ENVIRONMENTAL MANAGEMENT SYSTEMS • EMS

1011 Environment and Technology: Perspective on Environmental Problems (3) *See ENVS 1000.*
2051 Soil Science (4) *See AGRO 2051.*
3040 Applied Environmental Management (4) S *Prereq.: EMS 1011, ENGL 2000. 3 hrs. lecture; 3 hrs. lab.* Applications of planning, management, and decision making to environmental policy, systems, and management; evaluation of environmental decision making; environmental ethics; analysis of environmental issues at the local, state, and national levels.
3045 Soil Conservation (2) *See AGRO 3040.*
3050 Environmental Regulations and Compliance (3) F *Prereq.: EMS 1011, ECON 2030 or AGEC 2003.* Local, state, and federal environmental regulations; enforcement of and compliance with regulations; roles of regulatory agencies.
3090 Environmental Internship (3) F,S *Prereq.: permission of department and junior standing. Credit will not be given for this course and AGRO 3090.* Professional experience in some aspect of environmental management; student must submit a proposal explaining internship goals and education component; reports, employer evaluation, paper, and presentation are required.
4010 Applied Ecology (2) *See ENVS 4010.*
4020 Quantitative Risk Assessment (3) F,S *Prereq.: six hours of chemistry and six hours of biological sciences, MATH 1431 or equivalent.* Assessment of environmental risks; interactions of pollution/toxins with the human body; managing and predicting risks.
4030 Environmental Permit Writing (3) S *Prereq.: ENGL 3002 or 3101, EMS 3040. May not be taken for graduate credit.* Permit writing; permitting process; environmental assessment; environmental impact statements; communicating technical information.
4040 Environmental Instrumental Analysis (3) S *Prereq.: CHEM 1201, 1202, 1212, 2001. 2 hrs. lecture; 2 hrs. lab. May not be taken for graduate credit.* Analysis of pollutants in the environment; development of analytical technique; sampling of different media including soil and water.
4055 Chemical Properties of Soil (4) *See AGRO 4055.*
4056 Microbial Ecology and Nutrient Cycling in Soils (4) *See AGRO 4056 or BIOL 4256.*
4077 Environmental Soil Physics (3) *See AGRO 4077.*
4999 Senior Project in Environmental Management (1-3) F,S,Su *Prereq.: permission of department, senior standing, and a minimum gpa of 3.00 on all course work taken in the major. This course may be repeated for up to 6 hrs. of credit. Course may not be taken for graduate credit.* Student will develop and submit a research proposal to the faculty; student will work on a specific project under the supervision of a faculty member. This course is intended to prepare students for graduate work in some area of environmental management.
7057 Advanced Soil Physics (4) F *See AGRO 7057.*

ENVIRONMENTAL SCIENCES • ENVS

1000 Environment and Technology: Perspective on Environmental Problems (3) *Also offered as EMS 1011.* Environmental quality problems involving water, air, and land, and society's response to such problems; analysis of the interrelationships and nature of ecological stresses.
1051 Soils and the Environment (3) Complexity and diversity of the earth's land surface; soils and land use management, reclamation of mismanaged soils, and use of recyclable waste materials as soil amendments.
1126 Introduction to Environmental Sciences (3) Essential principles of environmental sciences; comprehensive and fundamental understanding of sound science, stewardship, and sustainability in environmental sciences; interactions and relations between humans and earth; an up-to-date look at today's global, national, and regional environmental issues.
2144 Environmental Issues in Economics and Water Resources (3) Economic principles and control mechanisms governing man's interaction with the biosphere; engineering principles and technologies that transform the environment into commodities and unwanted waste; use cycles of water from its source through processing, reprocessing, use, reclamation, and disposal.
3102 Mathematical Methods in Science (3) *Prereq: MATH 1550, 1552, and EXST 2201 or equivalent.* Introduction to numerical methods, data analysis, error propagation, box models, linear and nonlinear least squares, perturbation theory, numerical integration.
3999 Undergraduate Research (1-4) F,S,Su *Prereq.: permission of instructor. May be taken for a max. of 4 hrs. of credit.* Individual study of a specific environmental problem or individual laboratory research.
4010 Applied Ecology (2) *Prereq.: minimum of 10 sem. hrs. of biological and/or physical science. Also offered as EMS 4010.* The biosphere, air, land, and aquatic environments; development of alternative techniques for correcting environmental pollution; environmental risk assessment analysis and management.
4035 Aquatic Pollution (3) *Prereq.: ENVS 1126 or OCS 1005 or OCS 1006; or OCS 2008 and 2009 or equivalent. Credit will not be given for this course and ENVS 4036.* Interdisciplinary study of the interaction between man and the aquatic environment and human impacts on marine and freshwater biological systems; biological, ecological, social, legal, and managerial aspects of water pollution are examined through a series of case studies.
4036 HONORS: Aquatic Pollution (3) *Prereq.: ENVS 1126 or OCS 1005 or OCS 1006; or OCS 2008 and 2009 or equivalent.* Same as ENVS 4035 with special honors emphasis.
4101 Environmental Chemistry (3) *See CHEM 4150.*
4112 Concepts in Coastal Eco-toxicology (3) *Prereq.: ENVS 1126, ENVS 4101 or ENVS 4035 or permission of instructor.* Coastal pollution and toxicology of industrial and non-point source materials related to ecological risk in near shore and inland coastal wetland areas.
4141 Radioecology (3) F *See NS 4141.*
4149 Design of Environmental Management Systems (3) Environmental systems planning at local, national, and international levels; identification of system requirements and available resources; definition of constraints, establishment of evaluation criteria; evaluation of alternative concepts and plans for subsystems; implementation using qualitative tradeoffs, mathematical models, and computer simulations.
4261 Energy and the Environment (3) Methods of stationary power generation; pollution related to fuel production, transportation, and use; energy use and pollution problems related to transportation; energy resources, regulatory aspects, and control technology related to stationary and moving sources of air pollution.
4262 Environmental Hazards Analysis (3) Systematic framework for examining the nature and consequences of natural and man-made hazards; strategies that may be taken to plan, respond, recover, prevent, or mitigate hazards.
4264 Regulation of Environmental Hazards (3) Federal, state, and local regulation for mitigating the occurrence and effects of hazardous events, including the National Flood Insurance Act, Emergency Planning and Community Right to Know Act, and government planning and zoning authority.
4266 Ocean Policy (3) National and state ocean policy; Law of the Sea; regulation of the high seas; marine pollution, marine resources, and marine scientific research; other related topics.
4477 Environmental Toxicology: Introduction and Applications (3) *Prereq.: 6 hrs. of chemistry, 6 hrs. of life sciences, and permission of instructor.* Introduction to the basic principles of environmental toxicology; applications of these principles in industrial and other job related environments; regulatory perspectives; spills; anthropogenic pollution problems; human risk management; overview of classes of toxic agents, routes of exposure, target tissues (human mammalian), and toxicological testing.
4500 Health Effects of Environmental Pollutants (3) *Prereq.: minimum of 6 sem. hrs. of chemistry and 6 sem. hrs. of either biology or zoology.* Effects of environmental pollutants on human health and quality of life.
4900 Watershed Hydrology (3) *Prereq.: an introductory statistics course. 12 hrs. lecture; 12 hrs. lab. Also offered as RNR 4900.* The principles of hydrology with emphasis on how natural systems are analyzed, modeled, and used in management decisions; laboratory exercises involve hands-on experience with hydrologic data analysis, use of geographic information systems (GIS), and spatial modeling.
4950 Special Topics in Environmental Sciences (1-3) *Prereq.: permission of the Department. May be taken for a maximum of 6 hours of credit. More than one section may be taken for credit concurrently when topics differ.* Special topics in environmental issues, problems, techniques, and/or methods.
6010 Topics in Environmental Science for Teachers (2-4) *May be taken for a max. of 8 sem. hrs. credit when topics vary.* Topics in environmental science with an emphasis on inquiry-based scientific learning and on issues of importance to Louisiana; hands-on activities and field trips will be major components of the class.
7010 Mathematical Modeling in Energy and Environmental Management (3) S *Prereq.: OCS 4410 or equivalent.* Advanced studies in the development of models of energy and environmental systems.
7040 Environmental Planning and Management (3) *Prereq.: ENVS 4149.* Environmental systems planning and management at local, state, and federal government levels
using problem identification; design of alternative solutions, evaluation of alternatives, political action decision processes, and implementation and monitoring.
7041 Environmental Policy Analysis (3) *Prereq.: EXST 7003 or 7004 or 7005; ENVS 7040.* Management-oriented approach to major phases of environmental policy; formulation, implementation, evaluation; theoretical bases and analytical techniques.
7042 Environmental Conflict Resolution (3) Practical approaches and techniques commonly used to mediate environmental conflicts and facilitate participatory group decision making among stakeholders.
7043 Environmental Law and Regulation (3) Introduction to basic principles of federal and state laws, regulations, and court decisions involving pollution of the environment, including the National Environmental Policy Act, Clean Water Act, Clean Air Act, Resource Conservation and Recovery Act, Oil Pollution Act; current topical legal developments.
7044 Regulation of Toxic Substances (3) Federal laws, regulations, judicial decisions, and policies regarding the development, production, use and disposal of toxic substances, including the Toxic Substances Control Act, Federal Insecticide, Rodenticide, and Fungicide Act, and the Food, Drug, and Cosmetic Act; toxic tort lawsuits will be reviewed.
7045 Land Use Law and Regulation (3) Federal, state, and local laws, regulations, judicial decisions, and polices regarding land use, land use planning, and environmental regulation of land use, including: zoning; subdivision regulation; planned unit development (PUD); comprehensive land use plans; limits on growth and urban sprawl; and regulatory "takings."
7046 International Environmental Law (3) International and multilateral agreements and practices for controlling pollution and depletion of natural resources; relationship between international trade agreements and environmental quality; other international environmental issues.
7047 Environmental Economics and Policy (3) S *Prereq.: ECON 4720 or equivalent or consent of instructor.* Economic concepts applied to the development of appropriate policies to achieve environmental protection goals; emphasis given to linkages between economics and the environment, the role of market failure, and economic instruments that can be used to address environmental concerns.
7050 Spatial Modeling of Environmental Data (3) *Prereq.: EXST 7003 or 7004 or 7005.* Development of an approach to analyze spatial and temporal processes for environmental data modeling.
7061 Water Quality Management and Policy (3) *Also offered as RNR 7061.* Physical, chemical, and biological characteristics of surface water in natural systems; sources and effects of water pollutants; water quality standards and criteria; total maximum daily loads; federal water quality regulations; watershed approach and application of mathematical models to water quality management.
7100 Environmental Toxicology (3) *Prereq.: CBS 4001.* Technical, ecological, and economic considerations relating to air, water, and soil contamination; classification and detection of environmental toxicants; their biological effects on current and future trends in agribusiness and the chemical, transport, and power industries.
7110 Toxicology of Aquatic Environments (3) *Prereq.: ENVS 7100. Cross listed with OCS 7110.* Aquatic pollution and toxicology of industrial materials related to environmental risk assessment in coastal areas; physical, chemical, and biological factors affecting the fate of toxicants in marine and freshwater coastal areas.
7112 Concepts in Marine Ecotoxicology (3) *Prereq.: ENVS 7100 and 7110 or permission of instructor. Also offered as OCS 7112.* Marine pollution and toxicology of industrial and non-point sources materials related to ecological risk assessment in costal and marine areas; biological processes and wastes in the ocean; physicochemical processes and wastes in the ocean; laboratory and field techniques in epibiotic, endobiotic and fecal-sestonic habitats; benthic habitats and metals/chemical specification/geoavailability; fish as a biological model; microcosm theory and design for littoral and neritic habitats; approaches to ecological risk assessment in marine habitats.
7151 Watershed Hydrology and Floodplain Analysis (3) *See RNR 7151.*
7200 Comparative Metabolism of Environmental Pollutants (3) *Prereq.: BIOL 4094 or consent of instructor.* Biochemical systems from various invertebrate, vertebrate, and plant species involved in metabolic activation and detoxification of xenobiotic substances; use of these systems as biomonitors of pollution impact.
7220 Biochemistry and Toxicology of Metals (3) *Prereq.: BIOL 4093, 4094; CHEM 2262. Also offered as BIOL 7220.* Integration of metals and metal complexes with biochemical processes; adaptations of the coordination sphere of metal complexes to life function; metalloenzymes and metalloproteins; properties and modifications of metals that impart specialized biochemical function, as well as toxicity, mutagenicity, carcinogenicity.

7335 Water Quality Modeling for Management (3) *Prereq.: ENVS 7061 or permission of instructor.* Problems and approaches in water quality modeling, with particular attention to model uncertainty, model choice, and applications for management; basic modeling concepts, mechanistic models, empirical models, modern statistical methods and uncertainty analysis applied to problems of eutrophication, toxic substances, and trend assessment.
7385 Decision Theory and Environmental Risk Analysis (3) Fundamental principles and techniques involved in decision making and environmental risk analysis; methods for identifying decisions that optimize outcomes; rationality (utility) and interactive (game theory) decision theory, and application of decision theory to natural resources and environmental policy-making.
7622 Fundamentals of Carcinogenesis (3) S-E *Prereq.: CBS 7603 or consent of instructor. Same as CBS 7622 and BIOL 7622.*
7623 Toxicology I (3) *Prereq.: ENVS 4477 or consent of instructor.* Fundamental principles of toxicology, dose response relationship, design and conduct of acute and chronic toxicity tests, basic analytical toxicology, biochemical markers, basic principles of hazard evaluation and risk assessment, industrial toxicology, principles of toxicology applied to the environment and ecosystems.
7624 Toxicology II (3) *Prereq.: ENVS 7623 or consent of instructor.* Toxicokinetics; xenobiotic transport, distribution, metabolism, excretion; principles of receptor interaction.
7625 Toxicology III (3) *Prereq.: ENVS 7623 or consent of instructor.* Toxicology of major organ systems, to include dermal, pulmonary, hepatic, cardiovascular, renal, neural with both CNS and PNS, immune, gastrointestinal, and reproductive; target organ toxicology with mechanistic study of the pathophysiology of classic and prototype toxicants.
7626 Toxicology IV: Genetic Toxicology (3) P*rereq: ENVS 7623 or approval of instructor. Also offered as BIOL 7626.* Evaluation of induced heritable and/or phenotypic changes in the organism and individual cells (germline and somatic); emphasis on human and mammalian species; reproductive toxicology and teratogenesis; testing and screening agents for genotoxic activities; molecular genetic approaches to human and environmental biomonitoring.
7699 Toxicology Seminar (1) *See CBS 7699.*
7700 Integrated Environmental Issues (3) Multidisciplinary analysis of a current environmental issue. Discussion of topics from the perspectives of natural science, economics, social science, and political science. Integration and synthesis of information to develop a science-based approach to environmental decision-making.
7900 Special Problems in Environmental Sciences (1-4) *May be taken for a max. of 4 hrs. credit.* Individual study of a specific environmental problem.
7950 Special Topics in Environmental Sciences (1-6) F,S,Su Research and methodological review of current topics.
7995 Environmental Seminar (1) F,S Reports and discussions of student/faculty activities in environmental sciences.
7998 Environmental Colloquium (2) *Non-thesis students only. May only be taken during semester of graduation.* Written and oral presentation of a literature review on a selected environmental issue, as approved by the departmental non-thesis committee.
8000 Thesis Research (1-12 per sem.) *"S"/"U" grading.*