

FISH AND WATER QUALITY  
FAS 4932 & FAS 6932  
Fall 2021

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

CREDITS: 3

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

**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 fisheries 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 fisheries, aquaculture, and fish health.

**Objectives:**

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

- Define chemical parameters of importance to fish and other aquatic organisms
- Identify state and federal guidelines for specific chemical parameters
- Assess how federal and state guidelines relate to fisheries and fish health issues
- Prioritize the most critical chemical parameters affecting fisheries and fish health
- Organize and lead a classroom discussion on a designated water quality issue

**Classroom Participation:**

This course is designed not only to increase your knowledge of water quality issues, 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.

## Quizzes, Exams, & Assignments:

### Quizzes:

There is no textbook for this class. However, each week students will be assigned reading related to the following week's topic. Students are expected to be familiar with these readings prior to in-class discussion. A weekly reading quiz, consisting of 4-5 questions, will be available each week on Canvas. The reading quiz will close each week at the start of class.

### Exams:

There will be two in-class exams 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. Water Quality Parameter Reference Guide: Each student is required to compile a water quality parameter reference guide. Using the excel spreadsheet provided, students will fill in abiotic conditions, biotic conditions, sources, related parameters, diagnosis methods, water quality standards, and treatment methods for each parameter discussed during the course. Parameters shall be organized in order of importance (most to least) for the specific area of concern for the student (i.e., aquaculture, fisheries, health, etc.). The reference guide will be submitted 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. Articles will be submitted each week on the Canvas discussion board, and will be discussed in-class (5%). Absent students will be expected to post their article and comment on other articles posted.
3. Case Study: Students will form teams of two, and each team will be in charge of leading a class discussion on a water quality case study. Teams will be allowed to choose from a list of case studies and dates. Teams will be in charge of researching data relevant to the case study in question and presenting the class with an overview of the case study. As part of the overview, teams will identify stakeholder groups and discuss their viewpoints. Teams will then lead a class discussion of the issue including all stakeholder viewpoints, and pros and cons of potential outcomes/concerns. One week prior to the case study presentation, the team will need to meet with the TA to discuss their case study research, plans for class discussion, and assign a short paper, editorial, or other relevant background information for the class to read. Each team 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 (15%).

## Grading:

Weekly Quizzes	10%	Portfolio	10%
Exams (2)	20%	Water Quality in the News	5%
Final	20%	Classroom Participation	20%
Case Study	15%		

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 25)	Course overview What is a fish? What is quality? Definition of terms Understanding numeric standards Scientific Method & Theory of Multiple Working Hypotheses
2 (Sept 01)	Where did we come from? A brief history of water quality. Are all water bodies created equal? Geology, Lake Morphology, Hydrology, Climate
3 (Sept 08)	Basic water chemistry parameters: Temperature, Specific Conductivity (salinity), pH, Alkalinity, Hardness, Oxygen
4 (Sept 15)	TP, TN, Chlorophyll & Trophic State The Numeric Nutrient Debate
5 (Sept 22)	Phosphorus (phosphate, phosphoric acid, and orthophosphate) Nitrogen (The nitrogen cycle: nitrate, nitrite, and ammonia)
6 (Sept 29)	<b>Exam 1</b> Heavy Metals Bioaccumulation, Bioconcentration, Biomagnification
7 (Oct 06)	Point Source v. Nonpoint Source Pollution Chromium, Cadmium, Lead & Hydrocarbons
<u>Week</u>	<u>Lecture Topics</u>
8 (Oct 13)	Pesticides, Herbicides, & Piscicides: Introduction

	Arsenic, Glyphosphate, Toxaphene, & Rotenone
9 (Oct 20)	Pesticides & Herbicides Chlorinated hydrocarbons (DDT, Chlordane, 2-4-D)
10 (Oct 27)	<b>Exam 2</b> Introduction to industrial waste
11 (Nov 03)	Industrial Contaminants <b>Student Case Study</b>
12 (Nov 10)	Biological Contaminants, HAB (Harmful Algal Blooms) Invasive species, Waste & bacterial/fungal contamination <b>Student Case Study</b>
13 (Nov 17)	Pharmaceuticals, Microplastics <b>Student Case Study</b>
14 (Nov 24)	Happy Thanksgiving! No class!
15 (Dec 01)	Risk Assessment <b>Student Case Study</b>
16 (Dec 08)	Science, Persuasion, and Propaganda Take-home <b>FINAL</b> assigned <b>Water Quality Parameter Reference Guide DUE</b>

**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/](http://www.dso.ufl.edu/drc/)).

