

**Fish and Limnology**  
**FAS 6932 - 3 Credits - Spring 2015**

**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 and teaching assistants are located off main campus at the School of Forest Resources and Conservation, Program of Fisheries and Aquatic Sciences (7922 NW 71<sup>st</sup> Street, Gainesville, FL 32653).

Instructors: Dr. Daniel E. Canfield, Jr. - Professor, Limnology  
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Dr. Chuck Cichra - Professor, Fish Ecology and Management  
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**Office Hours:**

Instructors and teaching assistants are available for help before and after class, by phone and 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:**

Course materials are available via UF's e-learning CANVAS site accessed at <https://lss.at.ufl.edu/>

**Schedule:**

Lecture: 5<sup>th</sup> period (11:45 AM to 12:35 PM) on Tuesday and Thursday in 3194 McCarty A.

Laboratory: 6-9<sup>th</sup> period (12:50 PM to 4:55 PM) on Thursday at Lake Alice, in the classroom (3194 McCarty A), UF computer lab (G512 Norman Hall), or 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 find these useful:

American Fisheries Society. 2013. Fisheries Techniques. Zale, A.V., D.L. Parrish, and T.M. Sutton (editors), American Fisheries Society, Bethesda, MD. 1009pp. (see <http://fisheries.org/shop/55067c> )

American Fisheries Society. 1999. Inland Fisheries Management in North America. C.C. Kohler , and W.A. Hubert (editors), American Fisheries Society, Bethesda, MD. 718pp. (second edition currently on sale until 12 Jan 2015 for \$20 - <https://fisheries.org/shop/x55027xm> )

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. (UF/IFAS Bookstore - \$15)

### Grading:

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

|             |              |              |             |              |              |
|-------------|--------------|--------------|-------------|--------------|--------------|
| 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%     |

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

### 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 exam if the students nicely request a review prior to the exam.

There are five assignments to be completed over the course of the semester:

- 1) *Field notebook* – Each lab, students will need to make an entry in their field notebook. Entries should include the following: date, time, weather conditions, gear information (specifications, biases, intended use, etc.), sampling methods, 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). Each student should have a minimum of 12 entries (1 per lab). **Due April 9<sup>th</sup>**
- 2) *References* – Write up a references section following AFS guidelines and list the associated in-text citations, from a group of provided references. **Assigned during ‘introductory’ first lab; Due Jan 22<sup>th</sup>**

- 3) *Paper Reviews* – Two past Lake Alice papers will be handed out during the first day of class. You will be asked to read them prior to our first lab, at which time, they will be discussed. 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. **Due Feb 12<sup>th</sup>**
- 4) *Data Lab*– During the DATA lab, you will use a provided dataset to manipulate the data, perform statistical analyses, and create graphs and tables. **Due March 26<sup>th</sup>**
- 5) *Peterson Estimate: Methods & Results* – Using the provided guidelines and variable values, write up a methods and short results section for a Peterson estimate. Using your results and provided values for previous Peterson estimates, write a short discussion paragraph. **Due April 2<sup>nd</sup>**

#### **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. The student must use 2015 data; however, annual data for Lake Alice are available from 1992 to present. Thereafter, a 12-minute oral presentation, either by use of Power Point or poster, will be given to the course instructors and TAs.

#### **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.

#### **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 nine weeks in the field, spending each lab period doing a specific task. The tasks include:

- Water sampling and analysis
- Electrofishing
- Data analysis

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, and ecology
- Fish anatomy

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.). 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 12<sup>th</sup>**. It will be edited and returned to the student prior to their class presentation. The corrected hard copy will be provided to all other students in the class on **Thursday – April 2<sup>th</sup>**. Get together with the faculty or TAs to arrange to have the copies made. The final paper can be e-mailed to the instructors and TAs, so that copies can be made. 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 2<sup>th</sup>**.

### **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. 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 class.

#### 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 ( <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-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 instructor or TAs in this class.

#### 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.

#### 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: <http://www.counseling.ufl.edu/cwc/Default.aspx> , phone: 352/392-1575.

## FAS 6932 Course Schedule (2015)

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

| Week              | Lecture Topics  | Laboratory – Thursdays (1:00 – 4:55pm)   |
|-------------------|---|--|
| 1. Jan 6, 8       | Introduction<br>Scientific method   | Syllabus, Schedule, Lake Alice Overview<br>Lab Organization, Teams, Rotations<br>Lab Methods, Paper Guidelines, References |
| 2. Jan 13, 15     | Morphometry<br>Properties of water  | Lake Alice (Rotations)   |
| 3. Jan 20, 22     | Geology, water chemistry<br>Water chemistry   | Lake Alice (Rotations)<br><b>REFERENCES ASSIGNMENT DUE</b>   |
| 4. Jan 27, 29     | Limiting environmental factors<br>Nutrients, productivity   | Lake Alice (Rotations)   |
| 5. Feb 3, 5       | Eutrophication / management<br>Sampling fish  | Lake Alice (Rotations)   |
| 6. Feb 10, 12     | Marking and tagging<br>Estimating fish abundance  | Lake Alice (Electrofishing, Plants, Inverts)<br><b>PAPER REVIEW DUE</b>  |
| 7. Feb 17, 19     | What does a fish tell you?<br><b>EXAM I</b>   | Lake Alice (Electrofishing, Plants, Inverts)   |
| 8. Feb 24, 26     | Petersen estimates / assumptions<br>Fish condition factors  | Lake Alice (Electrofishing, Fish Anatomy)  |
| 9. Mar 3, 5       | <b>SPRING BREAK</b>   | No lectures or lab session   |
| 10. Mar 10, 12    | Springs<br>Springs  | Computer Lab and Classroom (Data)<br><b>TOPICAL REVIEW PAPER DUE</b>   |
| 11. Mar 17, 19    | Lakes<br>Lakes  | Lake Alice (Electrofishing)  |
| 12. Mar 24, 26    | Rivers<br>Estuaries   | Lake Alice (Electrofishing)<br><b>DATA LAB ASSIGNMENT DUE</b>  |
| 13. Mar 31, Apr 2 | Age and growth of fish<br>Fish diseases / parasites   | Classroom - Data Analysis / Paper Writing<br><b>PETERSEN ESTIMATE ASSIGNMENT DUE</b><br><b>TOPICAL REVIEW PRESENTATION</b> |
| 14. Apr 7, 9      | Artificial reefs<br><b>EXAM II</b>  | <b>LAKE ALICE PAPER <u>AND</u> NOTEBOOK DUE</b>  |
| 15. Apr 14, 16    | Pond management<br>Fisheries Management   | <b>LAKE ALICE ORAL PRESENTATIONS</b>   |
| 16. Apr 21, 23    | “Silver and Gold”<br><b>FINAL TAKE-HOME EXAM GIVEN OUT</b>  | <b>LAKE ALICE ORAL PRESENTATIONS</b>   |
| 17. April 28      | <b>FINAL EXAM</b> (turn in at 1 PM) in 3094 McCarty A. (Your exam <u>can</u> be turned in <u>early</u> at Fisheries <u>or</u> with Cynthia Hight, in the SFRC Graduate Program Office [Room 120 Newins-Ziegler Hall] – Let us know where you turn in your final exam) |  |