



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Avanced Electroanalytical Chemistry							
Course Code		KİM512		Couse Level		Second Cycle (Master's Degree)			
ECTS Credit	6	Workload	149 ( <i>Hours</i> )	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		Modern electroanalytical techniques are classified as they are related to static and dynamic processes. The use and meaning of fundamental equations of electrochemistry are dealt with in relation to particulars of each technique.							
Course Content		The difference in measurement systems of potentiometry and voltammetry are accented and electrodes used in each technique are presented.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Individual Study, Problem Solving					
Name of Lecturer(s)									

### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	35
Assignment	3	45

### Recommended or Required Reading

1	Fundamentals of Electroanalytical Chemistry. P. Monk. John Wiley& Sons, 2002
2	Analytical Electrochemistry. 2nd Ed. J. Wang. Wiley-VCH, 2000
3	Electroanalysis. C.M.A. Brett, A.M.O. Brett. Oxford University Press, 1998.

Week	Weekly Detailed Course Contents	
1	Theoretical	Nomenclature and terminology
2	Theoretical	Equilibrium and dynamic measurements
3	Theoretical	Potentiometry
4	Theoretical	Dynamic electrochemistry and chronoamperometry
5	Theoretical	Coulometry and Faraday Laws. Quiz-1
6	Theoretical	Polarography at mercury electrodes
7	Theoretical	Linear sweep and cyclic voltammetry at solid electrodes
8	Theoretical	Pulse methods
9	Theoretical	Stripping voltammetry
10	Theoretical	Student presentations. Discussion
11	Theoretical	Convective systems. Rotating disk electrode
12	Theoretical	Flow ceels and wall-jet electrodes. Quiz-2
13	Theoretical	Rate constants of electron transfer
14	Theoretical	Electrode preparation and microelectrodes
15	Theoretical	Student presentations. Discussion
16	Final Exam	Final exam

### Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	3	42
Assignment	5	0	5	25
Midterm Examination	1	48	2	50



Final Examination	1	30	2	32
Total Workload (Hours)				149
[Total Workload (Hours) / 25*] = ECTS				6
*25 hour workload is accepted as 1 ECTS				

### Learning Outcomes

1	to be able to comprehend the distinction between equilibrium and dynamic conditions electrochemical measurements.
2	to be able to recognize the general principles of potentiometry.
3	to be able to find out the principles of chronoamperometry and understand the importance in the measurement of physicochemical magnitudes.
4	to be able to comprehend the role of cyclic voltammetry in understanding reaction mechanism at electrodes.
5	to be able to recognize the significance of puls voltammetric technics in analytical determinations.
6	to be able to find out the principles of classical polarography and stripping voltammetry and discuss the significance of these technics in trace metal analysis.

### Programme Outcomes (Chemistry Master)

1	To be able to gain proficiency in depths and analysis by statistical methods in the same or a related area depending on the undergraduate competence,.
2	To be able to use the knowledge of his/her field and the skills to solve problems and/or applications in interdisciplinary research.
3	To be able to adopt to evaluate the information and skill his/her field by critical approach.
4	To be able to evaluate the effect of important persons, case and fact on his/her field applications.
5	To be able to gain the ability to discuss write and orally present to a group of literate listener.
6	To be able to communicate orally and written in a foreign language at least at European language B2 level.
7	To be able to use computer programs related to his/her field and have skills for informatics communication.
8	To be able to be careful in protecting social, scientific and cultural ethics in collection data, application and presentation.
9	To be able to develop strategic, political and application plans in his/her field and may evaluate the outcomes in quality periods.

### Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5	L6
P1	4	4	4	4	4	4
P2	3	3	3	3	3	3
P3	3	3	3	3	3	
P4				3	3	3

