UNIVERSITY OF SOUTHERN MISSISSIPPI  
Department of Coastal Sciences  
Gulf Coast Research Laboratory  
Ocean Springs, MS 39564  

Course Syllabus – Summer 2015  

TITLE: Marine Ecology  

USM NUMBER:  
Lecture: COA-446/546  MAR-405/505  BSC-439/539  
Laboratory: COA-446L/546L  MAR-405L/505L  BSC439L/539L  

INSTRUCTOR: Chet Rakocinski, Ph.D.  
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Class web site:  
http://gcrlmarineecology.weebly.com/  

DURATION: 1st Summer Term (May 26 - June 23)  

CREDIT:  
Lecture: 3 semester hours  
Laboratory: 2 semester hours  

LEVEL: Undergraduate and Graduate  

PREREQUISITES: 4 semesters science or permission of instructor.  

Description: An examination of the relationships between marine organisms and their biotic and abiotic environments with emphasis on northern Gulf of Mexico ecosystems. Lecture topics cover primary production, dynamics of populations and communities, biogeochemical cycles, trophic ecology, larval ecology, and human influences. Laboratory involves weekly quantitative studies implemented as class projects.  

COURSE CONTENT:  

Lecture Outline  

1. Introduction to Marine Ecology  
2. Primary Production I and II  
3. Population Ecology  
4. Community Ecology  
5. Biogeochemical Cycles  
6. Trophic Ecology  
7. Consumers  
8. Pelagic Realm  
9. Benthic Realm  
10. Larval Ecology / Life History  
11. Coral Reef Ecology  
12. Ecology of Hydrothermal Vents and Cold Seeps  
13. Human Influences
Laboratory Outline

Laboratory emphasis will be on weekly quantitative studies designed and implemented as class projects, and interpreted individually as laboratory reports in manuscript format. Observational field trips will also be taken to sample different habitats within the region. Both field trips and class projects will focus on demonstrating various sampling gear, data collection, and processing methods, as well as on illustrating fundamental ecological concepts, principles, and theories.

I. Laboratory Elements

A. Quantitative Studies

• Marsh productivity,
• Predation pressure,
• Nekton community structure,
• Population estimation

B. Observational Field Trips

• Observation and collection of specimens from representative habitats to demonstrate ecological principles as discussed in lecture;
• Documentation of observations within a field notebook.

C. Ecological Methods

• Techniques for taking standard quantitative biological samples from representative habitats and communities with emphasis on comparative method, study design, replication, and sample size;
• Use of a variety of qualitative and semi-quantitative gear and techniques, including grabs, dredges, sieves, seines, kick nets, trawls, plankton nets, Yabi pumps, plankton nets, shovels, hand collecting, and snorkeling;
• Use and care of water quality/hydrological sampling gear including DO meters, salinometers, refractometers, turbidimeters, etc.;
• Appropriate methods for logging data using field notebooks, data sheets, and laboratory records.

D. Analysis and Interpretation of Ecological Data

• Compilation and analysis of quantitative data, including basic descriptive statistics and other appropriate metrics;
• Data interpretation;
• Scientific report preparation for each quantitative study, including Discussion relative to at least one relevant study published in the primary literature.

GRADE EVALUATION

Lecture

Exams - 90% of final lecture grade
  2 exams (100 pt ea)

Synthesized critical review of classic and recent literature (topic related) - 10% of final lecture grade - 3 articles will be read, reviewed, synthesized, and critiqued
Laboratory

**Lab Reports** – 80% of final lab grade

Written in scientific report format, including Introduction (Background and Justification), Methods (Enough Information to Enable the Study to be Repeated), Results (Analysis and Findings), and Discussion (Interpretation, Context, Problems, Caveats). There will be a total of 4 lab reports (20% each) due based on laboratory exercises performed by the class.

**Field Notebooks** - 10% of final lab grade

Documentation of each field trip and quantitative study including physical information, methods, diagrams, maps and personal observations.

**Participation** - 10% of final lab grade

Subjectively evaluated and quantified based on three criteria:
- Attitude and cooperation,
- Contribution and industry,
- Response to protocol and directives.

**Report on original research** – (Graduate Students) Oral presentations will be made to the class.

TEXTS

**Optional Lecture Text**


**Other Texts available in the USM GCRL library**


Laboratory Texts (None of these are required, but access to them is recommended.)


Optional references that may be of specific or general use are available for purchase in the campus bookstore (Oceanography Building) and at the Gulf Islands National Seashore visitor’s center.

Reference Books, Journals, and Keys

Furnished by instructor and/or GCRL. Many are available for student use in the Gunter Library.

Scientific Paper Writing Resources (will be on reserve in Library)


ADA Syllabus Statement

If a student has a disability that qualifies under the Americans with Disabilities Act (ADA) and requires accommodations, he/she should contact the Office for Disability Accommodations (ODA) for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODA if they are not certain whether a medical condition/disability qualifies.

Address:
The University of Southern Mississippi
Office for Disability Accommodations
118 College Drive # 8586
Hattiesburg, MS  39406-0001
Voice Telephone:  601.266.5024 or 228.214.3232    Fax: 601.266.6035
Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1.800.582.2233 (TTY) or email Suzy Hebert at Suzanne.Hebert@usm.edu.