CYCLIC VOLTAMMETRY

1	Course Title:	CYCLIC VOLTAMMETRY
2	Course Code:	KIM5016
3	Type of Course:	Optional
4	Level of Course:	Second Cycle
5	Year of Study:	1
6	Semester:	2
7	ECTS Credits Allocated:	6.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. MEHMET HALUK TÜRKDEMİR
15	Course Lecturers:	Yok
16	Contact information of the Course Coordinator:	Tlf: 2941741 e-mail: hturkdemir@uludag.edu.tr
17	Website:	
18	Objective of the Course:	This course is planned for to learn of knowledge about cyclic voltammetry basic knowledge and electrochemical characterization of various substances, and especially planned for graduate students from outside of the Electrochemistry.
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	
	1	To have the basic cyclic voltammetry and knowledge and its intended use.
	2	To know needed items of cyclic voltammetry and knowledge of experimental studies
	3	He can made redox characterization.of new chemicals in aqueous or non-aqueous media
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21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Cyclic voltammetry definition and usage, basic information of potentiostat	
2	Three-electrode cell voltammetry, the components, the electrode-solution interface, double layer structure, junction potential.	

3	The working electrodes (WE), variation and selection, selection criteria, GCE and Pt electrode	
4	Mercury working electrodes, working surface area	
5	Voltammetric reference electrode, types and characteristics	
6	Auxiliary electrode and the required properties, IR drop, IR Compensation	
7	Supporting electrolyte, specifications, oxygen removal,	
8	Establishment of potential screening programs, scanning speed, potential limits, number of cycles	
9	Peak potential, peak current and measurements, Randles-Sevcik equation	
10	General reminders, description of unifying concepts and Midterm	
11	Reversibility, semi-reversibility, irreversibility in cyclic voltammetry curves.	
12	Electron transfer mechanisms, gradual electron transfer steps and be monitored on voltammograms	
13	Examination of EC, CE, ECE and mechanisms, effects on voltammograms.	
14	Cyclic voltammetry in an anhydrous	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	2.00	28.00
Homeworks	1	20.00	20.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	40.00	40.00
Others	0	0.00	0.00
Final Exams	1	50.00	50.00
Total Work Load			180.00
Total work load/ 30 hr			6.00
ECTS Credit of the Course			6.00

22	Textbooks, References and/or Other Materials:	1. Techniques and Mechanisms in Electrochemistry, P.A. Christensenand A. Hamnett, Kluwer Acad. Pub 1994 2. Fundamentals of Electrochemistry, V. S. Bagotsky, WILEY 2006 3. Electrochemistry, Principles, Methods, and Applications, C.M.A. Brett, A.M.O. Brett, Oxford 1993 4. Analytical Electrochemistry, J. Wang, WILEY 2001

TERM LEARNING ACTIVITIES	NUMBE	WEIGHT
Midterm Exam	1	30.00
Quiz	0	0.00
Home work-project	1	10.00
Final Exam	1	60.00
Total	3	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		

24	**ECTS / WORK LOAD TABLE**

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	4	0	4	4	3	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	3	4	3	0	0	0	0	0	0	0	0	0	0	0
ÖK3	4	0	3	4	3	0	0	0	0	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	**1 very low**		**2 low**			**3 Medium**				**4 High**			**5 Very High**			