

**CRSS 3050**  
**INTRODUCTION TO WATER QUALITY**  
**Spring 2009 -- Griffin Campus**

*The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.*

**Instructor:** Dr. Qingguo “Jack” Huang, Assistant Professor in Environmental Water Chemistry, University of Georgia

**Guest Lecturer:** Dr. Junhe Lu

**Course Introduction:**

This course covers both fundamental and practical aspects related to water quality. The knowledge and training provided in the course prepare the students for occupations involving water use, discharge, treatment, and management. The course also provides useful information for students to pursue higher degree studies in disciplines directly or indirectly involving water topics. The fundamentals to be present in the class serve as a foundation for high-level environmental/water/soil chemistry and microbiology classes. The course is comprised of a lecture and a laboratory component. Students are expected to have prerequisite introductory chemistry and algebra to take this course.

**Course Objectives:**

The course is intended to provide students comprehensive knowledge and training in the following aspects

- Important water quality parameters, and their environmental/health consequences
- Approaches to determine and describe important water quality parameters
- Environmental processes that influence water quality
- Skills to identify and describe factors that impact water quality

**Credits and Class Meetings:**

This is a 4 Credit Hour course. Lectures meet 9:05 to 10:00 am Mondays and Wednesdays in Room 301 in Flynt Building. The laboratory sessions meet on Tuesday morning at 9:05 am, unless otherwise informed, and will be completed no later than 12:00pm in Room 275 of Redding Building. Attendance in lecture is not mandatory, but highly advised.

Attendance at laboratory sessions is mandatory. Unexcused absence will result in a 0 grade for that session.

**Homework and Laboratory Reports**

A total of four homework sets will be handed out, and they are due back one week after the handing-out date. Laboratory reports will be due by the next lab period. Each student is expected to have two notebooks dedicated to the use for laboratory reports. The two notebooks alternate with one handed in for grading and the other one used for the next laboratory session. A complete laboratory report should contain three components: i) an outline of expected experiment objective and steps that is prepared before the laboratory, ii) the actual experimental execution and results that are recorded during the laboratory, and iii) any necessary and appropriate data analysis and discussion that is completed

after the laboratory.

**Course Materials:**

Text book — Water Quality: An Introduction, Claude E. Boyd, 2000, Kluwer Academic Publishers. Course and laboratory materials will be handed out as appropriate. These materials in combination with the lectures will cover the majority of the course content. Therefore, if you keep a good record of the handout materials and lecture notes, you won't need the textbook to follow through the course. The students are required to read laboratory handouts before performing experiments.

**Exams**

There will be a total of three exams including the final. The first two exams will cover materials taught to the date when the exam will be taken, and the final exam will be comprehensive covering the entire course content.

**How your grade will be computed:**

- Exam 1 15%
- Exam 2 15%
- Final exam 25%
- Four homework sets 20%
- Laboratory performance and reports 25%

**Determining your letter grade:**

- A 90% -100%
- B 75% - 90%
- C 60% - 75%
- D 40% - 60%
- F below 40%

**Food and Drink in the Classroom:**

University policy prohibits smoking, food or drink in all labs and classrooms.

**Academic Honesty:**

Students are reminded that they are bound by the University's Academic Honesty Policy. This policy is available online at [www.uga.edu/honesty](http://www.uga.edu/honesty). Each student is responsible to inform themselves about those standards before performing academic work.

**Help Outside the Classroom:**

Dr. Huang offers office hours every Tuesday and Wednesday 2:00-4:00 pm. Appointments for times other than the office hours can be made by phone (770-229-3302) or email ([qhuang@uga.edu](mailto:qhuang@uga.edu)).

# **Introduction to Water Quality CRSS 3050**

## **Tentative Course Outline**

### **Section 1: Introduction**

1. Course overview
2. Water and water quality
3. Physical, chemical, and biological characteristics of water
4. Water cycle and hydrology
5. Aquatic systems and processes
6. Units and unit conversion

### **Section 2: Water Quality Parameters (Physical and Inorganic)**

7. Solids, temperature, color
8. pH, carbon dioxide, and alkalinity
9. Equilibrium
10. Hardness
11. DO, BOD, and COD
12. Oxidation-reduction
13. Metals in water
14. Solubility
15. Nitrogen
16. Sulfur
17. Phosphorous

### **Section 3: Water Quality Parameters (Organic and Biological)**

18. Dissolved natural organic matter
19. Organic pollutants
20. Sorption
21. Volatilization
22. Photolysis and hydrolysis
23. Microorganisms in water and wastewater
24. Microbial degradation of contaminants

### **Section 4: Special Topics**

25. Water, wastewater treatment
26. Irrigation water quality
27. Water treatments for specific problems
28. Water quality modeling
29. Emerging contaminants

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**Tentative Plan for Laboratory Sessions**

1. Introduction to the laboratory (Redding building 275) and safety protocols
2. Wash and use of glassware
3. pH
4. Color
5. Total Dissolved Solids
6. Conductivity/Salinity
7. DO
8. BOD (1)
9. BOD (2)
10. Alkalinity