

An asynchronous pre-recorded online short course

Corrosion: Fundamentals and Experimental Methods

Fontana Corrosion Center, The Ohio State University, Columbus, OH

October 17, 2022 – November 18, 2022

During each week of this five-week course, you should pace yourself to view the material from one day of the weeklong course, as broken out in the schedule below. On each of the days mentioned in this schedule, there will be five discussion periods to give you time to ask questions regarding the material from that day and have a discussion with an instructor. The times for the live sessions will be as follows, given in Eastern US time (see <https://www.timeanddate.com/worldclock/converter.html> to convert to your local time).

Discussion times during each of the five days listed below:

0700 - 0800

1100 - 1200

1500 - 1600

1900 - 2000

2300 - 2400

Topics to cover by Monday, October 17:

Prerecorded lecture 1 - Fundamentals of Corrosion

Lecture 1 - Corrosion Thermodynamics

Lecture 2 - Corrosion Kinetics 1

Lecture 3 - Corrosion Kinetics 2

Lecture 4 - Corrosion Kinetics 3

Lab 1 - Corrosion Potential Measurements and Polarization Methods for Determining Corrosion Rate

Lab 1 wrap-up

Topics to cover by Tuesday, October 25:

Prerecorded lecture 2 - Introduction to Electrochemical Instrumentation

Lecture 5 - Galvanic Corrosion

Lecture 6 - Experimental Issues

Lecture 7 - Passivity

Lab 2 - Galvanic Corrosion

Lab 2 wrap-up

Topics to cover by Wednesday, November 2:

Prerecorded lecture 3 - Pourbaix Diagrams

Lecture 8 - Localized Corrosion 1

Lecture 9 - Localized Corrosion 2

Lecture 10 - Localized Corrosion 3

Lab 3 - Localized Corrosion

Lab 3 wrap-up

Topics to cover by Thursday, November 10:

Prerecorded lecture 4 - Fundamentals of Electrochemical Impedance Spectroscopy

Lecture 11 - EIS and Coated Metals 1

Lecture 12 - EIS and Coated Metals 2

Lecture 13 - EIS and Coated Metals 3

Lab 4 - EIS

Lab 4 wrap-up

Topics to cover by Friday, November 18:

Prerecorded lecture 5 - Intergranular Corrosion

Lecture 14 - Atmospheric Corrosion

Lecture 15 - Corrosion Inhibitors

Lecture 16 - Thermodynamic and Kinetic Modeling of Corrosion

Lecture 17 - Environment Assisted Cracking 1

Lecture 18 - Environment Assisted Cracking 2