Ridges to Reefs: Ecology of Coral Reef Ecosystems in Belize

BIOL 4590.005/5590.005
Department of Life Sciences
Summer I 2019

A. **COURSE INFORMATION**

Course number/section: BIOL4590.005/5590.005  
Class meeting time: MTWRF 08:00AM-20:00PM  
Class location: Tobacco Caye Marine Station/Pine Ridge Forest Reserve  
Course Website: https://bb9.tamucc.edu/

B. **INSTRUCTOR INFORMATION**

Instructor: Dr. Derek Hogan, PhD  
Office location: HRI 102  
Office hours: 1:20 – 3:20 MW and 3:30 – 4:30 F  
Telephone: 361-825-5883  
e-mail: james.hogan@tamucc.edu  
Appointments: Upon request when available

Instructor: Dr. Kim Withers, PhD  
Office location:  
Office hours: 1:20 – 3:20 MW and 3:30 – 4:30 F  
Telephone:  
e-mail:  
Appointments: Upon request when available

C. **COURSE DESCRIPTION**

Catalog Course Description  
An advanced study of a biological topic. May be repeated with full credit in another area of biology.

Extended Course Description  
Students will study the ecology of coral reefs with hands on experience in the Belizean barrier reef system. Students will learn fish and coral identification; underwater survey techniques for community structure and habitat assessment on snorkel; Students will learn the tools, techniques and protocols riverine ecology; Students will learn how coral reef ecosystems function in conjunction with seagrass, mangrove, and riverine ecosystems. Independent study projects will emphasize special topics learning.

D. **PREREQUISITES AND COREQUISITES**

Prerequisites  
None
Co-requisites
None

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Optional Textbook(s) or Other References
Reef fish identification- Florida, Caribbean, Bahamas – Paul Humann

Supplies
Passport, field notebook (rite in the rain)

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

Upon completion of this course, students will be able to perform these outcomes:

2. Understand the interactions between fishes, corals, invertebrates and their environment.
3. Discover patterns in community structure and diversity across coral reef associated habitats.
4. Gain skills and tools for quantifying species assemblages and populations using visual transects and size estimation.
5. Learn underwater habitat assessment techniques using snorkel.
6. Gain skills in river habitat assessment, water quality measurement, riparian zone estimation, and canopy cover estimation.
7. Learn the flora and fauna of tropical forests.
8. Understand connections between rivers, forests, and coastal habitats.
9. Become immersed in the culture of Belize and understand the significance of marine natural resources to the Belizean culture.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

This course will be a combination of lecture section which will include traditional lecture, discussion, and in class participation (including student presentations) as well as hands on field experiences that reinforce lecture materials.

H. MAJOR COURSE REQUIREMENTS AND GRADING
1. Class Participation 15
2. Field Notebook 10
3. Student led Special Topic Lecture 25
4. Independent Study Project & Presentation 35
5. Final Exam 15

TOTAL POINTS POSSIBLE 100
Extra credit assignment may be given at the prerogative of the instructor.
A > 90 pts  B = 80-89  C=70-79  D=60-69  F<60

I. COURSE CONTENT/SCHEDULE

TENTATIVE LECTURE SCHEDULE: (All components and order are subject to change)

June 4 – 7  In class lectures and activities at TAMUCC in preparation for the trip
June 12
Arrive Belize
Travel to Monkey Bay
Discussion: Economy and natural resources of Belize (boat ride to Calabash)
Lecture: Introduction to Tropical Lowland Savannah to Riparian Forest
Field: Hike the habitats

June 13
Lecture: Watershed Continuum Concept
Field: Sibun River excursion
Discussion: discussion on the geology, effects of commercial gravel extraction and impacts of agricultural land use along river

June 14
Arrive Mountain Pine Ridge Forest Reserve
Field: Hike the Rio Frio, water quality and riparian zone determination
Discussion: Explore riverine habitats including runs, riffles, pools, cascades, waterfalls and caves.
Field: Independent project time

June 15
Lecture: Cultural history of environmental issues in Belize and Mayan culture
Field: Caracol Archaeological Reserve, explore reasons for the decline of Mayan civilization
Lecture: Mayan drought cult, and the ecology of ancient societies

June 16
Lecture: Human impacts to riverine habitats
Field: Visit hydroelectric dam, water quality, riparian zone determination
Lecture: Intro to independent projects
Field: Independent project time
June 17
Lecture: Agriculture, forestry, and riverine health
Field: Independent projects

June 18
Travel to Tobacco Caye Marine Station
Discussion: Fisheries and marine protected areas of Belize
Lecture: Intro to the Mesoamerican Barrier Reef System

June 19
Field: Snorkeling 101 Workshop to review reef etiquette, snorkeling introduction and safety protocols. Overview of the area.
Lecture: Seagrass ecosystems
Field: Seagrass habitat assessment, community composition, quadrats, transects

June 20
Lecture: Mangrove ecosystems
Field: Mangrove island habitat assessment, community composition
Discussion: Connectivity among habitats
Field: Mangrove habitats as refugia and nurseries (birds and fishes)

June 21
Lecture: Back reef – fore reef continuum
Field: Assessment of fore reef communities, coral health assessment
Lecture: Independent project development
Field: Independent project

June 22
Lecture: Management of reefs and their fishes
Field: Independent project time
Lecture: Connectivity and reef management
Field: Independent project time

June 23
Field: Glovers Atoll
Discussion: Crepuscular Community Turnover
Field: Night Snorkel

June 24
Field: Finalize projects
Pack to go home

June 25 Return to USA

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

Attendance/Tardiness
Students are expected to attend every scheduled class. It is the responsibility of the student to obtain any material missed during an absence from his/her classmates. PowerPoint slides are usually not provided on Blackboard 9.1 for students present in class, and will not be provided for late or absent students. You will get 10 points subtracted from the final total for each unexcused absence (negative attendance grade possible). Three unexcused tardies (2 minutes or more) equals one unexcused absence.

The professor makes the decision as to what constitutes an unexcused absence, as defined by the Catalogue and the University Handbook. Please schedule routine personal events (e.g., vacations, weddings, reunions, non-emergency medical or dental visits, parent-teacher conferences, household or auto repairs) to avoid conflicts with your classes. Oversleeping is never an acceptable excuse.

Late Work and Make-up Exams
Students will be given a Late Assignment Penalty for tardy work: 10% assignment grade deduction per class day late. However, after the 3rd day, late assignments will not be accepted. In-class late assignments are defined by being turned in after 9:50 am. Please note that assignments may be sent to me by e-mail. Tardiness is determined by the time noted on the instructor’s Inbox, but allowances can be made for server problems. Files contaminated by viruses, spyware, and worms will not be accepted. Missed extra credit assignments cannot be made up for unexcused absences; approved University absences may be given alternative extra credit work which may NOT be identical to the missed assignment.

Extra Credit
No extra credit is given.

Cell Phone Use
DO NOT USE CAMERA PHONES IN LECTURE OR LAB. DO NOT SEND TEXT MESSAGES DURING CLASS. Please turn off all cell phones, beepers, and Bluetooth devices, iPhones, Palm Pilots, Blackberries, etc., before entering the classroom, or at least place them on silent or airplane mode. I would prefer that earpieces not be worn in lecture. Recording of lectures with tape recorders can only be done with permission of instructor.

Food in Class
Eating in class is permitted so long as it does not disrupt the learning environment or the health and safety of others in the class.

Missed Exam
Prior notice will be required to miss the scheduled exam date/time. If absence is caused by an emergency such as accident, illness etc. an alternative date for the exam may be arranged with the professor.

Participation
Will be required and is graded as part of the course evaluation.
K. COLLEGE AND UNIVERSITY POLICIES

- Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- Classroom/Professional Behavior
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- Statement of Civility
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- Deadline for Dropping a Course with a Grade of W (University)
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- Grade Appeals (College of Science and Engineering)
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards
as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  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 of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

http://disabilityservices.tamucc.edu/

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. **OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set
up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

**GENERAL DISCLAIMER**

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.