INTERNATIONAL/INDIGENOUS COURSE MODULE PROGRAM

All student participants must be current Arts & Science (St. George) undergraduate students in good standing and be enrolled in an academic program and course listed at the time the proposed activity takes place. Note: In an effort to ensure that as many students as possible can participate in Faculty-funded international opportunities, priority for participation in these opportunities will be given to students who have not previously received funding from Arts and Science for an international experience.

PART I – Applicant + course information

Name of applicant: D. Luke Mahler
Sponsoring Department/Unit: Ecology & Evolutionary Biology

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Alternate phone: 647-609-3766
Course title(s) and number(s) (only students from courses listed may participate):
EEB384H1S Diversity of Amphibians and Reptiles
Estimate of total number of students enrolled: 40
Maximum number of students proposed to participate in ICM: 15
Location of proposed ICM: Ecuador (Yasuni, Yanayacu)
Proposed travel dates: Feb. 16-24, 2019

PART II – International course module details

1) Brief description of the module.

Students will travel to Ecuador to gain firsthand experience with tropical reptiles and amphibians in natural settings. Amphibians and reptiles make fascinating subjects of classroom study anywhere in the world, but opportunities to observe these organisms in nature are limited in northern climes. Ontario’s climate precludes incorporation of local herpetological field experiences into my herpetology course (EEB 384) – our few reptiles and amphibians are dormant during the fall and winter terms. This module would bring highly motivated students from EEB 384 to Ecuador to directly observe the highest concentration of herpetological diversity on the planet.

With the assistance of two Ecuadorian colleagues who are professors at Pontificia Universidad Católica del Ecuador (PUCE), and one additional U of T EEB professor (supported by EEB; see budget), I will lead 15 U of T students on a 1-week herpetological survey expedition focused primarily in Ecuador’s Yasuni National Park, a pristine lowland Amazon rainforest preserve with
a PUCE-affiliated research station that will serve as our base of operations for excursions into natural habitats. Students will participate in two surveys per day (afternoon, and just after sunset) in which they observe, identify, and photograph reptiles and amphibians occurring in a wide diversity of habitats (139 amphibians and 121 species of reptiles are known from this park alone). Instructors will capture individuals of particularly interesting species for closer examination back at the research station. Students will keep a field log in which they document the activity and habitat of encountered reptiles and amphibians, using standard survey notation. Each morning, groups of students will synthesize the class’s observations, photos, and videos into a shared inventory and trip log. During the return from the lowland Yasuni site, the course will stop for one full day at Yanayacu, a high elevation Andean cloud forest site that will allow students to directly observe the dramatic changes in herpetological communities that accompany elevation gain.

With the goal of fostering international cultural connections among students, I have requested funds to support participation by 5 local students from PUCE, as well as funds to support the two PUCE professors who will help lead the module (accommodation and food costs only; because we will rent a tour bus, Ecuadorian counterparts will not add to our transportation costs). I have added this request as a distinct module within the budget.

2) What are the learning objectives of this module?

The primary learning objectives of this module are to (1) expose students to the taxonomic and morphological diversity of reptiles and amphibians, (2) illustrate the ecological role these organisms play in their ecosystem, and (3) reveal how herpetological research is conducted in a field setting.

1) Students will have the opportunity to observe representatives of nearly all major taxonomic groups of reptiles and amphibians alive, and in a natural setting. Many of the major taxonomic groups of reptiles and amphibians live only in the tropics. Amazonian Ecuador has the highest herpetological diversity on the planet, and a healthy representation of all major groups except one (the tuatara, found only in New Zealand). In addition to taxonomic diversity, students will observe firsthand the tremendous morphological diversity exhibited by reptiles and amphibians, from lizards the size of a thumbnail to caimans that exceed four meters in length. The opportunity to observe these species in the wild will serve my course goal of introducing students to as full a range as possible of reptile and amphibian biodiversity.

2) Students will directly observe the myriad ways amphibians and reptiles interact with their environments. A key theme in my class is the ecological roles that amphibians and reptiles play in their ecosystems. With over 200 species present at a single site, Ecuadorian amphibians and reptiles offer an unparalleled opportunity to observe how species partition ecological niches in highly diverse ecosystems. In this regard, the ability to observe species in their natural habitats provides opportunities for ecological observation that cannot be replicated in artificial settings such as zoos.

3) Expose students to herpetological field research techniques. Throughout my course at
U of T, students in EEB 384 encounter the results of herpetological research through my lectures, writing assignments, and specimen labs. However, it is difficult to communicate in a classroom setting how such knowledge is generated via herpetological field research. Students will observe firsthand how herpetological biodiversity surveys and behavioral observations are conducted as they survey amphibians and reptiles alongside practicing Ecuadorian biologists, who will be our hosts and module co-instructors.

Finally, a more general overarching learning objective will be to expose students to biodiversity in an ecosystem very different from the temperate ecosystems that characterize southern Ontario. My first trip to the tropics (as an undergraduate, during a study abroad course) changed the way that I thought about ecological communities and inspired me to pursue my present career.

3) If participation by less than the total number of students in the course is proposed, what procedures and criteria will be used to select ICM participants? (Note that if there are more students enrolled than there are ICM spots, in an effort to provide as many opportunities as possible, priority must be given to those students who have not already received funding for a Faculty of Arts & Science international opportunity including 398 REP, ICM, or DFIII – formerly known as DIIF. Some exceptions may apply, please inquire for details.)

Eligible students will submit a CV, informal transcript, and a short statement describing their desire to participate. I will evaluate students using four equally-weighted criteria: enthusiasm for reptiles and amphibians; enthusiasm for ecology and evolution; academic record (preference for high performing students); and prior opportunities for international travel (preference for students who have had fewer opportunities).

4) How does the ICM enhance students’ (both ICM participants and non-participants) learning for the course in which it is embedded?

In my experience leading this ICM in 2018, students’ engagement with biodiversity course matter is tremendously enhanced when they have the opportunity to observe organisms and biological processes in situ. As detailed above (in Question 2), this module will use an experiential approach to illustrate central themes from my course. Participants will serve as ambassadors to the course at large, communicating their experiences to other students as described below. As I did this winter, I will draw upon our Ecuador ICM experiences in subsequent course lectures. I find that these vignettes are particularly effective and memorable for all students.

5) How will the ICM be incorporated into the course’s curriculum and marking scheme? Please describe the assignments and marking scheme for the ICM. (Bear in mind that not all enrolled students may end up taking part in the ICM. However, a course can have two marking schemes: one for the students involved in the ICM and one for those who are not. It is required, of course, that the two marking schemes be outlined in the course syllabus.)

Together, two assignments related to the ICM will comprise 25% of the course grade for participants. Students will record their daily observations of reptile and amphibian habitat use and behavior in a field notebook. At the end of each of the five field days, a group of three
students will synthesize these individual experiences into a cohesive, chronological, multimedia weblog trip account. This account will be graded (as a 3-person group project) for 5% of the course grade. Back in Toronto, participants will also author a blog-style essay about a key research topic in herpetology. ICM students will be encouraged to pick an animal or topic they encountered during the ICM for this assignment. This account will comprise 20% of the course grade.

Non-participating students will visit Toronto Zoo to observe amphibians and reptiles (an EEB supported activity that has worked well for the past 2 years), and will author a similar account based on a species observed at the zoo (25% of the course grade for non-ICM students).

6) How will ICM participants share their experience with other in the class and the wider Arts & Science community?

Students will share their experience with others in the class through contributions to a chronological, multimedia trip weblog, and by authoring descriptive species accounts. Students will be encouraged to engage in discussion about these experiences using our course website’s conversation forum and commenting options.

To reach a wider community, our students will participate in the ROP/ICM research poster fair (they enjoyed presenting at this fair this year). Participants will also be encouraged to submit images to the annual CIE photo contest. As always, I am available and willing to give presentations about my research and this ICM to interested undergraduates (e.g., via the Ecology and Evolutionary Biology Undergraduate Union, or similar groups). I have given research talks to EEBU twice in the past few years, and their meetings would provide an ideal forum for sharing our experiences.

7) If funding is requested for multiple years, how will the success of the module be measured after each year? (For ICMs approved to run for more than one year, continued funding will be contingent on the success of the module as determined by the unit and the Dean’s Office.)

Please see my 2018 report for an evaluation of our 2018 ICM, which I feel was a tremendous success. I will soon consult my teaching evaluations for additional feedback on the ICM (these are not yet available), and will use this information in planning next year’s module. I am requesting funding for 2 additional years of this ICM module, following this first successful year; the annual budget below is not expected to change in later years.

All undergraduate students, graduate students, and faculty taking part in international opportunities must meet the UofT Safety Aboard guidelines as noted on the Safety Abroad website: http://www.studentlife.utoronto.ca/cie/safety-abroad in order to participate. Support will be provided by the Professional and International Programs (PIP) office at Woodsworth College to ensure safety abroad requirements are met.

**PART III – Itinerary**
Please provide an approximate itinerary (briefly indicating daily locations and activities) and a budget in Canadian dollars. The budget should include expenses for students and one faculty member and should clearly indicate any contributions from other sources received or applied for.

1) BRIEF ITINERARY (list dates and daily activity)

<table>
<thead>
<tr>
<th>Dates</th>
<th>Location</th>
<th>Activity</th>
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<tbody>
<tr>
<td>February 16</td>
<td>Flight</td>
<td>Depart Toronto; Arrive Quito</td>
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<tr>
<td>February 17</td>
<td>Drive to Yasuni</td>
<td>Travel</td>
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<tr>
<td>February 17-21</td>
<td>Yasuni (Amazon rainforest)</td>
<td>Survey reptiles, amphibians</td>
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<tr>
<td>February 22</td>
<td>Drive to Yanayacu</td>
<td>Travel</td>
</tr>
<tr>
<td>February 22-23</td>
<td>Yanayacu (Andean cloud forest)</td>
<td>Survey reptiles, amphibians</td>
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<tr>
<td>February 24</td>
<td>Flight</td>
<td>Depart Quito; Arrive Toronto</td>
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