SYLLABUS

Freshwater Sciences Practicum 512
Laguna Bacalar Research Experience
Winterim
Destination: Bacalar, Mexico – January 9 – 19, 2017

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School of Freshwater Sciences
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Class location: School of Freshwater Sciences
Office Hours: By appointment; call, email or contact Dr. Kaster.

Course Overview
A graduate student field experience in the Southern Yucatan Peninsula, Mexico. Mexico's 2nd largest natural lake, Laguna Bacalar is one of the most unique, world class freshwater lakes on Earth. Students will participate in the scientific investigation of lake and cenote bathymetry, chemistry, hydrology and ecology. Laguna Bacalar ecological studies will center on the giant freshwater, living Stromatolites (oldest known life forms at 3.5 Ga), extensive freshwater mangroves, and invertebrate ecology. Students will learn to sample water and benthos using fathometer and GPS system, YSI sondes, and other instrumentation. Additionally, students will examine a laguna-side land parcel where the development of a field station has been proposed. Students will also participate the School of Freshwater Sciences meetings with ECOSUR representatives to plan the field station. Other activities may include trips to the Maya ruins and the Mesoamerican Barrier Reef, the second largest in the world.

Learning Outcomes
Students will 1) become proficient at field analyses, 2) gain international experience through meetings with an international cast of scientists and government representatives, 3) learn the logistics involved in conducting international field research.

Prerequisites
Prereq: consent of instructor, jlk@uwm.edu.

Reading List


Powerpoint presentations at: http://www.lagunabacalarinstitute.com/Agenda.html

POET. Made available from Kaster. Extensive terrestrial environmental report for area around Laguna Bacalar.

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**Grading**

<table>
<thead>
<tr>
<th>Component</th>
<th>Graduate</th>
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<tbody>
<tr>
<td>Attendance &amp; Participation</td>
<td>25%</td>
</tr>
<tr>
<td>Lab/field Exercises</td>
<td>25%</td>
</tr>
<tr>
<td>Individual Field Reports</td>
<td>30%</td>
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<tr>
<td>Field Leadership</td>
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Point Distribution

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
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<td>97-100%</td>
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<tr>
<td>A</td>
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<td>A-</td>
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<td>B+</td>
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<td>B</td>
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<td>C</td>
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<td>D-</td>
<td>60-62%</td>
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<tr>
<td>Less than 60% is an F</td>
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</table>

**TRAVEL ITINERARY**

(Tenative)

Freshwater Science Practicum 512

Bacalar, Mexico; January 09 – 19, 2017

**Laguna Bacalar Research Experience, Winterim 2017**

**NOTE:** Other than air travel, the itinerary is highly fluid due to local arrangement details once in Mexico.

<table>
<thead>
<tr>
<th>Day</th>
<th>Location</th>
<th>Time</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 Mon</td>
<td>Travel to Bacalar, MX</td>
<td>4AM - 9PM</td>
<td>- Travel day&lt;br&gt;- Arrive at Milwaukee Mitchell Field, check-in&lt;br&gt;- Depart Milwaukee&lt;br&gt;- Students will arrive in Cancun and transported to Bacalar by rental van.</td>
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<tr>
<td></td>
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<td>2:05PM</td>
<td>Road lunch - Tulum&lt;br&gt;- Arrive Bacalar&lt;br&gt;- Lodging: Amigos Hotelito, Bacalar, check-in</td>
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<tr>
<td></td>
<td></td>
<td>3:00PM</td>
<td>- Dinner&lt;br&gt;- Lunch&lt;br&gt;- Kayak shore, swim and snorkel&lt;br&gt;- Dinner</td>
</tr>
<tr>
<td>10 Tue</td>
<td>Bacalar, MX</td>
<td>7AM – 9PM</td>
<td>- Morning brief/breakfast&lt;br&gt;- Meeting with planning committee&lt;br&gt;- Visit Field Station site.</td>
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<tr>
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<td></td>
<td>- Boat trip to north Laguna Bacalar; collect bathymetry, secchi disc, chemistry data; swim and snorkel check-out, east shore; mid-morning snack. Return to Amigos Hotelito.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>- Lunch&lt;br&gt;- Dinner</td>
</tr>
</tbody>
</table>
| 11 Wed | Bacalar, MX | 7AM – 9PM | -Morning brief/breakfast  
-Field Station site work  
-Boat to south Laguna Bacalar; collect bathymetry, secchi disc, chemistry data.  
-Rio Chaac River ("The Rapids"): Giant Stromatolites Boat to river mouth; Kayak up river to Xal Ha; float river downstream to observe stromatolites.  
-Lunch  
-Tour Bacalar lake front, Fort of San Felipe, market  
-Dinner |
| 12 Thu | Bacalar, MX | 7AM – 9PM | -Morning brief/breakfast  
-Field Station site work  
-Boat to Submarine cenotes; collect bathymetry, secchi disc, chemistry data.  
-Return to Amigos hotelito  
-Lunch  
-Open |
| 13 Fri | Bacalar, MX | 7AM – 9PM | -Morning brief/breakfast  
-Field Station site work  
-On-water research  
-Meeting with planning committee  
-Interaction with scientists  
-Open |
| 14 Sat | Bacalar, MX | 7AM – 9PM | -Morning brief/breakfast  
-Interaction with scientists  
-Analize data/write report  
-Open |
| 15 Sun | Bacalar, MX | 7AM – 9PM | -Morning brief/breakfast  
-Maya ruins: Kohunlich and Dzibanche  
-Lunch  
-Analize data/write report |
| 16 Mon | Bacalar, MX | 7AM – 9PM | -Majahaul Caribbean, ecotourism, mangrove impact  
-Chetumal ECOSUR trip  
-Student presentation at ECOSUR  
-Open |
| 17 Tue | Bacalar, MX | 7AM – 9PM | -Breakfast/brief/swim  
-Open/prepare for departure |
| 18 Wed | Puerto Morales | 7AM – 9PM | Depart Bacalar, MX, travel to Puerto Morales  
-Lodging: Eco Boutique Hotel Amarte  
-Open for Puerto Morales |
| 19 Wed | Travel day | 10AM  
2:00PM  
4:15PM  
9:55PM | -Depart Puerto Morales  
-Lunch on road  
-Arrive at Cancun Airport  
-Depart for Milwaukee  
-Arrive Milwaukee |
Program of Study

The study program will consist of the following components:

1) Pre-travel:
   A pre-travel dialog will provide background information to students on what they might expect at the principal site during the trip. Not all sites will be visited with a stay, e.g., Cancun and Riviera Maya, however much can be gained as the road trip to Bacalar takes us through these areas. Ecological historical and cultural information will be provided pre-travel so that students can more easily make notes in their log as we pass through. For example, Playa del Carmen grew in population from about 10,000 to 200,000 in just 10 years. The highlighted areas are Milwaukee (infrastructure, streets, good and not-so good areas), Cancun, Riviera Maya, Playa del Carmen, Tulum South of Sian Ka’an, Costa Maya, and Bacalar.

2) Travel:
   See itinerary above. This will be both the travel and scientific substantive portion of the course. Students will engage in collecting research data, witnessing the impact of tourism and vs. ecotourism, and interacting with local cultures including present and past Maya culture.

3) Post-travel:
   A short time period may be needed to re-integrate what we have just accomplished. We will establish the final protocol for the scientific presentation

4) Group presentation of trip to the SFS faculty and students (open to all): To be arranged.
   The presentation is meant to disseminate the results of the trip, both scientific and otherwise. Media will include a combination of power point, poster, video, and spoken communication.

Prior to Travel

In addition to the academic pre-travel information given above, the students will receive information on physical safety, food/water safety, field safety and anticipatory travel difficulties. A packet will be provided that gives specific details of general conduct, safety, travel alternatives, e.g., bus from Bacalar to Cancun, police station, medical care, and contact information of U.S. expatriates living in Bacalar that they can rely on for help. Interpersonal relations among participants will be discussed. These issues will be discussed during regular class time and also by individual interview. If necessary, meetings outside of class may be arranged.

Issues of Interest

Students will be instructed on what to bring (e.g., hat, snorkel gear), what to expect (e.g., language barriers, local customs), and what are the special health and safety issues.

Personal safety issues in Mexico have recently made headlines. Up-to-date details can be found at http://travel.state.gov/. If you will search “Mexico” you will see there are many warnings in the drug trafficking areas, especially along the borders. The Bacalar area lies about 30 miles north of the Quintana Roo state capital of Chetumal. Quintana Roo includes about one-third of the Yucatan Peninsula; the part juxtaposed next to the Caribbean. Mexico is very cautious about protecting this area in that the 100 mile long slice next to the Caribbean Sea, from Cancun to Tulum (Riviera Maya), produces one-third of Mexico’s nation tourism income! Tourism is Mexico’s top income source (other than Pemex state ran oil). This region is rigorously patrolled by law enforcement and thus, students will experience such a stop for identification and possible inspection. This I view as a positive and proactive.

Bacalar itself is a small village of 11,000. Many of the residents are Maya in that Bacalar served as one of their last strongholds during the indigena removal conflict. Its residents are highly family oriented. The village has been designated as a Pueblo Magicos (City of Magic), highly-desired designation. There is a
state teachers college in Bacalar and many small businesses of every variety (there are no large box stores in Bacalar). You will still find horse and carts using the streets. The residents are very friendly and especially interested in any one or activity to preserve Laguna Bacalar. I have been told that violent crime does not exist there, however, crimes of convenience (theft) is said to be wide spread (cars left unlocked, packages unattended. I have no access to the official rates but always felt safe during my 5 years of travel to Bacalar.

Special Notes

Participation by Students with Disabilities: If you need special accommodations in order to meet any of the requirements of this course, please contact me as soon as possible.

Accommodation for Religious Observances: Students will be allowed to complete examinations or other requirements that are missed because of a religious observance.

Academic Misconduct: The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others’ academic endeavors. A more detailed description of Student Academic Disciplinary Procedures may be found in Regents Policy Statements, UWS Chapter 14 and UWM Faculty Document #1686.

Complaint Procedures: You may direct complaints to the head of the department. If the complaint allegedly violates a specific university policy, it may be directed to the head of the department in which the complaint occurred or to the appropriate university office responsible for enforcing the policy.

Grade Appeal Procedures: You may appeal a grade on the grounds that it is based on a capricious or arbitrary decision of the course instructor. Such an appeal shall follow the established procedures adopted by the department, college, or school in which the course resides. These procedures are available in writing from the respective department chairperson or the Academic Dean of the College/School. A more detailed description of the grade Appeal Policy may be found in UWM Selected Academic and Administrative Policies, Policy #S-28 and UWM Faculty Document #1243.

Sexual Harassment: Sexual harassment is reprehensible and will not be tolerated by the University. It subverts the mission of the University and threatens the careers, educational experience, and well being of students, faculty, and staff. The University will not tolerate behavior between or among members of the University community which creates an unacceptable working environment.

Financial Obligation: The submission on your registration form and your subsequent assignment to classes obligates you to pay the fee-tuition for those classes or to withdraw your registration in writing no later than the date specified in the schedule of classes. It is important to both you and the University that you make payment on time. A complete description of UWM fee policies may be found in the Schedule of Classes.

Incomplete: A notation of "incomplete" may be given in lieu of a final grade to a student who has carried a subject successfully until the end of a semester but who, because of illness or other unusual and substantiated cause beyond the student's control, has been unable to take or complete the final examination or to complete some limited amount of term work. An incomplete is not given unless you prove to the instructor that you were prevented from completing course requirements for just cause as indicated above. A more detailed description of the Incomplete Policy may be found in UWM Selected Academic and Administrative Policies, Policy #S-31 and UWM Faculty Documents #1558 and #1602. Also, a description of this policy may be found in UWM Schedule of Classes.

For further information and links to University policies and procedures, please reference:
http://www.uwm.edu/Dept/SecU/SyllabusLinks.pdf