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
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	4.00	56.00
Homeworks	1	18.00	18.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	25.00	25.00
Others	0	0.00	0.00
Final Exams	1	35.00	35.00
Total Work Load			176.00
Total work load/ 30 hr			5.87
ECTS Credit of the Course			6.00

TERM LEARNING ACTIVITIES	**NUMBE**	**WEIGHT**
Midterm Exam	1	30.00
Home work-project	1	10.00
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		

22	Textbooks, References and/or Other 1. Martin Telting-Diaz and Yu Qin, Potentiometry 2. D. Midgley and K. Torrence. Potentiometric Water Analysis, John Wiley and Sons Springer-Verlag
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**			