

GEOL-G490 Coastal Environments & Sustainability And Virgin Island Experiential Field Study Course Syllabus (DRAFT)

The mission of the VI Experiential Field Study program is to provide a field-based integrative learning experience in the Virgin Islands for IUPUI's advanced BSES students. Students will explore the dynamic inter-relationships between ecological and human systems within the context of conservation and sustainability. Through lectures, service learning, research, and fieldwork, students will become equipped with the tools necessary to investigate, understand, and positively impact the environment around them.

Location & Time:

- Course Meetings: classroom, time and date to be determined. The class will meet weekly for two hours.
- VI Experiential Field Study: March 13 to March 23, 2013; St Croix, USVI, and Jost Van Dyke, BVI

Instructors:

Dr. Gabriel Filippelli

Professor, Dept. of Earth Sciences, SL118E

Director, BSES Program

Director, Center for Urban Health

gfilippe@iupui.edu

(317) 274-3795

Office Hours: TBD

Jennifer Nelson

Lecturer, Dept. of Earth Sciences, SL118S

Assistant to the Director, BSES Program

jsembach@iupui.edu

(317) 274-7732

Office Hours: TBD

Prerequisites:

BIOL-K341, CHEM-C341, GEOL-G306, GEOL-G430, GEOL-G406, GEOG-G315 or GEOG-G310

Course Description:

The Coastal Environments & Sustainability Course presents biological, chemical, geological and physical coastal systems concepts to help students make observations and draw conclusions about the dynamics of coastal environments within the context of sustainability and human interactions with those systems. Students apply the scientific method to a variety of hands-on learning experiences, including labs, field studies and service learning projects. Students evaluate human impacts and conservation strategies relevant to earth and water resources, both at home in the Midwest, and abroad in the Caribbean's Virgin Islands.

This course includes a 10-day field study program (Virgin Islands Experiential Field Study) that will occur during Spring Break of the semester-long course. Two days will be allocated for travel, and the remaining 8 days will consist of field studies, research, service learning projects, lectures, and/or cultural studies activities.

Upon returning to IUPUI, students will work in small groups to prepare a formal paper and oral presentation based on their focus project topic and research. To extend their learning to the Department and broader IUPUI community, student reports will include a proposal for an outreach and education component related to environmental science and sustainability.

Required Readings:

This course does not require a textbook. Required readings will include journal articles, fact sheets, and other scientific publications relevant to the field study site and research focus topics. Students will have at least one

required reading per class session. Readings will be handed out as paper copies or as PDF's administered through Oncourse and/or email.

Learning Outcomes:

Student learning outcomes include those specific to the B.S. Environmental Science degree program and the Earth/Water Resources Concentration. Upon completion of the course and associated field study, students will be able to:

- Solve environmental science problems using the scientific method and critical thinking.
- Evaluate physical, chemical and biological cycles related to surficial earth processes and how they operate to describe integrated earth systems from a local to global scale.
- Demonstrate competence in communicating environmental science problems to a broad audience through written, oral, and visual means.
- Describe the structure and function of major environmental systems.
- Effectively apply analytical skills, including basic measurement and monitoring skills, and use of appropriate technology.
- Understand current thinking and research on the nature, causes, and solutions of environmental problems as they affect human health and the environment.
- Develop knowledge in advanced disciplines of environmental sciences and evaluate inter-relationships between disciplines.
- Understand interactions between land, soil, and water and quantitatively assess processes in soils, hydrogeology, and biogeochemistry.
- Describe physical, chemical, and biological interactions and processes affecting soil and water resources.
- Apply advanced analytical techniques related to environmental quality assessments.

Class Format:

Class sessions will meet once per week for two hours. Course instructors will use lectures, readings, and discussion to present content that will build a foundation for the research students will complete during the experiential field study program. Lecture style will be interactive and student-driven. Videos, animations, and other media tools will be used to help student visualize and comprehend difficult concepts.

Class sessions will include two lab/field study methods classes to practice and apply the concepts and research methodologies discussed during lectures. These methods will be applied in the field studies, research, and service-learning projects in the Virgin Islands. Scientific investigation skills addressed in the methods classes include modeling, observation, inquiry, hypothesizing, problem solving, species identification, data collection, data representation, data analysis, and critical thinking. If student interest exists, one of these lab/field study sessions may include a visit to a local pool to practice snorkeling.

During class sessions students will select a focus research project that will become their final assessment for the course. Students will conduct their research during the VI Field Experience and will complete their analysis, written technical report, and oral presentation upon returning to IUPUI. As a capstone project for the BSES degree program, student research projects will require integration of course and degree program themes, disciplines and learning outcomes, as well as local and global perspectives. To encourage outreach throughout the Department and greater IUPUI community, students' focus projects will include a proposal for an environmental science/sustainability outreach and education component. In order to promote the program and recruit for subsequent years, participating students may be asked to discuss the program and present their final projects to other BSES faculty and students during departmental undergraduate seminars.

VI Experiential Field Study Format:

The Virgin Islands (VI) Experiential Field Study is a ten-day study abroad program based in the U.S. Virgin Islands (St. Croix) and British Virgin Islands (Jost Van Dyke). The VI Experiential Field Study is a required component of the course; students must be available and able to complete the 10-day trip over Spring Break. Complete details regarding health and safety, field activities, and logistical concerns will be discussed in class.

Daily instruction at the field sites will consist of two 3-hour sessions – one in the morning and one in the afternoon – in which students will participate in field studies, research, service learning projects, lectures, and/or cultural studies activities. Additionally, a 1-2 hour structured instructional activity (discussion, lecture, group project work, video) will occur each evening after dinner.

Each day will also include 1-3 hours of recreation time for students to explore the local surroundings, work on their projects, or rest. Students will be given explicit options for recreational activities by the Program Director. Recreational activities may include guided snorkeling, swimming, or kayaking, beach relaxation, visits to local cultural and historical sites, and/or guided hikes.

While on St. Croix, the group will reside at [Discovery Grove](#), an experiential learning camp located on the grounds of an historic sugar plantation near the North Shore. Students will live in separate male and female cabins, and will meet in a number of different common areas for meals, lectures, and course-related activities. While on Jost Van Dyke, the group will reside at [Ivan's White Bay Campground](#), located on the southwest end of the island and within walking distance (15 min.) from the [JVD Preservation Society](#) and the largest town on JVD, Great Harbour. For the days students are on JVD, the campground will serve as a home base for sleeping, showering, and preparing meals. Students will spend most of their time on JVD in the field conducting research. Students will live in separate male and female cabins, and will meet in a common area for meals, lectures, and course-related activities. Camp rules will be discussed at each site.

Physical Requirements for Student Participation:

Students must exhibit a level of physical fitness that will allow them to participate in activities at a recreational level. These activities include swimming, snorkeling, hiking, kayaking, and conducting fieldwork in a tropical environment. For all recreational activities that are not part of the formal curriculum, students will be required to be with at least one other student at all times and to complete a sign-in and sign-out sheet so the Program Director/coordinator is aware of their whereabouts at all times. For certain activities, students must also participate in a safety briefing prior to the activity that discusses proper attire (sun and foot protection), hydration, sunscreen, bug spray, proper diet, over-exertion, and natural hazards (wildlife, topography)

Service Learning Component:

The Department of Earth Sciences has established collaborative relationships with a variety of private, non-profit and governmental organizations throughout the Virgin Islands, including the University of the Virgin Islands, Discovery Grove, Caribbean Connections, VI Resource Conservation & Development Council, BVI National Parks Trust, and the Jost Van Dykes Preservation Society (JVDPS). Through these collaborations, students are afforded opportunities to assist in one or more of the following service learning projects: Coral Monitoring, Reef Fish Surveying, Lionfish Marking & Capture, Seagrass & Mangrove Monitoring and Planting, Water Quality Testing, Environmental Education & Outreach, Beach/Marine Debris Cleanups, Ecotourism Surveys, and Environmental Education.

Grading & Assessment Criteria:

Upon successful completion of the course, students earn 3 credits and satisfy the capstone experience required by the BSES degree program. Grades will be based upon completion of a student notebook and journal, lab and field activities, and a culminating research project paper and presentation. Participation in class sessions and in the entire VI Experiential field study will also be used to determine course grades. This course will use a standard percentage-based grading scale (A 90-100, B 80-89%, C 70-79%, D 60-69%, F <59%)

Grading Criteria:

- Science Notebook and Journal (entries and completion) —30%
- Labs and Field Activities (participation and completion) —30%
- Research Project Paper—20%
- Research Project Presentation – 10%
- Participation in class sessions and VI Experiential Field Study —10%

Guidelines for each of the criteria above will be discussed in-class and at the field site. Science notebook and journal entries will be discussed and assigned in class, and at the field site. You will be given written instructions for the final research project and presentation upon return from the field study portion of the class.

Academic Policies & Student Responsibilities

Students in this course are expected to abide the IUPUI Code of Student Responsibilities, outlined at <http://www.indiana.edu/~code/code/responsibilities/index.shtml>. Students should be familiar with all sections of this Code, including responsibilities related to Academic Misconduct and Personal Misconduct both On and Off Campus. Additionally, the students should be familiar with, and abide by, IU's Overseas Study Safety and Responsibility Guidelines, outlined at <http://overseas.iu.edu/policies/safety/index.shtml>, and IU's Overseas Study Academic Policies, outlined at <http://overseas.iu.edu/policies/academic/index.shtml>.

Violations of these codes and policies may result in verbal or written warnings, automatic withdrawal from the class, being sent home from the field study site, and/or failure of the class. These actions may result in consequences related to financial aid and academic progress. If you have any questions regarding academic and personal conduct in this course, and at the field site, please discuss them with your instructor.

Withdrawal, Refund and Non-payment Policies

This course will use IU's Overseas Studies policies on withdrawal, refund and non-payment as outlined at <http://overseas.iu.edu/policies/withdrawal.shtml>. If you decide to withdraw, you must follow the procedures outlined at this website. Please note that students who withdraw after a program begins should expect to repay any financial assistance awarded for the program.

Class Schedule (Semester Overview):

Week	Location	Course Content
1	IUPUI	Class Session: Orientation, Intro to Sustainability, Coastal Environments, Local / Global Connections
2	IUPUI	Class Session: Coastal Science / Coastal Processes
3	IUPUI	Class Session: Tropical Marine Ecosystems / Island Ecology
4	IUPUI	Class Session: Island Agroecology / Sustainable Agriculture
5	IUPUI	Class Session: Coastal Environments - Threats / Sustainability
6	IUPUI	Class Session: VI Geology & Ecosystems - St. Croix / BVI
7	IUPUI	Class Session: VI Geography / Culture / Natural History; Local/Global Connections
8	IUPUI	Lab / Field Study Methods
9	IUPUI	Lab / Field Study Methods
10	IUPUI	Pre-departure orientation (logistics, safety, security)
11	Virgin Islands (Spring Break)	VI Experiential Field Study Program: 10 days (2 for travel, 8 for fieldwork); see schedule below
12	IUPUI	Class Session / Post Trip Review & Project Planning
13	IUPUI	Class Session / Research & Project Prep
14	IUPUI	Class Session / Research & Project Prep
15	IUPUI	Class Session / Presentation & Final Reports
16	IUPUI	Class Session / Presentation & Final Reports

Virgin Islands Field Experience Schedule*:

Day	Location	Course Content
1	Travel to St. Croix, USVI	none
2	St. Croix, USVI	Field Study: Sustainable Agriculture
3	St. Croix, USVI	Field Study: Sustainable Agriculture
4	St. Croix, USVI	Field Study: Wetlands / Coastal Research
5	St. Croix, USVI	Field Study: Marine Science and Biobay
6	St. Croix, USVI	Field Study: Marine Science / Lab and Geology Hike
7	Travel to JVD, BVI	Field Study: VI Culture & History
8	JVD, BVI	Field Study: Coastal Environments / Ecotourism
9	JVD, BVI	Field Study: Coastal Environments and MPAs
10	Travel back to Indy	none

*Specific daily activities and topics will be discussed on-site. At each field site, the course instructors and coordinators will discuss relevant health and safety concerns, and orient students to the site.