

UNLV Department of Civil and Environmental Engineering and Construction  
**CEE 250 – SUSTAINABILITY IN CIVIL AND ENVIRONMENTAL ENGINEERING**

**Course Information**

- Lecture Days: Monday / Wednesday
- Room: BEH 212 / Webex
- Lecture Time: 1:00 – 2:15 p.m.
- Credit Hours: 3

**Instructor:**

- Office:
- Email:
- Phone:
- Office Hours:

**Teaching Assistants:**

**Communication:**

Email communication is the preferred method to communicate with the instructor. Phone calls will only be answered during office hours and when the instructor is available. Students attending office hours have priority over phone calls. The instructor will check Discord during office hours; do not expect the instructor to check for messages outside of that time.

**Disclaimer:**

The contents of this document are to be considered “tentative” and subject to change as the instructor deems necessary. Students will be notified of any changes.

**Catalog Description:**

Sustainability concepts applied to transportation, structural materials, construction, and water and wastewater systems. Air pollution, waste minimization, sustainable water resources, and green construction. Alternative energy sources, and contemporary issues that impact sustainability as it relates to safety, durability, economics, environmental, societal and health impacts.

**Prerequisites:**

MATH 181, CHEM 121, CHEM 121L. All prerequisites must be completed with a C or better.

**Corequisite:**

None

**Required Textbook:**

“Engineering Applications in Sustainable Design and Development” by Striebig, Ogundipe and Papadakis, 2016. Published by Cengage. ISBN-13: 978-1-133-62977-1. Students do NOT need to purchase the MindTap feature. You can choose to get the print or electronic version of the textbook. Link to purchase book online: <https://www.cengage.com/c/engineering-applications-in-sustainable-design-and-development-1e-striebig>

**Supplemental Text:**

“Urban Engineering for Sustainability” by Sybil Derrible, 2019. Published by MIT Press. ISBN-13: 978-0-262-04344-1.

**Required Skills:**

Proficiency in word processing software. Writing ability to ENG 102 standard.

### **Grading:**

The following categories are weighted and comprise the final grade.

- Group problem solving worksheets and in-class discussion polls: 10%
- Quizzes: 10%
- Homework: 15%
- Exams (2 each at 15%): 30%
- Projects: 15%
- Final Exam: 20%

### **Grading Scale:**

A = 92-100%, A- = 90-91.9%, B+ = 88-89.9%, B = 82-87.9%, B- = 80-81.9%, C+ = 78-79.9%, C = 72-77.9%, C- = 70-71.9%, D+ = 68-69.9%, D = 62-67.9%, D- = 60-61.9%, F = 0-59.9%

### **Final Exam:**

TBA

### **Course Format:**

This course will be conducted in two modes via two separate sections for this semester. One section is in person, and the other section is through Webex (web live). Students may **NOT** switch back and forth between the two modes. All lectures will be synchronous at the scheduled time. Course activities include recorded lectures, live lectures and discussions, recorded practice problems, group problems solving sessions, group projects, homework, quizzes and exams. Live lectures, group problem solving sessions, and exams will take place during the scheduled course time (two lectures per week) while recorded videos can be watched at the student's schedule. It is expected that students attend the live class sessions, fully participate in discussions and group problem solving, and complete all required work. Students are responsible for reading the resources posted on Canvas, reading the textbook, and completing online quizzes in Canvas by the due dates. Students should have all necessary resources (calculator, worksheets) for problem solving sessions, and they must be present during the group problem solving session to earn credit for completing the practice problems.

### **Course Requirements:**

Students shall:

- Attend live lectures and participate in discussions
- View recorded videos
- Participate in group problem solving sessions
- Read assigned material and complete quizzes
- Complete assigned homework and presentations
- Complete the project and exams

### **Central Learning Objectives (What we will learn):**

After completing this course, you will be able to:

1. Define 'sustainability' and describe how sustainability concepts are applied to areas of civil engineering practice.
2. Recognize and explain sustainability rating systems using in civil engineering practice.
3. Define, apply and convert between basic environmental measures of concentration and other units.
4. Correctly solve problems of difficulty similar to those on FE exam.
5. Recognize ethical/professional responsibilities in engineering design and their impact in economic, environmental,

global and societal contexts.

6. Identify the main water pollutants, explain their impacts, calculate the concentrations and demonstrate how sustainable practices can reduce pollutant generation on watersheds.
7. Solve problems using basic mass balances and environmental chemical reactions based on chemical equilibria for air, water, and pH.
8. Identify major air pollutants, how they are formed and transported, processes for removing/reducing them, health effects of air pollutants, and economic and environmental effects of air pollutants.
9. Solve energy balance problems and apply them to relevant civil engineering materials problems, such as asphalt, concrete production and construction materials.
10. Estimate carbon footprints for residential, industrial and transportation processes, and explain how carbon footprint, greenhouse effect and climate change are connected.

In addition to course learning objectives, CEE 250 integrates general education components. These include Information Literacy, Critical Thinking and Analytical Writing learning outcomes. It is also a key class in the development of your problem-solving skills needed to be successful (1) in the department's ABET-accredited Civil Engineering major (2) in engineering practice and (3) for successful performance on the FE and PE exams.

### **Lectures:**

Lectures will include discussions and polls. When indicated in Canvas, students should view the recorded lecture ahead of time in order to be prepared for the discussion. Students are expected to participate in the discussions through verbal and written comments. Points are awarded for completion of polls during the live lecture.

### **Group Problem Solving:**

Live problem solving sessions occur on a regular basis. Students should view the recorded practice problem ahead of time and work with their group during the scheduled time to complete the worksheet. Each student must submit their own work via Canvas. No credit will be given for students who submit the worksheet but do not attend the group problem solving session. Only students with an excused absence will be allowed to make up the missed work.

### **Quizzes:**

Canvas quizzes will cover assigned readings and other course content. Quizzes should be completed within the time allotted and submitted by the deadline given, which will typically be 11:59 pm on Sundays. Quizzes are meant to be learning opportunities and multiple attempts will be allowed; however, the questions might be different.

### **Homework:**

Homework will be due at the start of the specified class period unless other notice is given. Timing will be strictly enforced, so avoid uploading your work just prior to the deadline. Assignments must be submitted before or when due even if the student will be absent from class on the due date. Handwritten assignments for problem solving / calculations should be prepared **neatly** on Engineering paper or using software with all work shown. Written assignments should be prepared using a computer-based word processing program or spreadsheet program (e.g. Word, Excel). All homework must be submitted via Canvas. It is the student's responsibility to ensure the file is uploaded properly by the deadline, legible, and with sufficient contrast to read easily.

### **Written assignments:**

Because your supervisors and clients in engineering practice will expect you to write clearly, concisely and accurately, there will be written assignments. You will need to write these to an English 102 quality standard. Spelling, grammar, organization, and reference citation will be graded, as shown in the assignment

rubrics. *Please use any of the campus Writing Centers for assistance with your drafts before the deadline date.*

### **Project:**

Students will work in small groups on two projects and a presentation. One project involves information literacy and the other project involves materials balance. Specific details will be described on separate handouts and posted on Canvas. It is expected that all members of the group will contribute to the project and presentation. Peer evaluations will be taken into account when determining each student's final score.

### **Exams:**

Unless otherwise instructed, exams will be closed book with the exception of tables or resources provided by the instructor. Students attending the in person section will have paper-based exams, while students in the online section will have exams through Canvas and may require Lockdown Browser. Exams will be the same length and have the same types of questions.

### **Late Work:**

Late work is automatically reduced by 50% and may be turned in up to 2 days (48 hours) after the deadline. After this time, no points will be awarded for late work. Exceptions to posted deadlines will only be made for excused absences or documented emergencies.

### **Dropped Assignments:**

The lowest scores for 1 quiz, 1 group problem solving assignment, and 1 homework assignment will be dropped when calculating the final grade at the end of the semester.

### **Re-grading Policy:**

If students feel that their exams or homework have been inaccurately graded, they may prepare a clear one-paragraph description of the perceived inaccuracy. This can be given to the instructor along with the full exam or homework. The instructor will then re-grade the entire exam or homework and return it to the student within a week.

### **ABET Student Learning Outcomes**

The following are Student Outcomes specified by the Engineering Accreditation Commission of ABET:

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- an ability to communicate effectively with a range of audiences
- 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
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

### **UNLV Undergraduate Learning Outcomes**

1. Intellectual Breadth and Life-Long Learning Outcome - Integrate differing perspectives of the natural sciences, social sciences, humanities and fine arts, and develop skills and desire for life-long learning. Competence in the Intellectual Breadth and Life-Long Learning outcome is defined by the following objectives:
  - a. Demonstrate in-depth knowledge and skills in at least one major area.
  - b. Identify the fundamental principles of the natural sciences, social sciences, humanities and fine arts.
  - c. Apply the research methods and theoretical models of the natural sciences, social sciences, humanities and fine arts to define, solve, and evaluate problems. Transfer knowledge and skills gained from general and specialized studies to new settings and complex problems.
  - d. Demonstrate life-long learning skills, including the ability to place problems in personally meaningful contexts, reflect on one's own understanding, demonstrate awareness of what needs to be learned, articulate a learning plan, and act independently on the plan using appropriate resources.
  - e. Be capable of achieving success in one's chosen field or discipline, including applying persistence, motivation, interpersonal, leadership, goal setting, and career skills.
2. Inquiry and Critical Thinking Outcome – Use qualitative and quantitative reasoning and appropriate research methods to guide the collection, analysis, and use of information. Competence in the Inquiry and critical Thinking outcome is defined by the following objectives:
  - a. Identify problems, articulate questions or hypotheses, and determine the need for information.
  - b. Access, collect, and evaluate the needed information from appropriate primary and secondary sources.
  - c. Use quantitative and qualitative reasoning, including the ability recognize assumptions, draw inferences, make deductions, and interpret information to analyze problems in context and draw conclusions.
  - d. Recognize complexity of problems, tolerate ambiguity when appropriate and identify different perspectives from which problems and questions can be viewed.
  - e. Evaluate and report on conclusions, including discussing the basis for and strength of findings, and identify areas where further inquiry is needed.
  - f. Use results of inquiry and analysis to make judgments and guide actions.
3. Communication Outcome – Communicate effectively in written, spoken, visual, and digital modes. Competence in the Communication outcome is defined by the following objectives:
  - a. Demonstrate general academic literacy, including how to respond to needs of audiences and to different kinds of rhetorical situations, analyze and evaluate reasons and evidence, and construct research-based arguments using Standard Written English.
  - b. Effectively use the common genres and conventions for writing within a particular discipline or profession.
  - c. Prepare and deliver effective oral presentations.
  - d. Collaborate effectively with others to share information, solve problems, or complete tasks.
  - e. Produce effective visuals using various media.
  - f. Apply the up-to- date technologies commonly used to research and communicate within one's field.
4. Global and Multicultural Outcome - Develop knowledge of global and multicultural societies and an awareness of one's place in and effect on them. Competence in the Global and Multicultural Outcome is defined by the following objectives:
  - a. Demonstrate knowledge of the history, philosophy, arts and literature of world cultures.
  - b. Respond to diverse perspectives linked to identity, including age, ability, religion, politics, race, class, gender, ethnicity, and sexuality, both in American and international contexts.
  - c. Apply the concept of social justice.
  - d. Demonstrate familiarity with a non-native language or experience living in a different culture.
  - e. Function effectively in diverse groups.
  - f. Demonstrate awareness of one's own place in and effect on the world.
5. Citizenship and Ethics Outcome - Participate knowledgeably and actively in the public life of our communities and make informed, responsible, and ethical decisions in one's personal and professional life. Competence in the Citizenship and Ethics Outcome is defined by the following objectives:
  - a. Acquire knowledge of political, economic, and social institutions.
  - b. Identify the various rights and obligations that citizens have in their communities.
  - c. Apply various forms of citizenship skills such as media analysis, letter writing, community service, and lobbying.
  - d. Explain the concept of sustainability as it impacts economic, environmental, and social concerns.
  - e. Examine various concepts and theories of ethics and how to deliberate and assess claims about ethical issues.
  - f. Apply ethical concepts and theories to specific ethical dilemmas students will experience in their personal and professional lives.

## **University Policies**

### **Public Health Directives**

Face coverings are currently mandatory for all faculty and students in the classroom. Students must follow all active UNLV public health directives while enrolled in this class. UNLV public health directives are found at [Health Requirements for Returning to Campus](https://www.unlv.edu/coronavirus/health-requirements), <https://www.unlv.edu/coronavirus/health-requirements>. Students who do not comply with these directives may be asked to leave the classroom. Refusal to follow the guidelines may result in further disciplinary action according to the [UNLV Student Conduct Code](https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf), [https://www.unlv.edu/sites/default/files/page\\_files/27/StudentConduct-Code.pdf](https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf), including being administratively withdrawn from the course.

### **Academic Misconduct**

Academic integrity is a legitimate concern for every member of the University community. We all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy, and are encouraged to always take the ethical path whenever faced with choices. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's educational mission. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another person, from the Internet or any other source without proper citation of the source(s). See the [Student Conduct Code](https://www.unlv.edu/studentconduct/student-conduct), <https://www.unlv.edu/studentconduct/student-conduct>.

### **Auditing a Course**

Auditing a course allows a student to continue attending the lectures and/or laboratories and discussion sessions associated with the course, but the student will not earn a grade for any component of the course. Students who audit a course receive the same educational experience as students taking the course for a grade, but will be excused from exams, assessments, and other evaluative measures that serve the primary purpose of assigning a grade.

### **Classroom Conduct**

Students have a responsibility to conduct themselves in class and in the libraries in ways that do not interfere with the rights of other students to learn, or of instructors to teach. Use of devices such as cellular phones and pagers, or other potentially disruptive activities are only permitted with the prior explicit consent of the instructor. Students are specifically prohibited to record classes without instructor authorization, including online/remote classes (either audio only, or video and audio). The instructor may rescind permission at any time during the class. If a student does not comply with established requirements or obstructs the functioning of the class, the instructor may initiate an administrative withdrawal of the student from the course.

Since the COVID-19 pandemic forced some instruction to be delivered remotely starting in Spring 2020, numerous students have asked instructors to record their synchronous classes, so that they can access them at their convenience. Instructors who agree to record their classes (audio only, or video and audio) should inform students in advance. Recorded lectures may not be broadly released to anyone, but made available exclusively to those students enrolled in the class during the particular academic term. Recorded lectures must be stored securely, and are subject to the Nevada System of Higher Education's Records Retention Policy, meaning that the recordings can only be deleted 120 days after the end of class (i.e., after grades are posted). Once this requirement is met, the recordings should be deleted. Class recordings are protected from

disclosure, as they are deemed part of an educational record under the Family Educational Rights and Privacy Act (FERPA).

### **Copyright**

The University requires all members of the University Community to familiarize themselves with, and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The University will neither protect nor defend you, nor assume any responsibility for student or employee violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional [copyright policy information](https://www.unlv.edu/provost/copyright) is available at <https://www.unlv.edu/provost/copyright>.

### **Disability Resource Center (DRC)**

The [UNLV Disability Resource Center](https://www.unlv.edu/drc) (Student Services Complex, SSC-A, Room 143, <https://www.unlv.edu/drc>, telephone 702-895-0866) provides resources for students with disabilities. Students who believe that they may need academic accommodations due to a permanent disability, temporary or permanent medical need, or academic support due to pregnancy are encouraged to contact the DRC as early as possible in the academic term. A Disabilities Specialist will discuss what options may be available to you. Students who are already registered with the DRC should request their accommodations online each semester, and make an appointment to discuss their accommodations with their instructors.

### **Final Examinations**

The University requires that final exams given at the end of a course occur on the date and at the time specified in the Final Exam schedule. The Final Exam schedule is typically available at the start of the semester, and the classroom locations are available approximately one month before the end of the semester. See the [Final Exam Schedule](https://www.unlv.edu/registrar/calendars), <https://www.unlv.edu/registrar/calendars>.

### **Identity Verification in Online Courses**

All UNLV students must use their Campus-issued ACE ID and password to log in to WebCampus-Canvas.

UNLV students enrolled in online or hybrid courses are expected to read and adhere to the [Student Academic Misconduct Policy](https://www.unlv.edu/studentconduct/misconduct/policy), <https://www.unlv.edu/studentconduct/misconduct/policy>, which states that “acting or attempting to act as a substitute for another, or using or attempting to use a substitute, in any academic evaluation or assignment” is a form of academic misconduct. Intentionally sharing ACE login credentials with another person may be considered an attempt to use a substitute, and could result in investigation and sanctions, as outlined in the Student Academic Misconduct Policy.

UNLV students enrolled in online courses are also expected to read and adhere to the [Acceptable Use of Computing and Information Technology Resources Policy](https://www.it.unlv.edu/policies/acceptable-use-computing-and-information-technology-resources-policy), <https://www.it.unlv.edu/policies/acceptable-use-computing-and-information-technology-resources-policy>, which prohibits sharing university accounts with other persons without authorization.

To the greatest extent possible, all graded assignments and assessments in UNLV online courses should be hosted in WebCampus-Canvas or another UNLV-managed platform that requires ACE login credentials for access.

### **Incomplete Grades**

The grade of “I” (Incomplete) may be granted when a student has satisfactorily completed three-fourths of course work for that semester/session, but cannot complete the last part of the course for reason(s) beyond the student’s control and acceptable to the instructor, and the instructor believes that the student can finish

the course without repeating it. For undergraduate courses, the incomplete work must be made up before the end of the following regular semester. Graduate students receiving “I” grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the period indicated, a grade of “F” will be recorded, and the student’s GPA will be adjusted accordingly. Students who are fulfilling an Incomplete grade do not register for the course, but make individual arrangements with the instructor who assigned the “I” grade.

### **Library Resources**

Librarians are available to consult with students on research needs, including developing research topics, finding information, and evaluating sources. To make an appointment with a subject expert for this class, please visit the [Libraries’ Research Consultation](https://guides.library.unlv.edu/appointments/librarian) website, <https://guides.library.unlv.edu/appointments/librarian>. You can also [ask the library staff](https://ask.library.unlv.edu/) questions via chat and text message at <https://ask.library.unlv.edu/>.

### **Missed Classwork**

Any student missing class, quizzes, examinations, or any other class or laboratory work because of observance of religious holidays will be given an opportunity during that semester to make up the missed work. The make-up opportunity will apply to the religious holiday absence only. It is the responsibility of the student to notify the instructor within the first 14 calendar days of the course for Fall and Spring courses (except for modular courses), or within the first 7 calendar days of the course for Summer and modular courses, of their intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit the Missed Classwork policy, under Registration Policies, on the [Academic Policies](#) webpage.

In accordance with the policy approved by the Faculty Senate regarding missed class time and assignments, students who represent UNLV in any official extracurricular activity will also have the opportunity to make up assignments, provided that the student submits official written notification to the instructor no less than one week prior to the missed class(es).

The spirit and intent of the policy for missed classwork is to offer fair and equitable assessment opportunities to all students, including those representing the University in extracurricular activities. Instructors should consider, for example, that in courses which offer a “Drop one” option for the lowest assignment, quiz, or exam, assigning the student a grade of zero for an excused absence for extracurricular activity is both contrary to the intent of the Faculty Senate’s policy, and an infringement on the student’s right to complete all work for the course.

This policy will not apply in the event that completing the assignment or administering the examination at an alternate time would impose an undue hardship on the instructor or the University that could be reasonably avoided. There should be a good faith effort by both the instructor and the student to agree to a reasonable resolution. When disagreements regarding this policy arise, decisions can be appealed to the Department Chair/School Director, College/School Dean, and/or the Faculty Senate Academic Standards Committee.

For purposes of definition, extracurricular activities may include, but are not limited to academic recruitment activities, competitive intercollegiate athletics, fine arts activities, liberal arts competitions, science and engineering competitions, and any other event or activity sanctioned by a College/School Dean, and/or by the Executive Vice President and Provost.

### **Rebelmail**



Rebelmail is UNLV's official email system for students and by University policy, instructors and staff should only send emails to students' Rebelmail accounts. Rebelmail is one of the primary ways in which students receive official University communications, information about deadlines, major Campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the University. Sending emails within WebCampus-Canvas is also acceptable.

### **Tutoring and Coaching**

The Academic Success Center (ASC), at the Claude I. Howard Building, provides tutoring, academic success coaching, and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, please visit the [ASC website](https://www.unlv.edu/asc), <https://www.unlv.edu/asc>, or call 702-895-3177. The ASC is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of SSC A, Room 254. Drop-in tutoring is located on the second floor of the Lied Library, and on the second floor of the College of Engineering building (TBE A 207).

### **UNLV Writing Center**

One-on-one or small group assistance with writing is available free of charge to UNLV students at the [Writing Center](https://writingcenter.unlv.edu/), <https://writingcenter.unlv.edu/>, located in the Central Desert Complex, Building 3, Room 301 (CDC 3-301). Walk-in consultations are sometimes available, but students with appointments receive priority assistance. Students may make appointments in person or by calling the Center, telephone 702-895-3908. Students are requested to bring to their appointments their Rebel ID Card, a copy of the instructions for their assignment, and two copies of any writing they have completed on their assignment.