

FW 401 FISHERY SCIENCE SYLLABUS

Fall 2023

INSTRUCTOR INFORMATION

Instructor: Dr. Brett Johnson, Professor, Department of Fish, Wildlife and Conservation Biology

Office: TBD Wagar; Email: brett.johnson@colostate.edu

Teaching Assistant: Taylor Stack, Office: Wagar 102; Email: taylor.stack@colostate.edu

OFFICE HOURS

Dr. Johnson: 10:00-10:50 Mondays and Wednesdays, or by appointment. We can also “meet” in a video conference in Microsoft Teams or just email me with your questions.

Taylor: 1:00-2:00 Mondays and Wednesdays, or by appointment.

PREREQUISITES

FW300, M141/155/160, ST301/ST307 or equivalent. Computer literacy is assumed.

COURSE DESCRIPTION AND LEARNING OBJECTIVES

Fishery Science is a quantitative, ecological discipline that interfaces with human dimensions. Students will draw on knowledge gained throughout the Fisheries and Aquatic Sciences curriculum (fish biology, math, statistics, ecology, conservation biology and human dimensions) to tackle complex concepts and apply that understanding to real world datasets and contemporary fish conservation and management issues.

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

- Explain the fundamentals of fish population dynamics, including basic concepts and stock assessment methods, and applications to current fishery management issues.
- Apply demographic and ecological concepts to the conservation and management of non-game and sport fish populations and communities.
- Demonstrate critical thinking, mathematical and computational skills for gathering, analyzing and interpreting fish and fishery data.
- Apply critical thinking skills to collect, analyze and interpret fish and fishery data, and
- Demonstrate technical writing and scientific graphics skills.

TEXTBOOK / COURSE READINGS

There is no required textbook for this course. Readings will be available online. Papers should be read before the lecture. “Crib notes” will be required for some readings.

COURSE MATERIALS & EQUIPMENT

- Calculator capable of computing basic statistics
- FW 401 slides (Canvas). These are copyrighted materials so you may not duplicate or distribute any of them, they are solely for your use in the course.

HOW TO BE SUCCESSFUL IN THIS CLASS

- Attend all lectures and all laboratory sessions. Exams are largely based on material presented in lecture and lab and attendance is part of your course grade.
- Read and take notes on the assigned readings before the associated lecture or laboratory.
- Do the homework. Homework problems are designed to prepare you for the math on exams.

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- Don't get behind on lab reports- they are the biggest component of your course grade and if you fall behind you may fail the course.
- Expect to spend at least 10 hours per week outside of class reading and doing lab reports and homework for this class.
- Ask questions! If something is unclear to you it probably is to others also, and your questions make the class more useful and interesting for everyone.

PARTICIPATION/BEHAVIORAL EXPECTATIONS

- **Attendance at all lectures and labs is required and is 10% of your grade. You can have up to 3 excused absences from lectures and 1 excused absence from lab. You are still responsible for any homework or lab writeups if you miss class.**
- This course will adhere to the Academic Integrity Policy of the General Catalog and the Student Conduct Code. You will be asked to sign an Honor Pledge. I reserve the right to assign negative points or other penalties for academic misconduct on exams or assignments.
- Students are not allowed to use advanced automated tools (artificial intelligence or machine learning tools such as ChatGPT or Dall-E 2) on assignments in this course. Each student is expected to complete each assignment without substantive assistance from others, including automated tools.
- I do not allow students to record, reproduce, screenshot, photograph, or distribute any video, audio, or visual content from my courses without prior written approval from me.
- Please review the core rules of netiquette for some guidelines and expectations on how to behave in an online learning environment.

MAKE-UP EXAMS, LATE ASSIGNMENTS, ETC.

If you must miss an exam due to sickness or personal tragedy, Dr. Johnson must be contacted before the exam begins. Otherwise, you will receive a zero on the exam. I reserve the right to base grades on a subset of course scores instead of providing a makeup.

Homework assignments

Homework assignments should be turned in on Canvas in the form of a PDF file. No photos/images of homework will be accepted- scan it or import photos to a document, make sure they are oriented correctly and are sized for standard letter size paper (8-1/2 x 11"), then export as a PDF and upload to Canvas. Late assignments will be penalized at 10% per day (maximum 50%).

Laboratory grading

See the grading rubric and example lab report on Canvas.

1. Completed laboratory reports must be submitted via Canvas, as a PDF file.
2. Lab reports are due on the date specified in the lab schedule, at the beginning of the lab period. Labs are late after start of class time on Tuesdays. Don't fall behind!
3. Late labs submitted by:

	<u>Penalty</u>
Wednesday 2:00 p.m. - one day late	-10%
For <u>each</u> day thereafter	-10% additional (-50% maximum)

Late lab reports will not be accepted after the date of the exam for that section of the course.
5. You may drop 1 lab grade. Use this option wisely, when you really need it.

GRADING POLICY

We will follow the standard plus/minus grading curve in this course. In general course grades will follow the conventional curve (below) but adjustments may be required based on class performance.

Grade	Range
A+	100% to 96.67%
A	<96.67% to 93.33%
A-	<93.33% to 90.0%
B+	<90.0% to 86.67%
B	<86.67% to 83.33%
B-	<83.33% to 80.0%
C+	<80.0% to 76.67%
C	<76.67% to 70.0%
D	<70.0% to 60.0%
F	<60.0% to 0.0%

Your grade will be determined from your performance in these areas:

Assignment	Grade percentage
Lab reports, assignments	40%
Midterm exam 1	10%
Midterm exam 2	15%
Final exam	15%
Homework, quizzes, other	10%
Attendance, participation	10%
Total	100%

*Keep a copy of all work created for the course, including work submitted through Canvas course learning management system.

RECOMMENDED FISHERY SCIENCE REFERENCES

This list is provided to supplement material presented in class, to give you some resources to dig more deeply into topics that interest you, and to allow you to review basic concepts covered in prerequisite courses (you may also wish to review course notes from prerequisite courses).

Craig, J. F., editor. 2016. Freshwater fisheries ecology. John Wiley and Sons, West Sussex, U.K.

Guy, C. S. and M. L. Brown, editors. 2007. Analysis and interpretation of freshwater fisheries data. American Fisheries Society, Bethesda, MD.

Helfman, G. S., B. B. Collette, D. E. Facey, and B. W. Bowen. 2009. The diversity of fishes. Wiley-Blackwell, Oxford, UK.

Hubert, W.A. and M. C. Quist (eds). 2010. Inland fisheries management in North America. American Fisheries Society, Bethesda, Maryland.

Ogle, D. H. 2016. Introductory fisheries analysis with R. Taylor and Francis, Boca Raton, FL.

Ricker, W. E. 1975. Computation and interpretation of biological statistics of fish populations. Fisheries Research Board of Canada Bulletin 191.

Zale, A.V, D.L. Parrish, and T.M. Sutton, eds. 2012. Fisheries techniques, 3rd edition. American Fisheries Society, Bethesda, MD.

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LECTURE SCHEDULE

Date	Topic	Lecture homework DUE*
Aug 21	Module 1: Course overview	
Aug 23	Module 2: The Stock Concept, population dynamics	HW1, Crib Notes 1 (Bestgen)
Aug 28	Module 3: Abundance estimation I	
Aug 30	Module 3: Abundance estimation II – Study design	Crib Notes 2 (Spear)
Sep 4	Labor Day – no class	
Sep 6	Module 3: Abundance estimation III – Examples	
Sep 11	Module 4: Age and growth I - Ecological concepts	HW2 (Simple estimators)
Sep 13	Module 4: Age and growth II - Estimation techniques	Crib Notes 3 (MacLean)
Sep 18	Module 4: Age and growth III	
Sep 20	Module 5: Growth and Production	HW3 (Growth calculations)
Sep 25	FIRST MIDTERM EXAM	
Sep 27	Module 6: Evolutionary effects of fishing	Crib Notes 4 (Hutchings)
Oct 2	Module 7: Mortality I Ecological concepts and estimation	
Oct 4	Module 7: Mortality II - Estimation	
Oct 9	Module 8: Recruitment I - Ecological concepts	HW4 (Mortality calculations)
Oct 11	Module 8: Recruitment II - Mathematical models	
Oct 16	Module 8: Recruitment III - Maternal influence	Crib Notes 5 (Barneche)
Oct 18	Module 9: Bioenergetics I - Eco-physiological underpinnings	
Oct 23	Module 9: Bioenergetics II - The energy budget and models	
Oct 25	Module 9: Bioenergetics III - Yellowstone Lake case study	Crib Notes 6 (Ruzycski)
Oct 30	SECOND MIDTERM EXAM	
Nov 1	Module 10: Small-scale, subsistence, and artisanal fisheries	
Nov 6	Module 11: Fisheries management <u>principles</u>	
Nov 8	Module 11: Fisheries management <u>practices</u>	
Nov 13	Module 12: Stocking and hatcheries	Crib Notes 7 (Truschenski)
Nov 15	Module 12: Harvest regulations	
Nov 20	Fall break – no class	
Nov 22	Fall break – no class	
Nov 27	Module 12: Harvest regulations - Indirect effects	
Nov 29	Module 13: Suppression of invasive fishes	Crib Notes 8 (Hansen)
Dec 4	Module 14: Management decisions	
Dec 6	Module 15: Fishery economics	
Dec 11	FINAL EXAM - Monday 7:30-9:30 AM	

*See Canvas for the latest due dates

LABORATORY SCHEDULE

Lab	Date	Laboratory Topic (points in parentheses)	Lab assignments DUE
1	08/22	Review math/stats 1 (200)	
2	08/29	Review math/stats 2 (200)	Lab 1 report
3	09/05	Statistics and graphing in Excel (200)	Lab 2 (calculations)
4	09/12	Age and growth 1 (200)	Lab 3 report
5	09/19	Age and growth 2 (200)	Lab 4 report
6	09/26	Habitat issues (100)	
7	10/03	Mortality rates (200)	Lab 5 report
8	10/10	Biological statistics of fish populations (200)	Lab 7 report
9	10/17	Tentative: Becoming a professional (200)	Lab 8 report Draft résumé
10	10/24	TBD	revised résumé, cover letter
11	10/31	Sustainability of commercial fishing (100)	
12	11/07	Are you going to eat that? (200)	Lab 12 worksheet (by end of lab)
13	11/14	Population modeling (200)	
--	11/21	FALL BREAK – NO CLASS	--
14	11/28	Lost Lake Management (200)	Lab 13 report
15	12/05	Review session and course eval (50)	

COVID INFORMATION

For the latest information about the University's COVID resources and information, please visit the CSU COVID-19 site: <https://covid.colostate.edu>

CANVAS INFORMATION & TECHNICAL SUPPORT

Canvas is where course content, grades, and communication will reside for this course.

- [Login for Canvas](#)
- [Canvas Support](#)
- For passwords or any other computer-related technical support, contact the [Central IT Technical Support Help Desk](#).
 - (970) 491-7276, help@colostate.edu

The [Technical Requirements](#) page identifies the browsers, operating systems, and plugins that work best with Canvas. If you are new to Canvas quickly review the [Canvas Student Orientation](#) materials.

ACADEMIC INTEGRITY & CSU HONOR PLEDGE

This course will adhere to the CSU Academic Integrity/Misconduct policy as found in the General Catalog and the Student Conduct Code.

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course.

I reserve the right to assign negative points or other penalties for academic misconduct on exams or assignments.

Further information about Academic Integrity is available at CSU's [Academic Integrity - Student Resources](#).

BASIC NEEDS STATEMENT

At CSU, Rams take care of Rams—period. If you are experiencing food, housing, and/or transportation insecurity, please contact lsc_basicneedsinfo@colostate.edu.

CSU HAS RESOURCES TO HELP

Many of us are struggling. CSU is a community that cares. You are not alone. CSU Health Network Counseling Services has trained professionals who can help. Your student fees provide access to a wide range of support services. Call Counseling Services at (970) 491-6053, and they will work together with you to find out which services are right for you. Visit <https://health.colostate.edu/about-counseling-services> to learn more and <https://health.colostate.edu/mental-health-resources/> for additional student mental health and well-being resources. If you are concerned about a friend or peer, use **Tell Someone** by calling (970) 491-1350 or visiting <https://supportandsafety.colostate.edu/tell-someone/> to share your concerns with a professional who can discreetly connect the distressed individual with the proper resources. Rams Take Care of Rams. Reach out and ask for help if you or someone you know is having a difficult time.

STUDENT DISABILITY CENTER ACCOMMODATIONS

Students who have federally supported disabilities will find information about processes and supports available at this site: <https://disabilitycenter.colostate.edu/accommodations-process/>

UNIVERSAL DESIGN FOR LEARNING/ACCOMMODATION OF NEEDS

I am committed to the principle of universal learning. This means that our classroom, our virtual spaces, our practices, and our interactions be as inclusive as possible. Mutual respect, civility, and the ability to listen and observe others carefully are crucial to universal learning.

If you are a student who will need accommodations in this class, please contact me to discuss your individual needs. Any accommodation must be discussed in a timely manner. A verifying memo from [The Student Disability Center](#) may be required before any accommodation is provided.

The Student Disability Center (SDC) has the authority to verify and confirm the eligibility of students with disabilities for the majority of accommodations. While some accommodations may be provided by other departments, a student is not automatically eligible for those accommodations unless their disability can be verified and the need for the accommodation confirmed, either through SDC or through acceptable means defined by the particular department. Faculty and staff may consult with the SDC staff whenever there is doubt as to the appropriateness of an accommodative request by a student with a disability.

The goal of SDC is to normalize disability as part of the culture of diversity at Colorado State University. The characteristic of having a disability simply provides the basis of the support that is available to students. The goal is to ensure students with disabilities have the opportunity to be as successful as they have the capability to be.

Support and services are offered to student with functional limitations due to visual, hearing, learning, or mobility disabilities as well as to students who have specific physical or mental health conditions due to epilepsy, diabetes, asthma, AIDS, psychiatric diagnoses, etc. Students who are temporarily disabled are also eligible for support and assistance.

Any student who is enrolled at CSU, and who self-identifies with SDC as having a disability, is eligible for support from SDC. Specific accommodations are determined individually for each student and must be supported by appropriate documentation and/or evaluation of needs consistent with a particular type of disability. SDC reserves the right to ask for any appropriate documentation of disability in order to determine a student's eligibility for accommodations as well as in support for specific accommodative requests. The accommodative process begins once a student meets with an accommodations specialist in the SDC.

THIRD-PARTY TOOLS/PRIVACY

Please note that this course may require you to use third-party tools (tools outside of the Canvas learning management system), such as Skype and others. Some of these tools may collect and share information about their users. Because your privacy is important, you are encouraged to consult the privacy policies for any third-party tools in this course so that you are aware of how your personal information is collected, used and shared.

COPYRIGHTED COURSE MATERIALS

Please do not share material from this course in online, print, or other media. Course material is the property of the instructor who developed the course. Materials authored by third parties and used in the course are also subject to copyright protections. Posting course materials on external sites (commercial or not) violates both copyright law and the CSU Student Conduct Code. Students who share course content without the instructor's express permission, including with online sites that post materials to sell to other students, could

face appropriate disciplinary or legal action.

UNDOCUMENTED STUDENT SUPPORT

Any CSU student who faces challenges or hardships due to their legal status in the United States and believes that it may impact their academic performance in this course is encouraged to visit [Student Support Services for Undocumented, DACA & ASSET](#) for resources and support. Additionally, only if you feel comfortable, please notify your professor so they may pass along any additional resources they may possess.

FOOD INSECURITY

Any CSU student (along with faculty and staff) who is experiencing food insecurity can receive support from the [Rams Against Hunger](#) program. Services include a food pantry, a meal-swipe program, pocket pantries, and in-person assistance with navigating federal aid eligibility. The RAH page includes numerous resources as well as county, state and federal programs which are described and linked.

TITLE IX/INTERPERSONAL VIOLENCE

For the full statement regarding role and responsibilities about reporting harassment, sexual harassment, sexual misconduct, domestic violence, dating violence, stalking, and the retaliation policy please go to: [Office of Title IX Programs and Gender Equity](#).

If you feel that your rights have been compromised at CSU, several resources are available to assist:

- Student Resolution Center, 200 Lory Student Center, 491-7165
- Office of Equal Opportunity, 101 Student Services, 491-5836

A note about interpersonal violence: If you or someone you know has experienced sexual assault, relationship violence and/or stalking, know that you are not alone. As instructors, we are required by law to notify university officials about disclosures related to interpersonal violence. Confidential victim advocates are available 24 hours a day, 365 days a year to provide support related to the emotional, physical, physiological and legal aftermath of interpersonal violence. Contact the Victim Assistance Team at: 970-492-4242.

RELIGIOUS OBSERVANCES

CSU does not discriminate on the basis of religion. Reasonable accommodation should be made to allow individuals to observe their established religious holidays. Students seeking an exemption from attending class or completing assigned course work for a religious holiday will need to fill out the [Religious Accommodation Request Form](#) and turn it in to the Division of Student Affairs, located on the second level of the Administration building.

Once turned in, the Division of Student Affairs will review the request and contact the student accordingly. If approved, the student will receive a memo from the Dean of Students to give to their professor or course instructor.

Students are asked to turn in the request forms as soon as the conflict is noticed. Similarly, unanticipated conflicts requiring a religious observance, such as a death in the family, can also be reviewed.

CSU PRINCIPLES OF COMMUNITY

Inclusion: We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.

Integrity: We are accountable for our actions and will act ethically and honestly in all our interactions.

Respect: We honor the inherent dignity of all people within an environment where we are committed to

freedom of expression, critical discourse, and the advancement of knowledge.

Service: We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

Social Justice: We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

DIVERSITY AND INCLUSION

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Learn more about CSU's commitment to diversity and inclusion [here](#) and [here](#).

STUDENT PARENTS/GUARDIANS/CAREGIVERS

I realize that student parents/guardians and caregivers face distinctive challenges in succeeding academically, and I'm committed to supporting those of you who are parents to achieve our course's learning outcomes. If you encounter challenges in meeting course expectations – for example, fulfilling attendance and participation requirements or submitting assignments due to a child or person in your care's illness, essential appointment, school closure, etc. – please contact me as soon as possible (beforehand if feasible or as soon afterward you reasonably can if not). We'll develop a plan for you to make up missed work.

Finally, know that [pregnant and parenting students are guaranteed equal educational opportunities by Title IX](#); know your rights, the protections provided, and how to advocate for yourself.

STUDENT CASE MANAGEMENT

[Student case management](#) is available to help students with extenuating life circumstances and connect them with resources. In some cases, after you and I discuss your situation, I may request [verifiable documentation for class absences](#) from the SCM office if you request considerations for absences or missed coursework.

MENTAL HEALTH AND WELLNESS

CSU is a community that cares. You are not alone. CSU Health Network Counseling Services has trained professionals who can help. Your student fees provide access to a wide range of support services. Call Counseling Services at (970) 491-6053, and they will work together with you to find out which services are right for you. Visit <https://health.colostate.edu/about-counseling-services> to learn more and <https://health.colostate.edu/mental-health-resources/> for additional student mental health and well-being resources. An extensive set of mental health resources is available to CSU students: <https://health.colostate.edu/mental-health-resources/>

If you are concerned about a friend or peer, use **Tell Someone** by calling (970) 491-1350 or visiting <https://supportandsafety.colostate.edu/tell-someone/> to share your concerns with a professional who can discreetly connect the distressed individual with the proper resources. Rams Take Care of Rams. Reach out and ask for help if you or someone you know is having a difficult time.