

عنوان و نوع دوره:
اصول خوردگی الکتروشیمیایی

ارائه دهنده:
انجمن خوردگی ایران

مدرس:
خانم دکتر مریم احتشام زاده

تاریخ:
۱۱، ۱۲ و ۱۳ دی ماه ۱۴۰۲

۱- محتوای دوره:

- 1) Definition of relative nature of potential and introducing the laboratory and industrial references electrodes;
- 2) Electrochemical corrosion process and variables;
- 3) Basics of electrochemical cells and differences between corrosion cells and electrolysis cells;
- 4) Thermodynamics of corrosion phenomenon;
- 5) Pourbaix diagrams;
- 6) Polarization, Mixed potential theory and other basics kinetics of corrosion phenomenon;
- 7) Corrosion of active-passive type metals and alloys;
- 8) Electrochemical techniques for corrosion rate measurements;
- 9) Basics of Electrochemical Impedance Spectroscopy (EIS).
- 10) Basics of Electrochemical Noise Analysis (ENA).

۲- فهرست دروس دوره:

- 1) Lesson #1, Basics of electrochemical corrosion; processes and variables.
- 2) Lesson # 2, References Electrodes & their rules in the Industries.
- 3) Lesson # 3, Thermodynamics of Electrochemistry (Section 1); the Gibbs Function and Half Cell Potentials.
- 4) Lesson # 4, Thermodynamics of Electrochemistry (Section 2); the Nernst Equation and Corrosion Tendency of Some Industrial Metals and Practical Examples.
- 5) Lesson # 5, Oxygen Reduction in Aqueous solutions; One the most important cathodic reactions in the aerated media in Industries.

- 6) Lesson # 6, Thermodynamics of Electrochemistry (Section 3); the Effect of Soluble Complexing Agents on the Corrosion Behavior of Metals.
- 7) Lesson # 7, Thermodynamics of Electrochemistry (Section 4), Electrochemical cell calculations in relationship to Corrosion; Examples 1 – 7.
- 8) Lesson # 8, Thermodynamics of Electrochemistry (Section 5); Pourbaix Diagram Interpretation and Relationship to Corrosion.
- 9) Lesson # 9, Electrode Kinetics & Kinetics of Corrosion (Section 1); Polarization.
- 10) Lesson # 10, Electrode Kinetics & Kinetics of Corrosion (Section 2); Mixed Electrodes, Mixed Potential.
- 11) Lesson # 11, Active – Passive Metals and Alloys (Section 1); Basics and Polarization curves.
- 12) Lesson # 12, Active – Passive Metals and Alloys (Section 2); Practical Systems, Stainless Steels.
- 13) Lesson # 13, Electrochemical Corrosion-Rate Measurements (Section 1), Potentiostatic Circuit and IR correction.
- 14) Lesson # 14, Electrochemical Corrosion-Rate Measurements (Section 2); Tafel Analysis & Polarization Resistance.
- 15) Lesson # 15, Electrochemical Corrosion-Rate Measurements (Section 3); Electrochemical Impedance Spectroscopy (E. I. S.), Basics & Applications in Studying Corrosion Behavior of Metals and Alloys (Section 1); Overview of Electrical Circuits, Data Presentation Formats in EIS, Data Analysis in EIS.
- 16) Lesson # 16, Electrochemical Corrosion-Rate Measurements (Section 4); Two electrodes method and Basics of Electrochemical Noise Measurement (ENM).

۳- شرکت کنندگان:

کارشناسان واحدهای بازرسی صنایع، کارشناسان مراکز تحقیق و توسعه صنایع و سایر علاقه مندان به مباحث اصولی خوردگی الکتروشیمیایی.

۴- جدول پیشنهادی زمان بندی ارائه دوره:

روز اول	
ساعت	سرفصل
08:30 — 10:00	Lesson # 1, Lesson # 2
10:00 — 10:30	استراحت کوتاه
10:30 — 12	Lesson # 3
12:00 — 13:00	چاشت
13:00 — 14:30	Lesson # 4 , Lesson #5
14:30 — 14:45	Short break
14:45 — 16:00	Lesson # 6

روز دوم	
ساعت	سرفصل
08:30 — 10:00	Lesson # 7
10:00 — 10:30	استراحت کوتاه
10:30 — 12	Lesson # 8
12:00 — 13:00	چاشت
13:00 — 14:30	Lesson # 9
14:30 — 14:45	Short break
14:45 — 16:00	Lesson # 10
روز سوم	
ساعت	سرفصل
08:30 — 10:00	Lesson #11
10:00 — 10:30	استراحت کوتاه
10:30 — 12:00	Lesson # 12
12:00 — 13:00	چاشت
13:00 — 14:30	Lesson #13
14:30 — 14:45	استراحت کوتاه
14:45 — 16:00	Lesson # 14
روز چهارم	
ساعت	سرفصل
08:30 — 10:00	Lesson # 15
10:00 — 10:30	استراحت کوتاه
10:30 — 12:00	Lesson # 15
12:00 — 13:00	چاشت
13:00 — 14:30	Lesson #15
14:30 — 14:45	استراحت کوتاه
14:45 — 16:00	Lesson # 16

۵. منابع اصلی:

تمامی کتب و مقالات انتشارات معتبر داخلی و خارجی با موضوع خوردگی الکتروشیمیایی

۶. منابع فارسی:

۱ - اصول خوردگی الکتروشیمیایی (نوشته ی استنزیری و همکاران)، ترجمه مریم احتشام زاده، انتشارات دانشگاه باهنر کرمان، چاپ سوم ۱۳۹۷، دسترسی الکترونیکی در سایت mybooket.com یا از طریق لینک:

B2n.ir/y37044

۲- مریم احتشام زاده، مقدمه ای بر کاربرد طیف نگاری امپدانس الکتروشیمیایی در مطالعه خوردگی، انتشارات دانشگاه باهنر کرمان، چاپ دوم ۱۴۰۰، دسترسی الکترونیکی در سایت mybooket.com یا از طریق لینک: B2n.ir/u97564

۳ - ترمودینامیک و سینتیک در علم مواد (مرجعی کامل و جدید نوشته ی بوریس بوکشتاین و همکاران)، ترجمه امین صالحی و مریم احتشام زاده، انتشارات دانشگاه باهنر کرمان، چاپ اول ۱۳۹۹، دسترسی الکترونیکی در سایت mybooket.com یا از طریق لینک: B2n.ir/u29537

۴- روش های الکتروشیمیایی DC، نوشته ی جو پایر، ترجمه مهدخت فهام و مریم احتشام زاده، انتشارات دانشگاه باهنر کرمان، چاپ اول ۱۳۸۹.

۷. رزومه مدرس:

MARYAM EHTESHAMZADEH

JOB POSITION

UNIVERSITY OF KERMAN (SHAHID BAHONAR), IRAN
MATERIALS SCIENCE AND ENGINEERING DEPARTMENT
FULL PROFESSOR OF MATERIALS ENGINEERING
Academic Board since 1999

<https://scholar.google.com/citations?user=F6Xr8-0AAAAJ&hl=fa>.

OBJECTIVE

Teaching and E-Learning and Research in Corrosion Engineering

SKILLS & ABILITIES

Electrochemical Corrosion Studying, Surface and Coatings Technologies, Electrochemical Techniques for Corrosion Rate Measurement, Metals Characterization, Corrosion Inhibitors, Cathodic Protection

EXPERIENCE

ASSOCIATE OF IRANIAN CORROSION ASSOCIATION (ICA)

The Scientific Association of Corrosion in Iran

From 2005 till now, Iranian Corrosion Association (ICA), Iran

SCIENTIFIC AND EXECUTIVE SECRETARY OF THE 11TH NATIONAL CORROSION CONGRESS

12- 14 May 2009 – Kerman, Kerman University and Iranian Corrosion Association (ICA), Iran

VICE CHANCELLOR OF RESEARCH AND TECHNOLOGY

June 2014 – June 2017

Kerman University, Iran

VICE CHANCELLOR OF EDUCATION

January 2019 – November 2022

Kerman University, Iran

EDUCATION

TARBIAT MODARES UNIVERSITY

PhD in Materials Engineering, 2001-2004, Tehran, Iran

SHARIF UNIVERSITY OF TECHNOLOGY

Master in Materials Engineering, 1995-1997, Tehran, Iran

KERMAN UNIVERSITY (SHAHID BAHONAR)

Degree in Materials Engineering and Extraction Metallurgy, 1992-1996, Kerman, Iran

RESEARCH INTERESTS AND ACTIVITIES

- 1- Characterization of Metals
- 2- Electrochemical Techniques in Corrosion Studies
- 3- Electrodeposition of Metals
- 4- Corrosion Prevention of Metals: Inhibitors, Coatings, Cathodic Protection

PROJECTS

- 1- Feasibility study of copper powder extraction from Electro refining and Electro wining cells, National Copper Complex, 2005.
- 2- Characterization of electrochemical copper powder, Iran National science Foundation, 2006.

- 3- Feasibility study of ceramic coating on steel by plasma electrolytic oxidation, International Center of Science and Technology and Environmental Sciences, Kerman, Iran, 2007.
- 4- Cathodic Protection of Reinforced Concrete, Kerman University, 2011.
- 5- Correction and Optimization of Earth System of Hormozgan Electrical Towers Using Cathodic protection, 2014.
- 6- Application of Nanotechnology for Increasing Durability of Electrical Towers under Cathodic Protection, 2020.

PUBLICATIONS

- 1- US Patent: Sayed Morteza Madani, Maryam Ehteshamzadeh, Hasan Hashemipour, "Surface pretreatment coating film and process for metallic substrates", US patent [2010/0304158](#), 2010.
- 2- Iran Patent: Davood Salehi Doolabi, Maryam Ehteshamzadeh, Mehdi Asadi Zarch, "Implementation of silica coating on aluminum by plasma electrolysis", Identification Number 46440, 2007.
- 3- Iran Patent: Maryam Ehteshamzadeh, Fatemeh Shahsavari, "Using copper Nano layer for synthesizing of crystalline diamond by PECVD method"; Identification Number 94185, 2017.
- 4- Presentation of 64 papers, all in team working, in the national and international conferences, 1997-2023.
- 5- Publishing of 55 articles in Iranian and international specialty journals, all in team working, 2005-2023, <https://scholar.google.com/citations?user=F6Xr8-0AAAAJ&hl=fa>.
- 6- Maryam Ehteshamzadeh, "An introduction to application of EIS in corrosion studies", Publications of Kerman University 2006.

OTHER ACTIVITIES

- 1- Member of Scientific Distinctive Board in Kerman University, 2018-2022.
- 2- Scientific Collaboration in Establishing a Knowledge Base Corporation for Corrosion Prevention, 2014.
- 3- Establishing a Charity Institute Called "Foundation of Charitable of Kerman University", 2018.

HONORS

DISTINGUISHED PROFESSOR IN THE COUNTRY, IRAN, 2020

Ministry of Science, Research and Technology (MSRT) in Iran

According to the regulations of MSTR, annually a number of faculty members of the Iranian universities are introduced according to their scientific works as distinguished professors in the country, Iran.

DISTINGUISHED PROFESOR IN KERMAN UNIVERSITY, IRAN, 2021

According to the regulations of Kerman University, annually a number of faculty members of the university are introduced according to their scientific works.

FORMALLY APPRECIATED FACULTY MEMBER IN VIRTUAL TEACHING DURING THE COVID-19 PANDEMIC, KERMAN UNIVERSITY, IRAN, 2020

According to the regulations of Kerman University, during the Covid-19 pandemic a number of faculty members of the university were introduced according to their attempts for e-learning and virtual teaching for the students, 2020.