

School of Pharmacy / School of Pharmacy (English)

2024 - 2025 Academic Year

ANALYTICAL CHEMISTRY I

Syllabus

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
ANALYTICAL CHEMISTRY I	PHA2113088	Fall Semester	3+0	3	5
Prerequisites Courses	GENEL KİMYA				
Recommended Elective Courses					
Language of Instruction	English				
Course Level	First Cycle (Bachelor's Degree)				
Course Type	Required				
Course Coordinator	Assist.Prof. Sema KOYUTÜRK				
Name of Lecturer(s)	Assist.Prof. Sema KOYUTÜRK				
Assistant(s)	Research assistants of faculty				
Aim	The major objective of this course is to provide a rigorous background in analytical chemistry.				
Course Content	This course contains; In analytical chemistry, chemicals, supplies and basic operations, In analytical chemistry, chemicals, supplies and basic operations, Calculations in analytical chemistry, Aqueous solutions and chemical equilibrium, Aqueous solutions and chemical equilibrium, Solutions of equilibrium problems in complex systems, Solutions of equilibrium problems in complex systems, Solutions of equilibrium problems in complex systems, Solutions of equilibrium problems in complex systems, Titrimetric methods and precipitation titrimetry, Titrimetric methods and precipitation titrimetry, Principles of neutralization titrations, Principles of neutralization titrations, Applications of neutralization titrations.				
Course Learning Outcomes			Teaching Methods	Assessment Methods	
1. Discusses encountered chemicals, supplies and the basic operations in analytical chemistry.			10, 16, 6, 9	A	
1.1. Discusses the necessary characteristics of chemicals used in analytical procedures.			10, 16, 6, 9	A	
1.2. Interprets and selects the instruments that is necessary for the laboratory in accordance with the intended use.			10, 16, 6, 9	A	
1.3. Selects the method of analysis needed to be done and explains the process.			10, 16, 6, 9	A	
2. Discusses the solutions, stoichiometric calculations related to solution concentrations and units of measurements in this field by using basic principles.			10, 16, 6, 9	A	
2.1. Interprets the stoichiometry of solutions used in analytical chemistry.			10, 16, 6, 9	A	
2.2. Interprets the structure and composition of standard solutions.			10, 16, 6, 9	A	
2.3. Explains the concentration conversions of solutions			10, 16, 6, 9	A	
3. Discuss the composition of various particles and their equilibrium interactions which exist in an aqueous solution medium.			10, 16, 6, 9	A	
3.1. Interprets the state of particles by making quantitative interpretation of chemical equilibrium.			10, 16, 6, 9	A	
3.2. Discuss which kinds of properties are given to the medium by the equilibrium that occurs in aqueous solutions.			10, 16, 6, 9	A	
3.3. Interprets the buffer properties with current events that occurs in aqueous medium.			10, 16, 6, 9	A	
4. Discuss the factors that affect the precipitation reactions by solving the equilibrium problems that occurs in complex systems.			10, 16, 6, 9	A	
4.1. Explains the mass and charge balance equations in solution equilibrium.			10, 16, 6, 9	A	
4.2. Explains the factors that affect the solubility of metal hydroxides and sulfides.			10, 16, 6, 9	A	
4.3. Interprets the quantitative properties of solutions with current events.			10, 16, 6, 9	A	
5. By applying the gravimetric analysis methods to analysis procedures, discuss the obtained gravimetric results.			10, 16, 6, 9	A	
5.1. By explaining the precipitation gravimetry, interprets the calculations of analysis.			10, 16, 6, 9	A	
5.2. By comparing the gravimetric methods applies for the analysis.			10, 16, 6, 9	A	
6. Discusses the principles of titrimetry, standard solutions and calculations.			10, 16, 6, 9	A	
6.1. Interprets the precipitation gravimetry			10, 16, 6, 9	A	
6.2. Explains the standard solutions and the volumetric calculations.			10, 16, 6, 9	A	
7. Discusses the titration curves, reagents and principles of neutralization titrations.			10, 16, 6, 9	A	
7.1. Explains the acid / base titration solutions and indicators.			10, 16, 6, 9	A	
7.2. Interprets the strong acid-base titration curves.			10, 16, 6, 9	A	
7.3. Explains the titration curves of weak acids and bases			10, 16, 6, 9	A	
Teaching Methods	10: Discussion Method, 16: Question - Answer Technique, 6: Experiential Learning, 9: Lecture Method				
Assessment Methods	A: Traditional Written Exam				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
1	In analytical chemistry, chemicals, supplies and basic operations	1, 2			
2	In analytical chemistry, chemicals, supplies and basic operations	1, 2			
3	Calculations in analytical chemistry	1, 2			
4	Aqueous solutions and chemical equilibrium	1, 2			
5	Aqueous solutions and chemical equilibrium	1, 2			
6	Solutions of equilibrium problems in complex systems	1, 2			
7	Solutions of equilibrium problems in complex systems	1, 2			
8	Solutions of equilibrium problems in complex systems	1, 2			
9	Solutions of equilibrium problems in complex systems	1, 2			
10	Titrimetric methods and precipitation titrimetry	1, 2			
11	Titrimetric methods and precipitation titrimetry	1, 2			
12	Principles of neutralization titrations	1, 2			
13	Principles of neutralization titrations	1, 2			
14	Applications of neutralization titrations	1, 2			

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Evaluation Methods	Weight(%)
Midterm Exam	40
General Exam	60

Resources
[1] Fundamental of Analytical Chemistry, D.A.Skoog, D.M.West, F.J.Holler, S.R.Crouch, 8th edition, Brooks Cole, 2013 [2] Quantitative Analytical Chemistry, Daniel Harris 2015