

Marine Sciences II – Marine Biology (COA 301, 301L)

Summer Session I; May 30–June 28, 2023; 3/2 credit hours

Contact Information

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Required and Recommended Materials

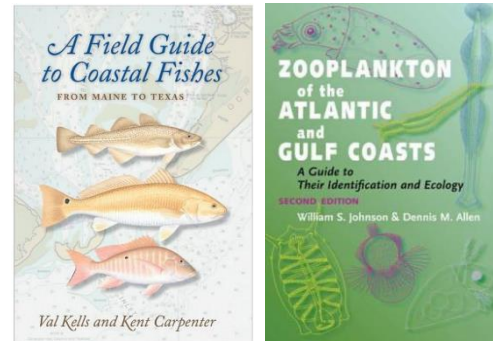
Required:

Kells, V., and K. Carpenter. 2011. *A Field Guide to Coastal Fishes from Maine to Texas*. The John Hopkins University Press. ISBN-10: 0801898382; ISBN-13: 978-0801898389.

Point Solutions app subscription (Echo360)

Recommended, but not required:

Johnson, W. S., and D. M. Allen. 2012. *Zooplankton of the Atlantic and Gulf Coasts: A Guide to Their Identification and Ecology*. 2nd edition. The John Hopkins University Press. ISBN-10: 1421406187; ISBN-13: 978-1421406183.



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Course Description

An ecological approach is taken to understand the biology of marine systems with emphasis on local organisms; their habitats, life cycles and survival strategies. Prerequisites: 8 hours of biology or permission of instructor. 5 credit hours (3/2).

Learning Outcomes

Upon successful completion of this course, students will be able to:

- sketch and describe models of nutrient and energy flow in marine food webs;
- illustrate bottom-up and top-down influences on trophic structure;
- explain the processes that regulate food web dynamics and community succession;
- describe the diversity and functional roles of organisms in lower food webs including viruses, bacteria, phytoplankton, zooplankton, and benthic macroinvertebrates;
- collect, preserve, and identify regionally common zooplankton and fishes;
- identify regionally common coastal plants;
- sketch a cladogram of marine fishes and describe the diversity of marine fishes;
- discuss the ecological roles of fishes;
- describe and demonstrate methods to quantify age, growth, and diets of teleost fishes;
- explain the importance of early life stages for recruitment of teleost fishes, including prominent recruitment hypotheses;
- explain and predict the effects of ongoing global stressors on marine ecosystems, including the CO₂ emissions, eutrophication, and overexploitation;
- critically assess and discuss evidence presented in peer-reviewed articles;
- write a professional-style, scientific research proposal on a topic of interest;
- design and present a professional-style PowerPoint presentation; and
- maintain a field and laboratory notebook.

These learning outcomes will be assessed throughout the session using quizzes, exams, successful completion of an original research proposal, maintenance of a field notebook, and active participation in all course activities (see Course Grading).

Course Requirements

The lecture and laboratory components are two separate courses that are graded independently. However, they must be taken concurrently, and they are designed to reinforce one another. The lecture component is 3 credit hours and the lab component is 2 credit hours. To be successful in lecture and lab, you must attend all class meetings and activities, review posted lecture slides outside of class, read and annotate all assigned articles before coming to class, complete all assignments on time, and study for all assessments. I recommend you study for lecture exams using the previous quiz as a guide. You may not use video or audio recorders in class without my permission. Please check your email regularly for updates and reminders.

Grading Policies and Calculation

Any make-up work will be at my discretion and will not ordinarily be allowed after an assignment is due. Assignments may be made up after a documented, excused absence if completed within two days. When extenuating circumstances for absence exist, the student should discuss the matter with me at the earliest possible opportunity. Make-up assessments will not be given without approval beforehand.

Students will be assessed by letter grade according to their performances on the course components listed in the tables below. Note that final grades are calculated according to these weights (i.e., % contributions), not raw point totals.

Lecture:

Course component	% Contribution to final grade
Quizzes (2)	10
Exams (2)	30
Participation in class discussions of readings	5
Clicker questions	10
Written research proposal	15
Oral PowerPoint presentation	15
Comprehensive final exam	15

Lab:

Course component	% Contribution to final grade
Practical exams (2)	50
Participation in lab activities	25
Field and lab notebook	25

Final grades will be assigned using a standard scale: $\geq 90\%$ = A, 80–89% = B, 70–79% = C, 60–69% = D, $\leq 59\%$ = F

Extra credit

There will be no unannounced extra credit opportunities in lecture or lab outside of questions built into the existing quizzes, lecture exams, and lab practical exams.

Syllabus Modification

The order of topics, activities, and assignment dates are tentative. I will try to adhere to the syllabus schedule, but expect changes as needed. I will keep you informed of all modifications. All field trips are contingent on suitable weather and safe environmental conditions.

Academic Integrity Policy

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):

- Cheating (including copying from others' work)
- Plagiarism (representing another person's words or ideas as your own; failure to properly cite the source of your information, argument, or concepts)
- Falsification of documents
- Disclosure of test or other assignment content to another student
- Submission of the same paper or other assignment to more than one class without the explicit approval of all faculty members involved
- Unauthorized academic collaboration with others
- 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: <https://www.usm.edu/advisement-center/academic-integrity.php>. Note that repeated acts of academic misconduct will lead to expulsion from the University.

Resources for Students with Disabilities

If a student believes that they have a disability which is covered by the Americans with Disabilities Act (ADA) and makes them eligible to receive classroom or housing accommodations, they should contact the Office for Disability Accommodations (ODA) for information regarding the registration process. Disabilities covered by the ADA may include but are not limited to ADHD, learning disabilities, psychiatric disabilities, physical disabilities, chronic health disorders, temporary illnesses or injuries, and pregnancies. Students should contact ODA if they are not certain whether their documented medical condition qualifies for ODA services. Students are only required to disclose their disability to the Office for Disability Accommodations. All information submitted to ODA by the student is held with strict confidentiality.

The University of Southern Mississippi
Office for Disability Accommodations
118 College Drive # 8586
Hattiesburg, MS 39406-0001
Voice Telephone: 601.266.5024 or 228.214.3302 Fax: 601.266.6035
Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1.800.582.2233 (TTY) or email ODA at oda@usm.edu.

FERPA and Privacy

The Family Educational Rights and Privacy Act of 1974 as amended (FERPA) deals with one subject only: educational records. The purpose of the law is to define, more precisely than ever has been done, who may or may not see these records. On the one hand, the law grants

students guaranteed access; on the other hand, it takes from the universities the privilege of indiscriminate disclosure. The FERPA sets forth these main requirements:

1. It allows a student access to each educational record that a university or college keeps on himself or herself.
2. It requires the institution to establish a policy on how students can access specific records.
3. It requires the institution to inform all students as to what rights they have under the amendment, how they can act on these rights according to school policy, and how they can see a copy of the policy.
4. It requires the institution to seek student permission, in writing, before disclosing any personally identifiable record to individuals other than professional personnel employed in the university or college and others who meet certain specified requirements.

The University of Southern Mississippi may release directory information on students to any interested member of the public unless the student requests in writing that it be withheld.

Directory information is defined as the following: student's name, address, telephone number, e-mail address, major, dates of attendance, classification, degree(s) earned, previous educational institutions attended, participation in university-recognized organizations and activities, weight and height of athletic team member, and honors and awards. The university has developed and put into writing a policy for handling requests from students and for disclosing personally identifiable information about students. Students are notified of their rights under the law by publishing the university policy on the Registrar's Web page at www.usm.edu/registrar.

Individuals have the right to file a complaint with the U.S. Department of Education concerning alleged failures by the college to comply with the requirements of FERPA. Students should contact the Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue, SW, Washington, D.C. 20202-4605.

Copyright

This course contains copyright protected materials such as audio or video clips, images, text materials, etc. These items are either linked to or are being used with regard to the Fair Use doctrine in order to enhance the learning environment. Please do not copy, duplicate, download or distribute these items. The use of these materials is strictly reserved for this online classroom environment and your use only. All copyright materials are credited to the copyright holder.

Mental Well-Being Statement

USM recognizes that students sometimes experience challenges that make learning difficult. If you find that life stressors such as anxiety, depression, relationship problems, difficulty concentrating, alcohol/drug problems, or other stressful experiences are interfering with your academic or personal success, consider contacting Student Counseling Services on campus at 601-266-4829. More information is also available at <https://www.usm.edu/student-counseling-services>.

Nondiscrimination Statement

The University of Southern Mississippi offers to all persons equal access to educational, programmatic and employment opportunities without regard to age, sex, sexual orientation, disability, pregnancy, gender identity, genetic information, religion, race, color, national origin, and/or veteran status pursuant to applicable state and federal law.

Confidentiality and Mandatory Reporting

As an instructor, one of my responsibilities is to help create and maintain a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role as a faculty member. I am required to share information regarding sexual misconduct or information about a crime that may have occurred on USM's campus with certain University

officials responsible for the investigation and remediation of sexual misconduct. The information will remain private and will only be shared with those officials necessary to resolve the matter. The sharing of information to the Title IX Office does not initiate a Title IX investigation or the criminal investigation process. Reporting to the Title IX Office initiates office outreach to those impacted by the alleged behavior to discuss available resolution options and supportive measures. You do not have to file a formal complaint with the Title IX Office in order to access on and off campus supportive measures. If you would like to speak in confidence, resources available to students include Confidential Advisors with the Shafer Center for Crisis Intervention, the Counseling Center, Student Health Services, and Clergy. More information on these resources and University Policies is available at www.usm.edu/title-ix.

Course Schedule
(Assessments in **bold**, lab activities in **blue**)

Date	Week day	Time	Activity	Reading
May 30	T	AM	Orientation, introduction, Scientific Method	
		PM	State of the climate, inorganic carbon cycle; Lab methods	
May 31	W	-	R/V Jim Franks transect sampling along salinity gradient (Pascagoula Bay to barrier islands)	
June 1	R	AM	Fish identification ; Organic carbon cycle, primary productivity	
		PM	Plankton identification ; Trophic ecology	Pauly et al. 1998
June 2	F	AM	Seining (Weeks Bayou) ; Fish identification	
		PM	Bottom-up and top-down effects, trophic cascades	
June 5	M	AM	Quiz # 1 ; Seining at GCRL	
		PM	Marine life throughout the Phanerozoic	Mays et al. 2023
June 6	T	AM	Stable C and N isotopes; GCRL seining, clearing and staining	
		PM	Food webs perspective on fishing-induced evolution	Hočevár and Kuparinen 2021
June 7	W	-	Trip to Dauphin Island, AL (Estuarium, West End Beach)	
June 8	R	AM	Fish and plankton identification ; Competition, succession	
		PM	Coastal eutrophication; Light trapping at GCRL	Dai et al. 2023
June 9	F	AM	Fish identification and diet analysis ; Catch up, review	
		PM	Exam # 1 ; Reynolds number concept	
June 12	M	-	R/V Jim Franks trip to Cat Island, MS	
June 13	T	AM	Fish and plankton identification ; Cladistics, developmental biology	
		PM	Viruses and prokaryotes, photosynthetic eukaryotes	Breitbart et al. 2018
June 14	W	AM	Lab review ; Lab Practical # 1	
		PM	Zooplankton diversity and ecology	Ratnarajah et al. 2023
June 15	R	AM	DNA barcoding ; Identifying coastal plants and birds	
		PM	Invertebrates; Light trapping	
June 16	F	AM	Quiz # 2 ; Early life history of fishes	
		PM	Recruitment, life history theory, and management of fishes	Dahlke et al. 2020
June 19	M	-	R/V Jim Franks trip to Chandeleur Islands, LA	
June 20	T	AM	Evolution of fishes, <i>Tiktaalik</i>	
		PM	Processing fish otoliths, spines	DePalma et al. 2021
June 21	W	AM	Life in the deep ocean; identifying coastal plants	
		PM	Coral reefs, kelp forests	Eger et al. 2023
June 22	R	-	Snorkeling Fort Pickens Jetty, Pensacola Beach, FL	
June 23	F	AM	Marine heat waves; Catch up, review	Smith et al. 2023
		PM	Exam # 2	
June 26	M	AM	Research proposals due ; Lab review	
		PM	Lab Practical # 2	
June 27	T	-	Research proposal presentations ; Lab notebooks due	
June 28	W	AM	Comprehensive final exam	