Earth Institute Center for
Environmental Sustainability
EARTH INSTITUTE | COLUMBIA UNIVERSITY

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SEE-U

Summer Ecosystem Experiences *for* Undergraduates

Five week, six credit summer field courses in:

India | The Western Ghats

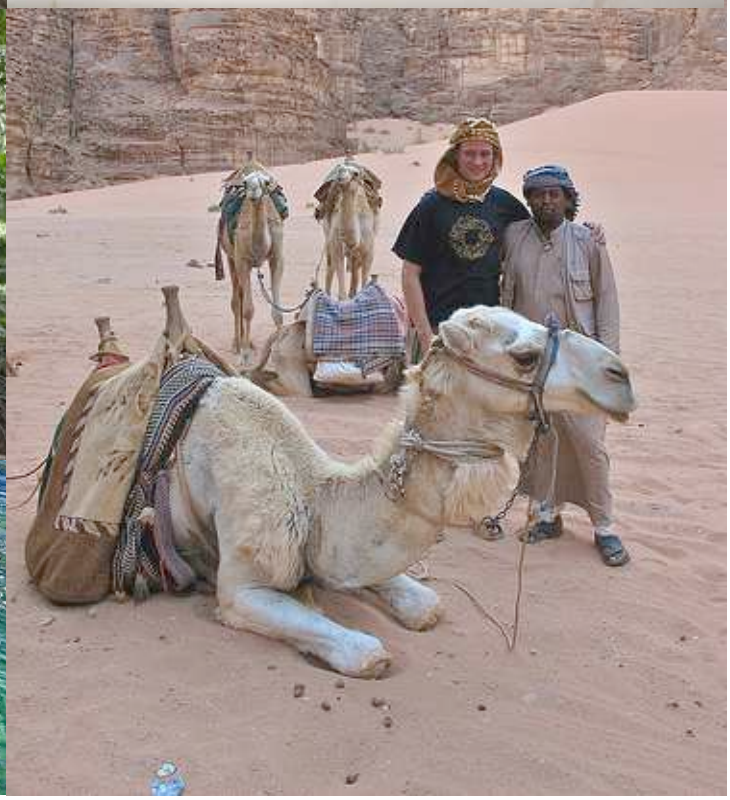
Jordan | Amman, Aqaba, Dana, & Ajloun

Brazil | The Atlantic Forest & Serra do Mar State Park

Program Overview

The Summer Ecosystem Experiences for Undergraduates (SEE-U) program provides undergraduate students of all majors with a global understanding of ecology and environmental sustainability. The SEE-U program gives you the opportunity to participate in a combination of lectures and labs, while conducting environmental fieldwork in unique natural settings around the world. In the words of one student:

"The SEE-U program is a life changing experience. This program teaches you not only about ecology and sustainable development but also about a new country, its culture, and, ultimately, more about yourself. SEE-U allows you to bond with your classmates and instructors in a way that is impossible to do in a formal classroom. These memories will last a lifetime."



Curriculum

The SEE-U program consists of introductory ecology and biology lectures, labs, and fieldwork activities. Lectures coincide with labs, activities, and topical discussions for the course, allowing you to apply classroom knowledge to practical field techniques in your chosen location.

The SEE-U program is designed for non-science majors as well as undergraduate students beginning scientific degree programs. There are no course prerequisites for the SEE-U program and no prior experience or knowledge of the topics, techniques, or computer programs used is required. All course instruction is in English.

Each week you will receive a schedule that outlines course reading assignments, lectures, and fieldwork activities. Typical daily activities revolve around a morning lecture and afternoon fieldwork, with full days of course instruction taking place Mondays through Saturdays.

Areas of Emphasis

Topics covered by the SEE-U program include: biomes, biotic ecological processes, abiotic processes, and contemporary issues in conservation biology and sustainable development.

Questions addressed by the program include:

- How do biomes differ from each other and what constitutes and distinguishes each major biome?
- How has evolution produced the natural history of currently existing species and why do these traits influence all other levels of ecological hierarchy?
- What are the natural constraints that control population size and what happens when they are disrupted?
- What structures biological communities? How do community members interact? How can we use the concept of community diversity to answer ecological questions?
- How does each level of an ecological hierarchy (individual, population, community, ecosystem, biome, and planet) influence one another?
- How do the main abiotic environmental factors create biomes and how are they altered by both natural and human activities?
- How do biomes interact?
- How have humans affected the environment at each of several geographic scales and how can these effects be mitigated?

SEE-U Field Sites – Summer 2014

Live and learn in one of these beautiful locations:

India | The Western Ghats - **New Field Site**

India is globally recognized as a megadiverse country, containing 70% of the world's biodiversity. Embark on a journey to explore India's ecology in the Western Ghats, a unique biologically rich ecosystem home to many of the world's plants and animals.

Jordan | Amman, Aqaba, Dana, & Ajloun

Embark in the exploration and appreciation of Jordan's ecology through coursework and field research. This location is ideal for biodiversity studies, as a wide variety of flora and fauna are found in Jordan's wetland, marine, freshwater, desert, and forest ecosystems.

Brazil | The Atlantic Forest & Serra do Mar State Park

The Atlantic Forest is one of the most endangered regions in the world. You will work and live in some of the largest remaining tracts of this diverse forest. Tropical flora and fauna abound here, including several endangered primates.

SEE-U India | The Western Ghats

Embark on a journey to explore India's ecology in the Western Ghats. India is globally recognized as a megadiverse country, containing 70% of the world's biodiversity. According to the United Nations Development Programme (UNDP), India accounts for over seven percent of the world's recorded species, containing thousands of animals and nearly half the world's aquatic life. India is home to 3 of the world's 34 global biodiversity hotspots - unique, biologically rich areas facing serious conservation threats. Rapid economic growth and urbanization have put significant pressure on the country's diverse ecosystems. These environmental concerns present a wide range of sustainable development issues which are addressed by the SEE-U program.

Located near the city of Bangalore, the Western Ghats are a chain of mountains that run along the western coast of peninsular India. Due to their proximity to the ocean, this ecosystem receives high amounts of rainfall throughout the year, resulting in a moist deciduous forest and rain forest. Many species of the Western Ghats are found nowhere else in the world, including over 75% of amphibians and more than 60% of reptiles. The area is home to over 6,000 vascular plants, of which over 3,000 are endemic to the region. Many of the world's spices, such as black pepper and cardamom, also have their origins in the Western Ghats. The Agasthyamalai Hills, in the extreme south of the area, are home to over 450 species of birds, 140 mammals, 260 reptiles, and 175 amphibians. Though the Western Ghats are rich in biological diversity, this ecosystem is facing extreme endangerment today. SEE-U India provides an intellectually stimulating experience and serves as a platform for necessary debates on how to better integrate environmental preservation into India's development strategy.

SEE-U India is offered in partnership with The Columbia Global Centers | South Asia, which provides programs and activities involving students and faculty to focus on issues relating to the South Asian region. Southern Asia has a unique history and is at a critical junction of global importance and faces unprecedented opportunities and challenges across several sectors, including: business; health; environment; education; urban planning; infrastructure; economic development; and arts and culture. By leveraging world-class thought leaders, sharing resources, and conducting innovative projects using a multidisciplinary approach, The Columbia Global Centers | South Asia collaboratively examines and attempts to find solutions to these complex issues.

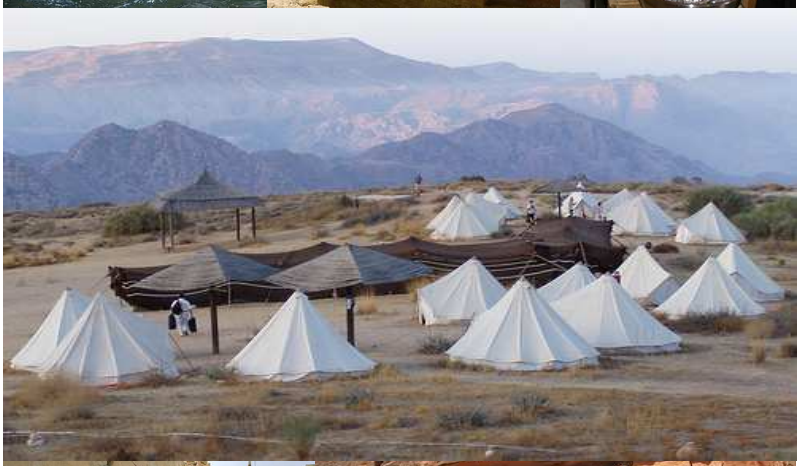
SEE-U Jordan | Amman, Aqaba, Dana, & Ajloun

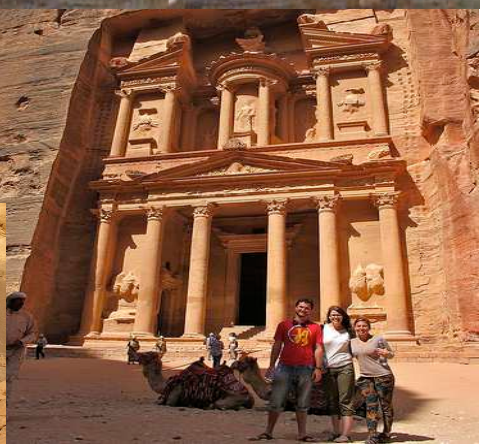
Through a partnership between EICES and The Columbia Global Centers | Middle East, the SEE-U Jordan program provides you with a unique opportunity to study ecosystems, biodiversity, and environmental sustainability in Jordan. Experience wetland, marine, freshwater, desert, and forest ecosystems as you travel the entire country of Jordan from Amman in the north to the coastal regions of Aqaba in the south.

In Jordan you will snorkel coral reefs and study marine ecology at the Red Sea Marine Science Center; a haven for international scientists studying sub-tropical ecosystems. These reefs contain over a thousand species of fish, hard corals, manta rays, turtles, eels, and dolphins. You will also explore deserts in Dana, see forests in Ajloun, and visit the Dead Sea to develop an in-depth understanding of ecology in Jordan. Extended stays at the Royal Society for the Conservation of Nature's reserves in Dana, the Wadi Mujib canyon (part of the lowest nature reserve in the world), and Aljoun provide a comprehensive look at the country's ecosystems and biodiversity. Cultural highlights during the program also include a trip to Petra, which has been named one of the New Seven Wonders of the World.

SEE-U Jordan uses current issues in Jordanian resource management to explore the interface between science and sustainable development. This program will teach you the fundamentals of ecology, evolutionary biology, environmental science, taxonomy, and experimental design. Ecology and biology coursework is integrated with labs and fieldwork across multiple sites and applied to the study of both marine and terrestrial ecosystems and to the wide variety of flora and fauna found across Jordan's ecosystems. The centerpiece of the program is an individual research project, which takes you through the process of planning, executing, and presenting your own ecological research on a topic of your choice.

Guest lecturers from the University of Jordan, Yarmouk University, government, and non-profit organizations are incorporated into the SEE-U curriculum to provide you with a full understanding of current issues in sustainable development including freshwater resource management, desertification, overgrazing, biodiversity conservation, and deforestation in Jordan.





SEE-U Brazil I The Atlantic Forest & Serra do Mar State Park

Live and learn in one of the most threatened ecosystems on the planet – the Atlantic Forest. Named one of Conservation International's 25 biodiversity hotspots, the Atlantic Forest is home to over 20,000 species of plants and 2,200 species of mammals, birds, reptiles, and amphibians. The Atlantic Forest contains several different canopies that bolster a rich diversity of vegetation including ferns, mosses, and epiphytes. As a world leader in primate diversity some of the Atlantic Forest's most iconic species are found nowhere else in the world, including the golden lion tamarin and wooly spider monkey. Threats to the Atlantic Forest include illegal logging and extraction of valuable timber species, land conversion to agriculture, pasture, and forest plantations, and development of urban areas.

SEE-U Brazil allows you to study at the third largest non-governmental organization in Brazil, the Center for Conservation Biology at the Instituto de Pesquisas Ecológicas (IPÊ). Located in Nazaré Paulista, IPÊ comprises more than 60 professionals working on over 30 scientific research projects throughout the region. The Institute is surrounded by a beautiful mosaic of forest, pasture, eucalyptus plantations, and pristine reservoirs, which are ideal for scenic hikes, mountain bike riding, swimming, and kayaking. Adjacent to IPÊ is a small organic community farm which provides the great variety of fresh fruits and vegetables used in meals prepared for the SEE-U program.

The two main ecological regions of this biodiversity hotspot are the interior Atlantic Forest, an expanse that borders the foothills of the Serra do Mar into southern Brazil where IPÊ is located, and the coastal Atlantic Forest, a narrow strip of 50-100 kilometers along the Brazilian coast. You will also travel with the SEE-U program and stay in Picinguaba, located within Serra do Mar State Park, where the native vegetation of the forest meets the sand in this largest continuous protected area of the Atlantic Forest. Containing over 40% of all amphibians, birds, reptiles, and mammals in the region, Serra do Mar State Park provides an ideal location for you to study the coastal Atlantic Forest and marine ecosystems of Brazil. There, you will also have the opportunity to explore nearby historic Paraty, a preserved Portuguese colonial and Brazilian Imperial town on the Green Coast of Brazil.

Sustainable Development

SEE-U is a unique academic opportunity that allows you to work alongside scientists and your fellow students to develop an understanding of ecological processes and systems, and the relation of these systems to sustainable development. The SEE-U program highlights major threats to biodiversity and equips you with tools useful in combating these threats. You will come away from the program with an appreciation of scientific methods, how to apply them, and an informed perspective on the role of nature, its conservation, and its connection to genuine sustainable development.

Course Components

Individual Research Project

The individual research project gives you the opportunity to develop and explore a testable research question around an area of your own interest in your respective field site location. This project entails:

- Literature searches
- Draft and final proposal
- Field data collection
- Data analysis
- Final presentation

You will have the full support of the course instructor and field assistants during the design and development process of the independent research project. This includes workshops on how to carry out scientific literature searches and the opportunity to learn field techniques in group settings before developing and carrying-out your individual project

Field Practicals

The field practicals are a chance for you to test out your newly acquired field skills in a group setting. Together, you will formulate your ideas, collect and analyze field data, and present your results and their implications. Field practicals emphasize the community nature of science, as many scientists conducting academic research must work together in teams to answer important large-scale questions.

Journal

You may be asked to keep a journal while you are at the SEE-U field site. This journal serves as an account of your work, both in and out of the classroom. A number of entries may be required; these entries can reflect your experiences and day-to-day activities. An electronic blog may also serve as your journal.

Participation

Participation is a significant component of the SEE-U program. You are graded on attendance, punctuality, engagement in group discussions, presentations and overall effort and professionalism during the course.

Quizzes / Exams

Periodic quizzes and exams may also be given during the course.

Academic Requirements Fulfilled by SEE-U

Course Credits

Upon completion of the SEE-U program you will receive six academic credits from Columbia University. Undergraduate students in good academic standing from all majors at all accredited colleges or universities may apply to the SEE-U program.

For Non-Columbia Students

Columbia University maintains high academic standards and it is likely that your institution will accept the credits from the SEE-U program as fulfillment of science or laboratory requirements. You are responsible for confirming that the credits from the SEE-U program are transferable and may be applied to your own academic program. If you have any questions or if your academic advisor would like to speak with one of our faculty members please call or e-mail EICES.

Requirements Fulfilled at Columbia University

We encourage you to speak with your academic advisor regarding how the SEE-U program can fit within your own particular academic program. Depending on your major and the school at which you are enrolled at Columbia University, the SEE-U program may be used to fulfill different sets of academic requirements:

Columbia College

- *Non-Science Majors*
  The six credit SEE-U program fulfills two of the three Core Curriculum Science Requirements.
- *Environmental Biology Majors*
  Three credits of the SEE-U program may be used to fulfill an upper level laboratory requirement. The remaining three credits can be applied to either your general distribution or college credit requirements.
- *Evolutionary Biology of the Human Species Majors and Concentrators*
  Three credits of the SEE-U program may be used towards the major / concentration and fulfills the conservation requirement. The remaining three credits can be applied to either your general distribution or college credit requirements.
- *Other Science Majors*
  How the six credits of the SEE-U program may be applied will depend on your major. In general, three credits are used to fulfill an upper-level laboratory requirement and the remaining three credits may be applied to either your general distribution or college credit requirements.

General Studies / Jewish Theological Seminary

- *Non-Science Majors*
  The six credit SEE-U program fulfills two of the three Core Curriculum Science Requirements.
- *Sustainable Development Majors and Concentrators*
  The six credits of the SEE-U program may be used to fulfill course requirements in the Skills and Systems area as well as in the Practicum.
- *Evolutionary Biology of the Human Species Majors and Concentrators*
  Three credits of the SEE-U program may be used towards the major / concentration and fulfills the conservation requirement. The remaining three credits can be applied to either your general distribution or college credit requirements.
- *Other Science Majors*
  How the six credits of the SEE-U program may be applied will depend on your major. In general, three credits are used to fulfill an upper-level laboratory requirement and the remaining three credits may be applied to either your general distribution or college credit requirements.

Barnard College

- *Non-Science Majors*
  The SEE-U program can be used to fulfill one of the two five-credit science requirements (the SEE-U program allows you to fulfill an entire intensive semester of science lab requirements).
- *Science Majors*
  The SEE-U program is most often used to fulfill an upper-level laboratory requirement. How the credits of the SEE-U program may be applied will depend on your major.

Application Process

Program Costs

Tuition: $8,820 ($1,470 per credit x 6 academic credits)

Room & Board: $1,950 (applies to all field-sites)

Airfare is not included. Additional costs may apply (shopping, books, supplies, etc).

Upon your acceptance to the SEE-U program a non-refundable deposit of $500 is required to secure your space at one of our field sites. This program deposit is applied toward your course tuition costs upon your successful completion of the SEE-U program.

**Costs may be subject to change at any time at the discretion of the Columbia University Trustees.*

EICES Fellowships

Need-based fellowships awards are available from EICES in amounts up to $3,000 for all of our 6 credit SEE-U programs. To apply for an EICES fellowship, simply fill out that section of the application.

Application Checklist

Students in good academic standing from all majors at all accredited colleges or universities may apply. The SEE-U application includes:

- Application Form (online at **http://bit.ly/1aali1P**)
- Transcript
- Essay; ~500 words describing why you have chosen to participate in the SEE-U program
- One letter of recommendation from a faculty advisor or instructor (past or present)
- A nonrefundable $95 application fee, payable by check or money order to 'Columbia University'

EICES offers rolling admissions for the SEE-U program so you may apply at any time. Applications are considered as they are received and there are a limited number of spaces available for our various field sites. Therefore, the earlier you apply the better the chance that there will be space available at the field site of your choice.

For more information on the SEE-U program visit our website at: www.eices.columbia.edu

or contact Desmond Beirne at: djb2104@columbia.edu or 212-854-0149.

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