Fisheries Ecology

AFS 415 – 3 credits

2025 Summer Session #1 – Online (asynchronous)

Instructor:
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Course Description:
This course will focus on the ecological characteristics of fishes and invertebrates in capture fisheries worldwide, including the relationship between aspects of fishing, fish populations, and habitat.

Course Objective:
This course prepares students to apply ecological principles and scientific evidence to fisheries management decisions. Students will develop a comprehensive understanding of (marine) fisheries science, including population dynamics, ecosystem impacts, and sustainable management approaches.

Learning Outcomes:
By the end of the course, you will be able to:

(1) Analyze global fisheries systems by evaluating catch methods, species diversity, and their economic and ecological significance

(2) Evaluate how environmental factors and biological processes influence fish population dynamics and spatial distribution patterns

(3) Interpret fisheries stock assessment models to evaluate population status and biological parameters needed for these assessments

(4) Assess how species' behavioral patterns and life history traits contribute to their vulnerability to fishing pressure

(5) Evaluate fishing impacts on marine ecosystems, including effects on non-target species and habitats, and develop evidence-based mitigation strategies

(6) Design management strategies that align fisheries regulations with specific biological objectives while considering ecological factors

These course outcomes will be assessed using reading assignments, blog posts, group project, and weekly quizzes specific to the learning outcomes listed above. **There are no exams in this course.**

Prerequisite Knowledge:
There might be a few quantitative exercises that require basic algebra skills and competency with formulas and graphing in MS Excel. These quantitative skills should be gained through MTH 131 or 141. Also, basic fisheries knowledge will be helpful and AFS 215 would achieve this.

Required Texts and Readings:
There is no required textbook for this course. However, most of your Reading Assignments will be drawn from:

> *Jennings, S., Kaiser, M. J., & Reynolds, J. D. (2001). Marine Fisheries Ecology. Blackwell Publishing, 432 pp*.

You will not need to purchase this (or any other) textbook as I will provide PDF copies.

Course Components:
This course is composed of four graded elements: **reading assignments** (25%), **blog posts** (25%), **group project** (25%), and **knowledge quizzes** (25%). There are no exams.

Grade scale: A, 93-100; A-, 90-92; B+, 87-89; B, 83-86; B-, 80-82; C+, 77-79; C, 73-76; C-, 70-72; D+, 67-69; D, 61-66; F, 60 or below.

Technology Requirements and Resources:
Computer access to the Internet is required to successfully navigate this course. The course is delivered through the Brightspace learning management system, Zoom, and Google Drive platforms. Announcements for the course will also be posted on Brightspace, so please check it frequently and *make sure you have the correct email address associated with your Brightspace profile* (i.e., the one you frequently check). Recommended browsers (those with the most QA testing effort against them) are Google Chrome, Safari, and Mozilla Firefox. The mobile versions of these browsers also work well with most operations in Brightspace. Internet Explorer is not recommended.

Online Learning:
This course is divided into 5 weeks with two learning modules per week. Each learning module contains learning outcomes associated with readings, mini-lecture videos, blog posts, and group project content. To begin this course, click the "Start Here" tab in Brightspace. The introductory items will act as your map to the online course. See the end of this document for specifics on course schedule and topics.

Time Commitment:
I expect you to work on course material for an estimated approximate time of **10 hours** each week. These are time estimates, and some students may spend more or less time than is estimated. My calculations are as follows:

> **~4 hours** to the weekly reading assignment and associated questions.
> **~2.5 hours** to blog post research, writing, and responses to classmates.
> **~2.5 hours** to group project research and writing.
> **~1 hour** to the weekly knowledge quiz, including study time and taking the quiz.

IMPORTANT: Something is due every week on Thursdays and Sundays. By staggering these, it encourages frequent interaction with the course material. Every week the following will be due:

Assignment	**Weekly Due Date**
Reading(s) with associated questions	Thursday by 11:59pm
Blog post	Thursday by 11:59pm
Blog post responses to classmates	Sunday by 11:59pm
Group project assignment	Sunday by 11:59pm
Knowledge quiz(zes)	Sunday by 11:59pm

Reading assignments will generally be 20-30 pages and include short-answer questions associated with the material. These questions are meant to guide your reading, point out some important aspects, and you will submit your answers directly in Brightspace. I will record and upload short mini-lecture videos each week summarizing key points from the reading. These are meant to complement the readings and support diverse learning modalities.

Blog posts will be written each week (at least 500 words) summarizing a current event related to the week's learning objectives. These posts are designed to help you apply what you're learning to real-world scenarios, critically analyze relevant issues, and improve your science communication skills. Your post should include a summary of the event, its significance, and its relevance to the week's learning objectives. After submitting your post in Brightspace, you are required to provide constructive feedback on at least two classmates' posts, highlighting insights, asking questions, and offering additional perspectives. Part of this assignment is to build your research skills by finding credible, current articles on fisheries ecology. While I won't provide specific articles initially, you're welcome to reach out if you're having difficulty finding suitable sources.

Group project replaces a traditional term paper and provides an opportunity to dive deeply into a specific fishery. Working collaboratively, you will explore a specific fishery's history as well as various ecological and biological aspects. Assignments are divided into manageable components due every week. The project culminates in a comprehensive final report synthesizing all findings. This project emphasizes critical thinking, teamwork, and the practical application of fisheries ecology concepts.

Knowledge quizzes are designed to help you review your understanding of the week's material. You will have 10 minutes to complete the true/false or multiple-choice questions once you begin the quiz on Brightspace. You **may not use outside materials** to complete the quiz.

Late assignments will be accepted and graded, but points will be taken off your grade. This is a criterion in all assignment rubrics within Brightspace, so I encourage you to check them for the specific penalty.

Brightspace or email messages to me will be responded to within 24 hours (excluding weekends). You can use my email, humphries@uri.edu, or Brightspace to communicate with me.

Artificial intelligence (AI) tools such as ChatGPT, Grammarly, or other generative technologies can be valuable for enhancing learning and productivity. However, their use in this course must align with the principles of academic integrity and the course's objectives.

Permitted Uses of AI:

- Idea Generation: Brainstorming ideas for assignments, blog posts, or project topics.
- Editing and Proofreading: Using tools like Grammarly for grammar, spelling, and style checks.
- Clarifying Concepts: Seeking explanations of general fisheries ecology concepts or terminology.
- Technical Assistance: Formatting references, citations, or tables.

Prohibited Uses of AI:

- Content Generation: Submitting AI-generated text as your own work is not allowed. All submitted content, including blog posts, quizzes, and group project deliverables, must be your original writing and analysis.
- Critical Thinking Tasks: Assignments designed to assess your understanding (e.g., interpreting stock assessment models, analyzing fisheries data, or synthesizing ecological concepts) must be completed independently without relying on AI for substantive analysis.
- Plagiarism: Using AI to paraphrase or rewrite content from sources without proper citation constitutes academic dishonesty.

Transparency and Citation:

- If you use an AI tool in completing an assignment, you must clearly disclose its use. For example, include a brief statement at the end of your work, such as:
    - "This work was reviewed using Grammarly for grammar and style suggestions."
    - "ChatGPT was used to brainstorm ideas for this report."

Consequences of Misuse:

- Misuse of AI tools, including submitting AI-generated work as your own or failing to disclose AI usage, will be considered a violation of the University's Academic Integrity Policy and will result in disciplinary action. The first violation will result in a warning and opportunity to redo the assignment. The second violation will result in the filing of a Student Academic Misconduct Report with URI.

Anti-Bias Syllabus Statement: I respect the rights and dignity of each individual and group. I reject prejudice and intolerance, and we work to understand differences. I believe that equity and inclusion are critical components for campus community members to thrive. If you are a target or a witness of a bias incident, you are encouraged to submit a report to the URI Bias Response Team at https://web.uri.edu/brt/. There you will also find people and resources to help.

Students with Disabilities: Your access in this course is important. Please send me your Disability, Access, and Inclusion (DAI) accommodation letter early in the semester so that we have adequate time to discuss and arrange your approved academic accommodations. If you have not yet established services through DAI, please contact them to engage in a confidential conversation about the process for requesting reasonable accommodations in the classroom. DAI is in room 302 of the Memorial Union, 401-874-2098, http://uri.edu/disability, or email dai@uri.edu.

Academic Enhancement Center: The Academic Enhancement Center (AEC) offers face-to-face and online services to undergraduate students seeking academic support. Services are based out of Roosevelt Hall, the Carothers Library room LL004, and online. Peer tutoring is available for STEM & BUS-related courses through the Drop-In Center and small-group tutoring. The Writing Center peer consultants offer feedback focused on supporting undergraduate writers at any stage of a writing assignment. The UCS 160 course and one-to-one Academic Skills Consultations offer strategies for improving studying and test-taking skills. Complete details about each of these programs, up-to-date schedules, contact information, and self-service study resources are all available on the AEC website, uri.edu/aec.

- **STEM & BUS Tutoring** helps undergraduate students navigate a variety of 100 and 200 level STEM & BUS courses through free peer tutoring in-person and online. Students can select **occasional or weekly tutoring sessions** through the TracCloud system or visit the Drop-In Center, located in the Carothers Library lower level room LL004. The TracCloud

application is available through URI Microsoft 365 single sign-on and more detailed information and instructions can be found at uri.edu/aec/tutoring.

- **Academic Skills Development** courses and programs teach students how to plan and apply time management and study strategies. **UCS 160: Success in Higher Education** is a one-credit course on strategic approaches to planning and studying. **UCS 161x: Becoming a Self Directed Student** teaches strategies for taking greater control over their academic work and lives. **Academic Consultations** are 1 to 1 meetings that help individual students to address their academic challenges. Students can schedule in-person or online consultations with David Hayes on Starfish. **Study Your Way to Success** is a self-guided web portal connecting students to tips and strategies on studying and time management related topics. For information or help with scheduling, contact Dr. Hayes directly at davidhayes@uri.edu.

- **The Undergraduate Writing Center** provides peer writing support to students in any class, at any stage of the writing process: from understanding an assignment and brainstorming ideas, to developing, organizing, and revising a draft. Writing consultations are available through: 1) 25- or 50-minute **in-person appointments**, 2) synchronous **online appointments**, and 3) asynchronous **written feedback.** Synchronous appointments hosted by WCOnline are video-based, with audio, chat, document-sharing, and live captioning capabilities, to meet a range of accessibility needs. View availability and book online at uri.mywconline.com. For more information, visit uri.edu/aec/writing.

Week & Dates	Learning Objectives
Week 1 May 19 – 25	1. Identify fisheries of the world 2. Explain patterns of exploitation and gears 3. Give examples of the need to manage fisheries 4. Classify production as either primary, heterotrophic, or habitat-associated 5. Compare types of production processes as they relate to fisheries
Week 2 May 26 – June 1	1. Identify fished species: finfish and invertebrates 2. Define fish life histories 3. Outline how fished species move in space and time 4. Explain how recruitment shapes population structure 5. Describe density-dependent habitat use
Week 3 June 2 – 8	1. Define maximum sustainable yield and describe how population biomass, yield, and growth rates impact it 2. Understand the basic density-dependence concepts used in single species stock assessments 3. Define and describe the principles of a subset of single species stock assessment models: surplus production, delay-difference, virtual population analysis 4. Identify fish stocks and the data needed to determine stocks 5. Explain dynamics of fish stocks in response to fishing and the environment
Week 4 June 9 – 15	1. Describe survey designs and methods to get data needed for stock assessments 2. Define the difference among visual census methods, mark-recapture methods, and fishery-dependent methods for obtaining stock assessment data 3. Breakdown the fishing effect on populations in relation to differential vulnerabilities 4. Explain how intraspecific effects impact fish populations 5. Define what community level effects are for fish populations
Week 5 June 16 – 20	1. Categorize alternatives to fisheries discards 2. Summarize different methods to reduce bycatch 3. Describe how birds and mammals are affected as bycatch 4. Define the difference between input and output management controls 5. Recognize the need for multispecies and ecosystem-based management and conservation trade-offs with fisheries