

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

Course Syllabus – Summer 2017

TITLE: Marine Ecology

USM NUMBER:

Lecture:	COA-446/546	MAR-405/505	BSC-439/53
Laboratory:	COA-446L/546	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 (June 5 - June 30)

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 – 75% 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 - 15% of final lab grade

Subjectively evaluated and quantified based on four criteria:

Attendance and participation,
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

Mann, K.H. 2000. Ecology of Coastal Waters - with Implications for Management - 2nd Edition
Blackwell Science, Inc. 406 pp. soft cover. ISBN 0-86542-550-7

Other Texts available in the USM GCRL library

Barnes, R.S.K. and R.N. Hughes. 1999. An Introduction to Marine Ecology (3rd ed.). Blackwell Science Ltd. London, UK. 286 pp.

Bertness, M.D., S.D. Gaines, and M.E. Hay. 2001. Marine Community Ecology. Sinauer Associates, Inc. Massachusetts. 550 pp.

Levinton, J. 1984. Marine Ecology. Prentice-Hall Inc, New Jersey. 526 pp.

Parsons, T.R., M. Takahashi, and B. Hargrave. 1984. Biological Oceanographic Processes (3rd ed.). Pergamon Press. New York. 330 pp.

Tait, R.V. 1998. Elements of Marine Ecology (4th ed.). Butterworth-Heinemann, Massachusetts. 462 pp.

Valiela, I. 1995. Marine Ecological Processes (2nd ed.). Springer-Verlag, New York. 686 pp.

Van Dover, C.L. 2000. The Ecology of Deep-Sea Hydrothermal Vents. Princeton University Press. New Jersey. 352 pp. (Chapters 8 and 10 available)

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

Britton, J.C. and B. Morton. 1989. Shore Ecology of the Gulf of Mexico. University of Texas Press, Austin. 387 pp.

Brower, J.E. and J.H. Zar. 1984. Field & Laboratory Methods for General Ecology (2nd ed.). Wm. C. Brown Company Publishers. Dubuque, Iowa. 226 pp.

Duncan, W.H. and M.B. Duncan. 1987. The Smithsonian Guide to Seaside Plants of the Gulf and Atlantic Coasts from Louisiana to Massachusetts, Exclusive of Lower Peninsular Florida. Smithsonian Institution Press, Washington, D.C. 409 pp.

Eleuterius, L.N. 1990. Tidal Marsh Plants. Pelican Publishing Co., Gretna, LA. 168 pp.

Fotheringham, N. and S. Brunenmeister. 1989. Beachcomber's Guide to Gulf Coast Marine Life (2nd ed.). Gulf Publishing Co., Houston, TX. 142 pp.

Heard, R.W. 1982. Guide to Common Tidal Marsh Invertebrates of the Northeastern Gulf of Mexico. MASGC-79-004, Mississippi-Alabama Sea Grant Consortium. 82 pp.

Hoese, H.D. and R.H. Moore (2nd ed.). 1998. Fishes of the Gulf of Mexico, Texas, Louisiana, and Adjacent Waters. Texas A&M University Press, College Station. 416 pp.

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)

McMillan, V.E. 1997. Writing Papers in the Biological Sciences (2nd ed.). Bedford Books. Boston, MA. 197 pp.

Lindsey, D. 2011. Scientific Writing = Thinking in Words. CSIRO Publishing. Collingwood, VIC. 128 pp.

Disability Accommodations

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 emailing ODA at oda@usm.edu.

Academic Integrity

All students at the University of Southern Mississippi are expected to demonstrate the highest levels of academic integrity in all that they do. Forms of academic dishonesty include (but are not limited to):

1. Cheating (including copying from others' work)
2. Plagiarism (representing another person's words or ideas as your own; failure to properly cite the source of your information, argument, or concepts)
3. Falsification of documents
4. Disclosure of test or other assignment content to another student
5. Submission of the same paper or other assignment to more than one class without the explicit approval of all faculty members' involved
6. Unauthorized academic collaboration with others
7. Conspiracy to engage in academic misconduct

Engaging in any of these behaviors or supporting others who do so will result in academic penalties and/or other sanctions. If a faculty member determines that a student has violated our Academic Integrity Policy, sanctions ranging from resubmission of work to course failure may occur, including the possibility of receiving a grade of "XF" for the course, which will be on the student's transcript with the notation "Failure due to academic misconduct." For more details, please see the University's [Academic Integrity Policy](#). Note that repeated acts of academic misconduct will lead to expulsion from the University.