

Courses with Sustainability Content

At Georgia Tech, sustainability is a way of life. From core courses through graduate programs, sustainability is inherent. The following list of courses place an added emphasis upon sustainability, within the context of the subject matter. There are 264 courses, spanning every college at Georgia Tech, that focus on sustainability or include an emphasis area of sustainability. Georgia Tech has a goal that every student will take at least one course in sustainability by the time they graduate.

	Dept Total	College Total
COA		46
Architecture	14	
Building Construction	4	
City Planning	22	
Industrial Design	5	
COE		105
Aerospace Engineering	8	
Chemical Engineering	8	
Civil and Environmental Engineering	65	
Electrical and Computer Engineering	7	
Polymer, Textile, and Fiber Engineering	1	
Industrial and Systems Engineering	4	
Material Science Engineering	2	
Mechanical Engineering	4	
Nuclear and Radiological Engineering	6	
Ivan Allen College		52
Economics	15	
History, Technology, and Science	5	
International Affairs	7	
Literature, Communication, and Culture	4	
Modern Languages	7	
Philosophy, Science, and Technology	2	
Public Policy	12	
College of Computing	3	3
College of Management	10	10
College of Science		48
Biology	15	
Chemistry	9	
Earth and Atmospheric Sciences	22	
Psychology	2	
Total	264	

To see the current course catalog of undergraduate and graduate courses, please see [Course Catalog](#).
 For a list of professional education and online courses, please see [Professional Education](#).

Courses with Sustainability Content

College of Architecture

Architecture

ARCH 3231 - Environmental Systems I Human physiology, the occupation of space, and principles of sustainability. Micro-climate, energy consumption, thermal loading, passive solar strategies, daylighting, optics, and acoustics.

ARCH 4011 - Arch Design Studio V Advanced studies in architectural design emphasizing application of analytical, conceptual, and representational skills within projects that engage and problematize urban context culturally, ecologically, and technologically.

ARCH 4012 - Arch Design Studio VI Advanced studies in architectural design emphasizing application of analytical, conceptual, and representational skills within projects that engage and problematize context culturally, ecologically, and technologically.

ARCH 4227 - Architecture & Ecology Introduction to ecological design theory, research, and practice in architecture, including writings, criticism, and analyses of buildings and projects.

ARCH 4231 - Environmental Systems II Active building systems design: artificial lighting, mechanical, electrical, communication, transportation systems. Case studies of integrated and sustainable building assemblies.

ARCH 4770 - Environmental Design Introduction to psychological concepts relevant to environmental design. Survey of selected methods for assessing human-made environments. Cross listed with PSYC 4770. Course Attributes: Social Science Requirement

ARCH 6051 - Arch Options Studio I Advance studio problems in Architecture emphasizing research and application in the areas of history and theory, urban and environmental design, culture and practice, electronic media, and construction technology.

ARCH 6052 - Arch Options Studio II Advanced studio problems in architecture emphasizing research and application in the areas of history and theory, urban and environmental design, culture and practice, electronic media, and construction technology.

ARCH 6053 - Arch Options Studio III Advanced studio problems in architecture emphasizing research and application in the areas of history and theory, urban and environmental design, culture and practice, electronic media, and construction technology.

ARCH 6206 - Building Assemblies Structural and cladding systems integration, environmental control, and tectonic representation explored through historical and contemporary case studies and applied design solutions.

ARCH 6216 - Eco-Tectonics Strategies of ecologically sustainable design and construction and the role of the architect in the stewardship of the environment.

ARCH 6218 - Material Logic of Arch Introduction to scientific and practical nature of architectural materials: soils, cements, metals, plastics, and glazing materials. Laboratory includes fabrication of, and experiments on, architectural materials.

ARCH 6226 - Green Construction This course focuses on the means, methods, strategies, and technologies to improve the energy efficiency and performance of buildings, and to reduce the environmental impact of buildings.

ARCH 6312 - Ecological Practice An historically and culturally grounded examination of the ecological perspective. Critical and productive engagement with green guidelines, laws, products, design briefs, and procedures.

Courses with Sustainability Content

Building Construction

BC 4650 - Lab for Sustainable Design The goal of the laboratory is to teach students a comprehensive sustainable design and construction information system and a program of real-world, hands-on projects.

BC 4710 - Green Construction This course focuses on the means, methods, strategies, and technologies to improve the energy efficiency and performance of buildings, and to reduce the environmental impact of buildings.

BC 6300 - Safety & Environ Issues This course covers the environmental issues related to the performance of buildings and the health and risk factors for new and existing buildings.

BC 8823 – Sustainable multigenerational communities. Co listed through Public Policy as PUBP 8803 Sustainability and Environmental Policy

Please know that we talk about sustainability in every course but the ones listed have a more direct link.

City Planning

CP 4010 – Found - Urban and Region Development. The course describes the economic function of cities and the significant factors that shape their growth and development. Course Attributes: Social Science Requirement

CP 4020 - Intro-Urban and Region Plan This course provides an overview of the planning of cities and metropolitan regions. The legal and historical context as well as substantive areas of urban planning are addressed. Course Attributes: Social Science Requirement

CP 4030 - City and Technology This course places urban infrastructure technology within the larger context of planning and development. The social and economic aspects of these systems are highlighted. Course Attributes: Social Science Requirement

CP 4105 - Land Conservation. This course considers the distinctive American view of land and history of the conservation movement, then discusses the why and how of modern land conservation.

CP 4210 - Environmental Planning and Impact Assessment. Covers the principles of environmental planning and decision making. Examines the methods and processes, and environmental impact assessment and regulation.

CP 4813 - Special Topics in City and Regional Planning.

CP 6016 - Growth Management Law Study of legal framework of planning focusing on managing development to achieve desired outcomes for the economy, society, and the environment.

CP 6105 - Land Conservation. This course considers the distinctive American view of land and history of the conservation movement, then discusses the why and how of modern land conservation.

CP 6112 - Introduction to Land Use Planning. This course introduces land use planning. The basic rationale for land use planning and its form in different states is covered.

CP 6122 - Land Use Planning Methods - This course explores the techniques of land use planning and applies them to specific land use types.

CP 6211 - Urban Environmental Planning and Design.

CP 6214 - Environmental Planning. Examines the principles, processes, and methods of environmental planning. Focus on environmental science and its use in impact assessment and project evaluation.

CP 6223 - Policy Tools-Environ Mgt The course covers the regulatory, market, and procedural tools used to manage the environment. It examines the strengths and weaknesses of alternative techniques.

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CP 6233 - Sustainable Urban Development Explores the principles and practice of sustainable urban development and the role of planning.

CP 6261 - Environmental Law This course introduces students to the framework of legislation that shapes environmental planning and policy, including NEPA, Clean Air Act, and Clean Water Act.

CP 6331 - Land Use and Transportation Interaction. Overview of land use and transportation principles, how development impacts transportation, how transportation investments impact development patterns and air quality.

CP 6412 - Foundations of Local Economic Development Planning and Policy. Introduces local economic development planning, examining theory, process and practice, international and regional factors, public and private roles.

CP 6432 - Industrial Restructuring. Examines industrial restructuring trends and theoretical frameworks; develops industry case studies; and considers economic development planning's role in industrial restructuring.

CP 6541 - Environmental GIS This course focuses on the application of geographic information systems (GIS) to environmental problems. It highlights the types and sources of data appropriate to those applications.

CP 6760 - Negotiation and Conflict Management. Practical and theoretical instruction on techniques of negotiation and consensus building using training exercises and case studies. Emphasizes environmental, policy, planning, and development disputes. Cross listed with PUBP 6760. (Minimal environmental content. Suggest you speak with instructor before enrolling to see if this will meet your needs.)

CP 8823 - Spec Topic-Environ Plan Topics of current interest in environmental planning.

CP 8873 - Spec Topics- Urban Design.

Industrial Design

ID 2201 - Issues for Design Introduction to the broad environmental issues that face humankind as a participant in the biosphere.

ID 3301 - Materials I This course examines the characteristics, production technologies, histories, and environmental impacts of nine categories of renewable materials familiar to industrial design.

ID 3302 - Materials II Examination of characteristics, production technologies, histories, and environmental impacts of nonrenewable materials used in industrial design.

ID 4813 - Spec Top: Sustainability Special topics in sustainability not included in the professional curriculum.

ID 6101 - Human Centered Design This course examines design artifacts in relation to the human body, aging, disabilities, and environments.

Courses with Sustainability Content

College of Engineering

COE 3002 - Micro/Nano Revolution Introduction to microelectronics and nanotechnology: the communications revolution, Moore's law, semiconductors, transistors, MEMS, photonics, analysis of common technological objects, global impact on technology and society.

Aerospace Engineering

AE 4060 - Aeroacoustics Concepts and techniques, noise sources, data acquisition and reduction, aeroacoustic resonances, commonalities in the music of wind instruments and sources of aircraft noise, community impact.

AE 4451 - Principles of aerospace propulsion systems. Thermodynamic cycles. Thermodynamics of combustion. Turbine engine and rocket performance characteristics. Cycle/component analysis of engines and turbomachinery.

AE 4461 - Intro to Combustion Basics of combustion and combustion devices. Chemical thermodynamics, reaction rates, premixed/nonpremixed flames, ignition, stabilization, and pollutants. Applications in turbine, rocket, and internal combustion engines.

AE 4760 - Acoustics& Noise Control Study of acoustics related to noise and its control; acoustics terminology wave propagation, wave equation solutions, instrumentation, data processing, room acoustics, noise control, noise legislation.

AE 4803 - Wind Engineering Wind energy and its potential, modeling and design of horizontal axis wind turbines, and analysis of the economic benefits of wind turbine systems.

AE 4883 - Micro-Renewable Energy Systems Micro and hybrid renewable power devices, including solar, wind and biomass technologies for off-grid communities and developing communities

AE 6361 - Propulsion Sys Design Air breathing propulsion design with emphasis on multidisciplinary design issues related to system integration, cycle selection, performance, cost, reliability, maintainability, etc.

AE 8803 - Air Transportation Architectures and Design

Chemical Engineering

CHBE 2100 - Chemical Process Principles Material and energy balances for single-phase and multi-phase processes common to chemical engineering. Phase equilibrium and analysis of reacting systems.

CHBE 2110 - Chemical Engineering Thermo I Elements of engineering thermodynamics. First and second laws. Analysis of engineering machinery: compressors, turbines, engines, refrigeration.

CHBE 3225 - Separations Processes Fundamentals of equilibrium-stage and continuous contacting operations. Applications of principles to distillation, absorption/stripping, extraction, absorption, and other separation technologies. Course Attributes: Tech Elect CS, Engineering, &Sciences

CHBE 4505 - Process Design & Economics Principles of flow sheet synthesis and economic analysis and optimization. A complete design on a chemical process will be undertaken, including concepts of unit operations, design, economics, and safety. Course Attributes: Tech Elect CS, Engineering, &Sciences

CHBE 4515 - Chemical Process Safety Fundamental sources of chemical hazards and degree of risk. Process design and hazard avoidance are used to reduce risk.

CHBE 4573 - Pulping & Bleaching Lab Experiments of pulping, bleaching, fiber, and chemical testing are performed. Hands-on experience from chip preparation, cooking, pulp processing, and bleaching are provided. Course Attributes: Tech Elect CS, Engineering &Sciences

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CHBE 4574 – Papermaking & Pulp Lab Experiments of pulp preparation, refining, paper forming, hand sheet testing, deinking, and recycled pulp processing are performed. Small paper machine operation will be taught.

Course Attributes: Tech Elect CS, Engineering & Sciences

CHBE 4782 - Biosystems Analysis Analytical methods for modeling biological systems, including white-noise protocols for characterizing nonlinear systems. Cross listed with BMED, ECE and ME 4782. Course Attributes: Tech Elect CS, Engineering & Sciences

Civil and Environmental Engineering

CEE 2300 - Environmental Engineering Prin Introduction to chemical, biological, and physical processes in the environment. Discussion of the basic processes governing air, water, and land quality, and the behavior and impacts of contaminants associated with human and industrial activities. Course Attributes: Tech Elect CS, Engineering, & Sciences

CEE 3000 - Civil Engineering Systems Infrastructure viewed from a systems perspective; analytical approaches and modeling of civil-engineered facilities; sustainability; engineering economy applications. Course Attributes: Tech Elect CS, Engineering, & Sciences

CEE 3020 - Civil Engineering Materials Physical, mechanical, and durability properties of concrete, metals, unreinforced and reinforced plastics, timber, asphalt, and asphalt concrete. Course Attributes: Tech Elect CS, Engineering, & Sciences

CEE 3340 - Environ Engineering Laboratory Theory and application of environmental laboratory methods for measurement of fundamental properties and characteristics of dissolved and particulate constituents in water, air and soil systems

CEE 4090 - Capstone Design An interdisciplinary civil and environmental design experience. Problem definition, data acquisition, modeling and analysis, evaluation of design alternatives, oral and written presentation of final design. Course Attribute

CEE 4100 - Construction Engineering & Mgt Fundamental concepts in planning, design, and construction of civil engineering projects. Introduction to project scheduling, cost estimating, controls, procurement, value engineering, quality assurance, and safety. Course Attributes: Tech Elect CS, Engineering, & Sciences

CEE 4110 - Construction Plan & Estimating An integrated approach to planning, estimating, and scheduling of construction projects, including basic and advanced concepts, applications, and tools for developing plans, estimates, and schedules. Course Attributes: Tech Elect CS, Engineering, & Sciences

CEE 4120 - Construction Operations An integrated approach to construction operations, including basic and advanced concepts, applications, and tools for planning, design, modeling, and analysis of construction operations. Course Attributes: Tech Elect CS, Engineering, & Sciences

CEE 4210 - Hydrology Global circulation and the hydrologic cycle, precipitation mechanisms and analysis, evaporation and other losses, stream flow, hydrographs, river and reservoir routing, and frequency analysis. Course Attributes: Tech Elect CS, Engineering, & Sciences

CEE 4230 - Environ Transport Model Introduction to mixing of pollutants and natural substances in the surface water environment. Use of mathematical models for mixing zones and water quality. Course Attributes: Tech Elect CS, Engineering, & Sciences

CEE 4300 - Environmental Engineering Sys Environmental engineering issues associated with water, air, and land pollution, including risk assessment, groundwater contamination, global climate change, and sustainable technologies. Course Attributes: Tech Elect CS, Engineering, & Sciences

CEE 4310 - Water Quality Reclamation of water and wastewater for potable and industrial uses, groundwater remediation. Principles of physical, chemical, and biological treatment processes. Course Attributes: Tech Elect CS, Engineering,

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&Sciences

CEE 4320 - Hazardous Substance Engineering Technical aspects of hazardous waste management and treatment including legislation, exposure and risk assessment, contaminant fate and transport, waste treatment methods, and remediation technologies. Course Attributes: Tech Elect CS, Engineering, &Sciences

CEE 4330 - Air Pollution Engineering Introduction to the physical and chemical processes affecting the dynamics and fate of air pollutants at the local, regional, and global scales. Particular emphasis is on tropospheric pollutant chemistry and transport. Course Attributes: Tech Elect CS, Engineering, &Sciences

CEE 4420 - Subsurface Character Introduction to field and laboratory methods for characterizing subsurface geological, hydrological, geotechnical, and contaminant conditions. Course Attributes: Tech Elect CS, Engineering, &Sciences

CEE 4430 - Environmental Geotechnic Chemical equilibria and partitioning in subsurface systems; hazardous waste site assessment technologies and data; including soil gas data, monitoring wells, and direct-push technology. Course Attributes: Tech Elect CS, Engineering, &Sciences

CEE 4530 - Timber & Masonry Design Stress-based design of tension, compression, and flexural members; design of building systems, unreinforced and reinforced walls using timber and masonry construction materials and techniques. Course Attributes: Tech Elect CS, Engineering, &Sciences

CEE 4540 - Infrastructure Rehab Rehabilitation of civil infrastructure systems including aspects of deterioration science, nondestructive assessment, renewal engineering, construction planning and management, and public policy and finance. Course Attributes: Tech Elect CS, Engineering, &Sciences

CEE 4395 - Environmental Sys Design. Design and assessment of an environmental system, component or process, including problem definition, data acquisition, modeling and analysis, evaluation of alternatives, and presentations. Course Attributes: Tech Elect CS, Engineering, &Sciences: Tech Elect CS, Engineering, &Sciences

CEE 4610 - Multimodal Transport Planning, design, and operation of systems of air, rail, water, and highway facilities, including those for bicycles and pedestrians. Course Attributes: Tech Elect CS, Engineering, &Sciences

CEE 4620 - Environ Impact Assess Key policy, planning, and methodological issues in the environmental impact assessment of engineering systems including the regulatory framework and analytical techniques. Course Attributes: Tech Elect CS, Engineering, &Sciences

CEE 4795 - Groundwater Hydrology Dynamics of flow and solute transport in groundwater, including theory, implementation, and case studies. Cross listed with EAS 4795. Course Attributes: Tech Elect CS, Engineering, &Sciences

CEE 6120 - Environmental Conscious-Design & Construction Introduction to framework, concepts, principles, strategies, and tools for environmentally conscious design and construction of facilities and civil infrastructure systems.

CEE 6310 - Process Principles-Environmental Engineering Principles that can be used in the analysis and modeling of environmental engineering processes, including material and energy balances, mass transfer, and reaction engineering.

CEE 6252 - Adv Fluid Mechanics Theory of three-dimensional turbulent boundary layers with application to environmental flows in rivers, estuaries, and the atmosphere of interest in water resources engineering.

CEE 6261 - Environ Fluid Mechanics Dynamics, mixing, and contaminant transport in surface water bodies, including lakes, rivers, estuaries, and coastal waters. Introduction to numerical models. Prediction of mixing zones.

CEE 6262 - Adv Environ Fluid Mechanical Buoyancy modifications to the mixing and dynamics of pollutant discharges and surface water bodies. Gathering and analysis of laboratory and field data for mixing problems.

CEE 6271 - Flow-Porous Media I Basic principles governing ground water flow. Topics covered: fundamental principles of saturated and unsaturated ground water flow, contaminant transport, and salt water intrusion.

CEE 6272 - Flow-Porous Media II Principles of numerical methods used in solving ground water flow, contaminant

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transport models, building on materials covered in CEE 6271. Topics: finite element, difference methods, saturated/unsaturated ground water flow, and contaminant transport.

CEE 6314 - Environmental Modeling This course is designed to provide an understanding of fundamental principles and approaches used in modeling environmental systems, as well as the necessary mathematical techniques.

CEE 6319 - Environmental Laboratory. Laboratory exercises and discussions for the understanding of fundamental chemical analytical, physicochemical, and applied microbiological principles in environmental engineering.

CEE 6320 - Legal Inst Poll Frame Fundamental principles of national and international water policy, legislation and management frameworks for transboundary water resources management.

CEE 6321 - Water Quality & Ecology Mixing/transport of pollutants and natural substances in surface waters, lakes, rivers, estuaries, coastal waters. Application of mathematical models of hydrodynamics and water quality to these water bodies.

CEE 6322 - Water Res Sys Analysis The policy, legal, and institutional contexts of water resources planning and management, information and modeling systems, modeling tools, and the practical experience with the use of decision support systems.

CEE 6323 - Natural Resources Environmental Econ Relation between economic and ecological systems, case studies and examples, tools of environmental policy, environmental economic evaluation.

CEE 6324 - Water Supply and Sanitation. Sanitation, wastewater characterization, wastewater treatment process analysis and selection, pre-treatment options, biological treatment, removal of pollutants biosolids treatment and disposal, and safe water systems.

CEE 6325 - River Hydraulics Open channel hydraulics, fluvial geomorphology, flood control structures, culverts, bridge openings, river bed and bank stability control measures.

CEE 6326 - Hydrological Principle & Practical Hydrologic cycle, global circulation, climate, atmospheric water vapor, thermodynamics, precipitation, evaporation, snowmelt, soil moisture, unsaturated flow, infiltration, geomorphology, runoff, and routing.

CEE 6327 - Stat Meth Environmental Data Provide a good understanding of the fundamental principles of probability/statistics, and demonstrate the application of these principles to environmental data analysis and prediction problems.

CEE 6330 - Physicochemical Process Theory and application of the physical and chemical processes of coagulation, flocculation, sedimentation, softening, filtration, and disinfection in water and wastewater treatment.

CEE 6331 - Biological Processes Microbial growth kinetics and bioenergetics, theory, modeling, and application of biological processes employed in water, wastewater, and hazardous waste treatment systems as well as subsurface bioremediation.

CEE 6332 - Separation Processes Theory and applications of the physical and chemical processes of sorption, membrane separation, and absorption in both gas-phase and liquid-phase environmental engineering systems.

CEE 6333 - Hazard Waste Remediation Selection, design and implementation of hazardous waste site remediation technologies including pump-and-treat, soil vapor extraction, thermal processes, bioremediation, surfactant flushing, and barrier-treatment walls.

CEE 6340 - Solid-Liquid Separations Characterization, stabilization, conditioning, thickening, dewatering, conversion, recovery, transportation, and disposal of air, water, and wastewater treatment residues.

CEE 6341 - Industrial Wastes A review of current policies and approaches in industrial waste treatment, and application of engineering principles and processes for waste treatment, recovery, and disposal.

CEE 6342 - Solid Wastes An introduction of the current regulations and fundamentals of solid waste management, characterization, handling, recycling, transportation, and final disposal systems.

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CEE 6343 - Membrane Processes An introduction of the theories of membrane separation processes with special emphasis on desalination, softening, THM precursors reduction using reverse osmosis and nanofiltration.

CEE 6350 - Adv Environmental Chemical. Chemical behavior of inorganic and organic compounds in natural waters. Topics include chemistry of metal ions, partitioning and distribution of organic pollutants, surface reactions.

CEE 6351 - Biotransformation Biotransformation pathways and kinetics of anthropogenic recalcitrant compounds and biological, biochemical, and environmental factors affecting these transformations in natural and engineered systems.

CEE 6355 - Industrial Ecology-Environmental Engineering Introduces the principles of environmentally conscious products, processes, and manufacturing systems.

CEE 6360 - Design-Treatment Facilities Theory and design of process tanks and equipment for capture, purification, conditioning, storage, and distribution of safe drinking water.

CEE 6361 – Model & Simulation -Biological Treat Systems Theory and design of biological treatment systems for water reclamation, nutrient removal, and integrated process design and optimization using advanced computer models.

CEE 6390 - Air Pollutant: Form & Control Analysis of air pollutants through the study of radical reaction pathways, combustion processes, and removal of particles and gaseous pollutants from exhaust gas streams.

CEE 6391 - Adv Topics-Air Pollution Current topics in air pollution engineering presented and discussed.

CEE 6402 - Soil Mechanics Fundamental concepts related to the mechanical behavior of soils, including: effective stress, strength, stiffness, permeability, time-dependent behavior.

CEE 6403 - Environmental Geotechnic Evaluation of equilibria and partitioning as applied to site assessment techniques including soil gas data, monitoring wells, soil samples, and direct-push technology.

CEE 6421 - Lab Characterization - Geomaterials Instruction in the procedures, methods of interpretation and apparatus limitations and influences for geotechnical laboratory index, strength, deformation, and permeability tests.

CEE 6422 - Soils& Experimental Meth Macro behavior and micro level phenomena in particulate media are experimentally studied. Topics in experimental research include: scale effects, similarity, falsification, errors, transducers, design of experiments.

CEE 6423 - In-Situ Testing Field testing and sampling of geomaterials, primarily soils and rocks. Introduces methods of drilling, probing, and in-situ measurement of soils for determining stratigraphy and engineering parameters for analysis, including soil borings, cone penetration tests, pressure meter, dilatometer, and other tests.
Lecture hours

CEE 6424 - Engineering Geophysics Geophysical techniques used to characterize near-surface soils and rocks including seismic, magnetic, electromagnetic, radar, and resistivity methods.

CEE 6441 - Analysis-Earth Structure Instruction in techniques for assessing the stability of earth-retaining structures including unreinforced slopes, reinforced slopes, free-standing retaining structures, and reinforced retaining structures.

EE 6624 - Land Use& Transportation Overview of land use and transportation planning principles, how development impacts air transportation, how transportation investments impact development patterns and air quality.

CEE 6625 - Transportation, Energy & Air Quality. Students investigate relationships between transportation demand, energy supply and consumption, fuel types, greenhouse gas emissions, and relationships between vehicle technology, pollutant emissions, modeling techniques, and air quality

CEE 8094 - Environment Engineering Seminar Developments in environmental engineering science and technology, current practice, current research, and special topics related to environmental quality assessment and control.

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Courses with Sustainability Content

CEE 8095 - Research Seminar in Environmental Engineering Discussion of current research topics in environmental engineering. Presentations by master's and doctoral students.

Electrical and Computer Engineering

ECE 3071 - Electric Energy Systems Non-renewable and renewable/sustainable energy sources. Processes, costs, and environmental impact of conversion into electric energy. Delivery and control of electric energy, electromechanical systems. Course Attributes: Tech Elect CS, Engineering, &Sciences

ECE 4001 - Engineering Practice and Professionalism Technical tools and professional issues for engineering practice and early career development. Engineering ethics, design tools, financial and economic principles, project management, probabilistic and statistical techniques, and decision making.

ECE 4320 - Power Sys Analy & **Control** Introduces basic concepts in electric power generation, distribution, system control, and economic operation. Course Attributes: Tech Elect CS, Engr, &Sciences

ECE 4802 - Special Topics Course Attributes: Tech Elect CS, Engr, &Sciences (currently taught under ECE 4802 but expect to become permanent listings with the course numbers listed below)

ECE 4803 - RFIDs: Fundamental and Applications

ECE 48xx - Devices for Renewable Energy

ECE 4803 - Hybrid Electric Vehicle Powertrain

ECE 48xx - Solid-State Lighting

ECE 6320 - Power Sys Ctrl & Operation Introduction to methods used in the real-time operation and control of power systems as well as to the hardware and software technology of energy management systems (EMS).

ECE 6456 - Solar Cells To provide a practical understanding of semiconductor materials and technology as it relates to design and development of efficient solar cells and photovoltaic systems.

ECE 6540 - Organic Optoelectronics Fundamental understanding of the optical and electronic properties of organic materials and devices that form the basic of the emerging technological area of printed flexible optoelectronics.

Polymer, Textile, and Fiber Engineering

PTFE 6759 - Mate-Environmentally Conscious Design Covers the environmental impact of materials choices and quantitative measure of life-cycle assessment and environmental burden. The Natural Step philosophy will be used as a model for the overall approach. Cross listed with ME and MSE 6759.

Industrial and Systems Engineering

ISYE 4740 – Biologically Inspired Design. Cross listed with ME/MSE/PTFE/BIOL. We examine evolutionary adaptation as a source for engineering design inspiration, utilizing principles of scaling, adaptability, and robust multi-functionality that characterize biological systems.

ISYE 4803 – Energy and Environmental Analysis. Evaluation of energy and environmental impacts of products, services, and industrial systems, including environmental lifecycle assessment and cost-benefit analysis.

ISYE 6701 – Energy Technology and Policy. Cross-listed with PUBP. Examines energy production, use, and policy using quantitative engineering and policy analysis. Addresses resource constraints, physical principles, and policy analysis methods.

ISYE 8803 – Quantitative Analysis of Energy and the Environment. Quantitative analysis of energy and environmental impacts including environmental lifecycle assessment, risk assessment, cost-benefit analysis and dynamics of technological change.

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Materials Science and Engineering

MSE 4010 - Environ Degradation Theory of environmental degradation of metals, ceramics, polymers, and biomaterials. Emphasis on the scientific principles of corrosion and physical degradation. Course Attributes: Tech Elect CS, Engineering, &Sciences

MSE 6759 - Mate-Envir Conscious Dgn Covers the environmental impact of materials choices and quantitative measure of life-cycle assessment and environmental burden. The Natural Step philosophy will be used as a model for the overall approach. Cross listed with ME and PTFE 6759.

Mechanical Engineering

ME 4171 - Environmental Dsgn & Mfg Including environmental considerations in engineering design; reducing environmental impact by design; recycling; material selection; de- and remanufacturing; life-cycle considerations, analyses, tradeoffs; ISO 14000. Course Attributes: Bioengineering Design II, Mechanical Systems Design II, Tech Elect CS, Engineering, &Sciences, Thermal Systems Design II

ME 4172 - Dsgn Sustainable Eng Sys Understanding sustainability in context of market forces, availability of resources, technology, society. Methods for identifying, modeling, and selecting sustainable designs. Course Attributes: Tech Elect CS, Engineering, &Sciences

ME 4182 - Capstone Design Teams apply a systematic design process to real multidisciplinary problems. Problems selected from a broad spectrum of interest areas, including biomedical, ecological, environmental, mechanical, and thermal. Course Attributes: Tech Elect CS, Engineering, &Sciences

ME 6759 - Mate-Envir Conscious Dgn Covers the environmental impact of materials choices and quantitative measure of life-cycle assessment and environmental burden. The Natural Step philosophy will be used as a model for the overall approach. Cross listed with MSE and PTFE 6759.

Nuclear & Radiological Engineering

NRE 2110 - Intro to NRE Introduction to nuclear and radiological engineering; nuclear energy production and radiation technologies and their role of importance to society, their environmental impact. Course Attributes: Tech Elect CS, Engineering, &Sciences

NRE 3316 - Radiation Protection Eng Covers radiation dosimetry, biological effects of radiation, radiation-protection criteria and exposure limits, external radiation protection, internal radiation protection, and sources of human exposure. Course Attributes: Tech Elect CS, Engineering, &Sciences

NRE 4404 - Rad Assessment & Waste Mgt Mathematical models for movement in the environment. Scenario development for release, environmental transport, and exposure. Radioactive waste disposal facilities and waste disposal technology. Course Attributes: Tech Elect CS, Engineering, &Sciences

NRE 4430 - Nucl Regulatory Require This course introduces regulatory organizations and delineates their jurisdictions. It covers the fundamentals of regulations, the impacts on occupational workers, the public, and the environment. Course Attributes: Tech Elect CS, Engineering, &Sciences

NRE 6755 - Rad Assessment & Waste Mgt Critical analyses of sources and human exposures, mathematical models for movement through the biosphere, environmental transport, and exposure for nuclear facilities and waste disposal processing. Cross listed with HP 6755.

NRE 6501 - Fission fuel cycle, uranium mining and milling, enrichment. Fuel fabrication. In-core fuel management. Reprocessing and fuel cycle economics. Spent-fuel waste management.

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Ivan Allen College

Economics

ECON 2100 - Economics and Policy Practice in analysis of decision problems of relevance to students in public policy and personal decision areas. Issues relating to individual decisions to produce, consume, invest, and trade will be explored. Analytical approaches will enable students to use and incorporate basic elements of micro- and macro-economic analysis and to appreciate issues regarding testing and measurements. Students can receive credit for either ECON 2100 or ECON 2101, or for ECON 2105/2106. Students cannot receive credit for ECON 2100 and ECON 2101 or for ECON 2100 and ECON 2105/2106 or for ECON 2101 and ECON 2105/2106. Course Attributes: Social Science Requirement

ECON 2101 - The Global Economy Historical and theoretical understanding of global economy, including international trade, finance, investment production; regional economic integration; economic development; environment, using micro and macroeconomic principles. Students can receive credit for either ECON 2100 or ECON 2101, or for ECON 2105/2106. Students cannot receive credit for ECON 2100 and ECON 2101 or for ECON 2100 and ECON 2105/2106 or for ECON 2101 and ECON 2105/2106. Course Attributes: Global Economics (IP), Social Science Requirement

ECON 2105 – Principles of Macroeconomics The principles of economics course is intended to introduce students to concepts that will enable them to understand and analyze economic aggregates and evaluate economic policies. Students can received credit for either ECON 2100 or ECON 2101, or for ECON 2105/2106. Students cannot receive credit for ECO 2100 and ECON 21201 or for ECON 2100 and ECON 2105/2106 or for ECON 2101 and ECON 2105/2106. Course Attributes: Social Science Requirement

ECON 2106 – Principles of Microeconomics This principles of economics course is intended to introduce students to concepts that will enable them to understand and analyze structure and performance of the market economy. Students can receive credit for either ECON 2100 or ECON 2101, or for ECON 2105/2106. Students cannot receive credit for ECON 2100 and ECON 2101 or for ECON 2100 and ECON 2105/2106 or for ECON 2101 and ECON 2105/2106. **Course** Attributes: Social Science Requirement

ECON 4311 – Global Enterprise This introductory course on the multinational enterprise (MNE) will examine from an economic and interdisciplinary perspective the challenges facing MNE's in a fast-changing international business environment. The emphasis will be on the use of economic tools to analyze these issues and understand their managerial implications. Course Attributes: Global Economics (IP), Social Science Requirement

ECON 4340 - Industrial Organization. This course examines the theory of the firm, the relationship between market structure, practices, and performance, and the determinants of technological change. The role (and ability) of government policy to solve various market failures, via antitrust enforcement, regulation, etc., is also discussed. Course Attributes: Social Science Requirement

ECON 4350 - International Economics. This is an introductory course in international economics and will cover important topics in trade theory, trade policy, and international finance. The emphasis will be on using economic tools to analyze a variety of current events in the world economy. Course Attributes: Global Economics (IP), Social Science Requirement

ECON 4411 - Economic Development Concepts and studies of developing economies. Selected topics include development experience and theories, growth, agriculture, urbanization, industrialization, and links between trade policy and development. Course Attributes: Social Science Requirement

ECON 4412 - Cost-Benefit Analysis This course will acquaint the student with the principles, tools, issues, strengths, and limitations of cost-benefit analysis (CBA); to prepare the student to competently review, criticize, and use CBA studies; and to enable the student to carry out limited CBA studies.

ECON 4440 - Economics of Environment This course covers three aspects of environmental economics. First, it considers policy interventions appropriate to problems involving environmental externalities. Second, it explains methods used to estimate economic values for environmental goods. Finally, it explains the economics of depletable and renewable resources. Course Attributes: Social Science Requirement

Courses with Sustainability Content

ECON 4450 - Afric-Amer Entrepreneur History and dynamics of African-American business. Impact of racial segregation on business formation. Case studies and empirical exercises. Course Attributes: Social Science Requirement

ECON 4460 - Public Economics This course focuses on public goods, how public decisions regarding public goods are made, the "free-rider" problem, voting and taxation principles, welfare, the Tiebout Hypothesis, budgeting, and fiscal policies. Course Attributes: Social Science Requirement

ECON 4510 - Health Economics. This course surveys the theoretical and empirical evidence regarding current issues in health and health care. Individual-level models of health behaviors and the demand for health and medical insurance are presented. The economic behaviors of physicians, hospitals, and insurance companies are also characterized. The possible role of government in encouraging the equitable and efficient performance of health markets is discussed with a particular emphasis on current debates involving individual health decisions, health care reform, and the diffusion of new medical technologies. Course Attributes: Social Science Requirement

ECON HP 4813 Globalization, Sustainability and Economic Development. Explores the impact of globalization on several dimensions of sustainable economic development such as environmental and water quality, energy use, human development, global health outcomes, poverty alleviation, and income inequality. We also examine the ethical and moral responsibilities of multinational firms and how the policies and institutional structures help or hinder sustainable development in an open economy.

ECON 7102 – Environmental Econ I. Topics includes externalities, property rights, incentive design, emission taxes, tradable emission permits, renewable and nonrenewable resources, innovation incentives originating with environmental regulations and globalization, trans-boundary pollutants within and across nations, international environmental agreements, and the globalization impacts on the environment.

Please know that we talk about sustainability in every course but the ones listed have a more direct link.

History, Technology, and Science (from old sustainability list and in current catalog)

HTS 2084 - Technology and Society Analyzes social conditions that promote or retard technological activity, emphasizing role of business, the state, and scientific and engineering professions, and the emergence of consumerism. Course Attributes: Ethics Requirement, Social Science Requirement

HTS 3005 - Amer Environmental Hist Transformation of the North American environment since 1500, including different notions of nature, romantic responses to wilderness during industrialization, rise of conservation movements, and environmental policy. Course Attributes: Social Science Requirement

HTS 3011 - City in American Hist Examines the historical background of the American city since colonial times, including city planning, urban technology and services, neighborhoods, and race relations. Course Attributes: Social Science Requirement

HTS 3012 - Urban Sociology Sociological perspectives on the city, urbanization, and problems of community, evolution of cities and problems of urban life in the United States and Third World. Course Attributes: International Relations (IP), Social Science Requirement

HTS 2016 - Soc Issues & Public Policy Draws on sociological theory and research to understand the major economic, social, and cultural issues facing American society today. Course Attributes: Social Science Requirement

International Affairs

INTA 2040 – Science, Technology & Int'l Affairs An overview of science and technology as a determinant in the development and functioning of states and societies worldwide and the international context for the development of science and technology.

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Courses with Sustainability Content

INTA 4040 - Environmental Politics Examines the interface between politics and the environment in developing countries. Foci include sustainable development, the politics of the rain forest, eco-tourism, and export agriculture and the environment. Course Attributes: Social Science Requirement

INTA 4050 - Int'l Affair & Tech Policy International policy issues in which science and technology figure prominently. Topics include: health, environment, information technologies, arms control and defense, critical infrastructure, transportation, and energy. Emphasis placed on policy analysis and formation. Course Attributes: International Relations (IP), Social Science Requirement

INTA 4060 - International Law Explores major issues, concepts and cases in public international law and their policy ramifications. Specific topics include human rights, armed conflict, crimes against humanity, and the environment. Course Attributes: International Relations (IP), Social Science Requirement

INTA 6103 - International Security Examines traditional and nontraditional issues in international security, including the uses of military force, military strategy and policy, arms control, peacekeeping, the environment, and migration.

INTA 6107 - Development & Demography

This course examines the role population plays in the development of countries and the international system.

INTA 6304 – Modernization & Development

This course empirically examines processes in which a country's organizational structure is altered through economic development, political democratization, and/or social liberalization.

Literature, Communication, and Culture

LCC 3302 - Science, Tech & Ideology Examines specific scientific, philosophical, and literary/cultural texts in order to determine the role ideology plays in the construction of culture, especially scientific and technological culture. Course Attributes: Country and Region (IP), Humanities Requirement

LCC 3308 - Environment Ecocritic Surveys the emergence of ecocriticism as an analytical framework for interpreting the verbal and visual rhetorics of environmentalism in both western and nonwestern cultures. Course Attributes: Humanities Requirement

LCC 3412 - Communicating Sci/Tech Examines both the theoretical and practical issues involved in communicating scientific and/or technological material to a variety of lay audiences.

LCC 3833 Special Topics in Issues of Science, Technology, and Culture, to address related issues, such as space and housing. "Study of one or more current issues in science, technology, and culture.

Modern Languages

SPAN 3235 - Latin America Today Selected journalistic and literary writings used as a springboard for discussion of social, economic, and political issues of contemporary Latin America. Conducted in Spanish.

SPAN 3690 - Commerce Sustain Community Study of the connectedness and community impact of contemporary issues of economic, sociocultural, and environmental sustainability in Mexico. Conducted in Spanish. Part of the Spanish intensive summer LBAT program. Admission by application only.

SPAN 4235 - Food Culture & Society Food as a gateway to in-depth exploration of Hispanic cultures, including issues of identity, community, cosmology, sustainability and effects of globalization. Conducted in Spanish.

SPAN 4500 - Integrates cross-cultural research and reflection into discussion of current issues in the Spanish-speaking world. Intended for students who have some study-abroad experience in a Spanish-speaking country. Conducted in Spanish. Course Attributes: Humanities Requirement

Courses with Sustainability Content

FREN 4500 - Integrates cross-cultural research and reflection into discussion of current issues in the French-speaking world. Intended for students who have some study-abroad experience in a French-speaking country. Conducted in French. Course Attributes: Humanities Requirement

GERM 4500 - Integrates cross-cultural research and reflection into discussion of current issues in the German-speaking world. Intended for students who have some study-abroad experience in a German-speaking country. Conducted in German. Course Attributes: Humanities Requirement

JAPN 4500 - Integrates cross-cultural research and reflection into discussion of current issues in the Japanese-speaking world. Intended for students who have some study-abroad experience in a Japanese-speaking country. Conducted in Japanese. Course Attributes: Humanities Requirement

Philosophy, Science, and Technology

PST 3105 - Ethical Theories Surveys traditional ethical theories of value, obligation, and rights and applies these theories to contemporary social problems such as abortion, euthanasia, poverty and distributional equity, and environmental problems. Course Attributes: Ethics Requirement, Humanities Requirement

PST 4176 - Environmental Ethics Conceptual and normative foundations of environmental attitudes and values. Impacts of traditional and modern beliefs that shape human attitudes toward nature on creating a more compatible relationship between humans and their environment. Course Attributes: Ethics Requirement, Humanities Requirement

Public Policy

PUBP 3315 - Environ Policy& Politics Overview of the major institutions, organizations, official and unofficial actors in environmental policy and politics, and what influences their environmental decisions and actions. Course Attributes: Social Science Requirement

PUBP 3600 - Sustain, Tech & Policy Ethical, scientific, technological, economic, and political dimensions of sustainable human practices, applying multidisciplinary perspectives to challenges facing public and private-sector approaches to sustainability. Course Attributes: Ethics Requirement, International Relations (IP), Social Science Requirement

PUBP 4338 - Environ Impact Assessment Examines policy, planning, and methodological issues in the environmental impact assessment of engineering systems. Emphasizes regulatory aspects of environmental analysis and key analytical techniques, and the incorporation of environmental considerations into engineering design processes. Course Attributes: Social Science Requirement (not taught but still in catalog)

PUBP 6300 - Earth Systems Describes the scientific principles and interactions that make up the Earth's environmental system. The course examines the interaction of natural and human influences that shape the development and operation of the Earth system and how public and private decision-making impacts this system.

PUBP 6310 - Environmental Issues Provides an overview of basic concepts and methods of environmental policy analysis and implementation through a case study approach. Cases will range from local to global environmental policy issues. The goal of the course will be to expose students to the broad range of social and physical problems referred to as "environmental" problems, and to orient the student for future work in the field.

PUBP 6312 - Economics-Environ Policy This course addresses key concepts in environmental economics, including externalities, efficiency, social welfare and environmental quality as a public good. Addresses environmental problems (i.e. water resources, air quality, urbanization) and vehicles of collective environmental action.

PUBP 6314 - Policy Tools-Environ Mgt Explores the various regulatory, managerial, and legal mechanisms available to policy analysts and decision makers for protecting environmental quality.

PUBP 6320 - Sustainable Systems This course is a historical introduction to sustainable development. The ethical, economic, ecological, and technological dimensions of sustainability are examined. Topics include sustainable development in developing and developed countries; ecosystem health and resilience; the global carrying capacity

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Courses with Sustainability Content

controversy; sustainable communities, new urbanism, regenerative technologies; designs for disassembly; appropriate technologies and the politics of technologies.

PUBP 6326 - Environ Values & Pol Goals Examines the goals and objectives of environmentalists, with special attention to the literature of environmental ethics.

PUBP 6330 - Environmental Law Presents the legal and institutional framework within which environmental law is developed and implemented in the in the United States and internationally. Also examines the major pollution control statutes, and reviews international law and conventions to address trans-boundary environmental issues.

PUBP 6760 – Negotiation & Conflict Mgt Practical and theoretical instruction on techniques of negotiation and consensus building using training exercises and case studies. Emphasizes environmental, policy, planning, and development disputes. Cross listed with CP 6760.

PUBP 8540 - Adv Environmental Policy Overview of core literature of environmental policy, theories of environmental policy, intellectual foundations of environmental policy.

Courses with Sustainability Content

College of Computing

CS 4230 - Distributed Simulation Systems. Parallel and distributed computing algorithms and systems for distributed simulation applications such as virtual environments and analytic models. Course Attributes: Computer Systems (CS), Tech Elect CS, Engineering, & Sciences

CS 4625 - Intel & Interactive Sys Explores how human-computer interaction and machine learning can interact to create personalized information environments. Emphasis on current research efforts from both fields. Course Attributes: Tech Elect CS, Engineering, & Sciences

CS 7497 - Virtual Environments. An introduction to virtual reality and virtual environments. Issues covered will include VR technology, software design, 3D human-computer interaction, and applications for VR.

Courses with Sustainability Content

College of Management

MGT 4611 - Integrative Mgt Analysis Integrates the functional areas of management, economics, and the external environment in which businesses operate. The course is designed to broaden the student's perspective on management.

MGT 4803 - Special Topics - Business Sustainability Ethics

MGT 6124 - Legal Environment of Bus This course involves an examination of laws, rules, and standards of regulation and conduct, guidelines, and systems of conflict resolution relating to business operations and administration.

MGT 6125 - Strategic Management Designed to provide a view of business organizations, with the focus on the total enterprise - the industry and competitive environment in which the organization operates.

MGT 6131 - Macroecon Environ of Bus This course is designed to provide future managers with an understanding of the underpinnings of macroeconomic analysis, including an understanding of the policy debates over alternative macroeconomic issues.

MGT 6133 - Business Law and Ethics This course is a survey of legal and ethical issues needed by the business manager in order to understand the modern company's operating environment.

MGT 6185 - Intl Business Environ This graduate course explores international environmental factors impacting firms' globalizing operations. Factors covered range from economic, political, and legal, to socio-cultural and technology forces.

MGT 6195 - Strategic Management This course examines the environmental and organizational factors that affect the performance of firms as well as the role of top managers in the organizational governance process.

MGT 6197 - Global Strategic Mgt This course provides a forum for the in-depth examination of the managerial and organizational demands associated with effectively competing in global industries.

MGT 6814 - Law, Mgt and Economics The interrelationships among law, economics, and managerial decision making. Focuses on the legal and economic environments that impinge on the profit-seeking enterprises.

Courses with Sustainability Content

College of Science

Biology

BIOL 2335 - General Ecology Introduction to ecological processes at individual, population, and community levels that occur in plant, animal, and microbial taxa, and their relevance to current environmental problems. Course Attributes: Tech Elect CS, Engineering, &Sciences

BIOL 2336 - General Ecology Lab The companion laboratory for BIOL 2335 (Ecology). This course stresses understanding ecological concepts through a combination of lab and field experiments, and computer simulations. Course Attributes: Tech Elect CS, Engineering, &Sciences

BIOL 2337 - Honors Ecology A problem-based learning course in ecology. Student teams will do research and solve challenges typically faced by ecologists and environmental scientists. Course Attributes: Tech Elect CS, Engineering, &Sciences

BIOL 2338 - Honors Ecology Lab Companion course to Honors Ecology. Student teams will explore solutions to ecological challenges using experiments and mathematical models. Course Attributes: Tech Elect CS, Engineering, &Sciences

BIOL 3100 – Ecology & Evol - Australia Evolution and ecology of Australian ecosystems, including rainforests, open woodlands, coastal habitats; conservation of endangered ecosystems. Earns Biology technical credit. Research project required. Course Attributes: Tech Elect CS, Engineering, &Sciences

BIOL 3300 - Tropical Ecology Ecological processes in the tropics including community organizations, biotic interactions, biodiversity, coevolution. Students perform research projects in rain forest, cloud forest, and seashore. Course Attributes: Tech Elect CS, Engineering, &Sciences

BIOL 4410 - Microbial Ecology Advanced studies of microbial ecosystems, the specific roles of bacteria in maintaining ecological balance, and the evolution of the ecosystem in response to changing environments. Course Attributes: Tech Elect CS, Engineering, &Sciences

BIOL 4417 - Marine Ecology An overview of the physical forces and biotic interactions structuring marine communities and of the major threats to these communities.

BIOL 4422 - Theoretical Ecology Theoretical foundations of ecology, from the population to the community and ecosystem levels. Course Attributes: Tech Elect CS, Engineering, &Sciences

BIOL 4803 Urban Ecology An integrated study of biological, physical, and socioeconomic processes in urban environments to understand, predict, and manage the impacts of cities. The course objective is to provide you with an understanding of how ecological and evolutionary processes can be managed to promote human and ecological health.

BIOL 4803 Mediterranean Ecology (Spain) An introduction to the ecology of the western Mediterranean region through study of montane forests, estuaries, dry forests, shrublands, lakes, and arid ecosystems. A comparison of the ecology of prominent groups including: plants, birds, mammals, insects, and fish. To understand the functioning of Mediterranean ecosystems, the origins of present day populations, the role of fire and drought in shaping communities, and the need for conservation.

BIOL 6410 - Microbial Ecology Advanced studies of microbial ecosystems, the specific roles of bacteria in maintaining ecological balance, and the evolution of the ecosystem in response to changing environments.

BIOL 6417 - Marine Ecology An overview of the ecological and evolutionary patterns, processes, and mechanisms affecting the organization, structure, and function of a broad variety of marine communities.

BIOL 6626 - Physiological Ecology Study of the basic physiological processes and systems in vertebrates and invertebrates. Comparative study on how these systems are adapted for specific environments and functions.

Courses with Sustainability Content

BIOL 6630 - Adv Microbial Ecology Advanced studies of selected aspects of the ecology of prokaryotic and eukaryotic organisms.

Chemistry

CHEM 1310 - General Chemistry Fundamental laws and theories of chemical reactions. Topics include atomic structure; bonding theory; stoichiometry; properties of solids, liquids and gases; chemical thermodynamics; electrochemistry; and kinetics.

CHEM 1311 - Inorganic Chemistry I Inorganic topics covering: bonding models including molecular orbitals and solid state structures, descriptive inorganic chemistry of s and p-block elements, Lewis acids/bases, and coordination chemistry.

CHEM 2311 - Organic Chemistry I An introduction to structure and reactivity of organic molecules.

CHEM 3281 - Instrumental Analysis Provides a background to modern analytical chemistry and instrumental methods of analysis with applications to engineering and other areas. Course Attributes: Tech Elect CS, Engineering, &Sciences

CHEM 3511 - Survey of Biochemistry Introductory course in biochemistry dealing with the chemistry and biochemistry of proteins, lipids, carbohydrates, nucleic acids, and other biomolecules. Course Attributes: Tech Elect CS, Engineering, &Sciences

CHEM 4511 - Biochemistry I The chemistry and biochemistry of proteins, lipids, carbohydrates, nucleic acids, and other biomolecules. Course Attributes: Tech Elect CS, Engineering, &Sciences

CHEM 4512 - Biochemistry II The chemistry and biochemistry of proteins, lipids, carbohydrates, nucleic acids, and other biomolecules. Course Attributes: Tech Elect CS, Engineering, &Sciences

CHEM 4740 - Atmospheric Chemistry This course provides a general chemical description of the Earth's atmospheric system with a major focus on the two lowest layers of the atmosphere, i.e., the troposphere and the stratosphere. Cross listed with EAS 4740. Course Attributes: Tech Elect CS, Engineering, &Sciences

CHEM 6284 - Environ Analytical Chem Application of techniques from analytical chemistry in monitoring the environment.

Earth and Atmospheric Sciences

EAS 1600 - Intro-Environmental Sci Introduction to environmental field science. Case study approach. Exposure to basic field equipment and techniques, analysis of data.

EAS 1601 - Habitable Planet Introduction to the origin and evolution of Planet Earth, creation of the universe and the elements, early history of Earth, radioisotope geochemistry and the timing of events in the universe, the galaxy, and on Earth. Formation of the atmosphere and oceans. Climate.

EAS 2420 - Environmental Measures Identify and quantify nature's physical and chemical contributions to human-made urban environments, and measure the impacts of urban area feedback on these natural systems. **Course Attributes:** Tech Elect CS, Engr, &Sciences

EAS 2600 - Earth Processes An introduction to earth materials and processes. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 2602 - Earth Through Time Dynamic processes affecting the Earth system on all time scales. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 2655 - Quantitative Techniques Integrated course in mathematical, physical, and computing techniques for applications in earth and atmospheric sciences. Course Attributes: Tech Elect CS, Engineering, &Sciences

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Courses with Sustainability Content

EAS 2803 Energy, Environment & Society special topics. Course Attributes: Tech Elect CS, Engr and Sciences

EAS 2420 - Environmental Measures Identify and quantify nature's physical and chemical contributions to human-made urban environments, and measure the impacts of urban area feedback on these natural systems.

EAS 2699 - Undergraduate Research Independent research conducted under the guidance of a faculty member. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 2750 - Physics of the Weather An introductory treatment of the application of the basic physical laws to the understanding of weather phenomena. Cross listed with PHYS 2750. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 3603 - Thermodynamics-Earth Sys Introduction to the principles of equilibrium thermodynamics and physical chemistry with applications to the atmosphere, ocean, and solid earth. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 3610 - Intro Geophysics An introduction to visualizing and understanding earth history, structure, and dynamics through geophysical methods including seismology, gravity, magnetism, heat flow, geochronology, and geodesy.

EAS 3620 - Geochemistry A quantitative treatment of geochemical processes in the Earth and natural waters, with emphasis on chemical reactions among atmospheric gases, minerals, and aqueous solutions. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 4110 - Resources, Energy & Environ Learn about the science behind the nature, occurrence and extraction of earth resources used by humans and the environmental impacts of that use.

EAS 4200 - Structural Geology Structural geology and continuum mechanics for scientists and civil engineers. Stress and strain in rocks; faults, joints, and folds; basic field mapping; laboratory exercises. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 4300 - Oceanography Chemistry and physics of the ocean. Distributions of temperature, salinity, and density. Equations of state and motion. Surface and deep-water circulation. Waves and tides. Composition of seawater: dissolved salts, gases, and nutrients. Biological processes. Marine sediments. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 4410 - Climate & Global Change The physics behind the climate and its potential changes, as well as an introduction to the policy issues in global change. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 4420 - Environmental Field Meth Semester-long focus on single environmental project in the local area. Chemical and physical techniques for parameterizing environmental problems, data analysis, report writing, and interpretation of results in societal context. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 4602 - Biogeochemical Cycles An investigation of global change focusing on the chemical, physical, geological, and biological processes that cycle the elements through the Earth system. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 4610 - Earth System Modeling An introduction to computer modeling in Earth system science. Course Attributes: Tech Elect CS, Engineering, &Sciences

EAS 6132 - Intro to Climate Change The climate of the Earth, its radiation budget, greenhouse gases and their sources and sinks, potential changes due to anthropogenic activities, detection of climate changes.

EAS 6135 - Introduction to Complex Environmental Systems Introduction to the concepts of environmental complexity through the inter-relationships between natural, human, and built systems.

Courses with Sustainability Content

Psychology

PSYC 2220 Industrial/Organizational Psychology

PSYC 4770 - Environmental Design Introduction of psychological concepts relevant to environmental design. Survey of selected methods for assessing human-made environments and development of design solutions to selected problems. Cross listed with ARCH 4770. Course Attributes: Social Science Requirement, Tech Elect CS, Engineering, &Sciences