

# CORROSION SCIENCE AND ENGINEERING - CERTIFICATE

This program trains engineers in multiple corrosion science applications to address widespread industry demands.

The Certificate in Corrosion Science and Engineering was designed in response to industry demand and the national need in strategic sectors, such as infrastructure renewal, energy (extraction, conversion, and transportation), utilities (in particular water), transportation, production, and manufacturing.

The curriculum incorporates:

- cross-disciplinary components on materials science and engineering, thermodynamics, kinetics, and electrochemistry;
- interdisciplinary, integrative courses on the forms of corrosion, the electrochemical and degradation processes in extreme environments, and the control and mitigation strategies to prevent these processes in specific environments; and
- elective courses related to different engineering disciplines and applications as well as professional internships in industry and national laboratories.

The goals of the corrosion science and engineering certificate program are to train the next generation of scientists and engineers:

1. who will serve as a trained, advanced workforce for industry, academia, and government agencies with a basic understanding of environmental degradation assets required to optimize asset life cycle, production efficiency, and worker safety;
2. are familiar with the technological and computational tools and methods for corrosion and material degradation evaluation, inspection, detection, and prevention;
3. have interdisciplinary collaborative experience in materials preservation and degradation, with individuals from different science and engineering disciplines;
4. contribute to interdisciplinary efforts while developing a comprehensive understanding of the potentials and limitations of corrosion science and engineering; and
5. acquire skills necessary to thrive in their chosen career path.

## Program Requirements

Code	Title	Semester Credit Hours
MSEN 440	Materials Electrochemistry and Corrosion	3
MSEN 444	Corrosion and Electrochemistry Lab	3
MSEN 446	Corrosion Prevention and Control Methods	3
Select one of the following:		3
AERO 413	Aerospace Materials Science	
BMEN 344	Biological Interactions and Testing	
CHEN 322	Chemical Engineering Materials	
CVEN 306	Materials Engineering for Civil Engineers	
MMET 207	Metallic Materials	

MSEN 201	Fundamentals of Materials Science and Engineering	
MSEN 222/ MEEN 222	Materials Science	
NUEN 265	Materials Science for Nuclear Energy Applications	
Select one of the following:		3
AERO 411	Applications of Fracture Mechanics to Aerospace Structures	
CHEM 466	Polymer Chemistry	
CHEM 470	Industrial Chemistry	
CHEN 430/ SENG 430	Risk Engineering	
CHEN 457	Environmental Engineering	
MEEN 460	Corrosion Engineering	
NUEN 465	Nuclear Materials Engineering	
PETE 355	Drilling Engineering	
<b>Total Semester Credit Hours</b>		<b>15</b>