

**Faculty of Science Course Syllabus
Department of Biology, SEASIDE Program**

BIOL 3640.06

**Tropical Ecology and Biodiversity Field Class (Sri Lanka) Summer
2019**

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Dalhousie campus:	One week, tentatively June 24 – July 02		
	Lectures:	9:05-11:55	LSC 244
	Laboratories:	13:05-16:55	LSC 244 or other (depends on activity)

Field trip to Sri Lanka: Around three weeks, tentatively July 03- July 25 (includes 1-2 travel days each way; see draft schedule below)

Course Description: Hands-on introduction to tropical ecology, biodiversity, and conservation. Includes an 18-day field trip to Sri Lanka to visit a variety of tropical terrestrial and aquatic ecosystems, quantify habitats, identify species, and study agroforestry, ecological interactions, and animal behavior. Evaluation includes lecture tests, field notebooks, class research projects, presentations, and reports. FORMAT: Field-intensive, Lectures, Labs, International experience
PREREQUISITES: Diversity of Life I ([BIOL 2003.03](#)), Diversity of Life II ([BIOL 2004.03](#)), and Introductory Ecology ([BIOL 2060.03](#)) or equivalent courses, or instructor's permission. An introductory course in statistics ([STAT 1060.03](#) or similar) is recommended.

Auxiliary fee: \$3990 (\$2200 of which will be due as a deposit in early February so Dal can purchase air tickets for the class)

Course Objectives/Learning Outcomes

After completing this course, students will be able to:

1. Describe and compare different terrestrial and aquatic ecosystems in the old-world tropics
2. Identify a variety of common tropical plant, bird and other animal species
3. Quantify habitat characteristics and relate them to plant and wildlife species. This involves hands on experiences on field data collection related to ecology and conservation:
 - a. Measure trees
 - b. Make quantitative observations of animals
 - c. Describe, and illustrate with examples, ecological and behavioural adaptations to tropical environments
 - d. Sample soil for nutrient and environmental analysis, and create soil profiles
 - e. Identify biotic and abiotic interactions

4. Describe and compare common tropical agroforestry practices
5. Evaluate terrestrial and marine protected areas for biodiversity conservation and to discuss the issues related to conservation in Sri Lanka

Course Materials

This course will be paper-free as much as possible. The following will be posted on the course website before the first class: course outline, lectures as pdf files, and other material. The posted lecture material will not be complete; many essential details can be obtained in class only (i.e., it will be essential to take good notes).

Required readings

Required readings will be posted on the course website.

Optional readings

Jaboury Ghazoul & Douglas Sheil. 2013. *Tropical Rain Forest Ecology, Diversity & Conservation*. Oxford University Press.

Further details: This course aims to provide students with a strong foundation in tropical ecology and first-hand experience with tropical species and their habitats in Sri Lanka. Students will learn through lectures, readings, discussions, guided field trips, field exercises, and research projects. This course is an exciting opportunity to learn about how species interact with their environment in different ecosystems in an exotic location. The first week in Halifax will focus on topics such as tropical ecology, biogeography, biodiversity, species interactions, tropical habitats, agroforestry, animal behavior, and conservation. Classes in Halifax will consist of presentations and discussions, exercises, a field trip to learn field techniques, a lab to learn analysis techniques, student-led discussions and student presentations. The first week of class will be intense and will culminate in a lecture exam, to ensure students are well prepared for the trip to Sri Lanka.

In Sri Lanka we will spend about 18 days visiting and sampling sites that represent the variety of tropical ecosystems which are inhabited by a large diversity of species. We will focus on several different types of tropical forest ecosystems, and also visit a freshwater wetland and marine ecosystems (coral reefs and coastal mangroves). Students will collect research data, analyze the data, and prepare presentations and reports on our findings. This part of the class is intense and meets all day (typically more than 8 hours per day). Some leisure time will also be scheduled. See schedule for details of activities and locations for each day. Note that the schedule may need to be modified due to weather and other unforeseen circumstances. Additional lectures, sampling techniques, and local conservation issues will be presented in Sri Lanka. Expect to be quizzed on the material presented in Sri Lanka.

Other class materials

- You will be provided with one or more write-in-the-rain field notebooks to record your field observations. To write in these field notebooks, we recommend using a Write-in-the Rain pen or just pencils. Bring several pencils and erasers.
- To write lecture notes you should have notebook paper. You will need a clipboard for writing lecture notes (you may not always be at a table) and for filling out data sheets in the field. We recommend a covered clipboard to keep your paper in better condition.

- A small tablet (e.g., iPad or similar) or a small portable computer would be helpful, but is not essential. Those or your cell phone can be used to check email when we have access to wireless.
- You will check out some field equipment to bring and you will be responsible for it in Sri Lanka.

See list on the Brightspace Biol 3640 course space for other items you will need for Sri Lanka.

Course Assessment

Component	Weight (% of final grade)	Location	Due date (tentative)
Tests (30% total)			
<i>Exam</i>	25	<i>Dal</i>	<i>July 02</i>
<i>Quizzes</i>	10	<i>Sri Lanka</i>	<i>July 5-20</i>
Written assignments (50% total)			
<i>Agroforestry</i>	3	<i>Sri Lanka</i>	<i>July 10</i>
<i>Biodiversity & Eco. Interaction</i>	3	<i>Sri Lanka</i>	<i>July 14</i>
<i>Animal behaviour</i>	3	<i>Sri Lanka</i>	<i>July 18</i>
<i>Plant morphology (adaptations)</i>	4	<i>Sri Lanka</i>	<i>July 20</i>
<i>Marine conservation</i>	4	<i>Sri Lanka</i>	<i>July 22</i>
<i>Field notebooks (digital copy)</i>	8	<i>Sri Lanka</i>	<i>July 25</i>
<i>Formal field report</i>	16	<i>Dal (online)</i>	<i>Aug 04</i>
Other (20% total)			
<i>Species profile presentations (3@3 each)</i>	9	<i>Dal</i>	<i>June 25-29</i>
<i>Symposium presentation and participation</i>	8	<i>Sri Lanka</i>	<i>July 24</i>
<i>Class participation</i>	7	<i>Dal, Sri Lanka, travels (throughout)</i>	

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (<50)
A- (80-84)	B- (70-72)	C- (55-59)	

Description of components

Exam: This comprehensive exam will cover lectures, species profiles, and any other information presented in class before leaving on the trip to Sri Lanka.

Quizzes: One or more quizzes adding to 10% will test you on material from informal lectures and field trips in Sri Lanka. These will be timed, open-note quizzes to encourage good note-taking and emphasize the practical use of your extensive and careful field notes and any field guides and supplemental material provided to you in Sri Lanka.

Written assignments: Before leaving for Sri Lanka, you will have a session on data analysis, oral presentation and report writing. Throughout the Sri Lankan field trip, we will engage in various activities

including investigating tropical agroforestry, studying the behaviour of animals, identifying species and discerning their habitat relationships, investigating ecological interactions between plants and animals, comparing the characteristics of different ecosystems, and considering issues in marine conservation in Sri Lanka. Every few days, you will complete a short assignment on one of these topics when visiting different areas and ecosystems. Data may be collected on separate data sheets or in your field notebook, depending on the assignment. You may illustrate with photographs you took or sketches you made. Field assignments will be submitted (on paper) when conducting the field study in Sri Lanka.

Field notebook: When conducting field studies it is extremely important to document everything that you do and see that may be relevant to the data you collect. If you are hired to conduct a study, your employer will want a copy of your field notes. A field notebook is a public record, which means it may be scrutinized closely. It is important to develop the skills of taking careful, accurate, complete, neat, and well-organized notes. Therefore maintaining a field notebook will be an essential part of this class. Record all pertinent sightings and other information from field trips in real time. Copied over notes will NOT be accepted. You must keep track of your notebook throughout your trip. Students are responsible for scanning or photographing their notebooks and submitting a digital copy before leaving Sri Lanka. The Field Notebook Marking Sheet will be presented on the first day of class and you will have a short exercise on making field observations in your notebook before leaving on the field trip.

Formal field report: You will summarize the field data you have collected throughout the trip in Sri Lanka. Some of the data will be collected by working in small groups and shared with group members. Others will be observations made by yourself, including photographs to document your observations. You will have a day or two after returning to Halifax to complete your report. The report will follow the format of a standard scientific paper (see Knisely's writing handbook for biology for details about how to format your paper). A marking sheet for the field report will be presented before the beginning of the field activities.

Class participation: The effectiveness of the class depends on everyone attending class, completing the assigned readings and being present as well as participating in lectures and discussions, and being an effective team member on field trips and around camp. Attendance is mandatory. Evaluation of participation is based on performance in the following categories: participating in discussions, asking questions during the species profile presentations, being on time for all classes and field trips, working as an effective team member, being engaged on field trips, contributing to camp chores, being helpful when travelling, and always adhering to safety rules, course policies, and instructions from your field leaders (e.g., not putting yourself or your classmates in any real or apparent danger; stay with the group and do not engage in any reckless behaviour); and being responsible and a good ambassador for Dal.

Species profile assignments and presentations: During the first week of class, each student will prepare a short (7 min) profile on each of three tropical species (a mammal, a bird, and a reptile) that we are likely to encounter on our field trip. Students will choose from a list of common or otherwise notable species provided by instructors. Students will use PowerPoint and present to the class in the first week. Presentations will consist of 7 slides that contain the requisite information. Evaluation will include content and effectiveness of the presentation. Instructions for preparing the profiles will be presented on the first day of class. Profiles will be posted on Brightspace for the class to study for their exam.

Symposium: On the last day of class in Sri Lanka, students will give group presentations on different aspects of the class research project, 30 minutes per group with an additional 10 minutes for questions and discussion. Use PowerPoint or similar presentation software that can save presentations as pdfs. The same grade (for 6%) will be given to each member of the group and is based on presentation content and format (audio-visual aids, organization, speaking style and overall presentation effectiveness). Another 2% will be your contributions to the discussions of other presenters. Together these two aspects comprise your 8% symposium mark.

Course Policies

It is important to keep up with work. Late assignments will be deducted at a rate of 10% per day. Deductions will be made for unexcused absences (1% per day or 0.5% per half day > 30 minutes) and lateness (0.25% for 5-30 minutes late). Excused absences include those for sickness or emergencies, but do NOT include those due to work or attending other classes. Please contact one of the instructors about any absences as soon as possible.

Student responsibilities

This class is hands-on, so you must participate fully in all activities, including attending all classes and field activities.

- (1) **Attendance is mandatory.** You are expected to attend all lectures, labs and field trips.
- (2) **Participation.** You are expected to participate and cooperate in all class activities and follow rules at the field stations and those provided by the guides.
- (3) **Safety precautions.** You must adhere to all safety guidelines including those that will be discussed in the first week of classes. Whenever out of sight of the instructors or the field centre where we will be staying, you must use the buddy system--stay in groups of 2 or more--AND inform the instructors of where you are going and when you will return. For everyone's safety, consumption of alcoholic beverages and recreational drugs are NOT permitted on the field trip.

Tentative schedule Dalhousie classes – first week

June 24	Mon	AM PM	Lectures (3 hrs): Introduction to course; Sri Lanka; Tropical Ecology, Tropical biomes: Processes and cycles I (Climate and Soils); Movie (1 hr) on Sri Lankan wildlife; Lab (2 hrs): Instructions and sign up for species profiles; start work on these assignments with instructors' assistance
June 25	Tue	AM PM	Lectures (3 hrs): Types of tropical forests: Formation and ecotones, Tropical biomes (3 hrs): Processes and cycles II (Nutrient cycling, productivity and hydrology), Biodiversity of SL Movie
June 26	Wed	AM PM	Lecture (1 hr): Tropical mammal ecology and biodiversity Presentations, Movie clips (2 hrs): 2017 Field course (3 hrs): Mammal profiles

June 27	Thu	AM	Lectures (1 hr): Tropical flora; Lab session with Discussions (2 hrs)
		PM	Lecture (1 hr): Tropical bird ecology and biodiversity Presentations (3 hrs): Bird profiles
June 28	Thu	AM	Lectures (1 hr): Tropical forests: Biodiversity and conservation Movie on tropical forests & discussion (2hrs);
		PM	Lecture (1 hr): Tropical herpetofauna ecology and biodiversity Presentations (3 hrs): Reptile profiles
June 29	Fri	AM	Lectures lab and field activities (3 hrs): Introduction to Sri Lankan field data collection and hands on activities; making field observations and notebook entries
		PM	Lab (4 hrs): techniques for soil analysis and data analysis
June 30	Sat	AM	Final info on SL trip (3 hrs)
July 01	Sun		Study day
July 02	Sun	AM	Exam
		PM	Packing field equipment
July 03	Mon	PM	Flight to Sri Lanka

Off-campus – next 3 weeks

Travelling to and from Sri Lanka (dates tentative; actual times will depend on air ticket availability)

Depart from Halifax on *July 03, 2019*

Return to Halifax on *July 25, 2019*

Overview of field trip in Sri Lanka

Lodging (Tentative):

Field Stay / Accommodations

1. In Kandy/ Kanda Uda, Hotel Paris Kandy (*5 days*)
2. Nuwara Eliya / Nuwara Eliya Resort (*3 day*)
3. Sinharaja/ Sinharaja Research Station (*3 days*)
4. Yala National Park/ Wildlife Bungalow (*5 days*)
5. Hikkaduwa/ Hotel Lavanga, Resort and Spa (*3 days*)
6. Colombo (*1 day*)

Field trip (Tentative):

Location	Duration	Activity
<i>Arrival in Colombo (BIA/CMB) on July 04/05</i>	<i>(mid-day)</i>	<i>Travelling</i>
<i>Travel to Kandy from Colombo</i>	<i>3-4 hours</i>	<i>Travelling</i>
Kandy city	0.5 day	<i>Get situated in accommodations</i>
Kandy (5 days & 5 nights)	5 Days	
Udawattakele and Gannoruwa forests, Vegetation types in Hantana mountain range (Pine forest, semi-natural forests, sub-montane grasslands)	2 days	Ecology of tropical forests/wildlife (Hands-on field activities)
Kandyan Homegardens & other Agroforestry systems	1 day	Agroforestry field visit
Botanical Gardens, Peradeniya & Upper Hantana Forest (Guided visit)	1 day	Flora of old tropics
Pinnawala Elephant Orphanage or Sigiriya Rock Kindom/ Dalada Maligawa Visit (The temple of tooth relic)	1 day	Wildlife conservation Cultural sites
<i>Travel to Nuwara Eliya from Kandy (1 day) (Departure 7.30am)</i>	<i>Day time (via Ramboda)</i>	
Spice Garden – Delpitiya	02 hours	Agroforestry field visit
Forest Nursery, Ramboda	01 hour	Species used in Plantation Forestry
Botanical Gardens: Hakgala	0.5 day	Flora of old tropics
Nuwara Eliya (3 days & 3 nights)	3 days	
Tea Estates: Pedro / Liddesdale	1 day	Tea Plantations/Ecology (Hands-on field activities)
Horton Plains (Montane Forest)	1 day	Ecology of tropical dry forests (Hands-on field activities)
Open field vegetable farming at Nuwara Eliya: Conventional and Organic	0.5 day	Tropical agroecosystem
<i>Travel to Sinharaja from Nuwara Eliya (Departure 2.00 pm)</i>	<i>0.5 day</i>	<i><u>Tropical Forests/ Observation</u></i> <i>NE-Welimada-Haputale-Balangoda-Pelmadulla-Ratnapura-Sinharaja</i>
Elephant Transit Home, Udawalawe	0.5 day	Wildlife conservation

Sinharaja Rain Forest (3 days & 2 nights)	3 days	
Rainforest exploration	1.5 days	Ecology of Tropical rain Forest (Hands-on field activities)
Indoor academic activity	1 day	Report, assignment preparation
<i>Travel to Yala from Sinharaja (Departure 2.00 pm)</i>	<i>0.5 day</i>	<u><i>Tropical Forests/ Observation</i></u> <i>Sinharaja-Rakwana-Godakawela-Uda Walawa-Thanamalwila-Tissa-Yala</i>
Yala National Park (5 days & 4 nights)	5 days	
Yala Wildlife Sanctuary	2 days	Ecology/Wildlife
Bundala Bird Sanctuary	1 day	Ecology/Birds
Yala National Park (Dry forest)	1 day	Ecology/Wildlife
Kumana Bird Sanctuary	1 day	Ecology/Birds
<i>Travel to Beruwala/Hikkaduwa from Yala (Departure 4.00pm)</i>	<i>3hrs</i>	<i>Travelling</i> <i>Yala-Habantota-Tangalle</i>
Beruwala/Hikkaduwa (4 days & 3 nights)	4 days	
Coral reefs (glass-bottom boat trip)	0.5 day	Conservation issues
Mangroves (boat trip)	0.5 day	Conservation issues
Conservation of Sea Turtle Populations	0.5 day	Conservation issues
Southern beaches	0.5 day	
Preparation for symposium	0.5 day	
Symposium	0.5 day	
<i>Travel to Colombo from Beruwala</i>	<i>2hrs (23 July)</i>	<i>Travelling</i>
Colombo (1 day)	1 day	
Leisure/shopping	1 day	
<i>Departure & Return to Halifax</i> (July 24th)	1.5 days	<i>Travelling</i>

ACCOMMODATION POLICY FOR STUDENTS

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. The full text of Dalhousie's Student Accommodation Policy can be accessed here:

http://www.dal.ca/dept/university_secretariat/policies/academic/student-accommodation-policy-wefsep--1--2014.html

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the **Advising and Access Services Centre (AASC)** prior to or at the outset of the regular academic year. More information and the ***Request for Accommodation*** form are available at www.dal.ca/access.

ACADEMIC INTEGRITY

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

The Academic Integrity website (<http://academicintegrity.dal.ca>) provides students and faculty with information on plagiarism and other forms of academic dishonesty, and has resources to help students succeed honestly. The full text of Dalhousie's ***Policy on Intellectual Honesty*** and ***Faculty Discipline Procedures*** is available here: http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html

STUDENT CODE OF CONDUCT

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. In general:

"The University treats students as adults free to organize their own personal lives, behaviour and associations subject only to the law, and to University regulations that are necessary to protect

- the integrity and proper functioning of the academic and non-academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;
- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members."

The full text of the code can be found here:

http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

SERVICES AVAILABLE TO STUDENTS

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

Service	Support Provided	Location	Contact
General Academic Advising	Help with <ul style="list-style-type: none"> - understanding degree requirements and academic regulations - choosing your major - achieving your educational or career goals - dealing with academic or other difficulties 	Killam Library Ground floor Rm G28 Bissett Centre for Academic Success	In person: Killam Library Rm G28 By appointment: <ul style="list-style-type: none"> - e-mail: advising@dal.ca - Phone: (902) 494-3077 - Book online through MyDal
Dalhousie Libraries	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	Killam Library Ground floor Librarian offices	In person: Service Point (Ground floor) By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: http://dal.beta.libguides.com/sb.php?subject_id=34328
Studying for Success (SFS)	Help to develop essential study skills through small group workshops or one-on-one coaching sessions Match to a tutor for help in course-specific content (for a reasonable fee)	Killam Library 3rd floor Coordinator Rm 3104 Study Coaches Rm 3103	To make an appointment: <ul style="list-style-type: none"> - Visit main office (Killam Library main floor, Rm G28) - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or - Simply drop in to see us during posted office hours All information can be found on our website: www.dal.ca/sfs

Writing Centre	<p>Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster)</p> <ul style="list-style-type: none"> - Learn to integrate source material into your own work appropriately - Learn about disciplinary writing from a peer or staff member in your field 	Killam Library Ground floor Learning Commons & Rm G25	<p>To make an appointment:</p> <ul style="list-style-type: none"> - Visit the Centre (Rm G25) and book an appointment - Call (902) 494-1963 - email writingcentre@dal.ca - Book online through MyDal <p>We are open six days a week</p> <p>See our website: writingcentre.dal.ca</p>
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