1. Course Description

COURSE DESCRIPTION FORM	
Course Code and Title	CHEM213 ANALYTICAL CHEMISTRY LABORATORY
Course Semester	3
Catalog Description (Content) of the Course	Analysis of Group I cations, II. Anatomy of group cations, III. Analysis of Group Cations, Analysis of IV and V Group Cations, General Cation Analysis, Acid-Base Neutralization Titration, Precipitation Titration (Volhard Method), Complex Metimetric Titration with EDTA (Water Hardness Test), Redox Titration (KMnO4 oxalate and Ca titration), Iodometric titration (Cu determination)
Main Textbook	"Analitik Kimya" Ç. Editörü Esma KILIÇ ve HAMZA YILMAZ: -Fundamentals of analytical chemistry; D. A. Skoog, D. M. West, F. J. Holler. Sounders College publishing, 8th Edition.
Supporting Textbooks	"Nicel Kimyasal Analiz"- Çeviri Editörü: Ali Rehber TÜRKER- Quantitative Chemical Analysis; Daniel C. Harris, 8th edition.
Course Credit (ECTS)	2
Prerequisites of the Course (Compulsory attendance should be indicated here.)	Attendance at classes is at least 70% for each semester according to the regulations. There is no other prerequisite or co-requisite for the course
Type of the Course	Compulsory
Instruction Language of the Course	English
Object and Target of the Course	Gravimetric analysis, titrimetric analysis, precipitation and separation in chemical analysis, quantitative and qualitative analyze. Covering experimentally titrations of acids and bases, precipitation, complexymetric and iodometric titrations, and some examples of their engineering applications.
Learning Outcomes of the Course	1. Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems. 2. Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose. 3 Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose. 4. Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively 5. Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems 6. Ability to work efficiently in intra-disciplinary teams. 7. Ability to work efficiently in multi-disciplinary teams; 8. Ability to work individually. 9. Ability to communicate effectively in Turkish/English, both orally and in writing; Ability to write effective reports and comprehend written reports, make effective presentations, 10 prepare design and production reports, give and receive clear and intelligible instructions. 11. Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.

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<tr><td></td><td>12. Awareness of professional and ethical responsibility
13 Information about business life practices such as project management, risk management, and change management.
14. Information about awareness of entrepreneurship, innovation, and sustainable development.
15. Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.
16. Knowledge about awareness of the legal consequences of engineering solutions.
17. Knowledge on standards used in engineering practice.</td></tr>
<tr><td>Mode of Delivery</td><td></td></tr>
<tr><td>Weekly Schedule of the Course</td><td>Week 1: General information in the first meeting, laboratory safety and some explanations on laboratory workings.
Week 2: Quantitative systematic analysis of group I cations, their separations and recognition of their reactions.
Week 3: Quantitative systematic analysis of group I cations, their separations and recognition of their reactions
Week 4: Quantitative systematic analysis of group III cations, their separations and recognition of their reactions
Week 5: Quantitative systematic analysis of group IV and V cations, their separations and recognition of their reactions
Week 6: Quantitative systematic analysis of General cations, their separations and recognition of their reactions
Week 7: Make-up (Quantitative systematic analysis of cations)
Week 8: Acid-base neutralization titration (Determination of acetic acid in the vinegar)
Week 9: Precipitation Titrations (Chloride determination by Volhard method)
Week10: Complexymetric titration with EDTA (determination of hardness of water)
Week11: Redox titration (Oxalate and Ca determination with $KMnO_4$)
Week 12: Iodometric titration (Cu determination).
Week13: Make-up(Quantitative Analysis)
Week 14: Make-up (Quantitative Analysis).</td></tr>
<tr><td>Educative Activities
(Credit will be determined based on the time given for these activities. Should be filled carefully.)</td><td>Practicing Hours of Course Per Week
Reading
Mid-Term and Studying for Mid-Term
Final and Studying for Final</td></tr>
<tr><td>Assessment Criteria</td><td>
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<tr><th></th><th>Quantity</th><th>Total Contribution (%)</th></tr>
<tr><td>Midterm</td><td>1</td><td>15</td></tr>
<tr><td>Homework</td><td></td><td></td></tr>
<tr><td>Assignment</td><td></td><td></td></tr>
<tr><td>Projects</td><td></td><td></td></tr>
<tr><td>Practice</td><td>10</td><td>30</td></tr>
<tr><td>Quiz</td><td>10</td><td>15</td></tr>
<tr><td>Contribution of In-term Studies to Overall Grade</td><td></td><td>60</td></tr>
<tr><td>Contribution of Final Examination to Overall Grade</td><td></td><td>40</td></tr>
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	Attendance

Workload of the Course

Activity	Total Week Count	Weekly Duration (in hour)	Total Workload in Semester
Theoretical Study Hours of Course Per Week	0	0	0
Practicing Hours of Course Per Week	12	4	48
Reading	4	1	4
Searching in Internet and Library	0	0	0
Designing and Applying Materials	0	0	0
Preparing Reports	0	0	0
Preparing Presentation	0	0	0
Presentation	0	0	0
Mid-Term and Studying for Mid-Term	1	3	3
Final and Studying for Final	1	3	3
Other	0	0	0
Total work load	31	36	58
Total work load/25			2,32
ECTS of the course			2,0

Course's Contribution To Program

Number	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathemati ertaining to the relevant discipline nformation in these areas to model				X	
2	Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.				X	
3	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.			X		
4	Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.			X		
5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.		X			
6	Ability to work efficiently in intra-disciplinary teams.				X	
7	Ability to work efficiently in multi-disciplinary teams;				X	

	8	Ability to work individually.					X
	9	Ability to communicate effectively in Turkish/English, both orally and in writing; Ability to write effective reports and comprehend written reports, make effective presentations,					X
	10	Prepare design and production reports, give and receive clear and intelligible instructions.		X			
	11	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.				X	
	12	Awareness of professional and ethical responsibility.				X	
	13	Information about business life practices such as project management, risk management, and change management.		X			
	14	Information about awareness of entrepreneurship, innovation, and sustainable development.		X			
	15	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X		
	16	Knowledge about awareness of the legal consequences of engineering solutions.	X				
	17	Knowledge on standards used in engineering practice.		X			
Name of Lecturer(s) and Contact Inıformation	Name-Surname of Lecturers E-mail address 1. Prof.Dr. Recai İNAM (rinam@gazi.edu.tr) 2. Doç.Dr. Halit ARSLAN(halit@gazi.edu.tr) 3. Doç.Dr. Özcan Yalçınkaya(oyalcinkaya@gazi.edu.tr)						