CORROSION SCIENCE AND ENGINEERING - CERTIFICATE

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 601	Fundamental Materials Science and Engineering	3
MSEN 643	Materials Electrochemistry and Corrosion	3
MSEN 644	Corrosion and Electrochemistry Lab	3
MSEN 646	Corrosion Prevention and Control Methods	3
Select one of the following:		3
BMEN 635	Biomaterials Compatibility	
CHEM 623	Surface Chemistry	
CHEN 655/ SENG 655	Process Safety Engineering	
MEEN 660	Corrosion Engineering	
MEMA 611	Fundamentals of Engineering Fracture Mechanics	
MSEN 602	Physics of Materials	
MSEN 603	Fundamentals of Soft and Biomaterials	
MSEN 616/ MEEN 616	Surface Science	
MSEN 620	Kinetic Processes in Materials Science	
MSEN 625	Mechanical Behavior of Materials	
MSEN 640	Thermodynamics in Materials Science	
NUEN 662	Nuclear Materials Under Extreme Conditions	
PETE 643	Oil Field Chemistry	
Total Semester Credit Hours		**15**