Amazon River Tropical Biology
BIOL 489 (Special Topics)
WFSC 489 (Special Topics)

SPRING 2015 SYLLABUS

Professors:

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COURSE DESCRIPTION/SUMMARY: Amazon River Tropical Biology (BIOL 489/WFSC 489) is a one-semester study abroad course (3 credits) that focuses on the natural history, ecology, evolutionary biology, geography, and culture of the Amazon River and Rio Negro, a massive black-water tributary. Students will discover the attributes of the world's largest and most bio-diverse river basin during a 10-day expedition that embarks in early January from Manaus, Brazil. During this boat-based expedition, students will learn about tropical biology by surveying biota and recording observations about this unique ecosystem. Upon completion of the expedition, students will select research topics and develop presentations that will be reported to the class in weekly one-hour sessions during the spring semester.

PREREQUISITES: RENR 205, BIOL 107, BIOL 112, BIOL 113, BIOL 357, or equivalent course and approval of instructor.

LEARNING OUTCOMES:

(1) Achieve increased knowledge of the geography, natural history, and culture of the Brazilian Amazon.
(2) Acquire a basic understanding of tropical ecology through field experiences in diverse ecosystems in the central Amazon River.
(3) Cultivate an appreciation for foreign cultures and languages (Portuguese).
(4) Learn to systematically observe and record observations of flora, fauna, and geography.
(5) Learn to work collectively in groups to hypothesize, research, and interpret.
(6) Gain experience in presenting a research topic to peers and evaluators.
(7) Interact professionally with peers, instructors, and expedition local staff.

COURSE MATERIALS:

1. No textbook required for course.
2. Field journal or notebook (black marble cover with lined pages)
3. List of required items for field excursion will be provided prior to departure.

MAJOR TOPICS OF INSTRUCTION AND STUDENT RESEARCH:

Geography – patterns of geology, soils, water chemistry, vegetation, land use, etc. within the Guyana Shield region of the central Amazon
Patterns in plant diversity – growth forms, canopy/understory profile, etc. – in relation to habitat features (elevation/flooding, soils, water type)
Herbivory in relation to habitat – incidence of leaf damage, plant growth form/diversity
Fungal diversity, associations with habitat types, patterns of trait variation, local assemblage structure, etc.
Insect diversity, associations with habitat types, patterns of trait variation, local assemblage structure, etc.
Fish diversity, associations with habitat types, patterns of trait variation, local assemblage structure, etc.
Reptile and amphibian diversity, associations with habitat types, patterns of trait variation, local assemblage structure, etc.
Bird diversity, associations with habitat types, patterns of trait variation, local assemblage structure, etc.
Mammal diversity, associations with habitat types, patterns of trait variation, local assemblage structure, etc.
Crypsis – insects, fishes
Coevolution – insects and plants, hosts and parasites, predators and prey
Diurnal versus nocturnal diversity – mammals, reptiles, fishes
Biological conservation – human impacts, biological preserves, sustainable use of natural resources

ATTENDANCE AND PARTICIPATION POLICY: In addition to participation in the field expedition, regular attendance is **expected** at weekly class sessions during the semester.
The Biology and Wildlife & Fisheries Departments do **not** accept the TAMU Explanatory Statement of Absence Form as an adequate verification for an absence. Students who miss class and want to make up missed assignments must provide verification for the reason of absence (see Student Rules 7, http://student-rules.tamu.edu/). **Prior notification of absence is expected whenever possible** (Student Rule 7.3). For an absence due to illness or injury, each student must notify the instructor within **two working days** of the absence. Additionally, the student must provide, within **one week**, written and signed evidence of consultation with a medical professional confirming that the injury or illness was serious enough to justify the absence. Submitted evidence will be verified prior to approval of any makeup.

COURSE WEBSITES: Syllabi and course materials can be located at http://ecampus.tamu.edu.

FIELD EXPEDITION DISCUSSIONS: Field outings will primarily occur during early morning hours and late afternoon/evening hours to avoid the extreme mid-day temperatures. Between field outings, students are expected to participate in expedition discussions related to the ecology/biology of specific field habitats.

FIELD OBSERVATION JOURNAL: The first morning on the boat, students will be instructed on the protocol of taking notes in a field observation journal. These notes may include site names, habitat descriptions, GPS coordinates, environmental parameters, species names (with reference to photographs), and other significant discoveries. These transcripts should also include ecological principles that relate to each unique habitat that is explored. Special attention should be devoted to one specific topic that students

select to research in greater depth upon their return to campus. Selected topics will then be presented as power point slides to the class at weekly class meetings. The field observation journal will be due the second week of classes of the spring semester at the first weekly one-hour class meeting.

RESEARCH TOPIC PRESENTATIONS: At the first weekly class meeting (the second week of classes) each student will be assigned a specific date for their research presentation. Presentations will focus on one topic selected during the field exploration portion of the course. Presentations will be 20 minutes in length and include between 15 and 30 power points slides. Students may submit their power point slides 2-weeks prior to their assigned presentation date for review and comments by the instructors. The presentations will be returned to students at least one-week prior to their assigned presentation date.

COURSE GRADE:

Final course grade will be determined by five criteria:

(1) Field observation journal = 20%
(2) Research topic power point slide report = 15%
(3) Oral presentation of research report = 15%
(4) Participation during field expedition (discussions and outings) = 30%
(5) Attendance and participation at weekly student presentations = 20%

Designation of letter grades should be expected to be determined as follows:
A= 90-100%, B=80-89%, C= 70-79%, D=60-69%, F= ≤ 59%

OTHER INFORMATION:

Policy on Possession and/or consumption of alcoholic beverages and illegal drugs while in Brazil:
Consumption or possession of illegal drugs while in Brazil is strictly forbidden. In general, substances illegal in the United States (marijuana, cocaine, methamphetamines, etc.) are also illegal in Brazil. Any student possessing illegal drugs while in Brazil will receive a final grade of "F" in the course and will immediately be returned to the United States and referred to a TAMU academic advisor for counseling. Although certain drugs and/or medications may be legal to purchase and possess in Brazil, their importation and use (with or without a prescription) may not be legal in the United States. Any questions or concerns should immediately be brought to the attention of one of the course instructors. Any prescription drugs brought into Brazil should remain in their original container, which includes the student's name, medication type, and prescribing physician's name.

In Brazil, the legal drinking age is 18 years. For safety and security reasons, all students are strongly cautioned against drinking alcohol. There may be occasions where social drinking is appropriate, but students are expected to act as adults and professionals. The instructors retain final authority in limiting the consumption of alcoholic beverages by students. This rule is not debatable and failure to follow the instructor's decision may result in a final grade of "F" for the student and expulsion from the course.

Q-Drop: Tuesday, April 21 (5:00 pm) is the deadline for dropping a course with no penalty (Q grade). If students have any question as to whether or not to Q-drop, they should talk to their instructor before this date. After this date, students will be assigned a letter grade or must negotiate a W (withdrawal) or NG (no grade) through your academic dean (see Student Rule 10.3).

Academic Integrity: "An Aggie does not lie, cheat, steal, or tolerate those that do."
Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. Academic misconduct involves any of the following offenses: cheating, fabrication, falsification, multiple submissions, plagiarism, and complicity in any of these offenses. All incidents of academic dishonesty will be referred to the Biology Lower Division Program, are subject to academic penalties, and will be reported to the Texas A&M Honors System Office at http://aggiehonor.tamu.edu.

Disability Statement: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation for their disabilities. Students who have a disability requiring an accommodation should contact the Disability Services in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu.

Copyright Statement: The handouts used in this course are copyrighted. "Handouts" are all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, power point slides, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, students do not have the right to copy the handouts, unless the instructor expressly grants permission.

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Course Schedule

Students registered for the field course will attend one pre-departure meeting with instructors during the fall semester. These pre-departure meetings will review course objectives and content, international trip preparation and logistics, and basic precautions for health, safety and security.

BIOL 489 and WFSC 489 Amazon River Tropical Biology, Brazil, Spring 2015
Schedule of Field Trip Events

Day 1, January 9:
Depart IAH for Manaus, Brazil, connecting through Miami, arrive Manaus airport 11:31 pm; Board bus for transfer to Amazon River ship at Pier of Tropical Hotel Manaus; Brief orientation of the ship and cabin assignment.

Day 2, January 10:
The ship will cruise in front of city of Manaus with sights of harbor, fish market, and then to the "Meeting of the Waters" where black waters (darkly stained, acidic) of Rio Negro and white waters (muddy, neutral pH) of the Rio Solimões meet to form the Amazon River. At this location, students will gather on the top deck to hear a lecture describing regional geology, natural history of the Amazon, and a concise history of settlement and economic development. Later in the day, the ship will navigate upstream through channels of the Solimoes River to view the varzea forest of the whitewater floodplains, and students will learn about tropical forest ecology. Later in the early evening the motorized canoes will explore a tributary of the Amazon River for an up-close exploration of the remarkable biodiversity of the region. After returning to the ship for dinner, students will work on their field notes and discuss the day's observations.

Day 3, January 11:
During the night the ship will have entered the Rio Negro, and the next morning the motorized canoes will enter a small tributary called Cuieriras to access a hiking area in the forest known as the campina "orchid field". During hikes, students will learn about tropical forest ecology, terrestrial animal biodiversity, with many examples to illustrate principles of ecology and evolution. After returning to the boat for lunch, students will work on field notes and discuss observations from the hike as the ship moves further up the Rio Negro.

Day 4, January 12:
In the morning, the group explores the rapids of a small black water river called Igarape Cachoeira to observe and photograph the unique fish fauna associated with this habitat. Students will learn to record water quality parameters using a digital YSI multiprobe, and will learn about community ecology and adaptive radiation by studying the diverse Amazonian fish fauna. Coming down from the Cuieiras River, the ship will enter the maze of channels of the Rio Negro's Anavilhanas Archipelago, with more than 380 islands, an excellent region for observing birds and other diurnal wildlife. After nightfall, the canoes will pass along narrow channels to survey the region's nocturnal wildlife. After returning to the ship and dinner, students will hear lectures about tropical ecology and work on their field notes.

Day 5, January 14:
After the ship passes upriver during the night, the canoes will explore the red, acidic waters of the Aturia River during a full-day expedition. Water parameters will be measured, and some rapids bordered by white sand bars will be surveyed by snorkeling and sampling fishes with nets. Lunch will be served along the banks of the river. A short hike leads to a marshy, sandy area that is habitat for hundreds of carnivorous sundew plants, and here students will learn about oligotrophic ecosystems, nutrient cycling, and ecological stoichiometry. The group will return to the ship, which will continue moving up the Rio Negro. On board ship during the evening, students will work on field notes and continue discussion of tropical ecology and evolution.

Day 6, January 15:
After moving upstream during the night, the ship will dock at a small village on the edge of the Rio Negro called Novo Airao famous for resident pink river dolphins and for being the only significant settlement on the border of the vast Anavilhanas Archipelago Protected Area, where no harvest of natural resources is permitted. Students will visit a cooperative for regional development with workshops for making woodcarvings, utensils, jewelry, and soap from natural materials from the Amazon forest. Sponsored by a local NGO, this cooperative promotes economic and social development for the indigenous people, and their items are available for purchase. After lunch, the ship will pass further upriver and stop at a small sand island surrounded by the very darkly stained, black water of the Rio Negro, and here the group will observe the diverse seeds that collect along the shore and measure water quality parameters. After dinner on the ship, students will work on field notes and discuss the day's observations.

Day 7, January 16:
In the morning, the ship will continue upstream on the Rio Negro to the mouth of the Rio Branco, a major clear water tributary that drains savannas of the Roraima region of the Guyana Shield. The canoes will access channels and oxbow lakes to investigate rich aquatic biodiversity, including some of top predators including, peacock bass, river dolphins, and black caiman. Water quality measurements will be taken, and predatory fishes will be sampled using fishing poles and photographed. On the ship's deck during the evening, students will learn about food web ecology and work on field notes.

Day 8, January 17:
In the morning and afternoon, the canoes will explore a small clear water tributary known as Agua Boa where diverse fishes and other aquatic animals can be observed while snorkeling. After surveying the water parameters and fauna of this region, the group will return to the ship to begin passage down the Rio Negro for the return to Manaus. During the return journey, there will be lectures about the region's geography, geology, ecology, and conservation biology, and students will have time to work on their field notes and discuss ideas for their research reports.

Days 9, January 18:
The ship continues down the Rio Negro, and the forest and wildlife can be observed from the ship's upper deck. While the ship is underway, there will be plenty of time for more lectures about the region's geography, geology, ecology, and conservation biology, and for students to work on their field notes and discuss with the instructors and peers their ideas for their research reports. Depending on time, the ship may stop again briefly in Porto Airao. The ship will continue downriver throughout the night.

Day 10, January 19:
If time permits, the group will visit the village of Igarape Preto, which provides an example of traditional indigenous life on the Amazon. Upon docking at the pier in Manaus, the group will visit the municipal fish market that offers a remarkable display of fish diversity as well as other natural products from the rainforest. The group also can visit the famous Manaus Opera House that was built during the rubber boom, and where the first opera was performed in 1896. The ship will return to the pier at the Tropical Hotel Manaus for transport to the airport with flight departing at 1:02 am, January 19, and arriving to Houston during the early afternoon on the same day.