MSCI 458/458L
Fisheries Science

Fall 2024 (Lecture MWF 9:00-9:50, SCI2 220; Lab T 2:30-5:20, SCI2 125)

Instructor: Rob Young — ryoung@coastal.edu
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Office Hours: Rob Young: M,T,F 8-9, M,F 2:00-3:30, by appointment
Anna Deitz: M,W,Th 10-12

Course Management: Moodle will be used to supplement this course. You will find items such as the syllabus, assignments, announcements, grades and other relevant course materials on Moodle. Each student is responsible for checking Moodle on a regular basis.

Text: None – see selected readings in syllabus and on Moodle

Pre-requisites: MSCI 302 and MATH 160

Credits 3 (lecture) / 1 (Lab)

Catalog Description:
An introduction to the practices and techniques of fisheries science. Topics include: analytical and empirical mathematical models for fisheries forecasting, stock assessment techniques, age and growth analysis; mortality, recruitment, and yield; production and early life history, harvesting techniques, and the development of fishery management strategies that reflect the intersection of fish and population biology, conservation goals, and the socioeconomics of the fishing community and industry.

Course Objectives:
Fisheries Science is an interdisciplinary field that includes the scientific, environmental, social, political, and economic aspects of managing fisheries. This course will emphasize the science of fisheries stock assessment and forecasting within the context of the logistic, social, and economic realities of fisheries practice and management. Through a combination of lecture, readings, field trips, and laboratory problem sets, you will explore sampling techniques and models for determining stock assessment, age and growth analysis, mortality, recruitment, yield, production, and early life history. You will also gain a sound understanding of fishery resources, harvesting techniques, historical and current management efforts, and issues associated with specific important fisheries.

Student Learning Outcomes:

Upon the completion of this course, students should be able to:

1. Identify current and historical trends in fisheries landings and production
2. Identify the major fished species at regional, national, and global scales
3. Identify the major types of fishing gear and describe their mechanisms and capture techniques
4. Describe the relationship between life history strategies of fished species, the physical environment, and intra- and inter-specific interactions
5. Explain the factors that influence primary production and the conversion of primary production into fisheries production
6. Explain and use various models to estimate abundance, growth, and mortality rates, and carry out field and laboratory techniques that support these models. Identify the assumptions and limitations of the models.
7. Describe, use, interpret, and compare various single species assessment models, such as surplus production models, age-structured or cohort models, and stock-recruitment models. Identify the assumptions and limitations of the models.
8. Describe the basic approaches, limitations, and successes of multi-species fishery models, socio-economic fishery models, and ecosystem models.
9. Explain the challenges to sustainable fishing, including overfishing and threats to environmental quality
10. Review the history of fisheries management in the US and describe, compare, and evaluate current fisheries management approaches, techniques, regulations, and organizational structure.
11. Meet the following EL student learning outcomes:
    - SLO 1.1. Students will demonstrate the knowledge and skills obtained through participation in experiential learning activities that are relevant/pertinent to their academic programs and/or career goals.
    - SLO 2.1. Students will demonstrate a high level of comprehension and skill in connecting theory with practice which is correlated to their level of participation in experiential learning activities.

Instructional Modality and Student Locality:

As of the start of the semester, all classes are online/remote until September 8, when face-to-face instruction will commence. I plan to deliver face-to-face instruction to students who choose to physically attend classes and to make the course accessible to all students, I will simultaneously (synchronously) live-stream the class or lab to those students who choose to attend remotely. All classes will be recorded and posted on Moodle.

It is very possible that this plan may vary during the semester, either due to changes in the COVID-19 procedures of the university or a hurricane-related closure or required quarantine or isolation by a student or myself. Therefore, I ask that all of you be ready to make adjustments when necessary to maintain the continuity of the course to the greatest degree possible.

If your personal or health circumstances change and you would like to change the way you attend the class (from streaming to in-person or vice versa), you may do so. However, you must provide me with 48-hours' notice of this change via email, excepting documented emergencies, so that I can track accurately your attendance and course participation. You should also change your in-person vs. virtual preference in WebAdvisor.

Closing of the University for Inclement Weather: In the event of hazardous weather, faculty, staff, and students are requested to listen to local radio and television stations or visit the Coastal Carolina University website for official University closing announcements. Announcements about hazardous weather are also posted on the University's homepage.

Assignments and Grading:
The lecture and lab sections of this course are complementary, such that the grading for the lecture and lab are combined, and you will receive the same grade for both. The point breakdown is as follows:

50%	3 tests (including final exam), worth 20% each, except lowest score worth 10%:
	Tests can be on topics covered in the readings, in lecture and lab, and in the problem sets and assignments. Given the mix of face-to-face and streaming/online this semester, tests will likely be a mix of scheduled and timed sections and takehome sections with extended time and flexible scheduling.
20%	Lab problem sets and exercises: These activities are usually introduced in lab, but will sometimes extend into lecture days and homework assignments. These include population modeling exercises, fishery case studies, biological assessments and techniques, and field collections.
15%	Reading/homework assignments: Small reading and homework assignments will be assigned regularly each week throughout the semester.
10%	Fishery assessment project: Skills developed in lab and lecture will culminate in a fishery assessment and recommended management for a given species, using multiple models and approaches.
5%	Participation in lecture and lab: Participation is expected. I expect you to do your assigned readings and assignments, and I envision class time as interactive.

"Final Responsibility for satisfying degree requirements, as outlined in the university catalog, rests with the student." - University Catalog.

Grading scale**:** A (≥90), B+ (87.00-89.99), B (80.00-86.99), C+ (77.00-79.99), etc…

Attendance Policy:
Attendance will be taken for each class and lab. If you are attending remotely through live streaming, you must be present the entire live-stream session, preferably with your camera on, though not required. Participation in online polls, responses, discussions, and an on-camera presence can all serve as evidence of your attendance. If you are listed online as present but you are not demonstrating participation in at least one of these ways, that is an absence.

As per the University Catalogue, unexcused absences in excess of 25% of the regularly scheduled classes may result in an F for the course. Excused absences are defined in the catalog. I may excuse

additional types of absences, but only if you clear it with me *ahead of time*. If you miss a class it is *your* responsibility to inform me in a timely manner (within 24 hours), find out what you missed, and make up the material if it is an excused absence. Whether attending online or face-to-face, you are allowed three absences throughout the semester from the lecture course without it negatively effecting your grade. After 3 unexcused absences, you may lose participation points. There are no make-up opportunities for missed tests, labs, or assignments that do not have an excused absence. Participation is essential in lab: each unexcused absence will result in the loss of 2% of your total grade, and I reserve the right to take up to that amount off per lab for excessive tardiness or incomplete participation.

COVID-19 Health and Safety:

Face coverings are required indoors at all times and outdoors when physical distancing is not possible. CCU requires all students to wear face masks or cloth face coverings in classrooms, laboratories, and other instructional spaces. Compliance with the face-covering protocol is expected. If you do not comply with a classroom rule, you may be asked to leave class and/or reported to the Dean of Students Office. If you forget your mask, or if your mask breaks on your way to class, there are disposable masks available for your use.

Individuals whose unique and individual circumstances require an exception to the face covering requirement, as indicated by a medical professional, may request an exception in accordance with campus ADA policies. Contact the Office of Accessibility and Disability Services at 843349-2503 or **disability@coastal.edu**. Appropriate accommodations relating to class modality and social distancing will be evaluated and implemented based on the student's needs.
A portion of the grade for this course is directly tied to your participation in this class. Successful participation is defined as consistently adhering to expectations and requirements in this syllabus. I expect you to wear a mask that covers your mouth and nose.

We know from existing data that wearing a mask in public can help prevent the spread of SARSCoV-2, which causes COVID-19, in the community (Lyu & Wehby, 2020; CDC, 2020; Johns Hopkins Medicine, 2020 – citations available upon request). In accordance with the Office of the
Commissioner of Higher Education and guidance from the Centers for Disease Control and Prevention (CDC), CCU has determined that everyone will be required to wear a face mask in university buildings, including classrooms. This requirement includes wearing a mask appropriately (i.e., covering both your mouth and nose).

Our classroom has a Sanitation Station that is stocked with cleaners and sanitizers. When you enter the classroom, please use the spray and/or wipes to clean your workspace. The Sanitation Station also includes hand sanitizer and disposable masks in case you forget your own face covering. These disposable masks are finite in supply, so please take one only when necessary!

Code of Conduct with Netiquette

Since some or potentially all students in this course may be attending remotely, students must follow the Online Code of Conduct. Online Code of Conduct Students are expected to treat one another with respect and basic common courtesies in our online classroom. All students should expect a safe environment learning environment. This is environment should be free of derogatory, offensive, harassing or inappropriate remarks or materials including but not limited to race, ethnicity, gender, sexual orientation, religion, and age. Flaming and spamming will not

be tolerated. Comments of this nature will not be tolerated and will result in appropriate action by the instruction. In this course, we will employ the following guidelines:

- Fully participate in our learning community. Honor the background and experiences others bring to the discussion.
- Respectfully agree or disagree your classmates.
- Respect your classmates' privacy.
- Share what you know with your classmates. Be helpful.
- Avoid typing in all capital letters as it can be seen as yelling. ● Avoid the overuse of textspeak (ROFL, LOL, IMHO, etc.) and slang.
- Read and review your posts for clarity and accuracy. Run spellcheck.
- Use language appropriate to an academic environment (grammar and punctuation). ● Be sure to appropriately cite the work of others.
- Be brief and to the point in your posts (within the assignment guidelines).

Student Services

Academic Support:

- Link to Learning Assistance Center
- Link to Kimbel Library Website
- Link to Counseling Services
- Link to online orientation

Technology Support

- Link to Technical Support from Student Computing Services
- Link to A list of on-campus HelpDesks and the Help Request Form

Other Student Services

- Link to Bookstore
- Link to Chant 411
- Link to Office of the Registrar
- Link to Financial Aid and Scholarships
- Link to Student Activities and Leadership
- Link to Dean of Students Office

Academic Integrity and Plagiarism Statement:

Violations of the Student Code of Conduct (including but not limited to academic dishonesty – cheating & plagiarism) will not be tolerated and will result in a minimum of a zero for an assignment and potentially removal from the course with an F. Poor grades earned due to cheating or plagiarism cannot be removed through the Repeat Forgiveness Policy. For information on the Code of Student Conduct, please see your Student Handbook or http://www.coastal.edu/judicialaffairs/codeofconduct.pdf.

Coastal Carolina University is an academic community that expects the highest standards of honesty, integrity and personal responsibility. Members of this community are accountable for

their actions and reporting the inappropriate action of others and are committed to creating an atmosphere of mutual respect and trust.

Lab Safety:
Students are expected to know about chemical hygiene plan documents, chemical inventory and storage, emergency equipment, use of protective measures, standard operating procedures for their lab room and procedures in case of an accident. Students must follow posted safety measures or given instructions in regard to appropriate clothing (close-toed shoes, appropriate length garments, protective gear) - students not conforming to these rules will be asked to leave and cannot return until they are in compliance. Students unable to complete the lab or field trip will not receive credit. If posted, students may not bring food or drink into the lab room

Disabilities Statement
Coastal Carolina University is committed to equitable access and inclusion of individuals with disabilities in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. Individuals seeking reasonable accommodations should contact Accessibility & Disability Services (843-349-2503 or https://www.coastal.edu/disabilityservices/). The Americans with Disabilities Act indicates "title II and title III entities must permit service animals to accompany people with disabilities in all areas where members of the public are allowed to go." As such, service animals are permitted in lab settings at Coastal Carolina University. Emotional support animals are not permitted in lab settings unless it is approved as a classroom accommodation. Students with service animals are strongly encouraged, but not required, to inform lab instructors of the use of a service animal. This communication provides both the student and the instructor with an opportunity to discuss and plan for the safety of the service animal as well as any other safety concerns. Students and instructors should contact Accessibility & Disability Services (843-349-2503 orhttps://www.coastal.edu/disabilityservices/) regarding any potential accommodations or for support and assistance.

Lecture and Lab Schedules:
Schedules may change depending on conditions during the semester. Any notable changes to the schedule will be posted on Moodle and distributed via email.

Lecture Schedule:

Date	Topic	Readings
Aug 19-21	Introduction, what is fisheries science?, brief history, global trends	SOFIA site (Moodle)
Aug 24-28	Current fishery resources and trends	FAO/NOAA (Moodle)
Aug 31-Sep 4	Fishers, Fishing gear and techniques (guest lecturer on the 6th)	Moodle
Sep 7	**Labor Day** (no class)	
Sep 8-11	Aquatic ecology, and production processes, life histories	Moodle
Sep 14-18	Aquatic ecology, and production processes, life histories	Moodle
Sep 21-25	**Test 1 (Sep 23)** Recruitment, stock-recruitment models	Moodle
Sep 28-Oct 2	Intro to fishery models, basic population models	Moodle
Oct 5-9	basic population models	Moodle
Oct 12-16	Surplus Production models, MSY, Parameter Estimation	Moodle
Oct 19-23	Various modeling techniques, YPR models, Age-structured models	Moodle
Oct 26-30	**Test 2 (Oct 28)** Models review and intro to management	Moodle
Nov 2-6	Historical and current fisheries management	Moodle
Nov 9-13	Historical and current fisheries management	Moodle
Nov 16-20	Historical and current fisheries management	Moodle
Nov 23-27	***Thanksgiving Break***	
Nov 30-Dec 2	Historical and current fisheries management, summary	Moodle
Dec 4	**EXAM**	

Lab Schedule:

Date	Topic
Aug 25	Problem Set 1: Estimating Abundance
Sep 1	Problem Set 2: Growth
Sep 8	Working up a fish, otolith collections and prep
Sep 15	Size at age, otolith reading
Sep 22	Field Lab – seining Wall Pond, mark recapture study
Sep 29	Problem Set 3: Estimating Mortality - Catch Curve Analysis
Oct 6	Problem Set 4: Estimating Mortality II
Oct 13	SC Shrimping case study and exploration
Oct 20	Problem Set 5: Yield Per Recruit and Dynamic Pool Models
Oct 27	Problem Set 6: Cohort Analysis and Virtual Population Analysis
Nov 3	**Election Day: No classes**
Nov 10	SC grouper snapper complex case study and exploration

Nov 17	Management Role Play: Marine Protected Areas
Nov 23-27	**Thanksgiving Break**
Dec 1	Lab Presentations, discussion