

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 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/ Materials Science
MEEN 222

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/ Risk Engineering

SENG 430

CHEN 457 Environmental Engineering

MEEN 460 Corrosion Engineering

NUEN 465 Nuclear Materials Engineering

PETE 355 Drilling Engineering

Total Semester Credit Hours 15