



Instructor Details

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Course Learning Outcomes

Listed below are the learning outcomes for this course that will be addressed

1. Demonstrate ability to use reference electrodes and open circuit potentials.
2. Demonstrate the ability to recognize different electrochemical cells design (2, 3 and 4 electrode system set up).
3. Demonstrate ability to conduct electrochemical and weight loss measurements of corrosion rate.
4. Demonstrate ability to generate potentiodynamic polarization curves to study anodic mechanisms and processes (i.e. passivity and localized corrosion).
5. Demonstrate ability to characterize and study electrochemical mechanisms and processes by using AC methods (Such as Electrochemical Impedance Spectroscopy)
6. Demonstrate ability to conduct electrochemical measurements in coatings, rotating disc electrodes and high-pressure vessels.

Textbook and/or Resource Material

Textbook(s): Electrochemical Techniques in Corrosion Science and Engineering, Robert Kelly, John Scully Editor, CRC Press, 2003

Alternative references:

1. J. Bard, L. R. Faulkner, Electrochemical Methods, Wiley & Sons, 2001
2. Corrosion and Corrosion Control, H. Uhlig and W. Revie, 3rd ed., 1985.
3. D. A. Jones, Principles and Prevention of Corrosion, Macmillan, 1996.
4. CORROSION, Metals Handbook, Vol. 13, 9th ed., ASM International, Metals Park, OH, 1987.
6. Atlas of Electrochemical Equilibria in Aqueous Solutions, M. Pourbaix, 2nd, NACE, 1974.
7. Lectures on Electrochemical Corrosion, M. Pourbaix, 1973.
7. Solartron Technical Notes, (<http://www.solartronanalytical.com/Literature/Technical-Notes.aspx>)
8. Gamry technical notes for electrochemical testing(www.gamry.com)