

#### OSTIM TECHNICAL UNIVERSITY FACULTY OF ENGINEERING

# COURSE SYLLABUS FORM

#### 2022-2023

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CHEM 111 Engineering Chemistry							
Course Name	Course Code	Period	Hours	Application	Laboratory	Credit	ECTS
ENGINEERING CHEMISTRY	CHEM 111	1	4	2	2	3	4

Language of Instruction	English
Course Status	Compulsory
Course Level	Bachelor
Learning and Teaching Techniques of the Course	Lecture, Question-Answer, Experiments, SimulationsAnimations, Thought Experiments, Argumentation

# **Course Objective**

The objective of this course is to make students understand the basic concepts of the whole general chemistry and also to give them chance for applications of the concepts by experiments, simulations, animations, thought experiments and argumentation processes so to make them gain a much deeper understanding about the concepts.

## **Learning Outcomes**

- 1. Learning the basic concepts of the whole general chemistry.
- 2. Solving problems about the basic concepts.
- 3. Being able to write experiment reports for a much deeper understanding.
- 4. Understanding the submicroscopic nature of chemistry by simulations and animations.
- 5. Arguing the thought experiments so to become critical thinkers which is a basic need for engineering education.



### **Course Outline**

Atomic and electronic structure, chemical bonds, molecular structures and bonding laws, the properties of liquids, solids and solutions, chemical equilibrium, chemical kinetics, thermodynamics, metallic complexes, organic chemistry and nuclear chemistry.

Weekly Topics and Related Preparation Studies					
Weeks	Topics	Preparation Studies			
1	Atomic and electronic structure	Mortimer's modern university chem.			
2	Chemical bonds	Mortimer's modern university chem.			
3	Molecular structure and bonding laws	Mortimer's modern university chem.			
4	The properties of liquids and solids	Mortimer's modern university chem.			
5	The properties of solutions	Mortimer's modern university chem.			
6	The properties of solutions	Mortimer's modern university chem.			
7	Chemical equilibrium	Mortimer's modern university chem.			
8	Midterm Exam				
9	Chemical kinetics	Mortimer's modern university chem.			
10	Thermodynamics	Mortimer's modern university chem.			
11	Thermodynamics	Mortimer's modern university chem.			



12	Metallic complexes	Mortimer's modern university chem.
13	Organic chemistry	Mortimer's modern university chem.
14	Organic chemistry	Mortimer's modern university chem.
15	Nuclear chemistry	Mortimer's modern university chem.
16	Final Exam	

# Textbook(s)/References/Materials:

Modern University Chemistry, Mortimer C. E., Çağlayan.

# Analytic Chemistry,

Skoog W., Holler, C., Bilim.

Assessment					
Studies	Number	Contribution margin (%)			
Continuity	14	10			
Lab					
Application					
Field Study					
Course-Specific Internship (if any)					
Quizzes / Studio / Critical					
Homework					
Presentation					
Projects					
Report	14	10			
Seminar					
Midterm Exams / Midterm Jury	2	10 + 10			



2	30 + 30
Total	100
Total	100
	2 Total Total

Relationship Between Course Learning Outcomes and Program Competencies						
Nu	Loorning Outcomes	<b>Contribution Level</b>				
Nu	Learning Outcomes		2	3	4	5
1	Learning the basic concepts of the whole general chemistry.					Х
2	Solving problems about the basic concepts.					Х
3	Being able to write experiment reports for a much deeper understanding.					х
4	Understanding the submicroscopic nature of chemistry by simulations and animations.					х
5	Arguing the thought experiments so to become critical thinkers which is basic need for engineering education.					х

ECTS / Workload Table					
Activities	Number	Duration (Hours)	Total Workload		
Course hours (Including the exam week: 16 x total course hours)	16	4	64		
Laboratory					
Application					
Course-Specific Internship					
Field Study					
Study Time Out of Class					



Presentation / Seminar Preparation			
Projects			
Reports	14	1	14
Homeworks			
Quizzes / Studio Review			
Preparation Time for Midterm Exams / Midterm Jury	2	16	32
Preparation Period for the Final Exam / General Jury	2	16	32
Total Workload			142