Materials Science and Engineering 7193.02
Impact of Corrosive Environments on Mechanical Performance
Proposed AU Semester 2017

Prerequisite: MSE 5951 or 6735, MSE 5763.7 or 6765

This is a 7 week course advanced level graduate course that is offered every 2 – 3 years.

Location/Time: Lecture occurs M and W from 1pm to 2:20pm in MQ 546

Textbook/ Reading Material: Due to the advanced content of this course, no singular text is holistically applicable. Therefore, highly suggested readings will be posted throughout the course to assist students with their learning. These readings will be in the form of sections from books and journal articles.

Instructor: Dr. Jenifer Locke, 546 MacQuigg Lab, 292-5868, locke.121@osu.edu

Office Hours/Assistance outside of lecture: Should you need assistance outside of lecture, you can come to office hours, send an email, or post a question on the Carmen discussion board. Please note that there is no expectation that your email will be replied to immediately. Please expect at least a 24 hour delay in any email response. Should office hours need to be cancelled, they will be rescheduled and a notice put on Carmen. Students will be given as advanced of warning as is possible.

• Prof Locke’s office hours are: M 3pm – 4pm in her office.

Course Goals: At the end of the semester, the successful student will:
   A) have improved technical writing and oral communication skills
   B) be knowledgeable on and able to discuss different experimental techniques to probe the effect of environment on mechanical performance
   C) be competent on and able to discuss, compare, and contrast the different types of environment assisted cracking
   D) be knowledgeable on the leading theories on the mechanisms driving environment assisted cracking
   E) have a working knowledge of the leading questions/uncertainties in the field of environment assisted cracking
   F) have improved ability to critically review corrosion and mechanical based literature
   G) have improved ability to develop questions/hypotheses based on the literature and a research plan to investigate a question/hypothesis

Topics: (A working knowledge of corrosion and fracture mechanics will be assumed based on the content in the above listed pre-requisites)

• Role of Corrosion in accelerating failure
• Stress Corrosion Cracking
• Corrosion Fatigue
• Internal Hydrogen Embrittlement
• Experimental techniques for quantifying the impact of environment on mechanical performance
• Proposed mechanisms for environment assisted cracking (includes: Film Rupture – Anodic Dissolution, Hydrogen Environment Assisted Cracking, Adsorption Induced Decohesion)

Assessment of Learning (i.e. Grading): In this course students will be assessed in several manners. If you find an issue with your grade on an assignment, please email or come to office hours. In the event of a grading mistake, the mistake will be corrected and points given back to the student. If no grading mistake is made, grades are non-negotiable, advice on how to properly work/complete the assignment and similar ones the future can be given, but grades will not be changed. The 4 modes of assessment are bulleted below.

• Short oral presentation on an assigned journal article in the field of environment assisted cracking – 50 pts
• Short oral presentation to teach fellow students on an assigned environment assisted fracture mechanism – 50 pts
• A 5 page max written literature review on a topic of your choice that is relevant to the course and not directly related to your graduate research topic – 100 pts
• 1 formal exam – 100 pts

Class Notes: The slides used for lecture will be available in part on Carmen. The actual slides used in class may slightly vary from those posted on Carmen. The instructor will not provide annotated notes or a new slide deck after class. It is expected that the successful student will take their own notes to supplement the slides provided via Carmen. The slides provided via Carmen are provided as an aide only. Please be aware that these lecture slides and notes are the intellectual property of the instructor. If used later, they must be properly referenced.

Recorded Lectures: Lectures may be recorded. If they are recorded, they will be made available on Carmen. The recorded lecture will typically be available 24 hours or less after the live lecture. In rare cases, this may not occur. If you have trouble viewing the posted recorded lectures, please contact streaming@osu.edu.

Disabilities Statement

Any student who feels s/he may need an accommodation based on the impact of a disability should contact the Office for Disability Services at 614-292-3307 in room 150 Pomerene Hall to coordinate reasonable accommodations for students with documented disabilities. (URL: http://www.ods.ohio-state.edu/)
Advice on such matters is also available from the MSE department’s undergraduate adviser and graduate coordinator whose offices may be found in room 143 Fontana Labs.

**Discrimination and Bias Statement**

In this class, no form of discrimination, explicit bias, or implicit bias will be tolerated. If you feel you are victim of discrimination or bias, please feel free to contact Prof Locke or report any incident of bias through BART (the Office of Student Life Bias Assessment and Response Team). BART’s website is shown here ([https://studentlife.osu.edu/bias/](https://studentlife.osu.edu/bias/)) and will take you to a page with a link for reporting any incident of bias.

**For distressed students**

A recent American College Health Survey found stress, sleep problems, anxiety, depression, interpersonal concerns, death of a significant other, and alcohol use among the top ten health impediments to academic performance. Students experiencing personal problems or situational crisis are encouraged to contact the OSU Counseling and Consultation Service (614-292-5766; [www.ccs.osu.edu](http://www.ccs.osu.edu)) for assistance, support, and advocacy. This service is free and confidential.

**Academic Integrity, Academic Misconduct**

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University’s Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University’s Code of Student Conduct and this syllabus may constitute “academic misconduct”.

The Ohio State University’s Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: “Any activity that tends to compromise the academic integrity of the University, or subvert the educational process.” Academic misconduct may be found in any action that tends to distort the accurate assessment of any student’s individual accomplishments that are evaluated for the purpose of grading or conferring academic credit. Note that a student may be guilty of academic misconduct, for example, by cheating, collaborating, plagiarizing, or by allowing another student to cheat, collaborate, or plagiarize. Note also that the distortion applies, for example, to exams, homework assignments, and laboratory work. To the extent that any class activity (for example: attendance or participation) is used for evaluation for the purpose of grading or conferring academic credit, falsifying or distorting such activity, or permitting another student to falsify or distort such activity, represents academic misconduct.

If the instructors or TA’s suspect that at student has committed academic misconduct in this course, we are obligated by University Rules to report our suspicions to the Committee on Academic Misconduct. If the COAM determines that you have violated the University’s Code of Student conduct, (ie. committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.
Additional guidance about what represents academic integrity and misconduct, and related university-wide policies and procedures are available at the following locations:

http://oaa.osu.edu/coam/faq.html

http://oaa.osu.edu/coam/ten-suggestions.html