**Introduction to Fishery Science – Spring 2024**

FAS 4305C – 3 credits

v.5Dec23

1. **Course Overview:**

The primary objective of this course is to provide students with a basic understanding of fishery / limnological science. Knowledge will be gained through classroom lectures, classroom activities, and hands-on experience in field, lab, and computer settings. A broad array of research methods used in fishery science will be introduced. Research methods will include not only field and laboratory techniques, but also data management and analyses, technical reading and writing skills, and the 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 fish data; and
5. many of the major issues facing aquatic resources.

The instructors for this course are a part of Florida’s LAKEWATCH program. Thus, students will have access to LAKEWATCH’s data, gear, and expertise throughout this course. LAKEWATCH is a water quality monitoring program that facilitates "hands-on" participation by community volunteers in the management of Florida lakes, estuaries, rivers and springs through monthly sampling activities. LAKEWATCH is one of the largest community science programs in the country, with over 1800 trained volunteers, 800 monitored ecosystems, and 30 years of water quality data. More information can be found at: <https://lakewatch.ifas.ufl.edu/>.

1. **Course Learning Objectives:**

By the end of this course, students should be able to…

1. explain fundamental limnological / fisheries principles;
2. describe and perform a diversity of limnological / fisheries sampling techniques in the field, laboratory, and on a computer (i.e., data analysis);
3. apply basic functions in the R coding software, relevant for limnological / fisheries sciences, to environmental data;
4. critically read and assess the quality of peer-review papers from limnological / fisheries sciences;
5. summarize and connect topics from primary literature from limnological / fisheries sciences, for both specialists and non-specialist audiences.
6. **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, Fisheries, and Geomatics Sciences, Program of Fisheries and Aquatic Sciences (7922 NW 71st Street, Gainesville, FL 32653).

Instructors: Dr. Gretchen Lescord – Assistant Professor of Applied Limnology and Florida LAKEWATCH director, <https://lakewatch.ifas.ufl.edu/>

 Phone: (352) 846-6313 Email: lescord.g@ufl.edu

Co-Instructor: Mrs. Marina Schwartz - Data Manager, Florida LAKEWATCH

 Phone: 352-273-3640 E-mail: mevanskeene@ufl.edu

 Mr. Jason “mo” Bennett - Regional Coordinator, Florida LAKEWATCH

Phone: 352-273-3639 E-mail: jpb@ufl.edu

Teaching Assistant: Ms. Ashely Wechsler, SFFGS M.Sc. student, wechsler.a@ufl.edu

1. **Dr. Lescord’s Office Hours: Tuesdays 2-3pm, on zoom**

Instructors are available for help during office hours and by appointment. Because we are based at the Millhopper Unit off campus, these hours and meetings will be held on zoom (link to be given in class and on the course Canvas webpage). One-on-one Zoom sessions can be scheduled to go over course content, project-related work, or any other topic. 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!

1. **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.

1. **Class Schedule:**

Lecture: 5th period (11:45 AM to 12:35 PM) on Tuesdays - 0220 RNK (Rinker Hall)

5th period (11:45 AM to 12:35 PM) on Thursdays - 3108 MCBB (McCarty B)

Laboratory: 6-9th periods (12:50 PM to 4:55 PM) on Thursdays at Lake Alice, in 3108 McCarty B,

in the CALS computer lab (3086 McCarty B), the FFGS Millhopper Unit, or at other designated locations

1. **Course Logistics:**

Students may access lectures, assignments, readings, and supporting materials through the course Canvas site, as they become available. This course will be taught in a face-to-face format.

For the first half of the semester, class periods will be largely lecture-based. However, several in-class activities will be used to break up long lecture periods, including group work. These lectures and activities will be organized into 4 sections: introductory material, water, fish, and integrated fisheries science (IFS). Several guest lectures will be presenting throughout the latter session, to give a broader overview of the tools and topics covered under fisheries and aquatic science. Additionally, we will have 2 paper discussion classes, during which we critically read, review, and discuss important and recent peer-reviewed papers on fish & limnology. The midterm will cover all four topic areas, including content from guest lectures and paper discussions.

The second half of the semester will include additional IFS lecture (guest and instructor led), but the focus will be on student-led presentations. The goal is to encourage peer-teaching and learning to facilitate both the enhancement of your “soft” skills (i.e., presenting, writing, reviewing) while simultaneously learning about current limnological concerns in Florida and beyond. We will have 1-2 (pending the number of student presentations) additional paper discussion classes during the second half of the semester. The course final will take place on the last day of class (April 23rd) and will cover the entire semester, including all guest and student presentations, paper discussions, labs, and lectures.

Labs for this class will be highly interactive and hands on, spanning the field (i.e., Lake Alice), lab, and computing environments. Some labs will also focus on building the soft skills necessary to successfully complete a comprehensive and concise literature review.

1. **Grading**:

Midterm 20% Annotated Biblo 10%

Lab Assignments 10% Oral Presentation 15%

Class/Lab Participation 10% Graphical PLS 10%

Final Exam 5% Lit Review Report 20%

A: 94-100% A-: 90-93.99% B+: 87-89.99% B: 84-86.99% B-: 80-83.99% C+: 77-79.99%

C: 74-76.99% C-: 70-73.99% D+: 67-69.99% D: 64-66.99% D-: 60-63.99% E: < 60%

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

1. **Exams and Assignments:**

There are a total of 6 activities and assignments that make up your grade in this course. Instructions for each assignment will be communicated within the first 2 weeks of course (except for some lab assignments, which will be explained on the specific day, when the assignment is introduced).

Assignments include (detailed descriptions can be found below):

1. Annotated bibliography, due February 22, 2024 (after the writing lab), 10%
2. Literature Review, final draft due April 23, 2024, 20% (first draft due March 21, 2024 to facilitate lab activity)
3. Plain Language Summary (PLS) Graphic, final draft due April 23, 2024, 10%
4. Student presentation on literature review topic, in class between March 28 – April 18, 15%
5. Laboratory mini assignments, due at the end of respective lab session, 1% each; collective 10%

*Research proposal & annotated bibliography (30%):* Every year, the LAKEWATCH staff hold annual meetings with our community volunteers, and we are frequently asked questions about fisheries science and waterbody management. When we do not know the answer, we conduct a literature search and provide a summary of the relevant information that we find. We will provide a list of the recent (2022-2023) questions we have received, as well as additional questions rooted in water resource management and research. This semester, you will be tasked with picking one of these questions and answering it by conducting a thorough and rigorous literature search. You will write a 2500–3500-word (or ~4–6-page) review paper, using high-quality scientific studies. Topic selection must be approved by a course instructor by the end of the lab period on January 11, 2024.

This writing assignment will be enabled with a stepwise process, and some labs and assignments will focus on the skills and tools needed to complete the assignment effectively. More specifically, you will be required to hand in an annotated bibliography of 5 papers related to your chosen question, for 10% of your mark, due February 22, 2024. Additionally, there will be labs with outlining and peer-feedback activities, as well as ample opportunities for instructor feedback. Your first rough draft will be due in lab on March 21, 2024 and be your lab assignment for that day. Your final draft, due on the last day of class April 23, 2024, will be worth 20% of your final mark.

*Plain Language Summary (PLS) Graphic (10*%): In addition to your review paper, you will also create a 1-page graphical PLS that summaries your literature review findings. At least 1 summary figure (also known as abstract art or table of contents art) will be required. The target audience for this summary will be our LAKEWATCH volunteers (i.e., non-specialists, general public). An effective example of a graphical PLS will be shown in class. Your PLS will be due on the last day of class April 23, 2024, will be worth 10% of your final mark.

*Oral presentation (15%):* To enable peer-teaching and learning, you will present a 10- to 12-minute presentation summarizing your literature review findings to the class. This will include a 3- to 5-min question period and be worth 15% of your final grade. Presentations will be given during class time, towards the end of the semester. All students are required to attend these talks. Each student will be required to ask 3 meaningful questions as an audience member across all presentations; this will make up part of your class participation mark (see below).

*Laboratory mini assignments (10%)*: A total of 10 small laboratory assignments will be handed out and completed during the lab period throughout this course. These assignments are designed to be relatively quick and simple, if the lab activities are completed and understood. They will be due at the end of each lab period and will be worth a collective 10% of your final grade. Students are expected to show up on time at the lab and do their share of the work.

Please note that because the labs are highly interactive and partly in the field, lab attendance is mandatory. Furthermore, your lab mates depend on you to get the collective work completed in the field and during peer-review assignments. Thus, attendance will be taken at every lab *via* lab assignments. Please provide prior notification if a laboratory must be missed (via email, lescord.g@ufl.edu; make-up options will be discussed on a case-by-case basis and based on the validity of the reason for missing lab.

Exams and attendance grading includes (detailed descriptions can be found below):

1. Attendance and participation in class and labs, collective 10%
2. Midterm, in-class on March 14, 2024, 15%
3. Final, in-class on April 23,2024, 10%

*Attendance and Participation (10%)*: Attendance will be regularly taken in the classroom. Your participation mark will be made up of three things, totaling 10%: class attendance (2.5%), participation in paper discussions (2.5%), and feedback / questions asked during other student’s oral presentations (5%, see above). You are permitted to miss 2 classes without any explanation required and it will NOT impact on your mark. You will be required to review all class materials and make up any in-class activity within 7 days of the missed class (unless otherwise negotiated, under certain circumstances) to receive participation credit. Beyond these two classes, prior notification to missing any class above and beyond must be given, via email (lescord.g@ufl.edu), including the reason for your absence; make-up options will be discussed on a case-by-case basis and based on the validity of the reason for missing lab.

*Midterm (20%)*: A midterm exam, consisting of short or long answer, multiple choice, and T/F questions, will be given during class on March 14, 2024 and will be worth 15% of your final grade. No make-up exam is available, except for those who provide prior notification for a valid reason (and this notification is acknowledged and confirmed by Dr. Lescord) or due to an emergency, in accordance with university policies.

*Final Exam* *(5%)*: A final exam will be given on the last day of class, April 23, 2024 and will be worth 10% of your final grade. It will consist of long-answer questions based on the full course content. No make-up exam is available, except for those who provide prior notification for a valid reason (and this notification is acknowledged and confirmed by Dr. Lescord) or due to an emergency, in accordance with university policies.

1. **Lake Alice Laboratories:**

A field study of the Lake Alice ecosystem will be conducted by teams of students to research 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:

- 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 imminent. All data should be recorded in pencil.

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

1. **Technology Requirements:**
* A computer with high-speed internet connection.
* Latest version of web browser. Canvas supports only the two most recent versions of any given browser. <https://www.whatsmybrowser.org/>
* R studio and R core software
* Microsoft Office: Excel, Word, PowerPoint
1. **Recommended Textbooks and Other Readings:**

There is no required textbook for this course. LAKEWATCH circulars, which were developed to educate Floridians on water quality and related topics, will be used as primary teaching materials. The circulars will be uploaded to their respective modules under the “Readings and Resources” folder on canvas. Additionally, all LAKEWATCH circulars can be downloaded here: <https://lakewatch.ifas.ufl.edu/extension/information-circulars/>

Additionally, a variety of handouts and research papers 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.
* 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> )
* Grill, G.; Lehner, B.; Thieme, M.; Geenen, B.; Tickner, D.; Antonelli, F.; Babu, S.; Borrelli, P.; Cheng, L.; Crochetiere, H.; Ehalt Macedo, H.; Filgueiras, R.; Goichot, M.; Higgins, J.; Hogan, Z.; Lip, B.; McClain, M. E.; Meng, J.; Mulligan, M.; Nilsson, C.; Olden, J. D.; Opperman, J. J.; Petry, P.; Reidy Liermann, C.; Sáenz, L.; Salinas-Rodríguez, S.; Schelle, P.; Schmitt, R. J. P.; Snider, J.; Tan, F.; Tockner, K.; Valdujo, P. H.; Van Soesbergen, A.; Zarfl, C. 2019. Mapping the World’s Free-Flowing Rivers. *Nature*. *569* (7755), 215–221. <https://doi.org/10.1038/s41586-019-1111-9>.
* Vannote, R. L., Minshall, G. W., Cummins, K. W., Sedell, J. R., & Cushing, C. E. (1980). The River Continuum Concept. Canadian Journal of Fisheries and Aquatic Sciences, 37(1), 130–137. https://doi.org/10.1139/f80-017
* Heard, Stephen. 2016, 2022. The Scientist’s Guide to Writing, 2nd Edition: How to Write More Easily and Effectively throughout Your Scientific Career. Princeton University Press. ($15 on Amazon: <https://www.amazon.com/Scientists-Guide-Writing-Effectively-throughout/dp/0691170223>)

Lastly, peer-reviewed papers chosen for paper discussion classes will be uploaded to Canvas at least 1 week before the discussion is to be held.

1. **General Policies:**

This course plan and syllabus are subject to change in response to student and instructor needs. Any changes will be clearly communicated in advance through Canvas and in class.

**Communication**

Email (lescord.g@ufl.ed) or Canvas messages are the preferred method of communication in this course. Please be polite, professional, and clear in all email/Canvas messages.

**Late Submissions & Make-up Requests**

It is the responsibility of the student to access on-line lectures (PowerPoint slides), readings, and assignments, and to maintain satisfactory progress in the course. Requirements for class attendance and make-up assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Computer or other hardware failures, except failure of the UF e-Learning system, will not excuse students for missing assignments. Any late submissions due to technical issues MUST be accompanied by the ticket number received from the Helpdesk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request consideration. For computer, software compatibility, or access problems call the Help Desk phone number—352-392-HELP = 352- 392-4357 (option 2).

In general, late submissions will be docked -10% for every 24 hours the assignment is late. Late assignments will be accepted more than 3 days past of the due date. Exceptions to these two policies may be made if prior notification for a valid reason (and this notification is acknowledged and confirmed by Dr. Lescord) or due to an emergency, in accordance with university policies.

Communication Courtesy and Professionalism

Students are expected to follow UF’s student code of conduct at all times: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>. Just as in any professional environment, meaningful and constructive dialogue is expected in this class and requires a degree of mutual respect, willingness to listen, and tolerance of opposing points of view. All members of the class are expected to follow rules of common courtesy, decency, and civility in all interactions. Failure to do so will not be tolerated and may result in loss of participation points and/or referral to the Dean of Students’ Office.

**Academic Honesty Policy**

Students are expected to follow UF’s honor code of conduct at all times: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>.

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*”

You are further expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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."*

It is assumed that you will complete all work independently unless the instructor provides explicit permission for you to collaborate on course tasks (e.g., assignments, papers, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to the appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated.

Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

**On use of Artificial Intelligence (AI) technology**

One of the goals of this course is to provide opportunities to practice and hone your technical writing skills. I am committed to providing you meaningful feedback either through direct review or peer-review activities, to enable this improvement. To gain the most from these efforts, and to ensure everyone’s time and efforts are equally respected: you are not permitted to use artificial intelligence (AI) software, such as ChatGPT, Perplexity AI, or Grammarly to generate new writing or significant modify your or other’s writing as part of your assignments herein. While I recognize that these tools may be employed in your future endeavors, building a strong foundation of effective technical writing will remain a necessity for a successful scientific career. Therefore, the use of an AI assistant for writing will be considered a violation of the academic honesty policy in this class, resulting in a grade of 0 on any related assignments.

The exception to this is for reference management. I strongly encourage the use to technology, including AI tools, to track, store, and format your references for your annotated bibliography and literature report. Please ensure you include which tool was used when submitting your assignments.

**Semester Evaluation Process**

Student assessment of instruction is an important part of efforts to improve teaching and learning.

At approximately the mid-point of the semester, the School of Forest, Fisheries, and Geomatics Sciences may request anonymous feedback on student satisfaction on various aspects of this course. These surveys will be sent out through Canvas and are not required but encouraged. This is not the UF Faculty Evaluation! At the end of the semester, 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 e-mail 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/>.

**Inclusive Learning Environment**

This course embraces the University of Florida’s Non-Discrimination Policy, which reads:

*“The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans’ Readjustment Assistance Act.”*

If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see the instructor or refer to the Office of Multicultural & Diversity Affairs website: <http://multicultural.ufl.edu>.

Services for Students with Disabilities

The Disability Resource 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. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. 0001 Reid Hall, 352-392-8565, <http://www.disability.ufl.edu>

**Software Use**

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.

**Campus Helping Resources:**

For issues with technical difficulties for e-learning in Canvas, please post your question to the Technical Help Discussion in your course, or contact the UF Help Desk at:

* Learning-support@ufl.edu | (352) 392-HELP - select option 2 | <http://elearning.ufl.edu>
* Library Help Desk support <http://cms.uflib.ufl.edu/ask>
* SFFGS Academic Hub <https://ufl.instructure.com/courses/303721>

**9.11 Student Life, Wellness, and Counseling Help**

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university’s counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

* Counseling and Wellness resources <http://www.counseling.ufl.edu/cwc/>
* U Matter, We Care <http://www.umatter.ufl.edu/>
* Career Connections Center <http://career.ufl.edu/>
* Other resources are available at <http://www.distance.ufl.edu/getting-help> for online students.

**9.12 Student Complaint Process**

The School of Forest, Fisheries, and Geomatics Sciences cares about your experience and we will make every effort to address course concerns. We request that all online students complete a course satisfaction survey each semester, which is a time for you to voice your thoughts on how your course is being delivered.

If you have a more urgent concern, your first point of contact should be the SFFGS Academic Coordinator or the Graduate/Undergraduate Coordinator for the program offering the course. You may also submit a complaint directly to UF administration:

· https://distance.ufl.edu/getting-help/

· <https://registrar.ufl.edu/complaint.html>