ChE 441 - Corrosion Engineering

Code and Name: ChE 441 - Corrosion Engineering
Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:
- Corrosion Engineering, Mars G. Fontana, 3rd Edition, McGraw-Hill, New York, 1986
Other References:
- Principles and Prevention of Corrosion, Denny A. Jone, 2nd Edition, Prentice Hall, 1996.
- Corrosion and Protection, Einar Bardal, Springer-Verlag London, 2004.

Course Description:
This course is designed to introduce basic and modern concepts of corrosion engineering, including mixed potential theory, types of corrosion, cell potentials, factors influencing the corrosion rate of metals, and prevention techniques. The corrosion properties of materials and their applications are also discussed.

Pre-requisites: ChE326 Mass Transfer, ChE325 Unit operation.
Co-requisites: None

Course Learning Outcomes:
With relation to ABET Student Outcomes (SOs: 1-7)

1. Realize the impact of corrosion on global economic and environmental issues (4)
2. Understand the basic and modern principles of corrosion; and what factors that can trigger the corrosion (1)
3. Comprehend types/forms of corrosion and methods used for corrosion prevention (1)
4. Demonstrate the knowledge of various materials and their properties (2)
5. Analyze the corrosion problems and find the appropriate solution (1)
6. Predict the corrosion rate of materials (1)
7. Show knowledge from the text book and independently solve the problems (4)
8. Prepare report and present it in a logical sequence (4)

Topics to be covered:

- Introduction to Corrosion Engineering
- Corrosion Principles
- Eight Forms of Corrosion
- Materials
- Corrosion Prevention
- Modern Theory - Principles
- Modern Theory - Applications

Grading Policy:
The grading for the course are 60% coursework and 40% Final Exam. The course work consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes, homework, and projects for the remaining 20% that is modified by the course instructor.