

# Environmental Assessment (EA)

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## **EA 501 Environmental Stressors** (3 credit hours)

Introduces students to how organisms are affected by and respond to changes or stressors - both natural and human-induced - in the environment. With a focus on the concepts most significant to the field of environmental assessment, the course emphasizes the fundamental processes and effects of pollutants and naturally-occurring substances in the environment, including emerging issues and historically significant cases.

Prerequisite: Graduate standing

*Typically offered in Fall only*

## **EA 502 Environmental Risk Assessment** (3 credit hours)

This course provides students with an appreciation and understanding of the principles of environmental risk assessment including: Hazard Identification, Toxicity Assessment, Exposure Assessment, and Risk Characterization. Emphasis is placed on contemporary problems in human health and the environment, and it will be based on the most current methodologies described in the "Risk Assessment Guidance for Superfund." Enrollment in the course requires graduate standing or consent of the instructor. Two semester sequence of college biology & college chemistry.

Prerequisite: Two semester sequence of college biology & college chemistry.

*Typically offered in Spring only*

## **EA 503 Environmental Exposure Assessment** (3 credit hours)

Provides students with an appreciation and understanding of the principles of environmental exposure assessment including the sources, transport and fate of chemicals in the environment. Emphasis is on contemporary problems in human health and the environment, covering topics such as: transformation and degradation processes, classes of contaminants as well as predicting environmental fate and exposure. Enrollment in the course requires graduate standing or consent of the instructor. Two semester sequence of college biology & college chemistry.

Prerequisite: Two semester sequence of college biology & college chemistry.

*Typically offered in Fall only*

## **EA 504 Environmental Monitoring and Analysis** (3 credit hours)

Monitoring and analysis of chemical and biological impacts to the environment. Theory of chemical, physical, biological, and ecological monitoring. Planning and conducting environmental sampling and monitoring programs. Management, analysis, and quality assurance and control. Enrollment in the course requires graduate standing or consent of the instructor.

Prerequisite: One Year College Biology and One Year College Chemistry

*Typically offered in Spring only*

## **EA 505 Environmental Assessment Law & Policy** (3 credit hours)

This course provides students with an appreciation for and understanding of the principles of environmental law and policy. Emphasis is on the US legal system and litigation process relevant to environmental law, covering topics such as: the National Environmental Policy Act (NEPA), the Pollution Prevention Act (PPA), the Clean Water Act, and the Clean Air Act. Throughout the course, a case study is integrated into the conceptual lecture material with the intent of providing practical examples to conceptual material.

Prerequisite: Graduate Standing

*Typically offered in Fall only*

## **EA 506 Water Quality Assessment** (3 credit hours)

Introduces students to topics fundamental to the understanding of aquatic systems and the processes that influence water quality. Covered topics include the hydrologic cycle, water chemistry, aquatic ecology, aquatic toxicology, water quality laws and standards, water quality assessment and techniques, and water pollution control and treatment. Emphasis is on contemporary water quality issues such as nutrient enrichment, introduced species, contaminants, and climate change.

Prerequisite: Graduate standing

*Typically offered in Spring only*

## **EA 507 National Environmental Policy Act Procedures** (3 credit hours)

Procedures and requirements for implementing the National Environmental Policy Act (NEPA) when projects involve a federal nexus, including permitting and consultation among agencies in the planning process. Illustrating the five NEPA mandates and examining implications for data generation and monitoring that result from responsibilities vested in the Council of Environmental Quality.

*Typically offered in Fall only*

## **EA 508 Data Analysis in Environmental Assessment** (3 credit hours)

This course provides students with an appreciation and broad understanding of environmental data, their analysis, and use in exposure and risk assessments. Topic areas include sources and types of environmental data and exposure/risk models; environmental data processing, cleansing, and visualization techniques; and a refresher to basic environmental data analyses useful for comparisons and evaluation. Numerous case-study activities are used to demonstrate learned concepts using publicly available data from environmental research publications and databases. Emphasis is placed on practical applications commonly used in environmental and health analyses and will be focused on data tools available in spreadsheet programs (e.g., Microsoft Excel(TM), Google sheets).

P: Graduate Standing

*Typically offered in Summer only*

**EA 509 Air Quality for Environmental Assessment and Fire Science** (3 credit hours)

Students will learn about assessment of air quality and will examine specific air pollutant problems induced by wildfire. The course will begin with a review of the criteria air pollutants, including sources, chemistry, transport, and dispersion. The majority of the course will focus on environmental assessment of the criteria pollutants. Units will include requirements of the National Ambient Air Quality Standards (NAAQS), monitoring methods and their biases, air pollution monitoring networks, compliance, permitting, and air pollution effects on health, ecology, climate, and equity. Throughout the semester, we will examine these topics through cases pertaining to wildfires.

P: Graduate Standing

*Typically offered in Fall only*

**EA 520 Renewable Energy Policy and Economics** (3 credit hours)

This course will cover global frameworks, as well as local, utility, state and federal policy and incentives that foster renewable energy implementation. It will also cover fundamental concepts of finance and economics to build a renewable energy project model that show how these policies affect the economics of a renewable energy project.

Prerequisite: Graduate standing

*Typically offered in Fall only*

**EA 521 Fundamentals of Renewable Energy Site Assessment** (3 credit hours)

This course will cover solar site assessment, wind assessment, and bioenergy with required exercises using current industry tools to assess the viability of the resource. Overview of the historical and current role of wind, solar, and bioenergy power technologies globally and the direction of each sector's evolution for the future, particularly in the USA. The course emphasizes the technology behind power generation for wind, solar, and bioenergy sectors. Students will evaluate policy and permitting issues and, consequently, determine if a site is appropriate for implementation of either or all of these technologies.

Prerequisite: Graduate Standing

*Typically offered in Spring only*

**EA 522 Photovoltaic Design and Assessment** (3 credit hours)

This course covers fundamental principles of the application, design, installation, and operation & maintenance of Photovoltaic (PV) systems in order to properly assess the best system options for a specific project or application. The course will begin with some background on electric energy and its use and delivery. In addition, the course will cover economic implications of the site and PV system considerations. Building on this foundation we will then take an in-depth look at solar photovoltaic function and design to aide students in assessing the environmental, and financial, sustainability of the project. This interdisciplinary approach allows the student to gain a comprehensive understanding of photovoltaics beyond the technical, and caters to individuals across a range of experience and expertise.

Prerequisite: Graduate Standing

*Typically offered in Fall only*

**EA 523 Assessment of Renewable Energy Storage Systems** (3 credit hours)

Energy Storage and operations and maintenance have become two areas in clean energy, particularly in the PV industry that have been rapidly evolving. This course will offer the basics of battery technology, as well as current market trends and incentives, to provide students timeless tools to assess the best possible option for a specific renewable energy + storage project. Meanwhile, the operations and maintenance portion will go through industry best practices that not only deal with technical management of a solar asset, but also understanding financial implications of the project. This interdisciplinary approach allows students of diverse STEM and non-STEM professional experience and expertise to gain a comprehensive understanding of this aspect of the solar industry.

Prerequisite: Graduate Standing and EA 522

*Typically offered in Spring only*

**EA 590 Special Topics in Environmental Assessment** (1-6 credit hours)**EA 665 Professional Project** (1-6 credit hours)

Environmental assessment project conducted under the mentorship of a member of the graduate faculty.

Prerequisite: EA 502, EA 503, and EA 504

*Typically offered in Fall, Spring, and Summer*