECON 51100 or 60700.
54	Fall	AGEC68200	The Macroeconomics And Trade Environment Of The Food System	Agricultural Economics	Graduate		✓	Credit Hours: 3.00. Exposes students to the nature of linkages among agriculture, international markets, and the macro-economy, which are key to the fortunes of U.S. farmers and agribusiness. Exam theories and methods that allow students to establish or quantify these linkages and evaluate the consequences of alternative policies, demonstrating the usefulness of economic analysis as a tool. Also explores current policy issues facing the food and agribusiness industries, which might include farm legislation; environmental regulations; and food safety and nutrition labeling rules, among other policy topics. Permission of department required.
55	Fall	AGR11100	Introduction To Agricultural And Biological Engineering Academic Programs	Agronomy	Undergraduate		✓	Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agricultural and Biological Engineering which include Agricultural Systems Management, Agricultural and Natural Resources Engineering, and Biological and Food Process Engineering. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8.
56	Fall	AGR11300	Introduction To Agronomy Academic Programs	Agronomy	Undergraduate		✓	Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Agronomy, which includes Applied Meteorology, Agronomic Business and Marketing, Environmental Soil Science, International Agronomy, Plant Genetics and Plant Breeding, Soil and Crop Management, Soil and Crop Science, Turf Science, and associate degrees. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8.
57	Fall	AGR11900	Introduction To Forestry And Natural Resources Academic Programs	Agronomy	Undergraduate		✓	Credit Hours: 0.50. An introduction to the academic programs offered in the Department of Forestry and Natural Resources. Topics include, but are not limited to undergraduate plans of study, courses, experiential programs, internships, student organizations, career opportunities, academic policies, scholarships, and student services. Course meets during weeks 1-8.
58	Fall	AGR29400	Directed Readings In Agriculture, Environment, And Society	Agronomy	Undergraduate	✓		Credit Hours: 0.00 to 3.00. Presentation of subject matter not available in other courses offered by the college. Directed reading and discussion of books and other documents of significant importance and current interest in agriculture, food systems, renewable natural resources, and the environment. The specific topic that is covered will be indicated on the student's academic record. Permission of instructor required.
59	Fall	AGRY25500	Soil Science	Agronomy	Undergraduate		✓	Credit Hours: 3.00. (NRES 25500) Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000.
60	Fall	AGRY38500	Environmental Soil Chemistry	Agronomy	Undergraduate		✓	Credit Hours: 4.00. (NRES 38500) Designed as an upper level introductory course covering environmental soil chemistry concepts in framework most applicable to inorganic and organic chemical contamination of soil and water resources and intended for students in environmental science fields that may not have a strong chemistry and/or math background. (el.5).



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61	Fall	AGRY51200	Integrated Turfgrass Systems	Agronomy	Graduate	✓	Credit Hours: 3.00. Integration of agronomic principles for professionally managing golf courses, athletic complexes, lawn care companies, and sod production facilities in an efficient and environmentally friendly manner. Emphasizes independent thinking and team cooperation for understanding the social, ethical, and economical aspects underlying the daily agronomic management decisions, including construction, establishment, cultural practices, fertilization, and pest management. Course meets for weeks 1-10.
62	Fall	AGRY56000	Soil Physics	Agronomy	Graduate	✓	Credit Hours: 3.00. Fundamentals of soil physics; transport of chemicals, heat, and gases; field spatial variability; principles and methods of physical analysis of soils; the influence of soil physical processes on environmental quality and agricultural production. Students having an understanding of introductory soil science will be suitably prepared.
63	Fall	ASEC35500	Controversial Science And Media In The Public Sphere	Agricultural Sciences Education and Communication	Undergraduate	✓	Credit Hours: 3.00. This course will utilize case studies of controversial science news to explore the multiple factors that converge to influence how science and technology become controversial issues across a variety of social/ political domains. In addition to foundational understanding of communication theory, students will develop two primary skills: 1) a structure for the critical analysis of science news, 2) the skills to meaningfully communicate across stakeholders. The science content (GMOs, climate change, pesticide use, etc.) will provide the background information for analysis of the main focus of the course, which is in learning the communication process for effectively communicating science to non-science audiences. Case studies and applied critical media theory will be utilized to explore such controversies as climate change, genetically modified foods, and other emergent science controversies.
64	Fall	ASM10400	Introduction To Agricultural Systems	Agricultural and Biological Engineering	Undergraduate	✓	Credit Hours: 3.00. Basic principles of selection and operation of agricultural production equipment, including farm tractors and machines and crop-processing equipment. Planning considerations for crop storage and animal production systems and devices for water conservation and erosion control.
65	Fall	ASM54000	Geographic Information System Application	Agricultural and Biological Engineering	Graduate	✓	Credit Hours: 3.00. Fundamentals of GIS analysis applied to environmental, agricultural, and engineering-related problems. Topics include data sources, spatial analysis; projections; creating data and metadata, and conceptualizing and solving spatial problems using GIS.
66	Fall	AT10300	Aerospace Vehicle Propulsion And Tracking Systems	Aviation and Transportation Technology	Undergraduate	✓	Credit Hours: 3.00. This course is an introduction to propulsion systems used in aerospace vehicles. The student will learn terminology, component parts, and operational theory of propulsion systems. Course topics covered are reciprocating and turbine engine operation theory as well as rocket propulsion systems, including electrical, fuel, fire, ignition and lubrication. Operational and regulatory fuel requirements are discussed. Emerging technologies and environmental practices will be explored.
67	Fall	AT20200	Aerospace Vehicle Systems Design, Analysis And Operations	Aviation and Transportation Technology	Undergraduate	✓	Credit Hours: 3.00. Introduction to the design and engineering analysis of various systems found on modern aircraft and aerospace vehicles. Operational theory will also be presented for specific aircraft. Systems include electric power distribution, digital data, instrumentation, hydraulic, pneumatic, environmental, flight management, and autoflight.
68	Fall	BIOL11000	Fundamentals Of Biology I	Biological Sciences	Undergraduate	✓	Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms.
69	Fall	BTNY50400	Advanced Weed Science	Botany & Plant Pathology	Graduate	✓	Credit Hours: 3.00. Emphasizes the mode and mechanism of herbicide action and herbicide interaction with plants, and the biology and ecology of weedy plants. Offered in odd-numbered years.
70	Fall	CE35500	Engineering Environmental Sustainability	Civil Engineering	Undergraduate	✓	Credit Hours: 3.00. (EEE 35500) An introduction to the examination of global-scale resource utilization, food, energy and commodity production, population dynamics, and their ecosystem impacts.



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Semester Offered	Course	Long Title	Department	Course Level	Sustainability Focused	Sustainability Inclusive	Description	
71	Fall	CE41300	Building Envelope Design And Thermal Loads	Civil Engineering	Undergraduate		✓	Credit Hours: 3.00. This course discusses the basic thermal processes in buildings and presents comprehensive methods for thermal design of envelope assemblies in commercial and residential buildings. The first part of the course includes steady-state transient conduction through envelope assemblies, convection and radiation heat transfer in buildings, solar radiation and solar gains, thermal performance of windows, internal gains, ventilation and infiltration. The second part of the course considers surface and room energy balance equations and presents analytical and computational models for calculation of hourly heating and cooling loads throughout the year. Climate-based standards, passive solar design, advanced energy guides, and innovative technologies for high performance buildings are discussed. The course also includes a design project on analytical heating/cooling load calculations for a commercial building.
72	Fall	CE51501	Building Energy Audits	Civil Engineering	Graduate		✓	Credit Hours: 3.00. This course is designed to provide students with the necessary skills to perform an energy audit on commercial and residential buildings. Energy accounting procedures for all major building subsystems are covered in detail, along with operational cost analysis of these systems. Students learn fundamental techniques for auditing the building envelope; electrical and lighting systems; heating, ventilation, and air conditioning systems; internal thermal loads; and building maintenance and operation procedures. Students also learn to analyze electric and natural gas utility tariffs and rate structures and apply their findings to the energy auditing process.
73	Fall	CE56100	Transportation Systems Evaluation	Civil Engineering	Graduate		✓	Credit Hours: 3.00. Concepts and principles of transportation economic analysis, transportation costs and benefits, user and nonuser consequences, needs studies, finance and taxation, methods of evaluation of plans and projects, cost-effectiveness, environmental impact assessment.
74	Fall	CE59801	Breakthrough Thinking For Complex Challenges	Civil Engineering	Graduate	✓		Credit Hours: 3.00. This course helps students learn and effectively employ high-impact design principles and structured problem solving methods to address complex multi-stakeholder socio-technical challenges. Case discussions of historical and contemporary high impact solutions to complex challenges are used to introduce techniques to frame problems, structure ambiguity, intentionally design non-incremental solutions, and communicate, trial, and iterate solutions to drive adoption and multifaceted sustainability. Techniques are drawn from multiple schools of thought such as business, design, engineering, and the social sciences. Over the course of the term, multidisciplinary student teams directly apply cumulative learning to address a real-world complex societal challenge in close collaboration with a partner organization in an experiential learning format. The course can be counted toward the College of Engineering Minor in Innovation and Transformational Change and the Burton D. Morgan Center for Entrepreneurship (BDMCE) Certificate in Entrepreneurship and Innovation.
75	Fall	CEM53100	Facilities Engineering And Management	Construction Engineering and Management	Graduate		✓	Credit Hours: 3.00. This course provides the student with an understanding of the issues related to facilities management for owner organizations. The course is oriented toward upper class and graduate students familiar with the delivery of capital construction projects and provides an owner's perspective of capital construction and ongoing operation. The course will focus on the total life-cycle cost of a capital construction project beginning with planning, business rationale, economic analysis, and programmatic specifications. The owner's perspective on annual operating costs will be examined including calculation of daily, weekly, monthly, and annual operating costs. The implications of stewardship and customer service will be reviewed and analyzed including the implications on total life-cycle costs. The human resources implications of operating a facility will be reviewed including determination of staffing requirements to meet various levels of service as well as tools and techniques to determine and manage contracted services. Numerous case studies will be described and discussed which will demonstrate the importance of careful planning and budgeting of annual and periodic maintenance. Issues of sustainability, regulations, and other legal factors will be discussed and examined.

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Semester Offered	Course	Long Title	Department	Course Level	Sustainability Focused	Sustainability Inclusive	Description	
76	Fall	EAPS11700	Introduction To Atmospheric Science	Earth, Atmospheric and Planetary Sciences	Undergraduate		✓	Credit Hours: 3.00. The weather/climate system. Solar variability and Milankovitch Theory. Atmospheric scales of motion. Chemistry of greenhouse gases and aerosols. Fundamental laws of meteorological dynamics and radiation. Weather systems, air masses and fronts. Severe storms, hurricanes and tornadoes. (Required for atmospheric sciences majors.)
77	Fall	EAPS31201	Earth Systems Science For Elementary Teachers	Earth, Atmospheric and Planetary Sciences	Undergraduate		✓	Credit Hours: 3.00. An Earth Systems Science perspective draws upon the wealth of Earth systems science research in both content and pedagogy. This approach has served as a guiding framework for how students learn, engage in, and develop deep understandings of the interconnections among Earth's many different systems of geosphere, hydrosphere, atmosphere, and biosphere and the important role that human civilization plays in affecting Earth's other systems. This course takes an Earth Systems Science approach - an emerging transdisciplinary endeavor - to build students' understanding of the structure and functioning of the Earth as a complex, adaptive system.
78	Fall	EAPS32700	Climate, Science And Society	Earth, Atmospheric and Planetary Sciences	Undergraduate	✓		Credit Hours: 3.00. This course will examine the broad problems of climate change by examining the relationship between science, politics, and society by using climate change as a lens through which to examine larger issues. Students will be encouraged to identify similar themes in their own experiences as emerging scientists, engineers and global leaders. Adequate preparation to write essays and perform basic arithmetic calculations needed. Prior knowledge of climate change science is not necessary.
79	Fall	ECON45600	Urban Economics	Economics	Undergraduate		✓	Credit Hours: 3.00. Examines the market forces that lead to the development, growth, and size of cities. In addition, this course covers the theory of location and land use, principles of local public finance, policy problems in the areas of urban housing, transportation, crime, and pollution.
80	Fall	CM51000	Topics In Environmentally Sustainable Construction, Design And Development	Curriculum and Instruction	Graduate	✓		Credit Hours: 3.00. This course explores environmental sustainability in all its forms, starting with the historical and theoretical basis and continuing through an understanding of sustainable building construction, design, development, and renewable energy strategies/management tools and how these can be applied in practice.
81	Fall	EEE25000	Environmental, Ecological, and Engineering Systems	Environmental and Ecological Engineering	Undergraduate		✓	Credit Hours: 3.00. An overview of systems thinking and examples, and applications to environmental, ecological, and engineering systems. Students will develop an understanding of complex and global systems, along with the tools and analysis methods required to deal with them. Basic environmental and ecological science concepts are also included. Typically offered Fall.
82	Fall	EEE29000	Introduction to Environmental And Ecological Engineering Seminar	Environmental and Ecological Engineering	Undergraduate		✓	Credit Hours: 1.00. Guest presenters, peer panelists, and small group discussions introduce students to the knowledge, skills, and abilities needed in order to exhibit the highest levels of professionalism & stewardship expected of an Environmental and Ecological Engineering graduate. Topics include planning a course of study; internship, research, study abroad opportunities; career planning and placement skills; professional responsibility and ethics; and functioning as a professional. Typically offered Fall.
83	Fall	EEE35500	Engineering Environmental Sustainability	Environmental and Ecological Engineering	Undergraduate	✓		Credit Hours: 3.00. (CE 35500) An introduction to the examination of global-scale resource utilization, food, energy and commodity production, population dynamics, and their ecosystem impacts. Typically offered Fall Spring.
84	Fall	EEE48000	Environmental And Ecological Engineering Senior Design	Environmental and Ecological Engineering	Undergraduate		✓	Credit Hours: 1.00 to 3.00. Senior-level environmental and ecological engineering design projects. Projects will integrate knowledge and skills earlier in the degree program and stress the application of the design process to interdisciplinary environmental and/or ecological engineering systems. Permission of department required. Typically offered Fall Spring.
85	Fall	EEE53000	Life Cycle Assessment: Principles And Applications	Environmental and Ecological Engineering	Graduate		✓	Credit Hours: 3.00. This course covers the basic concept of life cycle thinking, framework and computational structure of process and economic input-output based life cycle assessment (LCA), state-of-the-art LCA software tools, industrial case studies, and recent advances in LCA methodology. Students are required to complete a group project that could potentially facilitate the adaptation of LCA tools in engineering research, education, or practice. Typically offered Fall.

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86	Fall	ENGR13000	Transforming Ideas Into Innovations	Engineering Education	Undergraduate		✓	Credit Hours: 4.00. This introductory course to engineering teaches skills in managing complex problems related to design, systems analysis with computational tools, and academic professional development. Through multiple experiences, students will learn effective methods to design and analyze behaviors of complex engineering systems with an eye for innovation. These experiences will develop their skills in teaming, project management, logical reasoning, sustainability, coupled with oral, written and visual communication for multiple audiences. This course also develops students ability to build computational tools (e.g. Python, MATLAB and Excel) to analyze the performance of systems using fundamental concepts associated with physical science and data science (e.g. mathematical modeling, data processing, numerical modeling, statistics). Professional identify development is critical to preparing students for making an informed decision in their choice of major and the development of professional skills to succeed in that major. Therefore, the course includes learning experiences to help them gather and process information about all the engineering academic pathways they could choose at Purdue. Permission of instructor required.
87	Fall	ENGR31000	Engineering In Global Context	Engineering Education	Undergraduate		✓	Credit Hours: 3.00. This course provides students with opportunities to study how engineering is intertwined with larger economic, social, cultural, and technological dynamics in an era of intensified globalization. Its major goals are to help students understand and appreciate what engineering is, how engineers are trained, what engineers do, and how engineering and society interact. The course approaches these themes through discussion of: the relation and interaction of engineering, science, technology, and society; the historical origins and development of engineering as a profession; diversity issues in engineering and other STEM fields; engineering in cross-national/cultural contexts; and contemporary challenges related to globalization, ethics, and sustainability. In summary, the course is designed to help students understand what it means to identify as, and/or work with, engineers. Recitation sections and/or independent projects (at the instructor's discretion) provide further opportunities for students to expand their knowledge and improve their skills in relation to course themes. Typically offered Fall Spring.
88	Fall	FNR20100	Marine Biology	Forestry & Natural Resources	Undergraduate		✓	Credit Hours: 3.00. An introduction to the major groups of marine organisms and their habitats. Emphasis on application of ecological principles to the conservation of important marine species. Offered in even numbered years. Typically offered Fall.
89	Fall	FNR27000	Landscape-Level Planning	Forestry & Natural Resources	Undergraduate		✓	Credit Hours: 1.00. The main objective of this course is to teach students about natural resources planning with an emphasis on critical skills for developing landscape level management plans. This one credit course uses guest speakers, lectures, in-class activities, group presentations and take-home assignments to facilitate student learning. Typically offered Fall.
90	Fall	FNR35700	Fundamental Remote Sensing	Forestry & Natural Resources	Undergraduate		✓	Credit Hours: 3.00. Introduction to the principles of remote sensing, aerial photo interpretation, photogrammetry, geographic information systems, and global positioning systems. Primary applications of geospatial science and technology in forestry and natural resources. Typically offered Fall.
91	Fall	FNR46500	History And Role Of Hunting In North American Wildlife Conservation	Forestry & Natural Resources	Undergraduate		✓	Credit Hours: 1.00. Introduction to the social, economic and wildlife management importance of hunting and how it relates to North American wildlife conservation. History of hunting and the North American Model of wildlife conservation, contrasted with those of European nations. Students will be required to participate in or observe hunting-related activities outside of class. This exercise is conducted off-campus on local Purdue-maintained properties. Typically offered Fall.
92	Fall	HTM17300	Introduction To Tourism Management	Hospitality and Tourism Management	Undergraduate		✓	Credit Hours: 3.00. This is an introduction to tourism management using a system approach that integrates a variety of hospitality and travel organizations and businesses. It focuses on the understanding of tourism from the perspectives of travelers and destinations, while identifying tourism's economic, socio-cultural, and environmental impacts on communities. Typically offered Fall Spring.

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93	Fall	LA41600	Landscape Architectural Design V	Horticulture & Landscape Architecture	Undergraduate	✓	Credit Hours: 4.00. An intensive design studio focusing on urban issues, including environmental, social, and economic approaches to the built environment. Exploration of development history, regulatory structures, local and regional demographics, economies, and environmental systems will be expressed through detailed design proposals, case study, and presentation critiques. Typically offered Fall.
94	Fall	NRES12100	Stepping Stones To Environmental Science	#N/A	Undergraduate	✓	Credit Hours: 1.00. Intended to expose first-year students to emerging environmental problems and innovative solutions, to support their transition to Purdue through a sense of community and increased engagement, and to provide students access to faculty in the environmental sciences in a small group setting. Activities include field trips, hands-on learning, study halls, and meals together. Enrollment is restricted to members of the environmental science learning community. Department permission required. Typically offered Fall.
95	Fall	PHIL11400	Global Moral Issues	Philosophy	Undergraduate	✓	Credit Hours: 3.00. A systematic and representative examination of significant contemporary moral problems with a focus on global issues such as international justice, poverty and foreign aid, nationalism and patriotism, just war, population and the environment, human rights, gender equality, and national self-determination. Typically offered Fall Spring Summer.
96	Fall	POL32700	Global Green Politics	Political Science	Undergraduate	✓	Credit Hours: 3.00. Analysis and assessment of the nature of global environmentalism, its connections with other new social movements, and its impact on domestic and international politics worldwide, with particular attention to green political parties and nongovernmental organizations. Typically offered Fall Spring Summer.
97	Fall	TECH33000	Technology And The Global Society	Engineering Technology	Undergraduate	✓	Credit Hours: 3.00. The course examines the interplay of technology, globalization, intercultural awareness, political reforms, education, religion, gender roles, and history to allow students to gain insight into leading / enabling technology adoption and global business practices to address global markets and global challenges in their future professions.. Students will explore concepts and issues related to outsourcing; global competitiveness; intercultural communications; contemporary issues; cultural differences such as inequality, security, sustainability, and quality of life; and the ethical dilemmas that often emerge as a result of the impact of technology. This course will expose students to strategic and operational management topics that support decision making in global expansion of Business and Technology. This course is designed to provide knowledge and a higher level understanding of the principles behind globalization of technology and its regional and global markets. The course utilizes formal assessment instruments and intercultural activities to aid students in the development of increased intercultural capacity. Typically offered Fall Spring Summer.
98	Fall	ANTH10000	Being Human: Introduction to Anthropology	Anthropology	Undergraduate	✓	Credit Hours: 3.00. Introduces anthropology's holistic approach to human nature and behavior. This course uses the tools of cultural, biological, archaeological, and linguistic anthropology to follow the human journey of uniformity and diversity through time and across space.
99	Fall	CEM38000	Construction Engineering Professional Development II	Construction Engineering and Management	Undergraduate	✓	Credit Hours: 1.00. This course will build upon the topics discussed in CEM 28000 to further prepare students for their work in the construction industry. A focus of this class will be on presentation skills. By utilizing the first or last hour of CEM 42500-Construction Practice Project, the students of CEM 38000 will have the opportunity to present and also participate as an audience and active participant in CEM 42500 Construction Practice Project. The presentations of CEM 38000 will consist of their required Summer Internship Reports, which are a compilation of the work they have completed and skills they have learned in their first two internships (CEM 19100 and CEM 29100).

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100	Fall	CSR41600	Retail Supply Chain Management	Hospitality and Tourism Management	Undergraduate	✓	Credit Hours: 3.00. Supply chain management is a set of approaches utilized to efficiently integrate all parties of the supply chain to fulfill a request from a customer. Companies like Amazon, Zara, Walmart, Toyota, Dell, and Procter & Gamble are proof that excellence in supply chain management is a must to achieve industry leadership. With increasing competition around the globe, supply chain management is both a challenge and an opportunity for companies. The main goal of this course is to introduce you to the key concepts and techniques that will allow you to analyze, manage and improve supply chain processes for different industries. The course is a combination of lectures, case studies, in-class exercises, and games with the goal of defining key tradeoffs that managers need to understand and evaluate to successfully manage complex supply chains. Quantitative tools designed to evaluate these tradeoffs will be studied and used extensively throughout the course. Topics that will be covered in this course include: Managing inventory, forecasting in supply chains, the optimal design of the supply chain, transportation and distribution, bullwhip effects and dealing with uncertainty, sourcing and supply contracts.
101	Fall	EAPS12000	Introduction To Geography	Earth, Atmospheric and Planetary Sciences	Undergraduate	✓	Credit Hours: 3.00. Introduction to the major themes of modern geography, designed to enhance your spatial thinking skills, geographic literacy, and to help you understand the relevance of geographic concepts and how they relate to our changing world. This course will expand your awareness of global issues and provide you with tools to understand how the world around you changes at local, regional, and global scales.
102	Fall	ECE32100	Electromechanical Motion Devices	Electrical and Computer Engineering	Undergraduate	✓	Credit Hours: 3.00. The general theory of electromechanical motion devices relating electric variables and electromagnetic forces. The basic concepts and operational behavior of DC, induction, brushless DC, and stepper motors used in control applications are presented.
103	Fall	ECE49401	Professional Communication Capstone	Electrical and Computer Engineering	Undergraduate	✓	Credit Hours: 1.00. This course provides ECE students an opportunity to refine their professional communication skills before launching into the workplace or graduate school. Topics include: ethics in ECE, workplace communication (written and verbal), and plans for professional growth.
104	Fall	ECE50616	Physics And Manufacturing Of Solar Cells	Electrical and Computer Engineering	Graduate	✓	Credit Hours: 3.00. This course introduces the electronic, optical and material properties and the manufacturing of photovoltaic devices. Topics include electronic charge separation, transportation and recombination; optical concentration, trapping and confinement; material preparations in photovoltaic systems; bulk crystal, thin-film and organic photovoltaic device configurations; energy storage; as well as emerging concepts in photovoltaics. Discussions also involve the process and equipment for the manufacturing of various photovoltaic modules, with special emphasis on driving down the cost of photovoltaic systems.
105	Fall	ENGR16100	Honors Introduction To Innovation And The Physical Science Of Engineering Design I	Engineering Education	Undergraduate	✓	Credit Hours: 4.00. This course introduces students to the engineering profession using physics-based, multidisciplinary, societally relevant content. Students develop engineering approaches to systems, generate and explore creative and innovative ideas, and use of computational methods to support design decisions. In particular, the students will develop the ability to model and investigate physical systems at the microscopic and macroscopic levels with a focus on vectors analysis, linear momentum, angular momentum, work-energy, and solid material interactions. Design challenges and projects will explore a wide range of natural phenomena experimentally and computationally (utilizing Matlab and Python) and engage students in innovative thinking across the engineering disciplines at Purdue. They will learn the basics of descriptive statistics, data analysis, sensitivity analysis, and decision making. Students experience the process of design and analysis in engineering including how to work effectively in teams. Students also develop skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools. Typically offered Fall.

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106	Fall	ENGT55000	Manufacturing System Design For Sustainability	Engineering Technology	Graduate	✓	Credit Hours: 3.00. This course prepares manufacturing and information technology leaders to design and analyze manufacturing processes to achieve manufacturing system objectives that meet internal and external customers quality, cost and delivery requirements within a safe environment. The course project covers major aspects of manufacturing system design and Industry 4.0 in the context of meeting customer needs. Technology leaders and entrepreneurs learn how to work with others to develop the design of manufacturing systems that are sustainable (business, ecological, social, technological) for the long-term. When to use lean and six-sigma techniques in the context of the manufacturing enterprise system design to meet customer needs will be assessed from a system design perspective, through analytical and computer simulation techniques, and through the use of physical modeling tools. Typically offered Fall Spring Summer.
107	Fall	ENTM41000	Applied Insect Biology	Entomology	Undergraduate	✓	Credit Hours: 2.00. Identification, biology and management of insects associated with global food and energy security and human and animal health and well-being. Students are expected to have a knowledge of college biology. Typically offered Fall.
108	Fall	ENTR31500	Business Planning For Social Entrepreneurship	#N/A	Undergraduate	✓	Credit Hours: 3.00. Social enterprises use traditional organizational business structures to create scalable solutions to address social issues. This course builds on entrepreneurship concepts and skills developed in ENTR 20000 (pre-requisite course) to understand the differences, benefits and opportunities associated with social enterprise business models. Students work in teams to develop social enterprise concepts. This occurs through hands-on activities including gathering feedback, creating forecasts, developing a strategy, and pitching to investors. Students can choose ENTR 31000 or ENTR 31500 to serve as the second required core course Certificate in Entrepreneurship and Innovation. Typically offered Fall Spring.
109	Fall	HTM26200	Festivals And Special Events	Hospitality and Tourism Management	Undergraduate	✓	Credit Hours: 3.00. This course offers a comprehensive overview of the theory and procedures associated with the coordination of festivals and special events. Essential topics will include the conceptualization, planning, coordination, sponsorship, marketing, funding, staffing, legal issues, and assessment of festivals and special events. Students will gain hands-on experience by volunteering to work a minimum of six hours to set up, help coordinate, or tear down a large scale festival or special event. Typically offered Fall Spring.
110	Fall	HTM29102	Introduction To Foodservice Management	Hospitality and Tourism Management	Undergraduate	✓	Credit Hours: 3.00. An introduction to food preparation methods and service techniques in quantity food settings. Students become familiar with ingredients and culinary terminology, and learn to read, write and evaluate menus. Recipe conversion, inventory and costing skills are developed. Production methods, equipment, and product flow are examined. Front-of-the-house service techniques as well as front-and-back-of-the-house interactions will be studied.
111	Fall	HTM32200	Hospitality Facilities Management	Hospitality and Tourism Management	Undergraduate	✓	Credit Hours: 3.00. Technical and managerial issues relating to the operation and maintenance of the physical plant and equipment in hospitality industry facilities. Typically offered Fall Spring.
112	Fall	IDE48300	Multidisciplinary Engineering Analysis And Decision Making	Engineering Education	Undergraduate	✓	Credit Hours: 1.00. Application of product evaluation, cost estimating, and product/project feasibility and viability analysis from multidisciplinary perspectives in the context of new product development. Topics include exposure to company success measures, quantitative and qualitative analysis, sensitivity analysis, cost-benefit analysis, project comparisons, new product life-cycle analysis, and related engineering decisions. Topics are explored through case-based, industrially focused examples. The course centers on the creation and use of analytical spreadsheets with computer tools/software for routine engineering analysis and decision making. Typically offered Fall.
113	Fall	IDE48400	Multidisciplinary Engineering Design Methodology	Engineering Education	Undergraduate	✓	Credit Hours: 1.00. Engineering design methods targeted for MDE students. Introduction to Multidisciplinary Teams, Design Project Scoping and Task Clarification, Design Data Acquisition & Management, Design Communication & Iteration, and Design Review Processes. Permission of department required. Typically offered Fall.

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Semester Offered	Course	Long Title	Department	Course Level	Sustainability Focused	Sustainability Inclusive	Description
114	Fall	IDE48700	Multidisciplinary Engineering Senior Professional Development	Engineering Education	Undergraduate	✓	Credit Hours: 1.00. Senior professional development covers and assesses students in Multidisciplinary Engineering professional outcomes including, teamwork, professional and ethical responsibility, communication, impact of engineering in context, lifelong learning, impact of contemporary issues, and leadership. Methods to obtain a professional position after graduation. Permission of instructor required. Typically offered Fall.
115	Fall	MA15555	Quantitative Reasoning	Mathematics	Undergraduate	✓	Credit Hours: 3.00. This course will cover important mathematical ideas, including proportion, weighted averages, linear models, exponential models, basic probability and statistics, and some algebra, by using concrete real-world problems. It will not be a prerequisite for any other mathematics course. CTL: Quantitative Reasoning
116	Fall	MET42100	Air Conditioning And Refrigeration	Engineering Technology	Undergraduate	✓	Credit Hours: 3.00. Heat gains and losses, heat-producing equipment, cooling, and refrigeration equipment are studied. System design is presented, including controls and instrumentation for commercial, industrial, and residential systems. Typically offered Fall Spring.
117	Fall	NRES42000	Environmental Internship Reporting	#N/A	Undergraduate	✓	Credit Hours: 1.00. Reporting on participation in government, industrial, or other internship program. Permission of department required. Typically offered Fall.
118	Fall	PUBH20200	Health In The Time Of Pandemics: An Introduction	Public Health	Undergraduate	✓	Credit Hours: 3.00. This course will introduce students to basic concepts about health and disease through examination of the sweeping effects of pandemics. In addition to reviewing the effects directly related to human health and healthcare systems, the course will provide an interdisciplinary overview of the social, political, and economic consequences of infectious disease outbreaks and the range of local, national, and global responses to address them. The course will be taught by faculty members representing the broad diversity of disciplines within the College of Health and Human Sciences (HHS), with additional specific contributions from faculty representing other disciplines outside HHS. Typically offered Fall Spring.
119	Fall	SFS31100	Aquaponics	Horticulture & Landscape Architecture	Undergraduate	✓	Credit Hours: 1.00. (FNR 31300) (HORT 31110) There has been a significant renewed interest in the investigation of integrated fish-food plant systems. Such systems have a long and rich history, particularly in Asia; and our impending food crisis has kindled an interest in developing aquaponics systems in western countries. Many growers are turning to controlled environment and hydroponic production methods to produce high-value crops in tight quarters. The waste disposal problem of the fish can become the nutrient supply to the plants. Typically offered Fall.
120	Fall	SFS31300	Farm To Fork	Horticulture & Landscape Architecture	Undergraduate	✓	Credit Hours: 1.00. This course will investigate the culinary opportunities of local and seasonal foods and the horticultural demands of producing and marketing them. Dr. Hallett will represent the farm, giving students a brief overview of the production of local and seasonal foods in Indiana. The farm will harvest produce at the student farm and deliver it to the fork - Chef Ambarish Lulay - who will work his culinary magic in the teaching kitchens in the HTM department. The focus, from both sides of the course will be the importance of niche marketing for farmers and chefs. This course is going to be tasty and fun! Typically offered Fall.
121	Spring	FNR30200	Global Sustainability Issues	Forestry & Natural Resources	Undergraduate	✓	Credit Hours: 2.00. This course explores global sustainability issues in natural resources with emphasis on forestry, wood products manufacturing, conservation, water management, energy and their impact on the targeted geographic location (such as Central America, Eastern Europe) and the rest of the world. The purpose of this course is to present students, regardless of their disciplinary background, with an overview of the interdisciplinary aspects of sustainable natural resource management. This colloquium course will examine global sustainable natural resources and related issues (including population, poverty, pollution, climate change, deforestation, invasive species, urbanization, habitat loss, cultural traditions, water management, energy, education, technology, and international collaboration). Typically offered Spring.
122	Spring	ECET53500	Energy Sustainability	Agricultural Economics	Graduate	✓	Credit Hours: 3.00. A study of energy auditing, energy saving opportunities of commercial and industrial systems, utility rate structures, economic evaluation of investments, potential energy saving retrofits, maintenance considerations, and cogeneration opportunities. Data analysis and report writing are practiced using data from a real world energy audit.



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123	Spring	ABE52700	Computer Models In Environmental And Natural Resources Engineering	Forestry & Natural Resources	Graduate		✓	Credit Hours: 3.00. Offers students in environmental and natural resources engineering programs an understanding of the hydrological processes and related design skills. Principles of soil erosion by water; drainage of agricultural lands; surface runoff; flood and reservoir routing; hydrodynamic and water quality in pipe network; nonpoint source pollution; and transport phenomenon are studied. Current computer models utilized in industry for decision support are applied using case studies to further enhance the understanding of the hydrological processes. Limitations and advantages of the models are discussed. Offered in alternate years.
124	Spring	AGEC20400	Introduction To Resource Economics And Environmental Policy	Agricultural and Biological Engineering	Undergraduate		✓	Credit Hours: 3.00. The course provides an overview of microeconomic theory and its application to issues related to evaluating resource economic issues and environmental policy. Topics discussed include efficiency, sustainability, valuation, externalities, governmental policies, and benefit cost analysis.
125	Spring	BIOL48300	Great Issues: Environmental And Conservation Biology	Agricultural Economics	Undergraduate		✓	Credit Hours: 3.00. Concerned with the application of ecological principles to environmental issues, the course introduces fundamental ecology, emphasizing the interplay of theoretical models, natural history, and experimentation. New research developments are stressed, with the outlook for application to environmental management and restoration. Whole-biosphere issues, such as the loss of biological diversity, frame a focus at the population level to understand local and global extinction and community stability. In-depth case studies of endangered ecosystems (both temperate and tropical), with computer modeling, field trips, and discussions of policy formulation, demonstrate the range of tools and information necessary to accomplish coexistence of humans with the rest of nature.
126	Spring	HTM37000	Sustainable Tourism And Responsible Travel	Biological Sciences	Undergraduate	✓		Credit Hours: 3.00. This course will examine issues associated with sustainability in the hospitality and tourism industry. It will examine how principles of sustainable development and the triple bottom line (economic, social and environmental) are applied to hospitality and tourism. The course will address sustainability across a variety of tourism sectors including destination management, lodging, restaurants and meetings. The course will also examine consumer issues associated with sustainability. Typically offered Spring.
127	Spring	SOC33900	Sociology Of Global Development	Earth, Atmospheric and Planetary Sciences	Undergraduate		✓	Credit Hours: 3.00. Analysis of the causes and consequences of global development. Topics include: globalization; colonialism and decolonization; food insecurity and dependency; industrialization, poverty and inequality; migration; debt and trade; women's empowerment; global health; rights and social change; and sustainable development. This course will introduce you to the study of global development and globalization. The primary questions we will address are: What is development? What is globalization and what is its relationship with development? How have the processes of global development produced inequalities among nations, regions, races, genders, and classes? Is there a "developing" world and a "developed" world? If so, what are their differences and how do they relate with each other? How have some developing countries become more developed than others? What roles do corporations, the state, and civil society organizations play in the processes of global development? How is global development interrelated with the physical environment, inequalities of consumption, and the environmental crisis? How do people resist the inequalities and perceived injustices of global development through global social movements? How are we interconnected economically, politically, culturally, socially, and ecologically with people all over the world? What are the possible futures of development? To address these issues, our focus will be on the developing world, our scope will be global and long-term, our methodology will be historical-comparative, and our perspective will be social-scientific and critical.
128	Spring	ABE21000	Thermodynamics Principles Of Engineering And Biological Systems	Hospitality and Tourism Management	Undergraduate		✓	Credit Hours: 3.00. Application of thermodynamic principles to the design and operation of biological and engineering systems. The focus is on mass and energy balances for non-reacting processes and on the second law of thermodynamics. These principles are applied to biological and agricultural engineering systems. Specific topics include refrigeration systems, power cycles, energy conversion systems, and environmental impacts of energy production.

## Purdue University - Academic Courses (AC01)

Date: 10/20/2022

Semester Offered	Course	Long Title	Department	Course Level	Sustainability Focused	Sustainability Inclusive	Description
129	Spring	CE31100	Architectural Engineering	Sociology	Undergraduate	✓	Credit Hours: 3.00. This course introduces energy efficiency, thermal comfort, indoor environmental quality and green building design concepts. The course covers engineering fundamentals required for the design and analysis of building systems such as thermodynamics, fluid mechanics, heat and mass transfer, light and sound transmission. The course presents engineering principles and selected applications related to hydrothermal analysis of building enclosures, air conditioning processes in heating, ventilating and air conditioning systems, building illumination, and building acoustics.
130	Spring	CE51300	Lighting In Buildings	Agricultural and Biological Engineering	Graduate	✓	Credit Hours: 3.00. This course focuses on the design of illumination systems in buildings (electric and natural lighting) in order to achieve energy efficiency and visual comfort. The first part of the course includes analytical lighting calculation techniques, visual perception, radiative transfer, lamp characteristics, electric lighting system design and control for calculation of required indoor illuminance levels. The second part of the course covers daylighting (natural lighting) systems, including state-of-the-art daylighting prediction models as well as design and control of such devices and advanced metrics. The course also has a lab section, in which the students learn how to work with lighting and daylighting tools and build their own computational transient lighting models in open programming languages, in order to design illumination systems and predict electricity consumption and potential energy savings.
131	Fall	EDCI50600	Environmental Education	Civil Engineering	Graduate	✓	Credit Hours: 3.00. Synthesis of philosophies, scientific principles and methods for environmental education programs in forests, camps, and schools. Students conduct and summarize literature research on scientific and educational principles. In interdisciplinary teams, they develop, implement, and evaluate curricula for schools, nature centers, interpretive and outdoor education programs. Typically offered Fall Spring.
132	Spring	ABE55800	Process Design For Food And Biological Systems	Civil Engineering	Graduate	✓	Credit Hours: 3.00. This course will focus on the design, synthesis, creation, evaluation, and optimization of processes to convert basic biological materials into a finished product. Concepts of materials and energy balances, thermodynamics, kinetics, transport phenomena of biological systems will be used to design processes to minimize energy and environmental impacts, and evaluate economic factors while maintaining product quality. Course will include group projects, oral and written reports.
133	Spring	AGEC41000	Agricultural Policy	Civil Engineering	Undergraduate	✓	Credit Hours: 3.00. Economic analysis of U.S. food and agricultural policy; current and past farm legislation; international trade; agricultural policies in selected countries; domestic and foreign food assistance; structural change; agricultural research policy; macroeconomic linkages with the agricultural sector; and emerging environmental policy issues, land and water use.
134	Spring	ASEC58500	Science Communication	Medicinal Chemistry and Molecular Pharmacology	Graduate	✓	Credit Hours: 3.00. This course utilizes foundational research and commentary from scholars to track the evolution of media and our ability as scientists to understand and effectively communicate these issues to a non-science audience. Science and technology are evolving faster than societies ability to understand, assimilate, and make policies to address these increasingly complex issues. As a result, controversies arise over issues such as climate change, forest management, genetically modified foods, energy choices, genetic engineering, nanotechnology, water management, and agricultural practices, etc. This course covers the range of issues in the field of science communication including: the nature of science, how to translate evidence for a lay audience, media practices, reporting and qualifying uncertainty, human psychology and belief systems, information processing, and the most current research for messaging science. We will work together to examine the foundational scholarly literature in this area and how it is/ or is not reflected in construction of popular media. You will use this knowledge to construct both compelling oral science narratives, and a science story for popular consumption.

## Purdue University - Academic Courses (AC01)

Date: 10/20/2022

Semester Offered	Course	Long Title	Department	Course Level	Sustainability Focused	Sustainability Inclusive	Description	
135	Fall	HORT55100	Plant Responses To The Environment	Engineering Technology	Graduate	✓	Credit Hours: 3.00. Future agricultural production and the environment will encounter multifaceted challenges from global climate change, heat and drought incidence and severity, and limited land and resources. An understanding of how plant responds to these changes is essential to develop new technologies and systems approaches to mitigate the negative impacts and enhance agricultural crop productivity. This is an advanced plant biology course covering the present state of understanding of phenological, physiological, and molecular and genetic mechanisms and processes by which plants acclimate to transient and chronic environmental extremes. Typically offered Fall.	
136	Spring	BINY30200	Plant Ecology	Environmental and Ecological Engineering	Undergraduate		✓	Credit Hours: 3.00. Offered in odd-numbered years. This course will provide an introduction to the broad field of plant ecology. Through lectures and lab assignments, students will gain an in-depth understanding of ecological concepts regarding the occurrence and distribution of plant species and populations. Students will also gain insights into the application of these concepts to the conservation and management of plant species and populations.
137	Spring	CHE30600	Design Of Staged Separation Processes	Agricultural and Biological Engineering	Undergraduate	✓		Credit Hours: 3.00. The application of equilibria and mass and energy balances for the design of staged separation processes. Use of various equilibrium data and thermodynamic principles for the design of batch and continuous distillation, absorption, stripping, and extraction systems. Stagewise calculations and graphical methods for design of binary systems. Design of multicomponent separators. Determination of stage efficiency and column size.
138	Spring	EAPS32000	Physics Of Climate	Agricultural Economics	Undergraduate		✓	Credit Hours: 3.00. Open to majors in the Schools of Science, Agriculture, and Engineering. To understand climate we describe and synthesize physical processes in the atmosphere and their coupling to the ocean, ice, and land. We quantitatively explore climatology with an equal balance of physical principles and scrutiny of available modern data. Topics include: visualization of atmospheric/land surface/oceanographic climatological data sets; theories of climate dynamics; and climate change. Beginning with radiative balance and simple energy balance models, the course progresses toward understanding the effects of radiative-convective forcing and rotation on the fluid envelopes. Analysis of data in an interactive computer-enabled environment is an important part of the course. By the end of this course, the student should know how the Earth System behaves at large scales and grasp the physical understandings of why.
139	Spring	EEE43000	Industrial Ecology And Life Cycle Analysis	Agricultural Sciences Education and Communication	Undergraduate		✓	Credit Hours: 3.00. The outputs and processes associated with industrial systems are examined, with special emphasis placed on interactions of these systems with environmental and ecological systems. A full product life cycle perspective is stresses, including energy and material flows, processes used to produce materials and realize products, and the management of end-of-life products. Typically offered Spring.
140	Spring	ENGL23400	Literature And The Environment	Aviation and Transportation Technology	Undergraduate	✓		Credit Hours: 3.00. Literary study of nature writing; writing from the natural sciences; and canonical poetry, fiction, and essays through an ecological lens. Introduces students to ecocritical thought and environmental literary history. Typically offered Fall Spring Summer.
141	Spring	ENGL39300	Interdisciplinary Approaches To Environmental And Sustainability Studies	Botany & Plant Pathology	Undergraduate	✓		Credit Hours: 3.00. (ANTH 39300) This course is the lynchpin of the undergraduate Certificate in Environmental and Sustainability Studies. It will present a series of case studies, core concepts, and problem questions that integrate the following three academic approaches: 1) Human Dimensions and Environment/Sustainability, 2) Engineering and Environment/Sustainability, and 3) Environmental/Sustainability Sciences. Typically offered Fall Spring Summer.
142	Spring	ENTM43100	Human-Wildlife Conflicts	Chemical Engineering	Undergraduate		✓	Credit Hours: 3.00. Exploration of conflicts between human interests and wildlife and the regulations policies and legislation used to minimize conflicts. Negative interactions may be real or perceived, economic or aesthetic, social or political, and may pose risks to human health and safety. Emphasis on the causes of conflict and resolutions that seek to balance protection or conservation of wildlife with protection of other public resources and individual property owners. Prior knowledge of college level general biology and ecology is expected. Typically offered Spring.

## Purdue University - Academic Courses (AC01)

Date: 10/20/2022

Semester Offered	Course	Long Title	Department	Course Level	Sustainability Focused	Sustainability Inclusive	Description	
143	Spring	FNR25150	Ecology And Systematics Of Mammals And Birds	Earth, Atmospheric and Planetary Sciences	Undergraduate		✓	Credit Hours: 3.00. Introduction to the ecology and systematics of mammals and birds. Discuss the evolutionary adaptations and ecological processes of these vertebrate groups at the individual, population, and community levels. Examine the roles of phylogeny, physiology, morphology, and behavior in influencing organismal responses to the environment. Assess issues related to the conservation of mammals and birds. Typically offered Spring.
144	Spring	FNR45800	Advanced Marine Biology	Earth, Atmospheric and Planetary Sciences	Undergraduate		✓	Credit Hours: 3.00. Focus is placed on the structure and function of major marine ecosystems, including estuarine, mangrove, coastal, coral reef, open ocean, and deep ocean environments. Course content will include rigorous treatment of the biogeochemical processes that support these ecosystems, as well as the biology and ecology of characteristic flora and fauna. Typically offered Fall.
145	Spring	FNR56700	Advanced Mammalogy	Earth, Atmospheric and Planetary Sciences	Graduate		✓	Credit Hours: 3.00. The class explores approaches to mammalian research and wildlife management through readings, discussions, field, and laboratory exercises. Topics such as mammalian behavior, ecology, phylogeny, taxonomy, and conservation are emphasized. The intention of this class is to help students who have a sincere interest in mammalian research and management to progress beyond identification in their understanding of mammals. Typically offered Spring.
146	Spring	NRES49800	Individual Studies In Environmental Science	Earth, Atmospheric and Planetary Sciences	Undergraduate		✓	Credit Hours: 1.00 to 3.00. An opportunity for upper-level undergraduates to focus their interests and knowledge on an environmentally related problem. Arrangements must be made with a Natural Resources and Environmental Science Program faculty member before registration. Permission of instructor required.
147	Spring	SFS30200	Principles Of Sustainability	Environmental and Ecological Engineering	Undergraduate		✓	Credit Hours: 3.00. Principles of sustainability is an experiential (discussion/debate) course that delivers an expansive overview of the principles of sustainability as they relate to energy and resources, communities, and agriculture. Students will learn to understand and analyze different food and farming systems and how they relate to environmental, economic and social sustainability.
148	Spring	SFS31500	Principles Of Permaculture	Environmental and Ecological Engineering	Undergraduate		✓	Credit Hours: 1.00. The goal of this class is to encourage students to think of farming systems, including their energy and resource flows, economics and social characteristics, in the ways that ecologists think of ecological systems. How does energy flow through farming systems, and how do resources recycle (or not)? What are the weaknesses of farming systems that could be mitigated by mimicking natural systems? Issues of efficiency, sustainability and resilience will be investigated in the context of permaculture, a theory of food production and landscape design that has an emphasis on perennial crops, low input production, and ecological diversity. The centerpiece of the course will be to further develop the Purdue Student Farm using permaculture principles. Typically offered Spring.
149	Spring	SFS35100	SFS Capstone Project	Environmental and Ecological Engineering	Undergraduate		✓	Credit Hours: 1.00. The SFS Capstone Project is a directed-learning course that will require students to prepare and present a sustainability analysis of a farm enterprise, most likely the enterprise at which they conduct their required summer internship, and this may be an internship approved at an operation other than a farm. Students will be required to analyze and enterprise taking into account its economic, environmental and social sustainability, and its broader role in sustaining the local and regional economy, environment and community. The analysis will be prepared as a paper and a presentation that will be given to the undergraduates of the SFS program at an SFS program meeting. The paper and the presentation will be prepared in consultation with a faculty mentor from the SFS program committee and will be graded by the faculty mentor. Completion of an approved work or internship experience. Typically offered Fall Spring Summer.
150	Spring	ABE42600	Ecological Restoration Engineering	English	Undergraduate		✓	Credit Hours: 3.00. This course focuses on ecologically-based design principles to restore degraded ecosystems, specifically wetlands, stream/floodplains, and prairies. Students will identify and synthesize design elements, natural and anthropogenic stresses, and management considerations to develop resilient restoration designs. Laboratory experience provides open-ended projects, data collection, and field trips to reinforce the design process.

## Purdue University - Academic Courses (AC01)

Date: 10/20/2022

Semester Offered	Course	Long Title	Department	Course Level	Sustainability Focused	Sustainability Inclusive	Description
151	Spring	AGRY28500	World Crop Adaptation And Distribution	English	Undergraduate	✓	Credit Hours: 3.00. Examination of how environmental factors, including climate and soils, impact the global distribution of major food crops. Identification of the types of naturally occurring plant communities and comparison of these communities with those of environmentally and economically sound field cropping systems. Exploration of how man's intervention has maintained or modified the productivity of food crops in agricultural communities and how intervention has affected the environment.
152	Spring	AGRY54400	Environmental Organic Chemistry	Entomology	Graduate	✓	Credit Hours: 3.00. (EEE 54400) The fundamental properties and processes responsible for the fate of organic chemicals in the environment, with emphasis on soil and water chemistry. Areas to be addressed will include both conceptual and theoretical aspects of processes relevant to environmental fate of contaminants; measurement, estimation, correlation, and application of the parameters most commonly used to assess various chemodynamic properties in soil-water systems.
153	Spring	AGRY58500	Soils And Land Use	Forestry & Natural Resources	Graduate	✓	Credit Hours: 3.00. Soils as a resource in development planning; soil properties affecting land use; use of soil survey, aerial photos, topographic maps, and other resource data in land-use allocation; nonengineering aspects of site selection for various land uses, water conservation, waste disposal, and erosion control.
154	Spring	CE54400	Subsurface Hydrology	Forestry & Natural Resources	Graduate	✓	Credit Hours: 3.00. Basic principles of fluid flow in saturated and unsaturated materials. Darcy's law, well hydraulics, determination of hydraulic properties of aquifers. Infiltration theory. Discussions of artificial recharge, land subsidence, saltwater intrusion, ground water quality and contamination.
155	Spring	CEM53300	Infrastructure Analytics	Forestry & Natural Resources	Graduate	✓	Credit Hours: 3.00. This course investigates the data sources and numerical tools required to assess the status of constructed facilities and to make informed decisions from the data. The course is oriented toward upper class and graduate students familiar with the delivery of capital construction projects (buildings, roads, bridges, earthworks, utilities, rail/transit, ports, and canals) and includes numerical analysis techniques. The course will focus on data sources, either direct or indirect, and analysis methods to identify the current condition or project future conditions of built infrastructure. Course format will be highly interactive with discussion about recent infrastructure projects in both instructor, guest speaker, and student-led discussions. Issues of sustainability, regulations, and other factors will be discussed and examined.
156	Spring	EAPS10600	Geosciences In The Cinema	Engineering Technology	Undergraduate	✓	Credit Hours: 3.00. An introduction to earth and atmospheric sciences based on depictions in popular and documentary cinema. Topics will include: earthquakes, volcanoes, severe weather, dinosaurs, climate change, evolution, meteor impacts, and earth's interior. Lectures will focus on discussion of the relevant science, separating fact from fiction, and disaster management. Assignments will consist of viewing of films and answering questions about the science contained therein.
157	Spring	EAPS22100	Survey Of Atmospheric Science	#N/A	Undergraduate	✓	Credit Hours: 3.00. (NRES 23000) An introductory course for both science and non-science students. A general study of the atmosphere, basic meteorological principles, and weather systems. Relationships of the changing atmosphere to climate ozone depletion, and other contemporary issues.
158	Spring	EEE39000	Environmental And Ecological Engineering Professional Practice Seminar	Political Science	Undergraduate	✓	Credit Hours: 1.00. Seminar lectures and discussions to introduce students to aspects of professional practice within Environmental and Ecological Engineering. Topics include career planning and placement skills, professional responsibility and ethics, functioning as a professional, and other current important topics in the profession. Students will interact with several practicing Environmental and Ecological Engineers. Typically offered Spring.
159	Spring	ENTM61100	Toxicology Of Insecticides	Political Science	Graduate	✓	Credit Hours: 3.00. The chemistry, mode of action, and metabolism of insecticides and related compounds in both insect and vertebrate systems. Evaluation of toxic action, principles of selective toxicity, insecticide resistance, and environmental effects are also discussed. A minimal knowledge of entomology is required. Knowledge of biochemistry and neurobiology is useful.
160	Spring	FNR35300	Natural Resources Measurement	Horticulture & Landscape Architecture	Undergraduate	✓	Credit Hours: 3.00. An introduction to sampling techniques and fundamental principles for measuring natural resources. Typically offered Spring.

## Purdue University - Academic Courses (AC01)

Date: 10/20/2022

Semester Offered	Course	Long Title	Department	Course Level	Sustainability Focused	Sustainability Inclusive	Description
161	Spring	FNR37500	Human Dimensions of Natural Resource Management	Horticulture & Landscape Architecture	Undergraduate	✓	Credit Hours: 3.00. An introduction to the human dimensions of forestry, wildlife, and recreation; students will learn how values, attitudes, community, and behavior relate to natural resource management and decision-making; various natural resource management stakeholders such as private landowners, natural resource agencies, the judiciary, and environmental and natural resource interest groups will be discussed; course will utilize case studies specific to Indiana and the Midwest; course includes weekly discussions during recitations. Typically offered Spring.
162	Spring	FNR41910	Furniture Product Development And Strength Design	Horticulture & Landscape Architecture	Undergraduate	✓	Credit Hours: 3.00. Qualitative and quantitative principles of furniture construction, product development methodology and strength design principles, furniture performance testing, product sustainability and end of life options (LCA, computer-based applications and solutions). Course features laboratory evaluating, furniture joints and furniture structures. Typically offered Spring.
163	Spring	HORT31900	Controlled Environment Production Of Horticultural Crops	Agricultural and Biological Engineering	Undergraduate	✓	Credit Hours: 3.00. This course combines production principles with environmental concepts and advances in technology to provide a comprehensive training in sustainable production of herbaceous ornamentals and vegetables in controlled environment systems. The laboratory instruction provides hands-on experience with the practice of growing crops under controlled environments by combining the learning from lab prep with the use of technology to control environment during production. Typically offered Spring.
164	Spring	HSCI53400	Applied Health Physics	Agronomy	Graduate	✓	Credit Hours: 3.00. Lecture and case studies related to the application of radiation dosimetry and shielding principles to the practice of health physics, including environmental and in-plant monitoring, emergency response, decommissioning and decontamination, operational criteria for meeting ALARA exposure limits, and the transport, disposal and treatment of radioactive waste. Epidemiological studies related to radiological accidents and nuclear power are also examined. Typically offered Spring.
165	Spring	LA32600	Landscape Architectural Design IV	Agronomy	Undergraduate	✓	Credit Hours: 4.00. Community planning and design. Past, current and emerging planning theories are investigated via lectures, research assignments and studio projects. The interrelationship of land use, circulation, and open space are explored using environmental and sustainable principles within a framework of traditional neighborhood design. Typically offered Spring.
166	Spring	ME49200	Technology And Values	Agronomy	Undergraduate	✓	Credit Hours: 3.00. The impact of science and technology on personal and societal value systems. The special responsibility of engineers. Practical methods for using human values to guide future technological developments. Societal problems considered: warfare, energy, overpopulation, resource depletion, and environmental degradation. Interdisciplinary approaches stressed. Offered in alternate years. Typically offered Spring.
167	Spring	ME52900	Sustainable Energy Options And Analysis	Agronomy	Graduate	✓	Credit Hours: 3.00. This course develops an understanding of the current energy situation and impacts of energy choices on economics and sustainability metrics. A range of different technologies and approaches are presented for meeting future energy needs. Students learn how to assess the potential for alternative energy technologies in terms of economic and sustainability metrics and gain experience in assessing different energy technologies for specific case studies.
168	Spring	NRES20000	Introduction To Environmental Careers	Civil Engineering	Undergraduate	✓	Credit Hours: 1.00. This course offers an introduction to general developments and practices in the environmental arena. A presentation of environmental careers and aspects of those careers that may affect job satisfaction and commitment is the main focus of the course. Included is an overview of coursework that benefits particular careers. The course is designed to introduce students to the specialized environmental areas in which they may choose to work. Typically offered Spring.
169	Spring	NRES49700	Current Topics In Environmental Sciences	Civil Engineering	Undergraduate	✓	Credit Hours: 2.00. This course is part of the NRES capstone experience and helps students examine contemporary environmental issues through the diverse disciplinary lenses they have been exposed to through their NRES coursework.

## Purdue University - Academic Courses (AC01)

Date: 10/20/2022

Semester Offered	Course	Long Title	Department	Course Level	Sustainability Focused	Sustainability Inclusive	Description	
170	Fall	LA50100	Research Methods For Design Applications	Construction Engineering and Management	Graduate	✓	Credit Hours: 1.00. The growing need for understanding the role of individuals, communities, and society in shaping the natural environment has led to a greater emphasis on landscape architectural research and the need to provide training in the research methods to support these efforts. It is an exciting time to enter this arena as landscape architects are collaborating with natural and social scientist to achieve better conservation outcomes, promote sustainable behaviors, and increase awareness and understanding of the complex environmental challenges facing our society. Non-Landscape Architecture students may gain enrollment with permission of instructor. Typically offered Fall.	
171	Spring	FNR40910	Forest Resources Management	Earth, Atmospheric and Planetary Sciences	Undergraduate	✓	Credit Hours: 3.00. Forest Resources Management focuses on the long-term sustainable management of forests for the production of wood fiber, ecological services, and other market and non-market goods and services. Typically offered Spring.	
172	Spring	MGMT56900	Ethical And Sustainable Supply Chain Management	Earth, Atmospheric and Planetary Sciences	Graduate	✓	Credit Hours: 2.00 or 3.00. This course provides students with knowledge and skills for building and analyzing ethical and sustainable practices in supply chains, taking a holistic view of the interaction between businesses, the environment, and society. Typically offered Spring.	
173	Spring	MGMT65500	Competitive Strategy	Earth, Atmospheric and Planetary Sciences	Graduate		✓	Credit Hours: 2.00 or 3.00. Examines how firms obtain and sustain superior returns through the development and implementation of a competitive strategy at the business-unit level. Focus is on strategies that develop and exploit two sources of superior returns: unique value-creating resources (e.g., patents, brand equity, operational capabilities), and powerful positions in markets and supply chains. Participants are expected to be familiar with basic competitive strategy concepts and tools, such as "five-forces analysis", the value chain, and generic strategies. Presents a more analytical perspective of strategy, drawing from game theory. Prerequisites: MGMT 65000. Typically offered Fall Spring Summer.
174	Spring	MGMT65700	Manufacturing Strategy And Process Innovation	Environmental and Ecological Engineering	Graduate		✓	Credit Hours: 2.00. In recent years many firms have rediscovered manufacturing and operations as a potential source of strategic advantage. In general, these firms have sought to develop capabilities in operations which provide a sustainable advantage in the marketplace. In addition, successful firms have developed processes for understanding the cross-functional implications of product and process choices. In this course, we will seek to understand the circumstances under which particular operating capabilities are most beneficial and how such capabilities can be developed so that operations can be exploited for competitive advantage. Concurrent Prerequisite: MGMT 61000, 65000, 66000. Typically offered Fall Spring.
175	Summer	ENTM22810	Forensic Investigation	Environmental and Ecological Engineering	Undergraduate		✓	Credit Hours: 4.00. Forensic science investigation, crime scene management and field data collection techniques. Includes crime scene recognition and the documentation, collection, preservation, and processing of crime scene evidence. Emphasizes the place of field data collection as the first step in a sequence that takes evidence from scene to the lab for analysis and finally into the court of law. Typically offered Fall.
176	Summer	HTM16200	Introduction To Event And Meeting Planning Industry	Environmental and Ecological Engineering	Undergraduate		✓	Credit Hours: 3.00. Upon completion of this course, students will have a comprehensive overview of the event and meeting industry. Topics will include the supply and demand side of event and meeting management, the basic planning process needed for any event or meeting, sustainability, business ethics, and keeping pace with current industry trends through guest lectures from event and meeting planners. Typically offered Fall Spring.
177	Summer	PHIL29000	Environmental Ethics	Engineering Education	Undergraduate	✓		Credit Hours: 3.00. An introduction to philosophical issues surrounding debates about the environment and our treatment of it. Topics may include endangered species, "deep ecology," the scope and limits of cost-benefit analyses, and duties to future generations. Typically offered Fall Spring.