



ENV 4041C – Environmental Analysis

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Please contact through the CANVAS website

UG SUPPORT: TBD – See updates in CANVAS

OFFICE HOURS: Through zoom M,W Period 9 (4:05 – 4:55pm). In person tutorials by appointment.

LECTURE: Online, asynchronous. Lectures (power point slides, pre-recorded lectures, and supplemental reading) will be posted on CANVAS

LABORATORY: Laboratories will be in person in Black Hall 203

M, Period 3-4 (9:35 – 11:30am)

M, Period 6-7 (12:50 – 2:45pm)

W, Period 3-4 (9:35 – 11:30am)

W, Period 6-7 (12:50 – 2:45pm)

COURSE DESCRIPTION: This class provides the underlying theory of laboratory techniques for the analysis of contaminants in aqueous, gaseous, and solid phases, which are linked to basic concepts of ecosystems structure and function (4 credits).

COURSE PRE-REQUISITES: CHM 2046 or CHM 2096 and STA2023 or equivalent

COURSE LEARNING OBJECTIVES: After completion of this course, you will acquire knowledge necessary for:

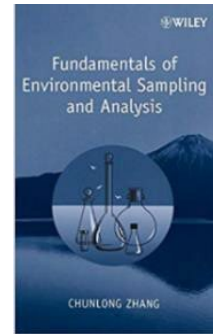
- accurate sampling, storage, handling, and analysis of different environmental samples,
- linking different analytical techniques to the identification and quantitation of different pollutants and pathogens of environmental concern,
- critical analysis and discussion of experimental data, and
- reporting of scientific information.

MATERIALS AND SUPPLY FEES:

A course fee of \$42.80 is required to cover lab materials.

REQUIRED TEXTBOOK AND SOFTWARE:

- Textbook
 - Title: “Fundamentals of Environmental Sampling and Analysis”
 - Author: Chunlong Zhang
 - Publisher: John Wiley & Sons, 2007
 - Print ISBN:9780471710974
 - Online ISBN:9780470120682
 - DOI:10.1002/0470120681
- Tools: CANVAS, Zoom, Labster, JoVe



PROFESSIONAL COMPONENT (ABET): Fundamental concepts and principles emphasized in this course will provide students with necessary skills needed to characterize environmental pollution qualitatively, and quantitatively in both natural and engineered systems. The hands-on component of this course (labs) is a tremendous asset for professional careers in environmental engineering as it exposes students to the analysis of experimental data, while helping develop scientific critical thinking and writing skills.

RELATION TO PROGRAM OUTCOMES (ABET):

| Outcome | Coverage* |
|--|-----------|
| 1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics. | High |
| 2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs. | |
| 3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. | High |
| 4. An ability to communicate effectively with a range of audiences | Medium |
| 5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. | Low |
| 6. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately. | Medium |
| 7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty | High |

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

COURSE FORMAT:

- **LECTURE:** The lecture portion of this course will be online and asynchronous. Students will be responsible for watching the pre-recorded lecture videos posted in CANVAS for each week and any other supplemental reading or video clips.
- **LAB:** You will complete lab assignments either individually or with your lab group throughout the semester. Two individual lab reports will be required (poster or manuscript format). The lab report grading rubric can be found under the “Start Here” CANVAS module. Some labs will include sampling and analytical protocol videos by JoVe and laboratory simulations by Labster. Each week you will be expected to complete a series of pre-lab assignments and/or quizzes. These exercises will be available to you in the form of a CANVAS quiz or embedded in the laboratory simulation activities.

TENTATIVE COURSE SCHEDULE: Refer to the course in CANVAS for deadlines and schedule updates.

Legend: D= discussion, Q=quiz, A=assignment, T=Test, LR=Lab Report

| Week | Date | Lecture Topics | Lab Activity | Assignments |
|--|------------|--|---|--|
| 1 | Jan 8, 10 | L1: Course Introduction/Syllabus | Lab 1: Lab Safety BLK 203 Lab Tour | D1. Student Intro |
| Module 1: Environmental Measurements by Dr. Deliz | | | | |
| 2 | Jan 15, 17 | Jan 15: Holiday L2: Intro to Environmental Sampling and Analysis | Online Safety Trainings | Read Chapter 1 Q1: Lab Safety |
| 3 | Jan 22, 24 | L3: Units, Calibration, Method Performance L4: Significance Tests | Statistical Analysis Exercise | Read Chapter 2 Q2: Chem Safety A1: Stats Lab |
| Module 2: Environmental Sampling by Dr. Deliz | | | | |
| 4 | Jan 29, 31 | L5: Sampling Plan & Env Sampling Techniques L6: QA/QC in Data Acquisition (Field/Analytical) L7: Water, Soil and Biological Sampling | Collection of soil samples (week 5 Lab) Set samples to air dry | Read Chapters 3-5 Quiz 3: Labster Experimental Design |
| Module 3: Wet Chemical and Electrochemical Methods by Dr. Deliz | | | | |
| 5 | Feb 5, 7 | L8: Basic operations and techniques in env. labs L9: Extraction of Organics and Metals | YSI calibration for water monitoring Collect water samples | Read Chapters 5-7,11 Quiz 4: pre-lab A2: Reporting Results |
| 6 | Feb 12, 14 | L10: Chemical and Electrochemical Methods: pH L11: Chemical and Electrochemical Methods: Alkalinity | Sieve soil samples, Acid Extractions | Read Chapter 8 Quiz 5: pre-lab |
| Module 4: Spectroscopic Methods by Dr. Deliz | | | | |
| 7 | Feb 19, 21 | L12: Intro. Spectroscopic Methods in Env. Analysis L13: Molecular and IR Spectroscopy | Filter samples, perform dilutions and prepare QCs | Read Chapter 8 T1: Modules 1-3 |

| | | | | |
|--|--------------|---|--|--|
| | | L14: Atomic Spectroscopy | | |
| 8 | Feb 26, 28 | L15: ICP-MS L16: NMR | Visit NIMET and ICP-OES in ABE | Quiz 6: pre-lab Read Chapters 9, 12 |
| Module 5: Chromatographic Methods by Dr. Morrison | | | | |
| 9 | Mar. 4, 6 | L22 and 23: Intro & principles of chromatography L24: Separation and Quantitation of Compounds | Separation of plant pigments – column chromatography | Read Chapter 10 Q7: pre-lab LR1: Group Poster Metals in soil |
| Week 10: UF Spring Break | | | | |
| 11 | Mar 18, 20 | L25: Types of Chromatography: HPLC L26: Types of Chromatography: GC | UV/Vis spectroscopy & Quantitation in Environmental Analysis: Part 1 | Read Chapter 10 A3: Labster HPLC module |
| 12 | Mar 25, 27 | L27-L29: Mass Spectrometry | UV/Vis spectroscopy & Quantitation in Environmental Analysis: Part 2 | Read Chapter 12 T2: Module 4 + 5 |
| Module 6: Application of Analytical Methods by Dr. Morrison | | | | |
| 13 | April 1, 3 | L30-L32: Methods for water analysis, with case studies | UV/Vis spectroscopy & Quantitation in Environmental Analysis: Part 3 | D2: discussion post |
| 14 | April 8, 10 | L33-35: Methods for air analysis, with case studies | Biological methods lab: Part 1 | LR2: Individual report UV/Vis Spectroscopy |
| 15 | April 15, 17 | L36-38: Methods for soil and solid analysis, with case studies | Biological methods lab: Part 2 | D3: discussion post Q8: biological methods assignment T4: Module 6 |
| 16 | April 22, 24 | L42: Methods for soil and solid analysis, with case studies | Presentations during lab session | A4: Slides for Oral Presentation |

CLASS EXPECTATIONS:

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v 1/2/2024

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Students are expected to exhibit behaviors that reflect highly upon themselves and our University:

- Read and refer to the syllabus
- Review laboratory notes prior to performing corresponding laboratory activities
- Arrive to laboratory sessions on time (i.e., a few minutes early)
- Show respect to the course instructor, UG support/graders and peers
- Submit assignments on time, or an acceptable excuse if you cannot comply
- Use professional, courteous standards for all emails and discussions:
 - Descriptive subject line
 - Address the reader using proper title and name spelling
 - Body of the email should be concise but have sufficient detail
 - Respectful salutation (e.g., cheers, thank you, sincerely, respectfully)
- No personal conversations and social media during instruction times
- **Adherence to the UF Student Honor Code:** <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>
 - 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.”
 - Honor code violations of any kind will not be tolerated and sanctions will be determined by the course instructor for first-time violators
 - All allegations, regardless of the severity, will be reported to the Dean of Students Office for University-level documentation and processing.
- **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.

MAKE-UP POLICY: *If you miss an assignment/quiz/lab report without prior approval or other exception as described below, you will earn a zero and will not be granted a make-up.* Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

To schedule a make-up, please fill out the [make-up request form](#) posted in the CANVAS “Start Here module” *in advance* and submit it to your course instructor via CANVAS email. Documentation will be required and should accompany your make-up request form. In case of last-minute illness or emergency, please contact the instructor via email explaining the situation. If you have a serious emergency or life event, please contact the Dean of Students Office (www.dso.ufl.edu) and they will contact all your instructors for you – which would serve as “documentation.”

GRADING: The following table outlines the point-accruing components of the course. The course final grade will be determined as follows:

| | Assignments | % Grade |
|------------|---|---------|
| Lecture | Module Assessments/Tests (T=2-4) | 35 |
| | Participation in CANVAS Discussions (D=2-4) | 5 |
| Laboratory | Lab Quizzes (Q=6-9) | 25 |
| | Lab Reports and Assignments (LR and A=4-6) | 35 |

GRADING SCALE AND POLICY: In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this

graduation requirement. For more information on grades and grading policies, please visit: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

All grades will be posted in the CANVAS gradebook, and the following grading scale will be used in this course.

POLICY ON GRADE CORRECTIONS: *Students have 1 week after receiving a grade to challenge errors or grading mistakes.* 1 week after students have been informed of their grade, the grade will become final and will not be changed. Do not wait for the end of the semester; we will not adjust your grade for assignments that are beyond this deadline. To challenge a grade: Students must attach a cover page to the front of the assignment, explaining what they want to be re-graded and submit to the corresponding instructor through CANVAS.

STUDENT PRIVACY: There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

STUDENTS REQUIRING ACCOMMODATIONS: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation and discussing their access needs. Students with disabilities should follow this procedure as early as possible in the semester.

COURSE EVALUATION: Students are expected to provide constructive and respectful feedback on the quality of instruction in this course by completing online evaluations via GatorEvals. Guidance on how to give professional and respectful feedback is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens, typically during the last two or three weeks of the semester. Summaries of the course evaluation results are available to students at <https://evaluations.ufl.edu/results/>.

COMMITMENT TO A SAFE AND INCLUSIVE LEARNING ENVIRONMENT: The Herbert Wertheim College of Engineering (HWCOE) values a diverse and inclusive community. It is integral to success in every area of our college. Therefore, the College is committed to non-discrimination with respect to all areas of human differences, including but not limited to national and ethnic origin, race, age, sex, sexual orientation, gender identity and expression, beliefs and opinions, religion and faiths, culture, socio-economic background, level of physical or mental ability, and veteran's status. This commitment applies in all areas—to students, faculty, and staff and intends to reflect the College's belief that educational and employment decisions and access to university activities should be based on an individual's abilities and qualifications.

The HWCOE values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. We aspire to educate students to become future leaders capable of creating diverse and inclusive work cultures wherever their careers may take them.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

| Grading scale used in this course | |
|-----------------------------------|-------------|
| Letter Grade | Range |
| A | 100 to 94% |
| A- | < 94 to 90% |
| B+ | < 90 to 87% |
| B | < 87 to 84% |
| B- | < 84 to 80% |
| C+ | < 80 to 77% |
| C | < 77 to 74% |
| C- | < 74 to 70% |
| D+ | < 70 to 67% |
| D | < 67 to 64% |
| D- | < 64 to 61% |
| E | < 61 to 0% |

CAMPUS RESOURCES: UF has available resources on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

HEALTH AND WELLNESS

- **U Matter, We Care:** Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.
- **Counseling and Wellness Center:** <http://www.counseling.ufl.edu/cwc>, and 392-1575.
- **Sexual Discrimination, Harassment, Assault, or Violence:** If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the [Office of Title IX Compliance](#), located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu
- **Sexual Assault Recovery Services (SARS):** Student Health Care Center, 392-1161.
- **University Police Department:** at 392-1111 or 9-1-1 for emergencies, or <http://www.police.ufl.edu/>.

ACADEMIC RESOURCES

- **E-learning technical support:** 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml>. Information on CANVAS tools is available via the Student Intro to ELS link at <http://lss.at.ufl.edu>.
- **Career Resource Center:** Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.
- **Library Support:** <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.
- **Teaching Center:** Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <https://teachingcenter.ufl.edu/>.
- **Writing Studio:** 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/>.
- **Student Complaints Campus:** https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.
- **On-Line Students Complaints:** <http://www.distance.ufl.edu/student-complaint-process>.