

FISH AND WATER QUALITY
FAS 4932 Section 1881
FAS 6932 Section 01C7

TIME: Wednesday
Periods 11-E2; 6:15pm – 9:10 pm

CREDITS: 3

INSTRUCTOR: Dr. Daniel E. Canfield, Jr.
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OFFICE HOURS: By appointment

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Course Description:

The focus of this course is to examine the relationship between water quality parameters (both organic and inorganic) and how they relate to human and fish health. The development of federal and state policies that govern these water quality parameters will be discussed. Students will learn through lectures and classroom discussion. Students will leave with a basic understanding of water quality and how it pertains to fish and human health.

Objectives:

At the conclusion of this course the student will be able to:

- Define chemical parameters
- Research and identify state and federal guidelines for specific chemical parameters
- Assess how federal and state guidelines relate to human and fish health issues
- Prioritize the most critical chemical parameters affecting human and fish health
- Organize and lead a classroom discussion on a designated water quality issue

Quizzes, Final Exam, & Assignments:

There will be two in-class quizzes consisting of a variety of short answer questions that will cover both information (such as definitions, information relating to testing or management of parameters) and critical thinking (scenarios). The final take-home exam will be a cumulative essay exam.

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

1. **Portfolio:** Each student is required to keep a portfolio of water quality parameters. The portfolio should contain a summary sheet of each parameter covered in class (organized alphabetically), and a quick reference sheet (see reference sheet template). Each summary sheet should contain: chemical name, class, original intended use of chemical, human and fish health concerns, the state of Florida's drinking and recreational water standards for that parameter, how you would test for that parameter, treatment recommendations, and a list of relevant literature references. This assignment will be due on the last day of class (10%).
2. **Water Quality in the News:** Each week, the student must find a news article, *current or historic* that relates to one or more of the topics/variables to be covered that week. Students should be able to discuss their article and how it pertains to the information presented. (10%)
3. **Case Study:** Each student will be in charge of leading a class discussion on a water quality case study. Students will be allowed to choose from a list of case studies and dates. Discussion leaders will be in charge of researching data relevant to the case study in question, providing the class with an overview of the case study, assigning stakeholder roles to classmates, providing each stakeholder with talking points, and then facilitating discussion in a stakeholder meeting format. One week prior to the case study presentation, the student will need to meet with the TA to discuss their case study research and plan for class discussion. The student will be graded on their knowledge about the case study, the quality of the prepared materials, and their level of professionalism while guiding the classroom discussion (20%).

Classroom Participation:

This course is designed not only to increase your knowledge of water quality issue, but to also build your critical thinking skills. This will be tested during classroom participation primarily during the debates associated with the student lead case studies and during the instructor lead 'water quality clue' scenarios. During 'water quality clue' the instructors will present scenarios related to a fish kill or other water quality events. Students will work together to determine what is the likely cause, how exposure occurred, and determine treatment recommendations.

Grading:

Quizzes (2)	20%	Portfolio	10%
Final	25%	Water Quality in the News	5%
Case Study	20%	Classroom Participation	20%

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

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

<u>Week</u>	<u>Lecture Topics</u>
1 (Aug 21)	Course overview What is a fish? What is quality? Understanding numeric standards Definition of terms Scientific Method & Theory of Multiple Working Hypotheses
2 (Aug 28)	Where did we come from? A brief history of water quality. Are all water bodies created equal? Geology, Lake Morphology, Hydrology, Climate
3 (Sept 4)	Basic water chemistry parameters: Temperature, Specific Conductivity (salinity), pH, Alkalinity, Hardness, Oxygen
4 (Sept 11)	TP, TN, Chlorophyll & Trophic State
5 (Sept 18)	Phosphorus (phosphate, phosphoric acid, and orthophosphate) Nitrogen (The nitrogen cycle: nitrate, nitrite, and ammonia) Case Study: The Numeric Nutrient Debate (Amanda)
6 (Sept 25)	Quiz Heavy Metals Bioaccumulation, Bioconcentration, Biomagnification
7 (Oct 2)	Point Source v. Nonpoint Source Pollution Chromium, Cadmium, Lead & Hydrocarbons
8 (Oct 9)	Pesticides, Herbicides, & Piscicides: Introduction Arsenic, Glyphosate, Toxaphene, & Rotenone
9 (Oct 16)	Pesticides & Herbicides Chlorinated hydrocarbons (DDT, Chlordane, 2-4-D)
10 (Oct 23)	Quiz Introduction to industrial waste
11 (Oct 30)	Industrial Contaminants
12 (Nov 6)	Biological Contaminants HAB (Harmful Algal Blooms) Invasive species Waste & bacterial/fungal contamination

13 (Nov 13) Week	Pharmaceuticals <u>Lecture Topics</u>
14 (Nov 20)	Risk Assessment
15 (Nov 27)	Happy Thanksgiving! No class!
16 (Dec 4)	Science, Persuasion, and Propaganda Take-home final Portfolios due

Reference Text:

Canadian Water Quality Guidelines, Classroom handouts

Attendance:

Attendance is required. Classroom participation is 20% of your final grade, and is dependent upon your involvement in classroom discussion.

Communication:

Please be advised that any emails concerning notices about class readings, cancellations, etc. will be sent to your UFL email account.

Syllabus Changes:

The instructor reserves the right to adjust the syllabus to preserve the integrity of the course.

Academic Honesty:

As a result of completing the registration form at the University of Florida, every student has signed the following statements: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and to understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

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 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 (www.dso.ufl.edu/drc/).

