

<b>Course Title:</b>	<b>Land or Sea – Tropical Research in Jamaica</b>																	
<b>Instructor(s):</b>	Dr. Jurek Kolasa (McMaster University) <a href="mailto:kolasa@mcmaster.ca">kolasa@mcmaster.ca</a>	Dr. Nigel Waltho (Carleton University) <a href="mailto:nigel.waltho@carleton.ca">nigel.waltho@carleton.ca</a>																
<b>Dates:</b>	Dec 27/28, 2020 – Jan 09/10, 2021. Two weeks (N.b. do not book flights until dates are confirmed)																	
<b>Location:</b>	<a href="#">Discovery Bay Marine Laboratory</a> , University of West Indies, Jamaica																	
<b>Cost:</b>	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 40%; text-align: center;"><i>Terrestrial or Snorkel Project</i></th> <th style="width: 10%; text-align: center;">OR</th> <th style="width: 35%; text-align: center;"><i>SCUBA Project</i></th> </tr> </thead> <tbody> <tr> <td><b>Fees:</b></td> <td>Deposit: \$350</td> <td></td> <td>\$350</td> </tr> <tr> <td></td> <td>Balance: \$1945</td> <td></td> <td>\$2595</td> </tr> <tr> <td></td> <td style="border-top: 1px solid black; border-bottom: 3px double black;"><b>Total: \$2295</b></td> <td></td> <td style="border-top: 1px solid black; border-bottom: 3px double black;"><b>\$2945</b></td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• <b>Course fees</b> cover students' transportation from Montego Bay to DBML, and return. <b>Course fees</b> include two weeks Room and Board at DBML, and Facility fees. For Scuba divers, the higher course fees cover the 2X daily air-fills, underwater ID books and slates, and the second week boat fees.</li> <li>• The <b>\$350 Deposit</b> is non-refundable, paid to your home university; the <b>Balance</b> (\$1945, or if scuba diving \$2595) is paid by cheque to <b>Carleton University 814308-166-228000</b>. Mail cheques by Aug 31<sup>st</sup> to: Haiyun Bo, Dept. Biology Nesbitt Bldg., Carleton University, 1125 Colonel By Dr, Ottawa, ON K1S 5B6.</li> </ul> <p><b>Airfare:</b> required to Montego Bay, and return</p> <p><b>Equipment:</b> each student must have a valid passport with a minimal 6-month expiratory date. Students must provide their own field equipment such PVC m<sup>2</sup> quadrats, tape-measures, pencils/erasers, and log books as appropriate to their research project. Further;</p> <ul style="list-style-type: none"> <li>• snorkelers and scuba divers must provide their own mask, snorkel, fins, and wetsuit</li> <li>• scuba divers must additionally provide their own dive watch/dive computer, and BCD's and Regulator (e.g., we recommend a two-week rental from your local dive store). All Scuba divers must have <a href="#">DAN membership &amp; Scuba insurance</a>.</li> </ul>			<i>Terrestrial or Snorkel Project</i>	OR	<i>SCUBA Project</i>	<b>Fees:</b>	Deposit: \$350		\$350		Balance: \$1945		\$2595		<b>Total: \$2295</b>		<b>\$2945</b>
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<b>Prerequisites</b>	<p><b>Academics:</b> students <i>should</i> be in their 3<sup>rd</sup> or 4<sup>th</sup> year of a Biology, Env. Sci., or similar program; and:</p> <ul style="list-style-type: none"> <li>• have at least one advanced 3<sup>rd</sup>/4<sup>th</sup> year ecology course beyond the Introductory (2<sup>nd</sup> year) level, and</li> <li>• have at least one biometry or similar statistics course.</li> </ul> <p><b>Snorkelling/Scuba:</b> students must be comfortable swimming. Scuba students must be minimally certified with their basic <i>open water scuba certification</i>.</p>																	
<b>Enrolment:</b>	20 (6) 14 students minimum																	
<b>Course Description (brief):</b>	<ul style="list-style-type: none"> <li>• Research projects on the ecology of marine/coastal organisms in the area (swimming/walking) of the Discovery Bay Marine Laboratory. Research emphasis is on the distribution and community structure of readily observable species assemblages (e.g., brittle stars, sea urchins, coral reef fish, corals, sponge &amp; algae, and coral diseases) as these relate to <i>ecological</i> process (e.g., competition, tri-trophic interactions, predator-prey refuge zones, crypsis, habitat structure). Projects on terrestrial shore crabs, molluscs, insects, and coastal plants or stream ecology are also possible.</li> <li>• Student teams (groups of 2-3) submit a 3-4 pg research proposal due Nov 1<sup>st</sup>, 2020. Proposals may need updating upon review/comments made.</li> <li>• Once in Jamaica the focus varies as the needs arise for the different research projects. For all projects, students will perform field work/data collection morning and afternoon, and engage in lectures/presentations/or workshops through the evenings.</li> </ul>																	
<b>Evaluation:</b>	<p><b>Research proposal:</b> due Nov 1<sup>st</sup>, 2020 (group project 10%)</p> <p><b>Field effort:</b> commitment, initiative, participation, &amp; industriousness (individual effort 10%)</p> <p><b>Quizzes:</b> (individual effort 10%)</p> <p><b>Final paper:</b> following your return home, students may assist each other with their statistical analyses, but the written final paper can only be individual in effort. This paper is to mimic the format of a published paper, due Feb 28<sup>th</sup>, 2021 (individual effort 70%)</p>																	

## An Average Day – What to Expect

(a) Daily timeline	<p>07:00-08:00 → prepare field gear/ dive gear          08:00-08:45 → breakfast and cleanup          09:00-12:15 → morning field work          12:30-13:15 → lunch and cleanup          13:30-17:30 → afternoon field work          18:30-19:30 → dinner and cleanup          19:30-23:00 → lectures, species id workshops, presentations, statistical workshops</p>
(b) Work habitat & Physical exertion, (c) Common activities	<p><b>Pre-field course:</b></p> <ul style="list-style-type: none"> <li>students will be assigned into research teams based on research interests &amp; home university. Teams are required to submit a 3-5 pg. peer-reviewed research proposal by Nov. 1<sup>st</sup> (10% final grade)</li> </ul> <p><b>Walking/ Swimming/ Snorkelling &amp; Scuba Competency:</b></p> <ul style="list-style-type: none"> <li>terrestrial projects may require up to km-long daily walks along coastal rocks (sharp, uneven, risk of falling/ bruising), or through thick bush (plant thorns, uneven rocks) carrying, as required, their field equipment.</li> <li>snorkellers and scuba divers will necessarily show a minimal level of swimming (&amp; scuba) competency. This will be evaluated the first day including:             <ul style="list-style-type: none"> <li>treading water for 10min., a 200m swim, and a 25m underwater swim</li> <li>for scuba divers → mask/regulator recovery, buoyancy control, scuba-scuba exchange</li> </ul> </li> </ul> <p><b>Research Projects:</b></p> <ul style="list-style-type: none"> <li>all students are expected to engage in field research activities through both morning, and afternoon – everyday</li> <li>all students are expected to keep their research site clean, and uncluttered when not in active use (e.g., during meals, overnight)</li> <li>all students are expected to stow their gear in a safe manner when in transit, and/or when work is complete</li> <li>all <i>in-water</i> students (e.g., snorkelling/ Scuba) need to address these common risks:             <ul style="list-style-type: none"> <li>seasickness → generally avoided with Gravol ginger</li> <li>middle-ear barotrauma → if sustained you'll be out of the water for minimally a week; easily avoided with slow descents and proper ear-clearing techniques that we'll practice again and again</li> <li>slow-creep hypothermia → avoidable by keeping warm (full body minimum 4-5 mm wetsuits), eating well, staying hydrated, and having good sleeps.</li> </ul> </li> <li>all students are expected to participate/engage in evening lectures, workshops, and presentations as scheduled.</li> </ul>
(d) Weather, dehydration, & biting insects	<p><b>Weather:</b></p> <ul style="list-style-type: none"> <li>average daily high temperatures are between 22-30°C; and average nighttime low temperatures are above 18°C. However, northern weather systems can significantly cool things down (Jan 2010 our temps. were 8°C cooler for a solid week). Rain and cold weather can make for a non-Caribbean experience – be prepared.</li> <li>the sun can be hot, and UV burns do occur. Common sense long loose clothing and hats are recommended over sunscreen. In-water students use Reef-friendly sunscreen only.</li> <li>snorkellers/Scuba divers bring an extra sweater/warmth – you need to protect against slow-creep hypothermia during the second week especially.</li> <li>occasional heavy winds/rains – bring appropriate gear</li> </ul> <p><b>Dehydration:</b></p> <ul style="list-style-type: none"> <li>a significant concern due to both being in a Caribbean climate and for the divers, that you are scuba diving. One year a student had kidney failure and had to be sent home for medical treatment because the student was not drinking enough. Fresh water is plentiful on campus – bring a water bottle and keep it with you at all times. Keep drinking – your pee should be clear.</li> </ul> <p><b>Bugs:</b></p> <ul style="list-style-type: none"> <li>mosquitoes are active among the vegetation, and in the evenings/night (bug spray, long sleeves and pants). P</li> <li>potentially the larger biting insect problem are the sand-flies and no-see-ums. Keep your outdoor shoes outside your residence (small sand grains can carry the no-see-ums indoors); deet-based bug sprays do not work on the no-see-ums, instead bring baby oil and “after-bite” for the itch.</li> <li>long loose clothing help as sun-screen and similarly as bug barriers. Scented soaps/shampoos attract these bugs.</li> <li>there is no malaria but dengue fever is present in Jamaica. If you feel flue-like symptoms talk to the instructors.</li> </ul>

(e) Toxic/poisonous, wildlife/ plants	<ul style="list-style-type: none"> <li>• on land → avoid manchineel apple and any plant that oozes white, sticky milk. Many plants have thorns and some have sharp leaf edges</li> <li>• In water → there are numerous hazardous marine species present that could abrade, sting, puncture, or bite. These include sponges, corals, fire-corals, fireworms, cone shells, urchins, jellyfish, stingrays, eels, scorpion fish, and sharks.</li> <li>• the simplest and most effective defenses against all of the above is good buoyancy control, be aware of your immediate surroundings, don't touch, and don't wag the tail of a passing shark. For scuba divers we will practise buoyancy control throughout the course.</li> </ul>
(f) Sleeping, washroom & laundry facilities	<ul style="list-style-type: none"> <li>• separate male/female student dorms (4-6 to a room) with bunk beds/mattresses/linen (no heating, no AC).</li> <li>• students should consider bringing a sleeping bag for extra warmth – especially the snorkellers/scuba divers</li> <li>• strongly recommend students bring their own towels</li> <li>• strongly recommend bringing second pair shoes/flipflops for indoor use only</li> <li>• each dorm room has its own flush toilet and cold-water shower</li> <li>• laundry facilities are available for a small fee</li> </ul>
(g) Meal plans & food allergies	<ul style="list-style-type: none"> <li>• meals are prepared on site by the kitchen staff. As the station accommodates many visiting courses a year the staff is well versed in addressing most vegetarian, gluten-free, or nut/seafood allergy diets. However, you may need to bring supplements if your diet is significantly restrictive.</li> <li>• if you need your morning tea/coffee – bring teabags/ pound or two of ground beans and an inexpensive bodum. Further, if you need to have your mid-morning/mid-afternoon snacks (e.g., granola bars) then bring your own non-perishable sealed snacks.</li> </ul>
(h) Non-academic responsibilities	<ul style="list-style-type: none"> <li>• students are responsible to keep their own dorms/washrooms clean (cleaning supplies provided)</li> </ul>
(i) Degree of isolation	<ul style="list-style-type: none"> <li>• the Discovery Bay Marine Laboratory is isolated. We are essentially off the map, however the town of Discovery Bay is approx.. a 30min. walk away.</li> <li>• DBML does provide power (Canadian style electric wall outlets) and wireless internet service (albeit slow but adequate for emails/browsing – DO NOT use the internet to download movies/YouTubes, or other). Keep your photos on your own computers/cameras, upload them to Facebook, Instagram, etc when you get home.</li> <li>• cell phone coverage is available, but make sure you obtain a roaming plan with your regular service provider BEFORE you leave home otherwise your roaming fees will be astronomically sky-high. Consider alternatively installing “WhatsApp” on your cell phone, or purchasing a local Simcard once in Jamaica.</li> <li>• the station does have its own medical facility for daily bumps and bruises. More significant injuries you'll necessarily be transported to Discovery Bay and beyond.</li> </ul>
(j) Alcohol & drugs	<ul style="list-style-type: none"> <li>• the course will remain alcohol and drug free. Transgressions will be evaluated for immediate exit from the course. Possible exceptions include New Year's Eve celebrations.</li> </ul>
(k) Vaccinations/ Insurances	<ul style="list-style-type: none"> <li>• to get the latest updates regarding health and recommended vaccinations for travelling to Jamaica visit <a href="https://travel.gc.ca/destinations/jamaica">https://travel.gc.ca/destinations/jamaica</a></li> <li>• every scuba diving student must have DAN diving insurance <a href="https://www.diversalertnetwork.org/insurance/dive/">https://www.diversalertnetwork.org/insurance/dive/</a> independent to other insurances you might already have</li> </ul>
(l) Social/ Cultural Situations	<ul style="list-style-type: none"> <li>• the DBML is an academic institution, not a holiday resort thus respectful swimwear and clothing is assumed.</li> <li>• avoid: <ul style="list-style-type: none"> <li>○ ladies → strappy/strapless tops/dresses (i.e., shoulders/midribs to be covered); butt cheeks showing shorts</li> <li>○ guys → muscle shirts</li> <li>○ wet bathing suits in the dining hall; clothing advertising drugs, alcohol companies, or inappropriate phrases</li> </ul> </li> <li>• accommodation is in rooms with mosquito screens but not glass windows. Sleep is easily disrupted by noisy behaviour in the adjacent rooms or access areas (stairs, passages). Do not contribute to these concerns.</li> </ul>
(m) Final comments	<ul style="list-style-type: none"> <li>• notwithstanding all the above, this course is a great experience for all (e.g., hands-on scientific research, personal growth, new friends with like-minds, unique experiential learning, local culture, music, colour).</li> <li>• on an academic front, the course is designed along multiple pedagogical trajectories, each contributing to your growth and maturation in: <ul style="list-style-type: none"> <li>○ tropical systems ecology</li> <li>○ research design and statistics</li> <li>○ writing scientific papers</li> </ul> </li> <li>• it's a lot to pack in in two weeks, but with advance preparation (i.e., your research proposal) and with years of experience teaching this course the rewards are well worth the efforts for all of us.</li> </ul>