

MME 4309 Corrosion (CRN 20532) and MME 5390 Corrosion (CRN 23096)

Syllabus

Spring 2024

Course Information

Meeting Day and Time: TR 9:00 am – 10:30 am

Location: CRBL 204

Instructor Information

Email: stellag@utep.edu

Office Hours: Monday and Wednesday 3-4 pm, M201A (or by appointment)

Course Description

Application of electrochemistry and engineering principles to the corrosion, passivity and protection of metals and alloys. This course includes an introduction to materials corrosion and focuses on the scientific theory associated with corrosion, the prevention and/or minimization of corrosion, and the different forms of corrosion in engineering applications. The first half of the course is an overview of the electrochemical background necessary to understand the corrosion process. This includes the potential measurement of electrochemical cells, construction of Pourbaix Diagrams, polarization diagrams, corrosion rates and factors affecting corrosion. The later part of the course is a review of the different types of corrosion and corrosion prevention.

Course Objectives/Outcomes

Students will be able to:

- Recognize and recall basic electrochemistry terms and processes related to oxidation and reduction reactions, thermodynamics, kinetics and passivity
- Understand aqueous corrosion related to passivation/depasivation, localized corrosion, galvanic corrosion and cathodic protection
- Discuss the different forms of corrosion
- Identify materials and the environments in which they are susceptible to corrosion
- Explain how corrosion can be controlled by design, environment modifications, inhibitors, coatings, anodic protection, and cathodic protection
- Calculate corrosion rates under different conditions

Handouts and Textbooks

Chapter handouts are provided to students and are uploaded to the Blackboard course site. Optional reading includes [Introduction to Corrosion Science by E. McCafferty, Springer, New York, 2010 \(ISBN 978-1-4419-0454-6\)](#)

Assignments and Deadlines

The course starts with the introduction of fundamental concepts. Reading of class material is assigned every Tuesday and should be completed by Thursday. Students should read and take notes to prepare for quizzes every Thursday. Homework is assigned on Thursdays and is due on Tuesdays. The dates for Exam I and II are February 22nd and April 18th, respectively. A makeup exam will be given on Dead Day,

May 3rd and can be used to replace Exam I or Exam II. A 6-page report is due on April 25th on an approved topic. Students will be provided with a template to follow and topics to choose from.

Grading: MME 4309

MME 4309 - Undergraduates
Homework – 10%
Quizzes – 10%
Exams – 50%
Paper – 20% (6 pages)
Presentation – 10%

Grading: MME 5390

MME 5390 - Graduates
Homework and Daily Updates – 10%
Quizzes – 10%
Exams – 50%
Paper – 20%
Presentation – 10%

Technology Requirements

You will need to have access to a computer/laptop during some lectures. You will need to use Excel and Microsoft Word to complete some assignments.

Course Communication

Communication is important for student success and should include:

- Office Hours: I will have office hours for your questions and comments about the course. My office hours are in-person or by Teams with an appointment.
- Blackboard Messaging: Please send messages through Blackboard. I will make every attempt to respond to your e-mail within 24 hours.
- Announcements: Check the Blackboard announcements frequently for any updates, deadlines, or other important messages.

Illness

Please stay home if you are feeling unwell and let me know as soon as possible so that we can work on appropriate accommodation.

Course Drop Policy

According to the [UTEP Catalog](#), "At the discretion of the instructor, a student can be dropped from a course because of excessive absences or lack of effort. A grade of "W" will be assigned before the course drop deadline and a grade of "F" after the course drop deadline." The drop deadline is March 28th.

Therefore, if I find that, due to non-performance in the course, you are at risk of failing, I will drop you from the course. I will provide a 24-hour advance notice via email. A grade of "W" will not be assigned after April 25th.

Incomplete Grade Policy

Incomplete grades may be requested only in exceptional circumstances after you have completed at least 75% of the course requirements. Talk to me immediately if you believe an incomplete is warranted. If granted, we will establish a contract of work to be completed with deadlines.

Accommodations Policy

The University is committed to providing reasonable accommodations to students with documented disabilities. Students who become pregnant may also request reasonable accommodation, in accordance with state and federal laws and regulations and University policy. Accommodations that constitute undue hardship are not reasonable. To make a request, please register with the UTEP Center for Accommodations and Support Services (CASS). Contact CASS at 915-747-5148, email them at cass@utep.edu, or apply for accommodation online via the CASS portal.

Scholastic Integrity, AI and Plagiarism

- **Scholastic Integrity:** Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as one's own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) for possible disciplinary action. To learn more, please visit HOOP: Student Conduct and Discipline.
- **AI:** Use of AI technologies or automated tools, such as ChatGPT or DALL-E is not permitted for any assignments in this course. Each student is expected to use critical and creative thinking skills to complete tasks and not rely on computer-generated ideas. Any direct use of AI-generated materials submitted as your own work will be treated as plagiarism and reported to the Office of Student Conduct and Conflict Resolution (OSCCR).
- **Plagiarism:** Some of your course work and assessments may be submitted to SafeAssign, a plagiarism detecting software. SafeAssign is used to review assignment submissions for originality and will help you learn how to properly attribute sources rather than paraphrase.