

Fish and Limnology
FAS 6932 - 3 Credits - Spring 2020

Course Overview:

The primary objective of this course is to provide students with a basic understanding of fishery science. Knowledge and application of knowledge will be gained through classroom lectures, classroom activities, computer labs, and hands-on field experience with a broad array of research methods used in fishery science. Research methods will include not only field and laboratory techniques, but also data management and analyses, hypothesis formation and testing, and formulation of management practices for aquatic resources.

Fishery science encompasses a variety of scientific disciplines including physics, chemistry, and biology. By participating in this course, students will gain an understanding of:

- 1) the structure and function of aquatic habitats/systems,
- 2) limnological field sampling and laboratory processing techniques,
- 3) common fish field sampling and processing methods,
- 4) analysis and reporting of limnological and fishery data, and
- 5) many of the major issues facing Florida's aquatic resources.

Instructors:

This course is team-taught to provide students the opportunity to benefit from the diverse experience of professionals who are working with water quality, habitat, and fish populations in natural systems. Instructors, along with their support staff and graduate students, are located off main campus at the School of Forest Resources and Conservation, Program of Fisheries and Aquatic Sciences (7922 NW 71st Street, Gainesville, FL 32653).

Instructors: Dr. Daniel E. Canfield, Jr. - Professor, Limnology
Phone: 352-273-3620 Email: DECAN@ufl.edu

Dr. Chuck Cichra - Professor, Fish Ecology and Management
Phone: 352-273-3621 Email: CECICHRA@ufl.edu

Teaching Assistant: TBA

Office Hours:

Instructors are available for help before and after class, by phone and/or email, and by appointment. Students, encountering difficulties with course material or seeking additional information, are strongly encouraged to make an appointment. We want you to succeed in our course!

Course Website:

This course will be supported by a UF e-learning CANVAS website located at <https://elearning.ufl.edu/>. It will include the course syllabus, lecture presentations, recommended readings, handouts, course assignments, past and current lab data, presentation and paper guidelines, and other materials.

Schedule:

Lecture: 5th period (11:45 AM to 12:35 PM) on Tuesday and Thursday in 3194 McCarty A.
Laboratory: 6-9th period (12:50 PM to 4:55 PM) on Thursday at Lake Alice, in our classroom (3194 McCarty A), UF/AT computer lab (TBA), or at other designated locations.

Recommended Textbooks:

There are no required texts. A variety of handouts will be provided to you either as paper copies or electronically through our e-learning website. You may also find these useful:

American Fisheries Society. 2007. Analysis and Interpretation of Freshwater Fisheries Data. C.S. Guy and M.L. Brown (editors), American Fisheries Society, Bethesda, MD. 961 pp.

American Fisheries Society. 2009. Standard Methods for Sampling North American Freshwater Fishes. S.A. Bonar, W.A. Hubert, and D.W. Willis (editors), American Fisheries Society, Bethesda, MD. 335 pp.

American Fisheries Society. 2010. Inland Fisheries Management in North America. W.A. Hubert and M.C. Quist (editors), American Fisheries Society, Bethesda, MD. 736 pp.

American Fisheries Society. 2013. Fisheries Techniques. Zale, A.V., D.L. Parrish, and T.M. Sutton (editors), American Fisheries Society, Bethesda, MD. 1009 pp.

Boyd, C. E. 1979. Water Quality in Warmwater Fish Ponds. Auburn University, Alabama Agricultural Experiment Station, Auburn, AL. 359 pp. (online \$10 to \$50 – newer edition is available)

Hoyer, M.V., and D.E. Canfield, Jr. 1994. Handbook of Common Freshwater Fish in Florida Lakes. Special Publication 160. University of Florida, Florida Cooperative Extension Service, Gainesville, FL. 178 pp. (UF/IFAS Bookstore – on sale for \$1.00 – <http://ifasbooks.ifas.ufl.edu/p-162-handbook-of-common-freshwater-fish-in-florida-lakes.aspx>)

Grading:

First Exam	15%	Lake Alice Oral Presentation	5%	Topical Paper	5%
Second Exam	15%	Lake Alice Research Paper	20%	Topical Paper	
Final Exam	15%	Classroom / Lab Participation	5%	Oral Presentation	5%
Assignments	5%	Laboratory / Field Notebook	10%		

A: 94-100%	A-: 90-93.9%	B+: 87-89.9%	B: 84-86.9%	B-: 80-83.9%	C+: 77-79.9%
C: 74-76.9%	C-: 70-73.9%	D+: 67-69.9%	D: 64-66.9%	D-: 60-63.9%	E: < 60%

For UF's grading policy, see <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Exams and Assignments:

The first and second exams are in-class exams consisting of a variety of short answer questions that cover only the first and second portions of the course. The final take-home exam is a cumulative essay exam. All exams will cover lecture, laboratory, and assignment materials. Review sessions may be held before the exams if students request a review prior to the exam.

There are four assignments and a lab/field notebook to be completed over the course of the semester:

- 1) *Paper Reviews* – Two past Lake Alice papers will be handed out during the first two weeks of class and posted on our e-learning website. You will be asked to read them prior to your first data lab (PAP), at which time, you will discuss the papers. You will then provide a written review of each paper, along with completing a score sheet for each paper, using the same score sheet used to score your Lake Alice paper. These will be due one week after your respective PAP lab.

- 2) *Lake Alice Paper Topics* – You will develop and turn in two possible topics for your Lake Alice paper, including your question (testable hypothesis) and what variables/data that you plan to use for your paper. **Due Feb 27th**
- 3) *Lake Alice Paper Methods* – After deciding which topic you plan to address in your Lake Alice paper, you will submit the appropriate methods section for your paper. This should include both field and laboratory methods. **Due March 19th**
- 4) *Data Lab (DATA)* – During this lab, you will use a provided dataset to manipulate the data, perform statistical analyses, and create graphs and tables. **Due March 19th**
- 5) *Field notebook* – Each lab, you will make an entry into your notebook. Entries should include the following: date, time, weather conditions, gear information (specifications, biases, intended use, etc.), sampling methods/locations, and any other notes related to the lab. Also, include any handouts that you are given (for example during the data and water quality labs). Entries also should be made for the data, anatomy, aquatic plant, and invertebrate labs. **Due April 9th**

Lake Alice Research Paper and Presentation:

Each student will submit a written research paper that includes a testable hypothesis (question) and at least one water quality parameter and one fish parameter from Lake Alice. Students must use 2020 data. Additional annual data for Lake Alice are available, from 1992 to present, on our course website. Thereafter, a 10 to 12-minute oral presentation, using Power Point or similar presentation software, will be given to the course instructors. **Paper Due April 9th Talk dates to be scheduled.**

Attendance and Participation:

Attendance is not regularly taken in the classroom. Participation is a part of your grade for the course and evaluated based on involvement in the classroom (i.e., asking and answering questions, attentiveness, involvement in discussion, etc.). Laboratory attendance is mandatory as your lab mates depend on you to be there. Please provide prior notification and/ or documentation if a laboratory must be missed. Attendance will be taken at every lab. Students are expected to show up on time at the lab and do their share of the field work.

Lake Alice Laboratory:

A field study of the Lake Alice ecosystem will be conducted by teams of students to determine the current status of the lake's water quality and fish community. Students will receive training in select field and laboratory methods and given the opportunity to analyze and interpret real ecological data.

Working in teams, students will spend much of the semester in the field, conducting a variety of specific tasks. These tasks include:

- Water sampling and analysis
- Electrofishing and processing of fish (identifying, measuring, weighing, marking, and tagging)
- Recording and analyzing data

Other activities will include:

- Discussion of course content/your reasons for taking the course
- Freshwater aquatic invertebrate identification, biology and ecology
- Aquatic plant identification, biology, ecology, and management
- Fish anatomy, biology, and ecology

The laboratories on Lake Alice will include intensive field work. Each student should be prepared to attend and actively participate in each field exercise. Dress warmly for cold weather, bring rain gear and a set of dry clothes. The lab will only be cancelled if thunderstorms are eminent. In addition, you will be provided with a notebook for recording your personal field notes (i.e., the methods for the given field activity, weather conditions, etc.). Bring it to each lab. All data should be recorded in pencil.

Topical Review Paper:

Each student will be assigned a topic pertinent to the ecology and management of Lake Alice. Other topics can be used if approved by the instructors. The student will prepare a short (3 to 5-page) written synopsis of the literature relevant to that topic. The written review paper is due on **Thursday – March 12th**. It will be edited and returned to the student prior to their class presentation. The corrected paper will be e-mailed to Dr. Cichra, prior to your oral presentation to the class. Information in the review papers will be orally presented to the other students in the class as a short (5 to 10-minute) presentation on **Thursday – April 2nd**.

This course requires a “Materials and Supplies Fee”, typically ~\$30.

General Policies:

Make-up Exams, Late Assignments, Missed Classes

The general policy for this course is no make-up exams or assignments will be accepted after their deadline. However, there are special circumstances that will be taken into consideration. In some cases, no loss of credit will occur. Talk with the instructors! In other cases, partial credit will be lost (the amount dependent on the lateness of the assignment). Please make special arrangements by the ADD/DROP deadline if there are known conflicts. Make-up exams and late assignment submissions will be granted only in extraordinary circumstances and require official documentation, such as a doctor’s note. The same guidelines apply for a missed laboratory session. For more information on UF’s attendance policies, see <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Academic Honesty

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructors or TAs in this class.

Services for Students with Disabilities

The UF Counseling and Wellness Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Contact information for the Counseling and Wellness Center: <https://counseling.ufl.edu/>

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Software

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate. UF students have access to lots of free computer software, see <https://software.ufl.edu/> for details.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

FAS6932 (Fish and Limnology) Course Schedule (2020)

Order/topics of lectures, near end of course, may change depending on guest lecture schedules

Week	Lecture Topics	Laboratory – Thursdays (1:00 – 4:55pm)
1. Jan 7, 9	Introduction Scientific method	Syllabus, Schedule, Lake Alice Overview Lab Organization, Teams, Rotations, Photos, Lab Methods, Notebook, Paper Guidelines
2. Jan 14, 16	Morphometry Properties of water	Lake Alice (Rotations)
3. Jan 21, 23	Geology, water chemistry Water chemistry	Lake Alice (Rotations)
4. Jan 28, 30	Limiting environmental factors Nutrients, productivity	Lake Alice (Rotations)
5. Feb 4, 6	Eutrophication / management Sampling fish	Lake Alice (Rotations)
6. Feb 11, 13	Marking and tagging Estimating fish abundance	Lake Alice (Rotations)
7. Feb 18, 20	Petersen estimates / assumptions EXAM I	Lake Alice Electrofishing / Data Lab
8. Feb 25, 27	Fish condition factors Age and growth of fish (Dr. Deb Murie)	Lake Alice Electrofishing / Data Lab LAKE ALICE PAPER <u>TOPICS DUE</u>
9. Mar 3, 5	SPRING BREAK	<u>NO LECTURE OR LAB SESSIONS</u>
10. Mar 10, 12	Springs Springs	Lake Alice Electrofishing / Fish Anatomy TOPICAL REVIEW PAPER DUE
11. Mar 17, 19	Lakes Lakes	Lake Alice (Electrofishing / Inverts & Plants) DATA LAB ASSIGNMENT DUE LAKE ALICE PAPER <u>METHODS DUE</u>
12. Mar 24, 26	Rivers Fish diseases/parasites (Dr. Ruth Francis-Floyd)	Lake Alice (Electrofishing / Inverts & Plants)
13. Mar 31, Apr 2	Pond and lake management Fisheries Management	Classroom - Data Analysis / Paper Writing TOPICAL REVIEW PRESENTATION
14. Apr 7, 9	Pond and lake management EXAM II	LAKE ALICE PAPER <u>AND NOTEBOOK DUE</u>
15. Apr 14, 16	Estuaries (Dr. Amanda Croteau?) Estuaries (Dr. Amanda Croteau?)	LAKE ALICE ORAL PRESENTATIONS
16. Apr 21, 23	“Silver and Gold” FINAL TAKE-HOME EXAM GIVEN OUT	LAKE ALICE ORAL PRESENTATIONS
17. Apr 28	FINAL EXAM (turn in at 1 PM) in our classroom - 3194 McCarty A. Your exam <u>can</u> also be turned in <u>early</u> at Fisheries <u>or</u> with Amy Abernethy, in the SFRC Graduate Program Office [Room 120 Newins-Ziegler Hall], or e-mailed as a PDF file to Dr. Cichra. Let Dr. Cichra know where/how you turned in your final exam.	