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Environment-Related CSU Degree Programs

Bakersfield

B.S. in Environmental Resource Management

The B.S. in Environmental Resource Management is an interdisciplinary program that prepares students for public and private sector careers. The major requires coursework in the physical and life sciences, communication and management, environmental policy analysis, and law and compliance. The program requires completion of an emphasis area that often is met via a transferable community college technology program relating to natural resources and the environment. One option for completing the emphasis requirement, the Aera Energy LLC Concentration in Occupational Safety and Health Management, is especially well received and supported. Students with this concentration are offered robust internship opportunities and have been well received by employers upon graduation. An advisory board is being formed for this endowed concentration

Channel Islands

BS Environmental Science and Resource Management

The program is grounded in the fundamentals of ecology, physics, and chemistry, by examining the intersection between the biological and the physical environments in the lab and field. Effective management of these natural systems are explored from a variety of social science and humanities perspectives including demography, economics, political science, sociology, literature, and environmental history. In addition to theoretical underpinnings, students are trained in a variety of skills necessary for the environmental science professional of the 21st century: Geographic Information Systems, quantitative data analyses and presentation, technical writing, and a variety of field and lab methodologies. Service Learning and Civic Engagement feature prominently in several courses, from the introductory level to the advanced. Program faculty and their students are engaged in a wide variety of research efforts across Ventura County, the United States, and the globe. We have particular strengths in human dimensions of resource management, geospatial analysis, and ecological restoration.

CSU Campuses Bakersfield Channel Islands Chico Dominguez Hills East Bay Fresno Fullerton Humboldt Long Beach Los Angeles Maritime Academy Monterey Bay Northridge Pomona Sacramento San Bernardino San Diego San Francisco San José San Luis Obispo San Marcos Sonoma Stanislaus

Chico

BS Agriculture

The BS in Agriculture and BS in Animal Science cover agriscience and technology.

The BS in Agriculture offers options in agriscience and education, and crops, horticulture, and land resource management. State-of-the-art procedures reflect the science-based nature of agriculture and natural resource management in the 21st century. A student can choose either to concentrate in a single option or emphasize a broad overview in the study of agriculture.

BS Animal Science

The BS in Agriculture and BS in Animal Science cover agriscience and technology.

BS Agricultural Business

The BS in Agricultural Business provides students with an excellent and comprehensive background in business theory combined with a working knowledge of production agriculture.

All programs in the college are designed for "hands-on" learning. The college offers 18 courses that have been recognized across campus in the area of sustainability. A rigorous industry-based internship program, undergraduate research experiences and a variety of learning activities at the University Farm, also known as the Agricultural Teaching and Research Center (ATRC), give this program its reputation for student-centered learning.

The ATRC offers students the opportunity to obtain practical experience in many different areas of both plant and animal production systems using sustainable agricultural practices. In addition, students have excellent opportunities to participate in funded applied agricultural research activities conducted by faculty and staff in areas such as but not limited to water conservation, beef cattle production, orchard and field crop production and organic dairy or vegetable production.

The college has two industry boards that support and provide advice on academic programs and financial and alumni outreach activities. Individual programs within the college have industry advisory panels as well. All of our advisory boards help ensure that we focus on providing graduates who can become productive members of the workforce or successfully enter into graduate school and veterinary medicine programs.

BS Biological Sciences

Option in Ecological, Evolutionary, and Organismal Biology (prepares students for positions within environmental and resource management or graduate studies in ecology and evolutionary biology); Option in Plant Biology (prepares students for positions in habitat restoration, field botany, forestry or range management, agricultural biotechnology or graduate studies in plant biology).

BA Economics, with an Option in Environmental Economics

The option is designed for those seeking a structured program in economics with an emphasis in environmental economics.

BS Environmental Science

Prepares students for careers in areas such as pollution remediation, resource conservation, or environmental management, as well as providing a firm foundation for graduate studies.

MS Environmental Science, with a Professional Sciences Master's Option

The PSM provides students with advanced training in the environmental sciences, along with professional courses aimed at preparing students for management and non-academic positions. Instead of a thesis, a required internship is an integral component of the program.

BA Geography, with an Option in Physical and Environmental Geography

The Physical and Environmental Geography Option emphasizes the conceptual and analytical skills required for professional work in resource management and environmental impact analysis. Physical geographers study patterns of climates, land forms, vegetation, soils, and water. They forecast the weather, manage land and water resources, and analyze and plan for forests, rangelands, and wetlands. Many human and physical geographers have skills in cartography and Geographic Information Systems (GIS).

Minor in Managing for Sustainability

This minor examines the ways in which organizations can be managed to meet the triple bottom line: profit, ethical treatment of workers, and environmental sustainability. Students learn to analyze organizational impacts and develop practices that foster a balanced ecosystem as well as organizational effectiveness.

BS Recreation Administration, Parks and Natural Resources Management emphasis

Environmental education and interpretation and recreation and natural resources management are strengths of the Chico program. Resource agency and NGO partnerships, an engaged alumni network, and a senior internship requirement keep campus and profession connected. We are particularly proud of our award-winning students and long-standing traditions of service learning and community-based stewardship.

BS Sustainable Manufacturing

Sustainable Manufacturing is an integrated field of study that combines technical feasibility with environmental responsibility and economic viability. The relative advantages and disadvantages of each process will be examined through lectures, discussion, and research, as well as experience in hands-on laboratories with industrial-grade machinery. Students will learn to anticipate the implications of decisions and to evaluate options in a global context that minimizes the impact of manufacturing activities on people, the environment, and resources, while understanding the underlying economics of producing goods. We are in the process of forming a Patrons Board which will include industry representatives to serve as the advisory board. There was considerable industry input while designing the program and we plan for this to continue. The BS in Sustainable Manufacturing is a program unique to

CSU, Chico. It aligns with our campus' strategic priority of creating environmentally literate citizens, who embrace sustainability as a way of living.

Geography Minor in Environmental Studies

The Environmental Studies Minor provides interdisciplinary investigation into critical environmental issues. The Minor is appropriate for all majors seeking to increase environmental literacy in their chosen fields.

Certificate in Rural and Town Planning

The Certificate in Rural and Town Planning is valuable to our majors and other students who wish to prepare for careers in urban or environmental planning and related fields such as resource management and rural economic development.

MA Geography, with an Option in Environmental Policy & Planning

The option provides the university with the ability to educate graduate students in current environmental policy and planning fields. These fields provide essential skill and knowledge to people who will manage environmental change in the public, private and nonprofit sectors. The focus on local and regional arenas supports the North State initiative of the university's Strategic Plan.

BS Health Science, with an Option in Environmental Health

Environmental health is the study of how environmental factors can harm human health and how to identify, prevent, and control such effects.

Dominguez Hills

MS in Environmental Science

The MS in Environmental Science is an interdisciplinary program in the College of Natural and Behavioral Science. The mission of the program is to prepare students to address and solve environmental challenges. Because of our location, the program emphasizes the problems and opportunities of the urban environment. The program consists of 24 units of required courses in the natural and social sciences and a minimum of 6 units of electives. An internship with associated academic credit (ENV 596) is required. The culmination of the program is directed research leading to the preparation of a thesis. Academic credit is associated with the research (ENV 598) and thesis preparation (ENV 599). An industry advisory board is still in the planning stage.

This will be the second year of the program's operation. We have been effective in recruitment and retention, and the students in the program are very good. There are currently approximately 12 students in the program including the 2009-2010 and 2010-2011 cohorts. Several students in the 2009-2010 cohort have started their internships and some will begin directed research in Fall 2010. We expect the first graduates of the program in Spring 2011.

East Bay

BS Construction Management MS Construction Management

Curricula for these programs include environmental topics such as; environmental laws and regulations pertaining to construction. Issues such as construction waste disposal and treatment, green building concepts, Leadership in Environmental and Energy Design permits, and scoring and submittal processes for construction projects. The programs were developed in consultation with our Industry Advising Board, which includes members from Bechtel, CalTrans, and several other construction firms. The goals of the of the degree programs in Construction Management are to prepare effective managers for public and private construction projects, to prepare the workforce required for the expected increase in the state's transportation infrastructure improvements, and to enable high school graduates, transfer students and working professionals to assume leadership roles in construction industry.

BA Environmental Studies

The Bachelor of Arts degree in Environmental Studies provides our graduates with a broadly based foundation for recognizing, assessing, and solving environmental problems at the local, regional, and global scale. Employing a faculty whose degrees are in subjects as varied as physics, economics, geography, and wildlife biology, the Environmental Studies program serves our student body and our broader community by providing a strongly interdisciplinary approach to understanding the environment and its modification and degradation by humans. The Environmental Studies program revolves around the core expertise of its faculty: sustainable resource management (with a focus on energy, water, cities, and climate), globalization, and environmental justice. Our graduates develop the fundamental skills of critical assessment, communication of complex ideas, and quantitative analysis.

BS Environmental Science

The Bachelor of Science degree major in Environmental Science is an interdisciplinary program of study in the Department of Earth and Environmental Sciences at CSUEB with faculty participation from the Departments of Biological Sciences, Chemistry and Biochemistry, and Geography and Environmental Studies. The B.S. degree major in Environmental Science requires students to take a structured core of science courses from a variety of physical and life science disciplines, as well as a specialized upper division option in life science, physical science or environmental systems and resource management.

Certificate in Sustainable Resource Management

Designed for upper-division university students and mid-career professionals seeking environmental resource management, this program is suitable for employment in environmental services positions in the public, private, and non-profit sectors and for students and professionals from environmental studies, environmental science, physics, chemistry, biology, engineering, public administration, public policy, law, business management, and entrepreneurship. An advisory board is in development.

Fresno

BS Environmental Science

The bachelor's degree in environmental sciences offers an interdisciplinary approach to the natural sciences with an emphasis on biology, chemistry, and geology. This degree is designed for students interested in areas such as pollution abatement, water resources, ecosystem protection, restoration, or management.

Fullerton

BS Chemistry, with an Emphasis in Environmental Chemistry There is no advisory board.

BS Biological Science, with a Concentration in Biodiversity, Ecology, and Conservation Biology

There is no advisory board.

MS Environmental Studies

This is an interdisciplinary program involving environmental sciences, environmental policy and planning, environmental education and communication, international learning opportunities in environmental studies. It is run through a center in the College of Humanities and Social Sciences and has an advisory board and research mentoring pool that consists of faculty from the College of Natural Sciences and Mathematics.

Certificate Programs

Applied Sustainability (Green Economics) Green Building (design and sustainable management of energy and waste) Green Data Center Management (IT resource optimization) Carbon Footprint Management (CO2 monitoring, cap and trade, AB 32) Energy Auditing of Municipal and Commercial Buildings Green HVAC Design Green Industrial Design Cloud Computing

The Cal State Fullerton College of Natural Sciences and Mathematics Dean's Advisory Council has a Sustainability Working Group of industrial advisors and the College of Natural Sciences and Mathematics also has a Sustainability Science Committee consisting of faculty members. The University has a Sustainability Committee made up of faculty, staff, administrators and external partners.

Humboldt

BS Biology

Within the major, options are offered in marine biology and environmental biology.

BS Environmental Management and Protection

Trains students in the relationships between human society and natural ecosystems. No advisory board is in place at this time.

BS Environmental Resources Engineering

The BS in Environmental Resources Engineering trains students to be environmental engineers with expertise in water quality, water resources, energy resources and indoor air quality. An advisory board is in place.

BS Environmental Science

The environmental science major trains students in either restoration ecology, energy and climate or environmental policy; no advisory board is in place at this time.

MS Environmental Systems

This master's program trains graduate students in applied geology, systems analysis engineering, or mathematical modeling techniques applied to environmental problems; no advisory board is in place at this time.

BS Fisheries Biology

This program trains students in marine or freshwater fish ecology; no advisory board is in place at this time.

BS Forestry

The BS in Forestry trains students to be professional foresters. An advisory board is in place for this nationally recognized program

BS Geology

The geology major trains students to be professional geologists; no advisory board is in place at this time.

MS Natural Resources

The master' program in natural resources prepares graduate students for professional careers or advanced graduate work in either wildlife, fisheries, forestry or natural resources planning and interpretation; no advisory board is in place at this time.

BS Oceanography

This bachelor's program trains students to be ocean scientists who collect, process, and interpret scientific data; no advisory board is in place at this time. This is one of a very few undergrad oceanography programs in the nation

BS Rangeland Resource Sciences

The major trains students to be either rangeland or soils scientists; no advisory board is in place at this time.

MA Social Science/Environment and Community

In addition to social science theory, this multidisciplinary program focuses on practical knowledge about the economic, social, and political factors that shape environments and communities in the U.S. and around the globe; no advisory board is in place at this time.

BS Wildlife

This bachelor's program focuses on conservation biology and management of wildlife populations; no advisory board is in place at this time for this nationally recognized program.

Long Beach

BA Environmental Science and Policy

This program provides a stronger emphasis on policy.

BS Environmental Science and Policy

The curriculum of this bachelor's program is grounded more in the sciences.

Minor in Environmental Science and Policy

The Environmental Science and Policy programs have one of the most active student clubs in the colleges, and graduates are highly successful in finding jobs within their area or expertise. With 140 majors, these are clearly successful and popular programs.

Los Angeles

BS Geology, with an Option in Environmental Science

The BS in Geology with an Environmental Science Option is designed for students who plan a professional career in government and industry and wish to focus on environmental aspect of geological science. Graduates from this program may expect to work for federal, state, and local governments. They may work in scientific or technical consulting services or architectural or engineering companies either as managers or environmental scientists.

MS Environmental Science

The Masters degree in Environmental Science prepares students for environmental science research, doctoral study, community college teaching or technical positions in universities, industry, or governmental agencies. There are three options: Environmental Biology, Environmental Engineering Science, or Environmental Hydrology. Associated with these options are two training experiences. The Professional Experience is designed for students who want the Master's degree to conclude their graduate study with the goal of immediately seeking employment. Students who wish to continue on in a doctoral program choose the Research Experience.

Monterey Bay

MS Coastal and Watershed Science and Policy

The master's program in Coastal and Watershed Science and Policy (CWSP) is an innovative interdisciplinary program offering training in science, economics and technology (particularly spatial-data analysis) in the context of environmental policy. The CWSP program prepares students for careers in applied scientific research, environmental resource assessment and management, environmental consulting, industry, non-profit agencies, environmental education, and further education in doctoral programs. We introduced a non-thesis Professional Science Master's (PSM) option for this degree in 2010. This program has an advisory board.

BS Environmental Science, Technology and Policy

This innovative, interdisciplinary degree program in Environmental Science, Technology and Policy (ESTP) links the natural science, physical science, technology, economics, and policy. The program emphasizes the critical thinking and technical skills necessary to develop workable solutions to complex environmental problems. ESTP provides students with active learning and applied research in marine, coastal, and watershed systems. This program does not have an advisory board.

BA Environmental Studies

BS Marine Science (under development)

Northridge

MS Biology

The graduate program in Biology provides students an opportunity for advanced study in specialized areas of biology and to develop the skills required to do independent research. Students typically publish their research in internationally recognized peer-reviewed journals. Graduates in ecology and evolution typically go on to Ph.D. programs, become government scientists, or teach at community colleges.

BS Environmental Biology

Option II of the B.S. degree prepares students for graduate school; for positions in government land-management agencies; for teaching biology; or for positions with environmental consulting companies.

BS Marine Biology

Option V of the B.S. degree is specifically for students who wish to work in the marine environment and is designed for those who intend to pursue graduate study in the marine sciences.

BS Marine Biology, with an option in Evolutionary Biology

Certificate in Sustainability, within Master of Public Administration Extended Education program.

Minor in Sustainability (planned for spring 2011)

Pomona

MArch Architecture

Three-year accredited professional degree program. Students learn state- of-the-art "green" building design using basic as well as high-end computer-aided design and rendering programs. The Architecture Department maintains a tight network of alumni in its Friends of Architecture group and also has generated support from companies such as Walt Disney Imagineering and architecture firms such as Marmol Radziner providing in-kind design services for the Neutra VDL House repairs, HMC Architects providing financial support and professionals to critique student work in studios, Henry Woo Architects funding a lecture series and travel scholarships, and Simpson Gumpertz & Heger funding an annual Building Enclosure Sustainability Symposium.

MS Biology

This program is not specific to environmental science. However, we have been cooperating with an effort by Dr. Michael Reibel (Department of Geography) to develop advanced training in Geographic Information Systems to bolster the Environmental Science aspect of our graduate program. Dr. Reibel is heading a Title V Graduate Program proposal. Currently about one-third of our Master's students do their Masters thesis in areas of Environmental Science.

We do not have an industry advisory board, although we have received a recent award of \$115,000 from the Prete Foundation to provide scholarships in Environmental Science in the next year.

BS Environmental Biology

The field of environmental biology translates what we know about biology and natural systems into practical solutions for life, productivity, and environmental quality. This rapidly growing discipline embraces such diverse topics as maintaining healthy workplaces and homes, sustaining production of food and other products from agricultural ecosystems, ensuring the health of natural ecosystems, and preserving the diversity of life on our planet. Because of increasing demands and pressures on the biosphere, environmental biologists will need specialized training to address the complex problems of the new millennium.

The Biological Sciences Department at Cal Poly Pomona added a program in Environmental Biology to its curriculum in 2003 to meet these demands, becoming the first such program in southern California. The Department has several options for majors in Environmental Biology and a multitude of study sites to explore, creating a rich environment for students interested in the environment. With faculty and students carrying out research at an on-campus ecological reserve, a nearby desert-studies field station, sea-going research vessels, and nearby mountain, desert and marine habitats, there are abundant opportunities for field studies and innovative research opportunities. As environmental awareness is surging across campus, students and professors in the Biological Sciences Department are studying environmental problems locally and around the world.

MS Regenerative Studies

The program's interdisciplinary emphasis combines environmental design disciplines from ENV with other disciplines across the University, such as Science, Geography and Engineering. Note that undergraduate students also may minor in Regenerative Studies. The program has strong industry support (especially from emerging "green businesses" and traditional design firms) exemplified by Amonix donation of two state-of-the-art solar panels and a \$1.2 million endowment from the family of one of the founders of Valley Crest, one of the biggest landscape management companies in the U.S.

Sacramento

BA Biological Conservation

The curriculum in Biological Conservation is designed to prepare students for careers in the fields of fisheries and wildlife biology/management, conservation biology, natural resource conservation, environmental impact assessment, and related areas. This curriculum meets the educational requirements for various entry level career positions with state and federal agencies. Students majoring in this concentration are urged to obtain on-the-job training with conservation agencies (such as California Department of Fish and Game) through summer or part-time employment, or through internships

MS Biological Conservation

The curriculum in Biological Conservation is designed to prepare students for careers in the fields of fisheries and wildlife biology/management, conservation biology, natural resource conservation, environmental impact assessment, and related areas. This curriculum meets the educational requirements for various entry level career positions with state and federal agencies. Students majoring in this concentration are urged to obtain on-the-job training with conservation agencies (such as California Department of Fish and Game) through summer or part-time employment, or through internships

BS Chemistry

MS Chemistry

The Department of Chemistry is accredited by the American Chemical Society, and students graduating with the BS degree will receive a certificate from the Society.

BA Environmental Studies

The Environmental Studies program uses methods from the natural and social sciences as well as the humanities, especially history and ethics, to prepare students for a variety of career and personal opportunities. Students from the program go into environmental science, law, assessment, policy, education, economics, ecological management, business, and related activities. The program has been training these students to think in interdisciplinary ways about sustainability for more than thirty years. Students are required to complete another major or a minor in a related field; they are encouraged to do internships to achieve work experience; and they are required to complete a senior thesis as a major research and writing capstone experience.

BS Geology

Geology is the study of the earth, its environments, and its history. It is an interdisciplinary science that combines geological observations and concepts with those of biology, chemistry, physics, and mathematics. Its goals are to study rocks, minerals, fossils, and energy and water resources, and to understand geologic principles and processes that shape the earth and its environments.

BA Physical Geography, Certificate in Resource Planning

Geography students at Sacramento State explore Earth's natural and cultural landscapes using methods from the natural sciences and the social sciences. Students study climate, weather, landforms, water resources, plants and animals, and at the same time, peoples, societies, economies, and cities. Students use a variety of tools, including Global Positioning Systems (GPS), Geographic Information Systems (GIS), and other computer applications to collect, display, and analyze spatial data. Students of geography study and address complex issues, especially those with a human-environment interface, such as climate change, resource degradation, urban growth and design, globalization, immigration, and ethnic and territorial conflict.

BS Physics

Physics is the most fundamental science and underlies our understanding of nearly all areas of science and technology. In a broad sense, physics is concerned with the study of energy, space, and matter, and with the interactions between matter and the laws that govern these interactions. More specifically, physicists study mechanics, heat, light, electric and magnetic fields, gravitation, relativity, atomic and nuclear physics, and condensed matter physics.

San Bernardino

B.A. Environmental Studies

This interdisciplinary major is housed in the Department of Geography and Environmental Studies and offers courses in Geography, Biology, Chemistry, Anthropology, Geology, Health Science, Economics, Math, and Physics. The program offers two tracks: One is designed as a focus on a study of the environment as part of a broader liberal arts curriculum, and the other prepares students for an environment-related career or for graduate school.

MS Environmental Sciences, with Professional Science Master's and Geology options PSM option is multidisciplinary with internship required. Geology option is standard thesis track. No formal industry advisory board; however the students often work with the Water Resources Institute, which has an advisory board, and completes internships with the affiliated organizations

BS Health Science, with Concentration in Environmental Health Science

This is a choice program for students to become registered environmental health specialists with knowledge and skills to *respond* to public health threats (chemical spills, natural disasters, bioterrorism); *investigate* cause of disease transmission; *inspect* regulated businesses (animal establishments, food facilities, waste generators); *review* environmental

legislation; and *enforce* state and local environmental regulations. Job opportunities exist at local and state environmental health agencies (as health inspectors), special districts (air quality management, vector control, water quality management, conservation, schools), US Public Health Service -Commissioned Corps (environmental health officers from nationally accredited programs only), and the private sector (hospitals, retail giants, chain restaurants, environmental groups, insurance companies). Graduates can also become industrial hygienists or occupational health and safety specialists with placement opportunities in both public (local and state) and private (institutional, commercial and industrial) sectors.

The CSUSB Environmental Health Science Program is one of three undergraduate programs in California fully approved by the California Environmental Health Specialist Registration Committee under the Health and Safety Code, section 106735. The program is among 28 undergraduate programs in the county accredited by the National Environmental Health Science and Protection Accreditation Council. Graduate of this program are eligible for recruitment as environmental health officers in the US Public Health Service-Commissioned Corps. The program has an advisory committee with representatives from the county environmental health services, air quality management districts, vector control districts, Santa Ana watershed project authority, and the San Bernardino community college district, all across the service area of the university.

San Diego

BS Biology, with an Emphasis in Ecology

Growing demand and expansion of general interest in and concern for the environment increases society's needs for biologists. Precursor for working in government agencies involved in environment protection, public health and conservation need ecologists, inspectors, wildlife, forest, coast and park managers. There is an opportunity for fulfillment and growth in the field of biology.

MA Biology, with a Concentration in Ecology MS Biology, with a Concentration in Ecology

These programs emphasize quantitative approaches to ecological research and the framing of problems within the general context of ecological theory. Faculty and student research currently falls into the areas of limnology, marine ecology, plant community ecology and primary productivity, physiological plant ecology, marine aquaculture and fisheries ecology, animal population ecology and energetics, ecological genetics, ecosystems management, and systems ecology.

MS Civil Engineering, with a Concentration in Environmental Engineering

The Department of Civil, Construction, and Environmental Engineering offers graduate study leading to the Master of Science degree in civil engineering. Available areas of study include a concentration in environmental engineering and specializations in construction engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources engineering. Programs of study may also include combinations of the

above areas and related courses from other disciplines subject to the approval of the graduate adviser.

PhD Ecology, offered jointly with University of California, Davis

The cooperating faculties of the Department of Biology, San Diego State University and the Graduate Group in Ecology, University of California, Davis offer a joint program in ecology leading to the Ph.D. The research interests of the participating faculty members cover a wide range of problems and represent the interdisciplinary nature of modern biology. At SDSU, the research projects are underway concerning coastal and marine ecology, ecosystem ecology and global change, and restoration and conservation ecology.

Minor in Energy Studies

Minor in Environment and Society

BS Environmental Engineering (B.S.)

Environmental engineering involves the identification and design of solutions for environmental problems. Society's most crucial environmental problems, such as providing safe drinking water, treatment and proper disposal of wastes, water and air pollution control, remediation of sites contaminated with spills or improper disposal of hazardous substances, are handled by environmental engineers. Environmental engineers are technical professionals who possess the scientific knowledge to identify, design, build and operate systems that protect the environment from the impact of human activities, and as such make modern society possible.

The environmental engineering field and environmental engineering education are multidisciplinary. The B.S. degree provides a solid foundation in the fundamentals of mathematics, physics, chemistry, and engineering design that are needed to practice the profession or to pursue a graduate degree. Environmental engineering education also includes a range of other disciplines, such as biology, computer science, ecology, economics, geological sciences, and public health. To be able to address the spectrum of issues facing the environmental engineers are broadly educated, as well as technically trained.

Environmental engineers are needed in both the private and public sectors. They are employed by engineering consulting firms that work in environmental pollution control, industries that need to comply with pollution emission and discharge regulations, private and municipal agencies that supply drinking water, treat and dispose wastes, government agencies that monitor and regulate waste discharges and air emissions, private and government laboratories, and universities that conduct environmental research, international agencies that transfer knowledge to the developing world, and public-interest groups that advocate environmental protection.

BS Environmental Sciences

This program provides students with a rigorous foundation in natural and biological sciences most relevant to environmental issues, allowing successful graduates to solve complex

problems. While the focus is on physical environmental sciences, some required coursework includes biology, computer science, geography, and statistics. Upon completion of the degree, students will be prepared to confront real-world problems through the gathering and disseminating of environmental information. This major is especially attractive to students who wish to obtain a broader background in natural sciences and biological sciences, or students who wish to take an interdisciplinary approach to natural and biological sciences.

BS Environmental Sciences, with an Emphasis in Watershed Science

Environmental sciences has a strong geographic component. Understanding how vegetation, soils, climate, water, and human activities interact within a spatial context is the basis for watershed analysis. Students in this emphasis will a) acquire a fundamental background in the scientific fields that contribute to watershed analysis (geology and geomorphology, hydrology, ecology, and climatology) and b) develop skills and techniques that are important in applying and integrating this knowledge within a spatial context to address watershed science and management challenges at local to regional scales.

Certificate in Environmental Studies

The Environmental Studies Certificate is designed for students already holding a bachelor's degree (in any field) who desire to increase their understanding of the theoretical and applied approaches to environmental problems and issues. This is not a certificate program in the hard sciences, but rather is intended to provide diverse ways for students to develop knowledge of the causes and consequences of the human impact on the environment and the impact on humans of philosophical, political, economic, spatial, and natural science perspectives. This professional development program offers a multi-disciplinary approach to environmental studies for natural resource managers, teachers, community activists, and others who are concerned about the interaction of people and the environment.

BA Geography, with an Emphasis in Natural Resource and Environmental Geography

Environmental geography is concerned with human impacts on the earth; urban and regional analysis dealing with the form of cities and the dynamics of regional systems.

Certificate in Green Energy Management (Extended Studies)

The Green Energy Management courses will emphasize an energy overview, a history of energy uses, policies, laws legislation, green workforce and energy trends, energy efficient technologies, solar, sustainable back-up heating systems and renewable energy options, how to convert to renewable energy, green sales strategies and concepts, and new trends. Students will learn to identify various energy conservation techniques as well as equipment which can be installed to further conserve energy.

Certificate in Residential and Commercial Sustainable Practices (Extended Studies)

The Sustainable Practices Certificate offers best practices and sustainable trends in order to take a proactive role in driving the workforce and the home. Students will define sustainability; learn the history of green, new policies and laws, codes and standards, new trends, all with a focus on green jobs. In addition, students will gain critical perspective and understanding of sustainable management in work and residential environments, and in career options.

BA Social Science, with an Emphasis in Environmental Studies

The social science major with an emphasis in environmental studies provides an opportunity for the student to gain an interdisciplinary perspective on the complex relationship between humans and the natural world. Students in the emphasis will take courses in the humanities, social sciences, and natural sciences, and will identify a topic or theme for their individualized program of study.

MPH, Public Health, with a Concentration in Environmental Health

Identification, evaluation and control of chemical, biological and physical agents in the environment. Current emphasis is on U.S.-Mexico border issues and on applying emerging technologies to environmental programs.

San Francisco

BS Atmospheric and Oceanic Sciences, with concentrations in Meteorology and Oceanography

This program, strong in environmental content, was developed to prepare students for careers in the fields of meteorology and oceanography. Several graduates have gone on to prestigious PhD programs.

BA Earth Sciences

The earth sciences major serves the purposes of preparing students to teach in earth science secondary education programs and of educating students to do environmental reporting on earth science related issues.

BS Environmental Studies, with a Concentration in Natural Resource Management and Conservation

This concentration provides students with the theoretical and applied knowledge and skills in ecology, conservation biology, and natural resources they need to address natural resource management and conservation issues. The program has a very good track record of graduates working for agencies such as the U.S. Environmental Protection Agency.

BS Environmental Studies, with a Concentration in Earth System Science

This concentration is for students interested in studying the environment through the physical sciences of geology, meteorology, oceanography, hydrology, and chemistry.

MS Environmental Sciences, with Professional Science Master's and Geology options PSM option is multidisciplinary with internship required. Geology option is standard thesis track. No formal industry advisory board; however the students often work with the Water Resources Institute, which has an advisory board, and completes internships with the affiliated organizations

BA Environmental Studies, with a Concentration in Environmental Sustainability and Social Justice

This concentration provides students with a theoretical and applied understanding of the issues of sustainability and the connections between social justice and environmental problems and solutions. This is one of the few in the nation covering this important and growing area (for example students have long studied the possible role of green jobs to address the dual roles of environment and poverty).

BA Environmental Studies, with a Concentration in Urban Environment

This concentration provides students with a strong interdisciplinary theoretical and empirical understanding for dealing with environmental issues in urban settings.

BA Environmental Studies, with a Concentration in Humanities and the Environment

This concentration explores the varied and complex ways that different cultures—past and present—view and communicate about the environment.

San José

BS in Biological Sciences, Concentration in Conservation and Organismal Biology

The Department of Biological Sciences enrolls over 600 undergraduate and 100 graduate majors whose studies range from conservation biology to fisheries management. The department is known for its strong undergraduate and master's programs in Conservation and Organismal Biology and recently established a Biodiversity Center involving 11 Department faculty. This degree program prepares students for careers in conservation and resource management.

BS in Biological Sciences, Concentration in Marine Biology

Prepares students for careers in marine conservation and resource management

MS in Biological Sciences, Concentration in Organismal Biology, Conservation and Ecology

Rigorous research-based program. Excellent preparation for Ph.D. programs.

BS in Civil Engineering

SJSU's engineering program is ranked 12th among engineering programs for master's-level institutions in the most recent edition of "America's Best Colleges 2009" by *U.S. News & World Report*. The focus of the civil engineering curriculum is to train students to plan, design and supervise construction of water supply and distribution systems, communications networks and transportation systems. SJSU's Civil Engineering program embraces the latest in modern technology to solve many of the most important environmental and social challenges facing society.

MS Civil Engineering

This program prepares students for careers in green building, water resources engineering, and sustainable transportation at mid-level and is also an excellent preparation for Ph.D. programs.

BA in Earth Science

The Bay Area Earth Science Initiative has provided professional development to over 100 K-12 teachers in earth science, environmental, and climate science for each year for the past 25 years.

MS in Engineering, with an Emphasis in Green Technology

The MSE Green Technology program with a focus on solar technologies will instruct students about the basics of green tech, sustainability, life cycle issues, and related topics. It was developed with the assistance of a green engineering advisory group and has been offered since Fall 2009. The program will also offer a solid background in related business, finance, and policy issues that must be factored in with the development and application of green technologies. Electives in the solar area will allow students to focus their academic program on a topic area that is critical to achieving global sustainability.

BS in Environmental Studies

Founded in 1970 as one of the first six interdisciplinary departments focused on the environment in the U.S. after the first Earth Day, these programs constitute an area of strength for the University. The programs provide students with a foundation in the natural and social sciences most relevant to sustainability. Programs are based on the concept of sustainability—balancing environmental, social, and economic issues for the overall benefit of people and the planet. All Environmental studies degrees provide students with an interdisciplinary background in issues ranging from environmental ethics to endangered species. Plans are underway to obtain Advisory Boards.

BS Environmental Studies, with a Concentration in Energy

This concentration provides students with a focus on energy conservation and renewable energy sources. Typical students careers in this area include energy specialists with utility providers such as PG&E, and positions in renewable energy companies, and municipalities.

BS Environmental Studies, with a Concentration in Environmental Impact Assessment This concentration provides students with expertise on the California Environmental Quality Act's (CEQA) intents and implementation. Graduates are prepared to be CEQA Specialists in city and county planning departments and consulting firms.

BS Environmental Studies, with a Concentration in Environmental Restoration and Resource Management

This concentration provides students with theoretical and applied knowledge in the management of restoration projects and natural resources, especially forests & wetlands. Graduates are prepared for careers as Environmental Restoration Specialists for park districts, municipalities, land management agencies, government agencies, and consulting firms.

BS Environmental Studies, with a Minor in Climate Change Strategies

This is a joint degree with Meteorology. Graduates gain knowledge of climate change science and policy solutions for addressing its adverse impacts.

BA Environmental Studies, with Minor in Energy Policy and Green Building

This program provides students with a focus on energy policy and its integration with green building. Program prepares graduates for future careers as Energy Policy Specialists and green building consultants.

BA Environmental Studies, with Minor in Sustainable Water Resources

This program provides students with a focus water supply, use, treatment, and reuse, with an emphasis on policy and sustainable management. Geographical focus is California and the U.S. West. Program prepares graduates for future careers as Energy Policy Specialists and green building consultants.

BA Environmental Studies, with a Minor in Park Ranger and Administration

This is a joint degree with West Valley Community College. Prepares students for positions in park administration and land management.

BA Environmental Studies, Teacher Preparation

This major is designed to meet California Commission on Teacher Credentialing requirements for diversified subject matter preparation. It prepares students for careers in K-12 education and as environmental educators.

MS Environmental Studies

This is a rigorous thesis-based program in which all students conduct original research on an interdisciplinary environmental issue. It is one of the oldest and most well respected interdisciplinary Master's program of its kind in the state and is a particular strength of the University.

BS Geology

Degree offers flexible program that prepares students for admission to graduate programs in the geosciences, and for entry-level positions in engineering, geophysical and geological firms; in engineering, hazardous materials, regulatory, or ecological firms; in computer mapping firms; and in local, regional, and state government agencies.

MS Geology

Graduates are employed as geologists, engineering geologists, hydrogeologists, hydrologists, geophysicists and environmental managers (in engineering, geological, geophysical and environmental consulting firms and in the mining and petroleum industries.)

Minor Green Engineering

The goals of this minor are to apply the principles of green and sustainable engineering to engineering problems; promote student understanding of sustainable energy conversion and storage; analyze the economic and environmental impact of biofuels, photovoltaics,

rechargeable batteries, and fuel cells; promote student research projects that apply new sustainable and environmentally sound technologies and methods to real world problems; and use life cycle thinking in engineering activities. The Green Engineering minor is housed in the General Engineering department at SJSU. It was developed with the assistance of a green engineering advisory group.

BS Industrial Technology

Curriculum has recently been entirely redesigned to address industry needs for sustainable manufacturing and green product design. The program prepares students for careers in Clean Tech engineering and product design.

BA Life Science, Concentration in Biodiversity Stewardship

This program prepares students for careers in conservation and resource management.

MS Marine Science

Moss Landing Marine Labs

Moss Landing Marine Labs is an internationally recognized center for Marine Science research center supported by a consortium of seven California State Universities. Faculty and affiliated researchers conduct cutting-edge research in fields including marine reptiles, birds and mammals; chemical oceanography (trace metals); and sediment and nutrient transport. The MS is a rigorous research-based program that prepares students for mid-level positions in industry, government, and non-governmental organizations and is excellent preparation for Ph.D. programs. This is an environmental area of strength.

BS Meteorology

SJSU is home to the only meteorology program in the CSU system, training students in weather forecasting, collection and analysis of climate data, and the environmental implications of climate change. The department offers a "Training the Weather Forecasters of Tomorrow" program, a two-week summer field program in weather analysis for undergraduate and graduate students.

BS Meteorology, Concentration in Climate Science

The degree is designed to prepare students for careers in emerging fields of climate change studies and mitigation, and related fields including energy and carbon management. Graduating students will be ready to begin careers in the private sector or in government, or will be ready to enter graduate programs in the atmospheric/climate sciences.

MS Meteorology

Research-based degree program covering topics in urban air pollution, climate change (atmospheric dynamics), regional wind modeling, and wind energy assessment.

Minor in Meteorology

Provides students with proficiency in meteorology that complements larger degree program.

MS in Urban Planning with Specialization in Environmental Planning

The linkage between the built environment and the natural environment is a subject of growing concern to planners at the local, regional, and national levels. This concentration prepares graduates to understand the linkages between land use patterns and the natural environment, as well as the policy tools that planners use to promote sustainable urban development.

San Luis Obispo

Bachelor of Architecture

MS Architecture

Preparation for architecture spans several different disciplines and requires a range of aptitudes. As the architect has a responsibility for solving problems of the built environment involving people, an understanding and sensitivity to human needs is required.

BS Architectural Engineering

The program carefully addresses architectural design, constructability issues, life safety and economy of construction. Course projects address realistic design criteria, such as economic implications and environmental, social, ethical and sustainability issues.

BS Biochemistry with Concentration in Polymers and Coatings

BS Biological Sciences

Students have the opportunity to concentrate in the following environment-related areas: ecology, field and wildlife biology, marine biology and fisheries, and systematics and biodiversity.

MS Biological Sciences

Students have the opportunity to concentrate in the following environment-related areas: ecology, field and wildlife biology, marine biology and fisheries, and systematics and biodiversity.

BS Chemistry with Concentration in Polymers and Coatings

BS City and Regional Planning

The profession of city and regional planning involves helping people and communities manage growth and change in their physical, social and economic environments.

MS Civil and Environmental Engineering

The areas of study include control of air and water pollution, industrial hygiene, environmental health and safety, solid waste, hazardous waste management and pollution prevention. *Industrial Advisory Board*

BS Construction Management

The program's major emphasis is on organizing and managing the construction phase of society's efforts to improve the environment.

BS Earth Sciences

This program provides a strong foundation for understanding and improving the utilization of land, water and atmospheric resources. Areas of concentration include: climate change studies, environmental interpretation and assessment and land and water resources.

BS Environmental Management and Protection

This is an interdisciplinary study integrating the biophysical and social/economic/political sciences. The curriculum emphasizes management and protection of ecosystems and processes that sustain uses of environmental resources. Students concentrate in areas of environmental impact mitigation strategies, environmental policy and management or watershed management.

BS Environmental Engineering

The areas of study include control of air and water pollution, industrial hygiene, environmental health and safety, solid waste, hazardous waste management and pollution prevention. *Industrial Advisory Board*

BS Forestry and Natural Resources

Students prepare for careers in the protection and management of our forest and natural resources, with areas of concentration that include environmental management, watershed management, and forest and environmental practices.

Bachelor of Landscape Architecture

The profession of landscape architecture is primarily involved with the design, planning and protection of the natural and developed environments

MS Polymers and Coatings

There is substantial course content related to the environmental impact of coatings and recent developments to minimize those impacts. Students and faculty are also engaged in research to develop biodegradable polymers for a variety of applications. Cal Poly has become the leading research center in the U.S. for development of new methods of detecting and quantifying volatile organic compounds (VOCs) from paints and coatings. Faculty routinely offer special courses and training for industrial and research scientists from around the world in the environmental aspects of polymers and coatings. Program faculty led a nationwide effort to develop a standard for recycled paint which has resulted in substantial increases in the collection of unused paint and the sale of recycled paint across the nation. The Polymers and Coatings program has an active *Industrial Advisory Council*.

BS Soil Science

This program includes concentrated study in environmental management, environmental science and technology, and land resources.

San Marcos

BA Environmental Studies (Pending Chancellor's Office Approval—proposed for implementation in fall 2011)

This is an interdisciplinary program combining traditional foundation courses (natural and life sciences, social sciences, research methods), with required courses in environmental and land-use planning, and environmental arts and humanities. The major will combine these theoretical underpinnings with applied professional skills (GIS, design, research methods, planning law) while simultaneously developing students' aesthetic and ethical appreciation of the environment.

No formal advisory committee exists at this time, but proposers were taking into account regional needs as indicated in, for example, a July 2006 San Diego Association of Governments 9SANDAG) survey that indicated that environmental-related issues were among San Diego's leading problems, specifically reporting problems of traffic congestion, housing, population growth, water supplies, protecting beaches from pollution, and securing reliable energy sources. The coursework in the major addresses—either directly or indirectly –all of these key regional concerns. In particular, the proposed major will emphasize issues of resource/energy management, protecting the region's environmental amenities (e.g., beaches), as well as urban planning issues such as housing, transportation, and population growth/overcrowding.

Sonoma

BS Biology, with a Concentration in Ecology, Evolution and Conservation BS in Biology, with a Concentration in Marine Biology

The biology curriculum, supported by physical sciences and mathematics, is designed to provide students with a strong background in the principles of biology and rigorous upperdivision instruction. This combination of breadth and in-depth instruction allows students to develop the intellectual foundations and the skills necessary to deal with the specific biological concerns of today and the flexibility to meet the needs of the profession.

MS Biology

Some graduates of this program advance to doctoral programs, while others use the degree to pursue careers in teaching, research, environmental consulting, resource management, industry, and various health professions.

BS Chemistry

In this program, certified by the American Chemical Society, all students do undergraduate research projects before completing the degree. Upper-division coursework incorporates research projects that allow students to excel in initiative, teamwork, and competence in chemistry. During these research projects, each student works directly with a professor.

BA Environmental Studies

This degree program offers curricular specialization tracks in Conservation and Restoration, Education and the Environment, Energy Management and Design, Outdoor Leadership and concentrations in City and Regional Planning and Water Quality Technology, and Hazardous Materials Management.

BS Environmental Studies

The bachelor of science program has a curricular specialization track in Energy Management and Design, as well as offering concentrations in Water Quality Technology and Hazardous Materials Management.

Both of the programs use the Sonoma State University Environmental Technology Center (ETC) as a center for learning. The ETC is a model for sustainable building techniques and technologies, featuring extensive energy management control technologies, environmentally-sensitive materials, passive solar heating and cooling, day-lighting technologies, and a roof-integrated photovoltaic system. It serves as a training facility for building professionals and teachers as well as an educational and research site.

BS Geology

The B.S. and B.A. degrees provide an excellent background for graduate school and for work in geology in such fields as environmental geology, hydrology, and mineral exploration. Many of our geology graduates work for consulting firms with specialties in one or more of these areas.

Stanislaus

MS Ecology and Sustainability, with Concentrations in Ecological Conservation and Ecological Economics

The San Joaquin Valley is home to a large number of unique species and ecological communities that are found nowhere else. Many of the species are rare and already at risk, and it is feared that the rapidly-growing human population will result in increased humannature conflicts, further impacting ecological integrity and possibly even the continued existence of some species and communities. The MS in Ecology and Sustainability program provides graduates with the expertise, knowledge, and skills to address these and other pressing environmental issues in this region. The overarching goal across both concentrations is to graduate students who are successful in effecting changes in the central Valley (and elsewhere), changes that lead to a more sustainable future. An industry advisory board is not involved at this time.