



MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering



Corrosion Engineering

COURSE SYLLABUS

Course Code	Course Name	Credits	Contact Hours
0404575	Corrosion Engineering	3	48

INSTRUCTOR/COORDINATOR

Name	Dr. Salah ALJBOUR
Email	saljbour@mutah.edu.jo
Website	

TEXTBOOK

TextBook:

- Principles of Corrosion Engineering & Corrosion Control, Ahmad, Zaki, IChemE, B.H. Elsevier, 2006, 1st edition.

References:

- Jones, D.A. Principles and Prevention of Corrosion, Macmillan, New York, 1995.
- Fontana, M.G. Corrosion Engineering, 3rd Edition, McGraw-Hill, 1986.
- Derrick, W.R. and Grossman, S.I., "Elementary Differential Equations with Applications", Wesley

SPECIFIC COURSE INFORMATION

A. Brief Description of the Content of the Course (Catalog Description)

Fundamental, principles and laws of electrochemistry. Thermodynamics and kinetics of electrochemical cells. Heat and Mass transfer in electrochemical reactors. Theory and applications of electrodeposition of metals. Theory of corrosion. Types and mechanisms of corrosion processes. Corrosion control by preventative methods, chemical additives, and electrical techniques.

B. Pre-requisites (P) or Co-requisites (C)

(P): 0404437 Mass Transfer

C. Course Type (Required or Elective)

Selected elective

SPECIFIC GOALS

A. Specific Outcomes of Instruction

Students who successfully complete the course will be able to:

1. To demonstrate the societal significance of corrosion and its relation other branches of science. (SLO-1, SLO-4)
2. To introduce students to the basic concepts of corrosion science including thermodynamics and kinetics. (SLO-1)
3. To familiarize students with technical methodologies in testing and interpreting corrosion processes, e.g. visual observation, corrosion rates. (SLO-1)
4. To explore various types of metal corrosion with respect to materials and environments. (SLO-1)
5. To acquaint students with techniques for corrosion control including cathodic protection, chemical inhibition, surface coating, equipment design and material selection. (SLO-1)

B. Student Learning Outcomes (SLOs) Addressed by the Course

1	2	3	4	5	6	7				
✓			✓							

BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
• Concept and Overview and introduction to corrosion	1	3 hr/week
• Basic concepts: electrode potentials, corrosion cells and thermodynamics	2-4	3 hr/week
• Kinetics: corrosion currents and rates, Tafel equation, Evans diagrams, polarization and passivity	5-7	3 hr/week
• Corrosion forms (types) applied to different practical materials and environments	8-9	3 hr/week
Mid Term Exam	1	
• Corrosion Control: Cathodic and anodic protection, inhibition and coating	10	3 hr/week
• Corrosion prevention by equipment design and materials selection	11-12	3 hr/week
• Case Studies	13-15	3 hr/week
Final Exam	16	

METHODS OF ASSESSMENT

No.	Method of assessment	Week and Date	%
1	Midterm Examination	9th week	30
2	Homeworks and Activities	All over the Semester	20
3	Final examination	End of Semester	50
Total			100

