Term Information

Effective Term	Summer 2017

General Information

Course Bulletin Listing/Subject Area	Evol, Ecology & Organismal Bio
Fiscal Unit/Academic Org	Evolution, Ecology & Org Bio - D0390
College/Academic Group	Arts and Sciences
Level/Career	Graduate, Undergraduate
Course Number/Catalog	5798
Course Title	Tropical Behavioral Ecology and Evolution
Transcript Abbreviation	TropBehEcolEvol
Course Description	Focus on the evolutionary processes that shape the ecology and behavior of invertebrate systems in a diverse tropical forest with a special emphasis on symbioses. Students will build skills in proposal writing, experimental design, and field research conducted at the world renowned Smithsonian Tropical Research Institute in Panama.
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	4 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	Yes
Allow Multiple Enrollments in Term	Yes
Max Credit Hours/Units Allowed	12
Max Completions Allowed	4
Course Components	Field Experience, Seminar, Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Sometimes
Campus of Offering	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites	EEOB 3193 with this course instructor or EEOB 8896.02 with this course instructor
Exclusions	

Cross-Listings

Cross-Listings	

Subject/CIP Code

Subject/CIP Code	26.1303
Subsidy Level	Doctoral Course
Intended Rank	Senior, Masters, Doctoral

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Students will learn to conduct research on tropical animals, plants and fungi with particular emphasis on social interactions and symbioses
- Students will understand the principles of proposal writing and research design
- Students will develop skills in manuscript preparation
- Students will communicate research ideas informally and formally
- Students will develop skills in research project assessment and peer mentoring

Content Topic List

- Logistics, methods, and practice of field work in a tropical forest in Panama
- Presentations on tropical ecology and evolution by active researchers
- Preparation and assessment of independent research proposals
- Oral and written communication of research results

Attachments

- 2_Academic Components_TBEE 22Aug16.pdf: Academic Justification
  (Other Supporting Documentation. Owner: Johnson,Norman F)
- 3_Logistical Components_TBEE_15Aug16.pdf: Logistics in Panama
  (Other Supporting Documentation. Owner: Johnson,Norman F)
- 4_Course Goal_Appendix 1_15Aug16.pdf: Course/Program Goals
  (Other Supporting Documentation. Owner: Johnson,Norman F)
- 1_TBEE 2017_ Syllabus_22Aug16a.pdf: Syllabus
  (Syllabus. Owner: Johnson,Norman F)
- ConcurrencesRequested.pdf: Concurrences Requested
  (List of Depts Concurrence Requested From. Owner: Johnson,Norman F)
- EEOB5798_concurrence_entomology.pdf: Entomology Concurrence
  (Concurrence. Owner: Johnson,Norman F)
- cover_letter.pdf: Cover letter
  (Cover Letter. Owner: Johnson,Norman F)

Comments

- See 4-21-16 e-mail to N. Johnson. *(by Vankeerbergen,Bernadette Chantal on 04/21/2016 10:39 AM)*
- The course has been provisionally approved by the Office of International Education pending succesful completion of normal course approval process. *(by Johnson,Norman F on 03/30/2016 03:48 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Johnson,Norman F	03/30/2016 03:48 PM	Submitted for Approval
Approved	Johnson,Norman F	03/30/2016 03:48 PM	Unit Approval
Approved	Fink,Steven Scott	03/30/2016 04:32 PM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	04/21/2016 10:39 AM	ASCCAO Approval
Submitted	Johnson,Norman F	08/30/2016 12:11 PM	Submitted for Approval
Approved	Johnson,Norman F	08/31/2016 08:54 AM	Unit Approval
Approved	Fink,Steven Scott	08/31/2016 10:03 AM	College Approval
Pending Approval	Nolen,Dawn Vankeerbergen,Bernadette Chantal Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler Hogle,Danielle Nicole	08/31/2016 10:03 AM	ASCCAO Approval

THE OHIO STATE UNIVERSITY

Department of Evolution, Ecology and Organismal Biology

College of Arts and Sciences
Division of Natural and Mathematical Sciences
1315 Kinnear Road
Columbus, OH 43212-1157

Phone (614) 292-2730
Fax (614) 292-7774

30 August 2016

Re: revision of request for new course in Tropical Behavioral Evolution and Ecology

The original proposal has been extensively reviewed and revised per comments received in April and in discussions across the University. Specifically in response to those comments:

- text describing the target student audience has been updated
- the proposed course number has been changed to 5798
- prerequisites are clarified: students must either take EEOB 3193 (Independent Studies) or EEOB 8896.02 (Graduate Seminar: Behavior) under the guidance of Dr. Adams
- a detailed rationale for the 3 credit hour request is added
- a curriculum map for the 3 undergraduate major programs in EEOB is provided (the three programs on separate worksheets within a single Excel file)
- Independent study has been removed from the course components

If there are further revisions suggested, we will be pleased to respond to them as soon as possible.

Sincerely,

Norman F. Johnson
Moser Chair in Arthropod Biosystematics & Biological Diversity
Associate Chair, EEOB
Chair, Curriculum Committee

EEOB 5798: Tropical Behavioral Ecology and Evolution

Summer May Term 2017 3 credit hours

Course description:
We will focus on evolutionary processes that shape the ecology and behavior of invertebrate systems in a diverse tropical forest with a special emphasis on symbioses. Students will build skills in proposal writing and experimental design in Columbus, Ohio and field research will be conducted at the world renowned Smithsonian Tropical Research Institute in Panama (May 2017). In addition, the students will review and discuss the work of their peers, and attend lectures, tutorials and trips. A final project report will be submitted in June 2017. This course provides unique opportunities to interact with a global community of scientists and learn successful research strategies while working in a Neotropical rainforest.

Faculty instructors:
-Dr. Rachelle M. M. Adams, EEOB, The Ohio State University
-Dr. Jonathan Z. Shik, Centre for Social Evolution, University of Copenhagen

OIA Program Coordinator:
Ms. Tiffany Pierskalla
Email: pierskalla.5@osu.edu

Enrollment:
This course has a minimum enrollment of 8 OSU students (12 max)
All students must take Undergraduate Independent Studies EEOB 3193 or EEOB Graduate Seminar: Behavior EEOB 8896.02 with Dr. Adams. See https://oia.osu.edu/getting-started/search-programs.html?sasid=528 for more details.

Learning goals:
- Students will learn to conduct research on tropical animals, plants and fungi with particular emphasis on social interactions and symbioses
- Students will understand the principles of proposal writing and research design
- Students will develop skills in manuscript preparation
- Students will communicate research ideas informally and formally
- Students will develop skills in research project assessment and peer mentoring

Learning outcomes:
- Students will apply their broader knowledge of tropical biology to their personal projects
- Students will write a proposal and conduct a field research project
- Students will write a manuscript about their personal project results
- Students will present research ideas as "chalk talks" in an informal setting and as a more formal PowerPoint presentation followed by an oral exam
- Students will assess and help peers with their research
- Students will recognize the research possibilities offered at STRI and have information and contacts that could facilitate a future visit

Readings: Course materials will be available on the course website on Carmen (carmen.osu.edu). Mendeley Desktop (http://www.mendeley.com) will be used to share scientific literature and as a reference manager for all assignments.

Expectations and grading:
We expect students to prepare for the field component of the course by attending a seminar/discussion group during the Spring semester. They will discuss literature and their personal field project proposals with peers and instructors to ensure project feasibility. Students will conduct their personal project, review and discuss classmate's projects, be present at all lectures and excursions, and actively share their research ideas. All deadlines are expected to be met, if they are not, points will be deducted. This course will be offered as S/U (satisfactory/unsatisfactory).

The final grade will be based on a portfolio containing:

1) Written proposal in STRI Short Term Fellowship format—Final (10%)
2) Short write-up about another student's project (5%)
3) Logbook and voucher documentation (5%)
4) Peer review of another student's manuscript (10%)
5) PowerPoint presentation and oral exam (in Panama) (10%),
6) Independent project and manuscript (60%)

Internet resources:

- *Rapid Color Guides (free downloadable photo guides to plants and animals)* *http://fm2.fieldmuseum.org/plantguides/rcg_intro.asp?zone=tropical&guidetype=plant* Select *Panama* under Country/Region, and look at guides for Barro Colorado
- *Bird sounds from the Americas website, birds of Gamboa* http://www.xeno-canto.org/location/map?lat=9.1223&long=-79.7501&loc=Gamboa%2C+Colon+province
- *Smithsonian Tropical Research Institute website* *http://www.stri.si.edu/*
- Attine ants in Gamboa, Panama, 2007, M. B. Dijkstra & H. H. de Fine Licht (pdf link)

Suggested books (optional):

- *Tropical Nature: Life and Death in the Rain Forests of Central and South America*, by Adrian Forsyth & Ken Miyata
- *Tropical Forest Ecology: a View from Barro Colorado Island,* by Egbert Giles Leigh
- *The Path Between the Seas: The Creation of the Panama Canal*, by David McCullough
- *The Tapir's Morning Bath: Solving the Mysteries of the Tropical Rain Forest*, by Elizabeth Royte
- Kricher, J. 1999. *A Neotropical Companion*. Second edition. Princeton Univ. Press.

Sustainability: I wish to reduce the ecological footprint of this course and encourage you to do the same. I provide lecture images and other course materials digitally; I encourage you to store and use them in that format. Please suggest ideas on how I might further decrease the ecological impact of the course.

Academic Misconduct: OSU has a strict code of academic misconduct that requires us to report any and all cases of suspected misconduct to the OSU Committee on Academic Misconduct for adjudication (Faculty Rule 3335-5-487). You should understand the nature and consequences of plagiarism (and of anti-plagiarism sites like www.turnitin.com).
I adhere to the following policy:
"It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct http://studentlife.osu.edu/csc/."

Students with Disabilities: I use a Universal Design for Learning approach in this course to accommodate different learning styles. I also accommodate the needs of students with varied disabilities. Should you need accommodation or have concerns about possible disabilities affecting your progress in my (or any) course, please contact me.
I adhere to the following policy:
"Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614-292-3307, TDD 292-0901; Email: slds@osu.edu; http://www.ods.ohio-state.edu/." (ASC Syllabus Template approved by the ASC CCI 5/9/08; revised ASCC 4/11/14)"

Diversity and Inclusion: As a member of the faculty of the Department of Evolution, Ecology, and Organismal Biology, I support my department's commitment to diversity and inclusion as stated in EEOB's suggested syllabus statement: "The Department of EEOB strives to create and maintain a welcoming climate for our faculty, staff, and students. Diversity enhances all aspects of our academic efforts including our research, teaching, and service. Diversity provides multiple experiences, generates multiple perspectives, and promotes the free exchange of ideas. We make this commitment to enhance our ability, and that of our students, to understand the biological world and apply that understanding to address problems confronting society. For more information on diversity at OSU, please see OSU diversity resources

2017 Schedule
4 May – Students arrive!
5 May – Location: Gamboa
Morning: Introductions and proposal presentations; Large group discussions about independent projects
Afternoon: Leaf-cutter walk, training (searching for bees, ants and termites) and preparation around Gamboa and schoolhouse

6 May – Location Plantation Road, School house
Morning/ Afternoon: Forest walk, training and preparation
Evening: Students will discuss research in small groups based on research interest.
7 May – Location: PLR and School house
Morning/Afternoon: Field trip to PLR, exploration in field
Evening: Rachelle Adams & Jon Shik– [Lecture] Introduction to our systems and research approach
8 May – Location: Panama City Coaster bus/Van and driver needed at 8am
Morning: STRI Tour
9am: Introduction to STRI an STRI grants [Lecture]
10am: Library
Evening: Mall stop and dinner pay by cash, Project plans and discussion
9 May – Gamboa and School house
Morning/Afternoon: Independent project preparation
1:00pm Rachel Page [Lecture] on auditory processing
Evening: Students will discuss research in small groups based on field site (Who is doing what and where?)
10 May – Location: Plantation Road, PLR, Gamboa
Morning/Afternoon: Field work, starting independent projects (searching for focal species)
11 May – Location: Plantation Road, PLR, Gamboa
Morning/Afternoon: Field work, starting independent projects (baiting and searching for focal species)
12-17 May – Location: Plantation Road, PLR, Gamboa
Morning/Afternoon: Field work, independent projects on focal species
Evening: Independent work
18 May – Location: Santa Clara (Las Veraneras Coaster bus/Van and driver needed at 7:30am Day at the beach!
19 May –– Location: Metropolitan Nature Park Coaster Bus/Van and driver needed at 7:30am
Morning/Afternoon:
8am Visit canopy crane at Metropolitan Nature Park

1:00 Lunch and Nikos
2:00 Miraflores Locks Museum
Evening: Big Group Discussion about projects (Do you have enough data? What do you need to get it?)
20 May – Plantation Road, PLR, Gamboa
Morning/Afternoon: Field work, data collection and writing.
Evening: Informal frog walk in Gamboa after dinner
21 May – Location: Culebra Nature Center Coaster Bu s/Van and driver needed at 8am
Morning/Afternoon: 10am John Christy [Lecture] on exaggerated sexual signals
2:00 Lunch near Culebra Nature Center or Naos
4:00 pm Tour at Naos Island Laboratories
22 May – Location: Barro Colorado Island BCI 7:15 boat to BCI
Morning/Afternoon/Evening: Students visit the island
23-28 May – Location: Plantation Road, PLR, Gamboa
Morning/Afternoon: Field work, data collection and writing
29 May – Location: Gamboa
Morning/Afternoon: Final Presentations/Party
30 May – Leave Panama!!
5 June – Final report on independent project due

1_Draft Syllabus (see previous document) and list of lectures, excursions, and cultural visits

2_Rationale for the number of credits (3 credits)
The students will be required to take a 1 credit preparatory course in Spring 2017 (*Undergraduate Independent Studies EEOB 3193 or EEOB Graduate Seminar: Behavior EEOB 8896.02*) for lectures, to practice scientific writing, submitting scientific permits for Panama (if necessary), and drafting a research proposal.

While in Panama students will have approximately 3 hours of formalized instruction, in addition to approximately 70 hours of structured educational experiences.

EEOB 5798: Tropical Behavioral Ecology and Evolution	
Formalized Instruction	**Structured Educational Experiences**
4 lectures x 50 min = 200/ 3.33 hrs	20 field days x 3.5 hrs = 70 hrs
3.33 hr/12.5 hrs per credit = 0.27	70 hr/25 hrs per credit = 2.8
0.27+2.8= 3 total credits	

Per the Arts & Sciences Curriculum guidelines equating 12 ½ hours of formalized instruction and/or 25 hours of structured educational experiences per credit hour, the Department of Evolution, Ecology and Organismal Biology requests that EEOB 5798 be valued at 3 total credit hours. Please see more detailed schedule and rational below.

Schedule	Formalized Instruction	Structured Educational Experiences
4 May – Students arrive!		
5 May – Location: Gamboa		3.5 hrs
Morning: Introductions and proposal presentations; Large group discussions about independent projects		
Afternoon: Leaf-cutter walk, training (searching for bees, ants and termites) and preparation around Gamboa and schoolhouse		
6 May – Location Plantation Road, School house		3.5 hrs
Morning/ Afternoon: Forest walk, training and preparation		
Evening: Students will discuss research in small groups based on research interest.		
7 May – Location: PLR and School house	50 min	3.5 hrs
Morning/Afternoon: Field trip to PLR, exploration in field		
Evening: Rachelle Adams & Jon Shik– [Lecture] Introduction		

to our systems and research approach		
8 May – Location: Panama City Coaster bus/Van and driver needed at 8am Morning: STRI Tour 9am: Introduction to STRI an STRI grants [Lecture] 10am: Library Evening: Mall stop and dinner pay by cash, Project plans and discussion	50 min	
9 May – Gamboa and School house Morning/Afternoon: Independent project preparation 1:00pm Rachel Page [Lecture] on auditory processing Evening: Students will discuss research in small groups based on field site (Who is doing what and where?)	50 min	
10 May – Location: Plantation Road, PLR, Gamboa Morning/Afternoon: Field work, starting independent projects (searching for focal species)		3.5 hrs
11 May – Location: Plantation Road, PLR, Gamboa Morning/Afternoon: Field work, starting independent projects (baiting and searching for focal species)		3.5 hrs
12-17 May – Location: Plantation Road, PLR, Gamboa Morning/Afternoon: Field work, independent projects on focal species Evening: Independent work		3.5 hrs X 6
18 May – Location: Santa Clara (Las Veraneras Coaster bus/Van and driver needed at 7:30am Day at the beach!		
19 May –– Location: Metropolitan Nature Park Coaster Bus/Van and driver needed at 7:30am Morning/Afternoon: 8am Visit canopy crane at Metropolitan Nature Park 1:00 Lunch and Nikos 2:00 Miraflores Locks Museum Evening: Big Group Discussion about projects (Do you have enough data? What do you need to get it?)		3.5 hrs
20 May – Plantation Road, PLR, Gamboa Morning/Afternoon: Field work, data collection and writing. Evening: Informal frog walk in Gamboa after dinner		3.5 hrs

21 May – Location: Culebra Nature Center Coaster Bu s/Van and driver needed at 8am	50 min	3.5 hrs
Morning/Afternoon: 10am John Christy [Lecture] on exaggerated sexual signals		
2:00 Lunch near Culebra Nature Center or Naos		
4:00 pm Tour at Naos Island Laboratories		
22 May – Location: Barro Colorado Island BCI 7:15 boat to BCI		
Morning/Afternoon/Evening: Students visit the island		
23-28 May – Location: Plantation Road, PLR, Gamboa		3.5 hrs X 6
Morning/Afternoon: Field work, data collection and writing		
29 May – Location: Gamboa		
Morning/Afternoon: Final Presentations/Party		
30 May – Leave Panama!!		
5 June – Final report on independent project due		

3.1_Audience

The primary student audience for this program will be graduate students in disciplines that require experimental research. The principles of research design, scientific communication, peer mentoring, and manuscript preparation are universal skills that are required for many OSU graduate school programs. The audience of this course is therefore very broad and we hope to recruit students from a range of science disciplines creating an interdisciplinary cohort.

This course is centered around insect-based research so that proposed projects are, 1) within the scope of the instructor's expertise; 2) able to be successfully completed in 3 ½ weeks (insects are very abundant and easy to collect in the tropics), and 3) not space demanding and can be accomplished in STRI facilities in Gamboa, Panama. In addition, if all students work on insects, it allows for a cohesive research group that can share field sites and schedules, making a course such as this, feasible and safe.

The diverse student group is encouraged to explore areas of science that teach them new skills they can apply to their personal thesis projects or work directly on a thesis project. Students in previous courses have developed fieldwork-related tools (e.g., sampling techniques, GIS (geographic information system), transects) and lab-based skills (e.g., bacterial culturing, chemical extraction, DNA extraction, behavioral observation, insect curation).

3.2_Eligibility

Students will be selected to join the course with an application process requiring a cover letter and a CV. Undergraduate students will be considered if they have an exceptional application and research experience (a letter of recommendation may also be requested). All students are required to enroll in a 1 credit preparatory course in Spring 2017 (*Undergraduate Independent Studies EEOB 3193 or EEOB Graduate Seminar: Behavior EEOB 8896.02*).

3.3_Complementarity

There is no other OSU course that offers graduate level independent research in the tropics. However, the Tropical Field Ecology (TFE) course (EEOB 4420H) is complementary to the proposed Tropical Behavioral Ecology and Evolution (TBEE) course.

1) *TFE is aimed at undergraduates.* The TBEE course is designed for graduate students and exceptional undergraduates thus requiring more independent and self-directed learning.
2) *TFE focuses on large and broad ecological questions including the conservation of biodiversity.* TBEE students should already be well versed in world conservation issues. In TBEE, the students may choose to conduct a project that samples insect biodiversity and practice techniques that can scale to larger ecological questions but are mainly focused in the areas of Behavioral Ecology and Evolution. This is further emphasized by lectures that cover these topics.
3) *TFE is a 12 day course that visits many sites with distinct tropical forest habitats in Panama.* TBEE is a 4 week course (3.5 weeks in Panama) where the students choose their research sites based on their questions and study organisms. Although they will travel on brief excursions, the objective of the TBEE course is to learn to lead a project from the proposal stage to the publication stage. Several former TBEE students generated publishable results (Papers: Adams et al. 2013; Kooj et al. 2014; Rytter and Shik 2016; Liberti et al. In Prep.; Shik et al. Submitted; Posters: Neupert et al. 2015; Wall et al. 2015; Adu-Oppong et al. 2013; Tripodi 2013) and in 2015, two Italian students were able to incorporate their Panama work into their Master's thesis (likely published in 2016). This is evidence that TBEE students have the potential to further their professional development beyond taking this course.

The first seven Learning Goals for EEOB undergraduates (EE and Zoology majors) and Master's and PhD students are identical in scope but shift in proficiency level. An eighth goal is unique to the PhD students (learning to teach undergraduates). The proposed TBEE course Learning Outcomes corresponds directly with the first seven graduate and undergraduate program goals. Below EEOB Learning Goal numbers are added behind the TBEE Learning Outcomes to illustrate this. For more details see Appendix 1 at the end of this document.

<u>Learning outcomes:</u>

- Students will apply their broader knowledge of tropical biology to their personal projects **(1, 2, 3)**
- Students will write a proposal and conduct a field research project **(2, 3, 4, 5, 6)**
- Students will write a manuscript **(4)**
- Students will present research ideas as "chalk talks" in an informal setting and as a PowerPoint presentation **(4, 7)**
- Students will assess and help peers with their research **(2, 6)**

3.4_Student enrollment and recruitment

This course was offered as an international course through the University of Copenhagen in 2011 (11 students), 2013 (9 students), and 2015 (12 students) allowing students from all over the world to enroll. Because it will now be offered for only OSU students, we anticipate a slight reduction in enrollment. We will allow a minimum of 8 and no more than 12 students. Exceptional undergraduates will be eligible to apply for the course (see 3.2_Eligibility above).

Efforts will be made to recruit students from a variety of OSU programs (Agricultural and Extension Education; Biochemistry; Biostatistics; Earth Sciences; Education: Teaching and Learning; Entomology; Environment and Natural Resources; Evolution, Ecology and Organismal Biology; Microbiology; Molecular Genetics; Molecular, Cellular and Developmental Biology). Dr. Adams will personally contact graduate studies coordinators of each program and request to present to the respective graduate students. Fliers will also be permanently posted in high traffic areas and in departmental offices. This course will be offered every two years therefore graduate students will be able to plan to incorporate it into their course program. The course has already gained an international reputation and we anticipate a similar standing at OSU in the future.

4.1_Curriculum fit and approval

Students will be able to take this course as a Life Science elective and therefore credits can apply to any degree. The course has been discussed with the EEOB Chair (Libby Marschall) and the EEOB Curriculum Chair (Norm Johnson) and approved by the EEOB curriculum committee.

1_Host Institution

We will be hosted by the Smithsonian Tropical Research Institute (STRI) that has hosted hundreds if not thousands student groups over the years (including OSU's Tropical Field Ecology, EEOB 4420H). STRI headquarters in the Republic of Panama is a unit of the Smithsonian Institution (Washington, DC, USA) and one of the world's leading centers for basic research on the ecology, behavior and evolution of tropical organisms.

Gamboa, Panama, is a small town made up of a friendly community of scientists and is located approximately 30 km from STRI's main headquarters in Panama City. Our students will have opportunities to meet an international community of researchers that live and work in the rainforests and streams of Soberania National Park.

STRI provides state-of-the-art laboratories and accommodations. OSU students will stay in the former "schoolhouse" that STRI has furnished as a dormitory facility for field courses that use Soberania National Park and nearby forested sites. Four large classrooms have been turned into sleeping quarters. There are two bathrooms with showers. There is a single room with a half-bath for the course leader, a washer and dryer, and a fully equipped kitchen. A cook and cleaning staff are provided and the whole facility is air conditioned. Two additional classrooms have been appointed as a dining room (lined with chalk boards) and a projection facility (a slide projector, a screen and an overhead projector are available).

I have been working at STRI as a researcher since in 1999. Not only do I know the STRI scientists but I have worked directly with the STRI Academic Programs staff to organize three courses (TBEE 2011, TBEE 2013, and TBEE 2015). They handle all in-county logistics (bus and van rentals) and excursion scheduling (e.g., BCI, Metropolitan Nature Park, Culebra Nature Center) as well as provide a presentation by Safety officer José Ramón Perurena.

2_Health, welfare, safety, and security

STRI takes extra precautions when it comes to the safety of students and researchers (http://www.stri.si.edu/ss/). In addition to the presentation by Safety officer José Ramón Perurena there are online resources that the students are reminded of throughout the course. Students are not allowed to work alone in the field and groups always have a cell phone and a first aid kit for emergencies.

The TBEE students will be staying in an area that is regularly sprayed to control the local mosquito population. We still ask that all students wear full pants, tall rubber boots, and long-sleeved shirts when in the field or walking at night. We also provide the students with Deet-based bug repellent and regularly remind them to be diligent to avoid mosquito bites. The schoolhouse dormitory is sealed and does not have mosquitos.

Snake bites are rare but still a possibility therefore we require all students to where tall rubber boots (helps protect the legs in case of a snake strike). We also take students out on orientation walks, show pictures of snakes they will likely see, and caution them against carelessly touching vegetation or the ground without first inspecting it for snakes.

For more information regarding safety and security in Panama see (Appendix 2 and Appendix 3) or go to: http://travel.state.gov/content/passports/en/country/panama.html

3_OIA Program Information sheet DRAFT (see final at: https://oia.osu.edu/getting-started/search-programs.html?sasid=528)

Program

This 4 Week Session 1 (formally May session) study abroad program will take place at the Smithsonian Tropical Research Institution (STRI) in Panama. STRI is one of the leading research institutions in the world and has been encouraging scientific advancement since 1923. With 38 resident staff scientists and hundreds of visiting tropical biologists, students will have a unique opportunity to become part of this vibrant scientific community.

This intensive program will focus on evolutionary processes that shape the ecology and behavior of invertebrate systems in a diverse tropical forest. Students will build skills in writing and experimental design as well as present to peers and instructors, honing public speaking skills while leading discussions to help develop research ideas. Participants will engage in fieldwork with the goal of generating publishable manuscripts. Graduate students will implement research projects that correspond to the broader aims of their graduate thesis. The few exceptional undergraduates invited to participate become completely immersed in the world of biological research and gain direct experience in graduate-level work.

Students from many areas of science are encouraged to apply. They will gain experience with 1) experimental design and proposal writing, 2) the implementation and trouble-shooting of field research, and 3) writing a manuscript for a peer-reviewed scientific journal. In addition, we plan educational excursions (e.g., Metropolitan Nature Park canopy crane, Culebra Nature Center, and Barro Colorado Island) and also have a fun day at the beach.

This is a unique Study Aboard experience with lasting professional outcomes!

Courses and Credits

Accepted student will need to take, and succesfully complete, the following courses Spring 2017 semester:

- Undergraduate students:EEOB 3193: Independent Studies (1 credit)
- Graduate students: EEOB 8896.02: Graduate Seminar: Behavior (1 credit)

Admitted participants are **required to register in 3 hours of EEOB 5798 (3 credits)** during the summer travel portion.

Accommodations

Students will stay in dormitory-style housing and meals are provided by the Smithsonian Tropical Research Institute. The group will be based at the Gamboa Field Station, located near Soberania National Park.

Program Costs

Students are responsible for paying The Ohio State University tuition for Spring semester plus a $TBD program fee. The program fee includes room, most meals, and in country instruction. It does not cover personal expenses, visas (if necessary) airfare, and some meals.

If students withdraw or become ineligible any time eleven days after the acceptance notification, they will be held responsible for a cancellation fee. Please refer to OIA's Cancellation Policy.

Application Information

Applicants must submit the Office of International Affairs Study Abroad Application online via Buckeyelink. Please note that upon application, a $150 application fee will be assessed to your Statement of Account. The application fee will be refunded only if you are not accepted or submit a written request to withdraw your application prior to the application deadline.

Scholarships

Students should begin researching funding opportunities before they have been accepted into a study abroad program. Grants and Scholarships deadlines may occur before the study abroad program application deadline.

Special Petition Process

Participation in programs located in a risk designated country is by special petition only and students must complete a petition at the time of acceptance. If a risk designation is established after acceptance to the program, the International Travel Policy Committee will review the current health and safety conditions within the specific country to determine if the program will proceed. Should the Committee approve the program, students are required to submit a petition acknowledging they have read the travel warning and recognize the risk involved.

Eligibility

Undergraduate student applicants must:

- Enroll in, and successfully complete, EEOB 3193: Independent Studies (1 credit) in Spring 2017
- Have a 2.3 GPA or Higher
- Have prior research experience. Students should describe this research experience in the personal statement.

Graduate student applicants must:

- Enroll in, and successfully complete, EEOB 8896.02: Graduate Seminar: Behavior(1 credit) in Spring 2017
- Have a 2.3 GPA or Higher

Students must also meet OIA's General Eligibility Requirements and Conditions for Participation. All students will also be required to participate in on-campus pre-departure orientations organized by the Office of International Affairs.

Passports
Passports are required for every Ohio State study abroad program. For many study abroad destinations, passport information is required to apply for an entry visa (as early as 6 months prior to departure). For information about applying for a passport, go to travel.state.gov.

Websites
Ohio State Funding Opportunities: oia.osu.edu
U.S. Department of State: travel.state.gov (travel warnings/country specific information)
Centers for Disease Control: cdc.gov/travel (geographic health recommendations)
http://go.osu.edu/GradEEOBPanama

Contact Us
Information about Getting Started sessions and study abroad coordinator advising hours can be viewed at http://oia.osu.edu/study-abroad.html. Questions about study abroad programs can be directed to abroadadvisor@osu.edu. The Office of International Affairs is located in Oxley Hall, 1712 Neil Avenue.

**Ohio State reserves the right to change without notice any statement contained herein, concerning but not limited to rules, policies, tuition, fees, curricula and courses. In the event of an issuance or change to an existing U.S. Department of State Travel Warning, CDC Travel Health Notice or other risk designated criteria, the Office of International Affairs reserves the right to cancel any program prior to departure or while in progress. Discrimination against any individual based upon protected status, which is defined as age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.*

Learning or Course Goal	**Learning Outcome or Objective (content/topic + behavior)**	**Formative Assessment (In class activity or homework)**	**Summative Assessment (exam question)**	**Program Goals (Line #)**
What will students <u>learn?</u>	**If they have learned it, what will students <u>know and be able to do?</u>**	**What will students <u>do to learn it</u>?**	**How will students <u>demonstrate they know it or are able to do it?</u>**	**Specific phrases have been pasted or paraphrased from the EEOB PhD level learning goals and the EEOB Program Goals for EE and Zoology Majors.*
Students will appreciate tropical animals, plants and fungi with particular emphasis on social interactions and symbioses	Students will apply their broader knowledge of tropical biology to independent projects	Students will attend lectures by STRI staff and see tropical organisms in the field and in the laboratory	Students will demonstrate what they have learned through in-class and in-field discussions	**1:** understanding of the processes that underlie evolution, and with their manifestation in the natural world **2:** understanding of interactions among organisms and their environment. **3:** understanding of organismal diversity and functioning at all levels
Students will understand the principles of proposal writing and research design	Students will write a proposal and conduct a field research project	-Before arriving in Panama, students will draft their proposal and receive feedback on their writing, experimental design and feasibility of their project. -In Panama, students will hand in their final proposal drafts and conduct their research, adjusting their approach	Students will hand-in a proposal in the format of a STRI Short Term Fellowship application, including a CV. This will be graded but may also be submitted to STRI for funding.	**2:** understanding of ecological concepts and methods of study **3:** understand the interplay between organismal functioning and ecological and evolutionary processes **4:** ability to work as independent researchers or participate in the process by learning to conduct original research following ethical standards of research conduct. **5:** ability to use mathematical and statistical concepts

		when necessary.		**6:** knowledge of the theoretical framework of evolution, ecology and organismal biology and understand science as a process
Students will develop skills in manuscript preparation	Students will write a manuscript	Students will peer-review a classmate's manuscript and write their personal research outcomes in a Biology Letters format.	The peer-review and final manuscript will be graded.	**4:** communicate the results of research in written form following standards in the field
Students will communicate research ideas informally and formally	Students will present research ideas as "chalk talks" in an informal setting and as a more formal PowerPoint presentation at the end of the course	Students will present to the class their expected or current results at least 4 times while in Panama	-PowerPoint slides and presentations will be graded by the instructors -Students will take an oral exam following their presentations	**4**: communicate the results of research verbally to peer audiences **7:** will be able to communicate scientific concepts and processes
Students will develop skills in research project assessment and peer mentoring	Students will assess and help peers with their research	-Students will offer verbal feedback to their peers following all presentations -Students will spend one day as a "field assistant" to learn about their classmate's project -Students will peer-review the final manuscript of a classmate	-Following the day as a “field assistant”, students will be required to write a summary about their classmate’s project and make suggestions to improve it (graded assignment) -The peer-review will be graded	**2:** understanding of ecological concepts, methods of study, and the interactions among organisms and their environment **6:** understand science as a process
In addition:				

Students will learn about the infrastructural aspects of tropical research (e.g. canopy cranes; permanent monitoring plots; STRI resources)	Students will recognize the research possibilities offered at STRI and have information and contacts that could facilitate future visits	Students will attend STRI tours and lectures, visit various field sites, and use STRI resources	Students will fill out an evaluation form at the end of the course that asks about their understanding of STRI infrastructure and if they would like to return for future research	This goal facilitates the potential for students to develop areas **1-4** following this course

CONCURRENCE REQUESTS

1. Department of Entomology; requested 25 Aug 2016

The Ohio State University
College of the Arts and Sciences Concurrence Form

The purpose of this form is to provide a simple system of obtaining departmental reactions to course requests. **An e-mail may be substituted for this form.**

An academic unit initiating a request should complete Section A of this form and send a copy of the form, course request, and syllabus to each of the academic units that might have related interests in the course. Units should be allowed two weeks to respond to requests for concurrence.

Academic units receiving this form should respond to Section B and return the form to the initiating unit. Overlap of course content and other problems should be resolved by the academic units before this form and all other accompanying documentation may be forwarded to the Office of Academic Affairs.

A. Proposal to review

EEOB 5798

Initiating Academic Unit | Course Number | Course Title

NEW

Type of Proposal (New, Change, Withdrawal, or other) | Date request sent

ENTOMOLOGY

Academic Unit Asked to Review | Date response needed

B. Response from the Academic Unit reviewing

Response: include a reaction to the proposal, including a statement of support or non-support (continued on the back of this form or a separate sheet, if necessary).

Some concerns - see attached document.

But concurrence is given.

Signatures

	Name	Position	Unit	Date
1.	Wendy Kloeffler	Acad. Prog. Coordinator	ENTOMOLOGY	8/29/16
2.				
3.				

Revised 5/27/14

This sounds like a really interesting study abroad experience. I find it odd that “study abroad” is not actually used in the course description! I would have assumed that this term would be used in the introductory statement in the Syllabus.

The Syllabus is not a syllabus in the usual sense in that it doesn’t present an outline of the topics and activities. That is buried in the part 2, academic components. I would have expected some short outline in the actual syllabus (unless this is the new formatting requested by the university!).

I also keep hanging up on learning goal 1. It’s probably just me, but “Students will appreciate…” is not a learning goal! Something like, “Students will learn investigative methods used to measure, quantify and analyze the social interactions and symbioses among Tropical American animals, plants and fungi.” would be more to my liking.

I can live with the rest of the goals and outcomes, but I think they could be improved – i.e., Goal 2 (understanding proposal writing, etc.) is a bit too general as I see that this particular exercise is to learn how to develop a STRI proposal. If this includes the stated “pre-trip” session in the spring where an actual project proposal is developed, then undertaken at STRI, then this should be stated. I suspect that Ross could really help this proposal in better stating the outcomes. By my logic, if they adopt my new Goal 1 above, then the outcome would be: Students will use investigative methods, gather and analyze data in order to write final reports suitable for publication.