

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**



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| **DEPARTMENT** | **ELECTROCHEMISTRY AND ELECTROCHEMICAL TECHNOLOGIES (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | ELECTROCHEMICAL METHODS |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7.5 | COMPULSORY  (   ) | | ELECTIVE  ( X ) | TURKISH |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
| X | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 50 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 50 |
| **PREREQUISITE(S)** | | | | | None | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Electrochemical and electroanalytical methods; electrolysis and galvanic cells, electrode voltages and cell thermodynamics, potentiometric, voltammetric, amperometric and coulometric methods | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of the course; to understand the electrochemical and electroanalytical measurement techniques which are very common in industrial applications and to have professional competence related to the basic information on this subject, to monitor current issues and to gain research skills. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Electrochemical measurement techniques which are very common in industrial applications and basic knowledge on this subject will be able to analyze the data to the students and to evaluate it by associating it with the subject. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1) By learning electrolysis and galvanic cells, they can find the reactions and cell thermodynamics in these cells.  2) Explains the electroanalytical methods and applications.  3) Interpret electrochemical data. | | | | | | | |
| **TEXTBOOK** | | | | | 1)Instrumental Methods\_in\_Electrochemistry, R.Greef, R.Peat, L.M.Peter, D.Pletcher, J.Robinson,Ellis Horword Ltd., England, 1993. 2)Electrochemical\_Methods (Second Edıtıon), A.J.Bard&L.R.Faulkner, John Wıley & Sons, Inc., 2001. | | | | | | | |
| **OTHER REFERENCES** | | | | | Enstrümantal Analiz Yöntemleri, Atilla Yıldız, Ömer Genç, Sema Bektaş, Hacettepe Üni. Yayını, 1997 | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Electrolysis cells |
| 2 | Galvanic cells |
| 3 | Electrode voltages |
| 4 | Cell thermodynamics |
| 5 | Introduction to electroanalytical methods |
| 6 | Midterm Examination 1 |
| 7 | Potentiometry |
| 8 | Voltammetry |
| 9 | Amperometry |
| 10 | Coulometry |
| 11 | Midterm Examination 2 |
| 12 | Industrial applications of electroanalytical methods |
| 13 | Interpretation of electrochemical data and problem solving |
| 14 | Interpretation of electrochemical data and problem solving |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE ELECTROCHEMISTRY AND ELECTROCHEMICAL TECHNOLGIES MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Learning to use knowledges which have been gained by undergraduate education in the postgraduate areas. |  |  |  |
| **LO 2** | To have a research qualificaiton with professional responsibility. |  |  |  |
| **LO 3** | Self-developing by following and being aware of the importance of innovation and Electrochemistry in the development of science and technology. |  |  |  |
| **LO 4** | By using individual working abilities, to be capable of sharing studies and opinions in various communication media such as seminars, symposiums, congress or workshops. |  |  |  |
| **LO 5** | To be capable of preparing scientific publications by using their acquired knowledge and experience in undergraduate and graduate study. |  |  |  |
| **LO 6** | To follow closely the developments of Electrochemistry in both national and international levels. |  |  |  |
| **LO 7** | To design and apply theoretical, experimental and modelling studies and to examine and solving complex problems encountered in these processes. |  |  |  |
| **LO 8** | To be capable of making disciplinary and inter-disciplinary studies. |  |  |  |
| **LO 9** | Ability to make literature survey, presentation, designing and performing experiments and interpretation of relevant results. |  |  |  |
| **LO 10** | Using the ability to take initiative by acting independently |  |  |  |
| **LO 11** | To have a scientific and personal ethics and defend this approach in any medium |  |  |  |

**Prepared by:**       **Date:**      

**Signature**: