MARB 6373 – MARINE BIODIVERSITY AND CONSERVATION SCIENCE

Spring 2010

INSTRUCTOR:
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E-mail: Thomas.Shirley@tamucc.edu  Office hours: MW 1-3:45 PM, or by appointment

CLASS MEETING:
MW 4:15 pm  Classroom: CI 106

TEXTBOOKS:
Class Textbook, Required:

ISBN 1-55963-662-9

COURSE DESCRIPTION
Biodiversity, from genetic diversity of individual populations to ecosystem diversity, will be addressed, with focus on the marine realm. Methods for assessing and quantifying diversity will be included. Threats to biodiversity, including resource extraction, invasive species, habitat alteration, global warming and ocean acidification, will be covered, as will techniques for recovering and restoring damaged ecosystems. Marine ecosystem management will be discussed, including marine protected areas, and state, federal and international fisheries and resource management issues. Advanced courses in Ecology or Marine Biology would benefit students.

COURSE AUDIENCE
PhD Students in the IDP Marine Biology program and the Coastal and Marine Science System Science program are the primary audience for this course. Secondary audience includes graduate students (M.S.) in Environmental Science, Biological Sciences or other graduate degrees. Resource managers employed by agencies may find the course useful.

STUDENT LEARNING OUTCOMES
• Provide future leaders and professionals with a comprehensive education on marine biodiversity and conservation issues
• Educate future leaders and professional with skills necessary to collect, interpret, analyze, and present scientific data and concepts, in both oral and written formats
• Enable future leaders and professionals to contribute to their profession or academic field
Establish competency in the application of the scientific method and the ability to conduct experiments

More specifically, at the conclusion of this course the student should:
1. Understand the concepts of biological diversity, including spatial and temporal components, genetic and population diversity, and habitat diversity;
2. Understand species richness, species surrogates, evenness and dominance, assemblages vs. communities, guilds, inverse J-curves and other biodiversity concepts;
3. Be able to apply and interpret commonly used metrics of diversity;
4. Be familiar with sampling methodologies and their influence upon diversity measures;
5. Know the threats to marine biodiversity, including resource extraction, habitat destruction, over fishing, nutrient enrichment, pollution, global warming and ocean acidification;
6. Understand the concepts and problems of species-based management and ecosystem management of marine fisheries;
7. Understand marine reserve function and design, and issues with marine protected areas;
8. Have a working knowledge of the interaction of global management issues.

COURSE TOPICS
Species-abundance distribution, inverse-J or log-normal curves, alpha and beta diversity, diversity indices, dominance, evenness, rarefaction, species surrogates, functional diversity, genetic variability, sampling methods, Allee effect, marine reserves and protected areas, metapopulations, ecosystem based management, high seas fishing, bottom trawling, international and global fishing councils and issues, habitat destruction, bioinvasions and human-mediated vectors, epizootics, nutrient enrichment, global warming, ocean acidification.

INSTRUCTIONAL METHODS AND ACTIVITIES
Traditional lectures via board demonstrations and power point presentations, classroom discussions, student projects, and student presentations. Some assignments and classroom demonstrations will require students to download software (freeware) from the web and utilize them to solve problems.

A mid-semester and final examination will be administered; both exams will consist of short answer and essay questions, with some quantitative applications. Questions will be derived from lectures, assigned readings, and classroom discussions.

Students will be required to write a research manuscript in the format of a peer-reviewed journal in the appropriate field, as specified in the ‘Instructions to Authors’ for that journal; original topics are encouraged. The manuscript will include at least one figure and one table and a minimum of five journal references. Manuscripts will be evaluated on originality, grammatical correctness, adherence to journal format, conciseness, timeliness, thoroughness of the literature review, and readability. The initial submission of the manuscript will
constitute half the value of the assignment, while the corrected manuscript will constitute the remainder of the assignment.

Students will receive instructions on how to properly peer-review and will receive instructions for reviewers of the appropriate journal. Each student will be required to submit an anonymous peer-review of the manuscript submission of a fellow student. The peer review will be evaluated on the basis of its thoroughness and adherence to journal requirements.

Students will demonstrate knowledge of presentation techniques by giving a power point presentation of their research manuscript to their peers.

**EVALUATION AND GRADE ASSIGNMENT**

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<tr>
<th>Assignment</th>
<th>Overall Grade Percentage</th>
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<tr>
<td>Journal article reviews &amp; class discussions</td>
<td>10%</td>
</tr>
<tr>
<td>Mid-term Exam</td>
<td>25%</td>
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<tr>
<td>Research Manuscript</td>
<td>15%</td>
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<td>Peer review</td>
<td>5%</td>
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<tr>
<td>Project Presentation</td>
<td>10%</td>
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<tr>
<td>Final Exam</td>
<td>35%</td>
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**Class Average X**

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<tr>
<th>Grade</th>
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<tbody>
<tr>
<td>A – Excellent</td>
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<td>B – Good</td>
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<tr>
<td>C – Satisfactory</td>
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<tr>
<td>D – Passing</td>
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<tr>
<td>F – Failing</td>
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**ATTENDANCE AND OTHER COURSE POLICIES**

Students are required to attend all class meetings. Participation is essential to do well in the class. Discussions and student input are considered an integral part of the class. Class exams cannot be retaken other than for an excused absence, limited to medical emergencies, participation in a TAMUCC sanctioned event or other similar circumstances justified in writing and specified in the TAMUCC graduate catalog. Assignments are expected on time unless prior arrangements are made, which will be granted only in exceptional circumstances. Submitting an assignment late without prior arrangement will lead to a substantial, incremental (daily) penalty.
Academic honesty: Please review the University policies on academic integrity and honesty listed in the Graduate Catalog under the Academic Honesty section. This instructor will follow these guidelines if such infraction such as plagiarism or other dishonest conduct occurred as part of this class. These guidelines will be followed for both the evaluation of the gravity of the infraction and the determination of an appropriate penalty. Any student who has been penalized for academic dishonesty has the right to appeal the judgment or the penalty assessed. The Appeals Procedure will be the same as that specified for grade appeals. The grade appeals procedure may be found in the University Rules manual at http://www.tamucc.edu/provost/university_rules/.

Grade Appeals: As stated in the Texas A&M University-Corpus Christi University Rules and Procedures (Section B [Academic Program], Part 13 [Students]: 13.02.99.C2 [Student Grade Appeals] and 13.02.99C2.01 [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 on 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, consult the University Rules and Procedures specified above (accessible through the University Rules and Procedures website at http://www.tamucc.edu/provost/university_rules/index.html). For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

Disability and Veterans’ Services
Texas A&M University-Corpus Christi is committed to providing persons with disabilities an equal opportunity to access campus facilities, resources and programs. 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. Support and accommodations are also available for returning veterans who experience cognitive and/or physical access issues in the classroom or on campus. Our Office of Disability Services arranges such support and academic accommodations. To make a request, or for more information, call (361) 825-5816 or visit Driftwood 101. It is important to contact the Office of Disability Services in a timely fashion as it will take time for them to review requests and prepare accommodations and accommodation letters.

TENTATIVE COURSE PROGRESSION
Measurement of biological diversity and terminology
Species abundance models
Measures of species richness and species surrogates.
Diversity measures
Comparative studies of diversity
Diversity in space and time
Marine populations
Threats to marine biological diversity
Overfishing
Place-based management
Metapopulation structure and marine reserves
Human dimensions, management regimes and legal issues
IMPORTANT DATES
Jan 18 – MLK Day, Holiday
Jan 21 – Last day to register or add a class
Jan 31 – Title, dataset, 5 cites for term project
Feb 22-24 – Ocean Sciences Meeting, Portland, OR
Feb 22- MID-TERM EXAM
Mar 10 – 1st draft of project ms.
Mar 10-13 – Benthic Ecology Meetings, Wilmington, NC
Mar 15-19 - M-F, Spring Break
Apr 2 – Last day to drop a class
Apr 5 – Your anonymous peer-review required
Apr 28 – Final draft of project due
May 4 – Last day of classes; Last day to apply for Aug 2010 graduation
May 6-7 (Th-F), 10-12 (M-W) – Final exams
May 10 – (M) FINAL EXAM FOR THIS COURSE, 1:45 -4:15pm
May 15 – Spring Commencement

BIBLIOGRAPHY


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