

POTENTIOMETRY IN ANALYTICAL CHEMISTRY

1	Course Title:	POTENTIOMETRY IN ANALYTICAL CHEMISTRY
2	Course Code:	KIM5011
3	Type of Course:	Optional
4	Level of Course:	Second Cycle
5	Year of Study:	1
6	Semester:	1
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:	-
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. MEHMET HALUK TÜRKDEMİR
15	Course Lecturers:	-
16	Contact information of the Course Coordinator:	e-mail: hturkdemir@uludag.edu.tr Tlf : 0224 29 41 741
17	Website:	
18	Objective of the Course:	As well as in a laboratory environment, operating principles of various potentiometric sensors using for follow up process and monitoring and to provide basic information about their use.
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	
	1	Understand the formation and structure of the electrode potential.
	2	Know what need to measure the electrode potential.
	3	Know the relationship among activity, activity coefficient, concentration and potential.
	4	Comprehend the intended use, potentiometric sensor structures such as ISE, pH and enzymatic sensor.
	5	Interpret results of potentiometric analysis.
	6	Comprehend importance of pH and ORP measurement in areas such as chemistry, environment engineering and chemical engineering. Knows in detail.
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21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Knowledge of basic electrochemistry, formation of the electrode potential , the Fermi energy	

2	Activity / concentration relationship, Nernst equation and the meaning of it, standard and formal potentials			
3	Measurement of the electrode potential, reference electrodes, structures, potential values			
4	Measurement of the electrode potential, potentiometer, compensation methods			
5	Quantities affecting the electrode potential, emf, the importance of the occurrence of the $i = 0$ during measuring, polarization			
6	Potentiometric measurement types, preparation of calibration graph, principles of titration and standard addition			
7	Potentiometric measurement electrodes, pH electrodes, types, pH electrode selection criteria, pH measurement			
8	Ion Selective Electrodes, types, classification, internal structure and measurement principles.			
9	Gas measurement electrodes			
10	General reminders, description of unifying concepts and Midterm			
11	Potentiometric biosensors, in vivo applications			
12	Potentiometric titration applications			
Activites		Number	Duration (hour)	Total Work Load (hour)
Theoretical		14	3.00	42.00
22	Textbooks, References and/or Other	1	Martin Telting-Diaz and Yu Qin, Potentiometry	
Practicals/Labs		0	0.00	0.00
Self study and preperation		2	D. Midgley and K. Torrence, Potentiometric Water Analysis, John Wiley and Sons	56.00
Homeworks		1	18.00	18.00
Projects		0	Springer-Verlag	0.00
Field Studies		0	0.00	0.00
Midterm exams		1	25.00	25.00
TERM LEARNING ACTIVITIES		NUMBE	WEIGHT	
Others		0	0.00	0.00
Midterm Exam		1	30.00	
Final Exams		1	35.00	35.00
Total Work Load				176.00
Home work project		1	10.00	
Total work load/ 30 hr				5.87
ECTS Credit of the Course				6.00
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	0	0	0	0	0	0	3	0	0	0	0	0	0	0
ÖK2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	3	0	0	2	0	0	0	3	0	0	0	0	0	0	0
ÖK5	4	0	0	3	3	0	0	0	3	0	0	0	0	0	0	0
ÖK6	4	0	0	0	0	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			