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: Professor Grant Henderson and Russell Pysklywec

Name of teaching- or tenure-stream faculty member with undergraduate appointment to Arts & Science leading ICM (if different from above): Professors

Sponsoring Department/Unit: Earth Sciences

E-mail: henders@es.utoronto.ca  Phone: 416-978-6041
E-mail: russ@es.utoronto.ca  Phone: 416-978-3021

Course title(s) and number(s) (only students from courses listed may participate):
ES221--Minerals and Rocks

Estimate of total number of students enrolled: 50

Maximum number of students proposed to participate in ICM: 15

Location of proposed ICM: Western and Central Turkey: Istanbul, Dardanelles, Cappadocia

Proposed travel dates: Fall break Nov. 2-11, 2018

PART II – International course module details

1) Brief description of the module.

Western and Central Anatolia has a fascinating geologic history of active and past tectonics. It is situated at the ancient Tethyan plate boundary that finished closure with the collision of the Himalayan system further to the east. Subsequently the entire Anatolia block seems to have been extruded westwards away from the Arabian plate collision and towards the retreating African subduction to the south below Crete. For Western Anatolia, these plate motions have been pulling apart the crust in a N-S direction while sliding the region westwards along the major North Anatolia strike-slip fault. In Central Anatolia there is widespread recent volcanism. As such, the areas are complex regions of major seismicity, tectonic extension, and geothermal activity and this remarkable geologic diversity makes it an ideal location to study minerals, rocks, and tectonics.
The ICM trip will allow students to observe a wide range of geologic features and discuss active geologic processes, with direct observation at specific field locations.

At the same time, the geological intrigue of Anatolia is reflected in the cultural and historical complexity of Turkey. As the meeting place of continents and civilizations, the area represents one of the unique regions of the world to understand human socio-economic development, conflict, and interaction from antiquity to the present day. Some of the past and present-day human life in the region has been impacted by the regional geology and tectonics. At several field sites the module will illustrate how anthropogenic factors are influenced by the geologic activity of Anatolia. We will also visit a gold mine site (owned by a Canadian company) that gives tangible evidence of geology on economic development.

2) What are the learning objectives of this module?
   
   **By the end of this module students will be able to:**
   - describe active and recent geologic features in Western Anatolia and place them into a geologic context
   - summarize the geologic history of the Eastern Mediterranean region generally
   - understand how these geologic processes give rise to the development and distribution of the relevant minerals and rocks in the region
   - appreciate early history of western civilization and understand how geological processes have affected humans (in the past and present-day); for example, with the development of economically valuable minerals
   - evaluate information learned in the ESS221 course to an actual field setting
   - relate information that will be covered in the courses to lessons learned in the field
   - interaction with Turkish geoscience students and discovery of how students in their area of study learn in a different environment and style of instruction/learning
   - explain their thoughts when confronted with new and complex observations
   - work with others in a field setting.

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.)

   If the number of interested students surpasses available spaces, we suggest a panel of students from our undergraduate student association and who are not enrolled in the course will make a decision based on brief interviews with the students.

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

   In ESS221 students study rocks and minerals as the basic building blocks of the solid Earth, exploring the physical and chemical properties of minerals; crystallography and crystals; descriptions of rocks in hand samples; optical techniques in mineral identification. What’s missing is a study of the development and occurrence of these rocks and minerals in the field. This proposed ICM trip will provide that key learning experience for our students. Further, the international location in Turkey—as a site of active tectonics—is important because it will provide the students with a field exposure to minerals, rocks, and processes that is not available elsewhere.
In general for their UofT education, the ICM trip will be of significant academic value. A capable geoscientist must look at a feature from a range of scales: microscopic, hand sample, outcrop, regional, and global. Of these five only the two smallest and the largest can be achieved in the indoor classroom. To comprehend the outcrop and regional scale it is necessary for our students to travel to the field sites for a full learning experience. In addition, fieldtrips are indispensable for building group dynamics and learning, and make students aware of the skills necessary to become a functioning member of a team.

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.)

There will be graded student activities during the fieldtrip (notebooks, mapping exercises, presentations), as well as a summary report after the fieldtrip. The fieldtrip mark will constitute 15% of the final grade.

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

As with past years, the students will create posters about what they learned on the trip to share with the other students in the class, to put up in the department, and to present at the FAS Research Forum. These posters will be part of the grade for the module. In addition, students on the ICM ES trips have been eager to share their real-time experiences with the University and public through social media (Instagram, blogs, Facebook, etc.) and we will continue this online dissemination of the geologic journey on this proposed trip.

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.)

A pre-departure orientation and recording of information in the UofT Safety Abroad Database are required by the ICM program. We are deliberately planning to stay at hotels with reasonable cost rather than camping as on previous trips to Texas and New Zealand for concern about our students’ safety in the area. Since November is a low season for tourism, the hotel rates in Turkey will be very reasonable.

Note: A previous planned ICM trip to Turkey was moved to New Zealand at the late stage in 2016-17 owing to security concerns and incidents in Turkey that happened in late 2016. The situation in Turkey has very much stabilized since although we will continue to monitor carefully this issue, in close consultation with colleagues there. Further, we are only travelling to the most-safe areas of the country. We note that a number of successful trips by other UofT groups has taken place to Turkey since 2016.

All undergraduate students, graduate students, and faculty taking part in international opportunities must meet the UofT Safety Abroad 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>November 2</td>
<td>Flight</td>
<td>Depart Toronto</td>
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<tr>
<td>November 3-4</td>
<td>Istanbul</td>
<td>Visit to Istanbul Technical University, Eurasian Earth Sciences Institute; intro to Anatolia geology; student exchange; cultural sites Istanbul</td>
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<tr>
<td>November 5</td>
<td>Dardanelles-Canakkale</td>
<td>Geology of NAF; tectonics of Dardanelles; earthquake hazards; Galipoli</td>
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<tr>
<td>November 6</td>
<td>Troy-Assos</td>
<td>Active faulting; ancient civilizations</td>
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<tr>
<td>November 7</td>
<td>Izmir-Menderes Massif</td>
<td>Efemçukuru gold mine (owned by Eldorado Gold, Canada)</td>
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<td>November 8</td>
<td>Ephesus</td>
<td>Detachment faulting—extensional faulting driven by slab retreat; Greek ruins</td>
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<tr>
<td>November 9-10</td>
<td>Cappadocia</td>
<td>Volcanism; igneous processes and mineralization</td>
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<tr>
<td>November 11</td>
<td>Istanbul-Toronto</td>
<td>Return</td>
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