Işık University
Faculty of Arts and Sciences
Department of Physics

CHEM 101 - General Chemistry

COURSE SYLLABUS

Course Name	Code	Semester	Theory (hour/week)	Application (hour/week)	Laboratory (hour/week)	Local Credits	ECTS
General Chemistry	CHEM 101	Fall	**3**	0	**0**	**3**	5

Prerequisities	None

Course Language	English
Course Type	Required
Course Level	Undergraduate
Course Coordinator	Professor Ayben Kilislioğlu
Course Lecturer(s)	Professor Ayben Kilislioğlu
Course Assistants	-
Course Objectives	Upon successful completion of this course, students should be able to: a) demonstrate knowledge of fundamental concepts in chemistry [1]; b) identify and apply principles of chemistry to problems in everyday life and engineering, and visualize their physical significance [1,2]; c) apply knowledge of mathematics and science [2]; d) develop skills in problem solving and critical thinking [2,6].
Course Learning Outcomes	At the completion of this course, the successful student will be able to compare and contrast the chemical behavior and physical properties of common substances. Classify matter by its state and bonding behavior using the Periodic Table as a reference. Solve stoichiometric problems involving chemical formulas and equations.
Course Content	Fundamental concepts of chemistry, elements and compounds; basic chemical calculations, mole problems, stoichiometry, and solution concentrations; gas laws; electronic structure of atoms; periodic properties of the elements.

WEEKLY SUBJECTS AND RELATED PREPARATION STUDIES

Week	Subject
1	Matter-Its Properties and Measurement
2	Uncertainty and Significant Figures/ Dimensional Analysis
3	Atoms and Atomic Theory
4	Chemical Compounds
5	Chemical Reactions
6	Chemical Reactions, Stoichiometry
7	Reactions in Aqueous Solutions
8	Precipitation, Acid-Base Reactions
9	Oxidation-Reduction Reactions and Titrations
10	Gases, Gas Laws, Ideal Gas Equation
11	Gases in Reactions, Mixtures of Gases, Kinetic Molecular Theory
12	Electrons in Atoms
13	Electron configuration
14	The Periodic Table and Some Atomic Properties
15	The Periodic Table and Some Atomic Properties

.

TEXTBOOKS

Required Textbook(s)	R. H. Petrucci, F. G. Herring, J. D. Madura, C. Bissonnette, *General Chemistry, Principles and Modern Applications with Mastering Chemistry*, 10th Edition, Prentice Hall, 2010.
Recommended Readings	T. L. Brown, H. E. Lemay, B. E. Burnsten, *Chemistry: The Central Science*, 10th Edition, Prentice-Hall, 2006.

EVALUATION SYSTEM

Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	-	-
Laboratory	-	-
Application	-	-
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Quizzes/Studio Critics	3	6
Homework Assignments	10	16
Presentation/Jury	-	-
Project	-	-
Seminar/Workshop	-	-
Midterms/Oral Exams	2	52
Final/Oral Exam	1	26
Total	16	100

Percentage of Semester Work	15	74
Percentage of Final Work	1	26
Total	16	100

COURSE CATEGORY

ISCED GENERAL FIELD CODE	GENERAL FIELDS	ISCED MAIN AREA CODE	MAIN EDUCATIONAL AREAS	%
1	Eğitim	14	Öğretmen Yetiştirme ve Eğitim Bilimleri	0
2	Beşeri Bilimler ve Sanat	21	Sanat	0
2	Beşeri Bilimler ve Sanat	22	Beşeri Bilimler	0
3	Sosyal Bilimler, İşletme ve Hukuk	31	Sosyal ve Davranış Bilimleri	0
3	Sosyal Bilimler, İşletme ve Hukuk	32	Gazetecilik ve Enformasyon	0
3	Sosyal Bilimler, İşletme ve Hukuk	38	Hukuk	0
4	Bilim	42	Yaşam Bilimleri	0
4	**Bilim**	**44**	**Doğa Bilimleri**	**70**
4	**Bilim**	**46**	**Matematik ve İstatistik**	**20**
4	Bilim	48	Bilgisayar	0
5	**Mühendislik, Üretim ve İnşaat**	**52**	**Mühendislik**	**10**
5	Mühendislik, Üretim ve İnşaat	54	Üretim ve İşleme	0
5	Mühendislik, Üretim ve İnşaat	58	Mimarlık ve Yapı	0
6	Tarım	62	Tarım, Ormancılık, Hayvancılık ve Su Ürünleri	0
6	Tarım	64	Veterinerlik	0
7	Sağlık ve Refah	72	Sağlık	0
7	Sağlık ve Refah	76	Sosyal Hizmetler	0
8	Hizmet	81	Kişisel Hizmetler	0
8	Hizmet	84	Ulaştırma Hizmetleri	0
8	Hizmet	85	Çevre Koruma	0
8	Hizmet	86	Güvenlik Hizmetleri	0

THE RELATIONSHIP BETWEEN COURSE LEARNING OUTCOMES AND PROGRAM OUTCOMES

Number	Program Outcomes	Level of Contribution*				
		1	2	3	4	5
1	To have a comprehension of the core areas of science, including calculational techniques, theoretical concepts of chemistry.				X	
2	To have a comprehension of basic mathematics, including differential and integral calculus, linear algebra, differential equations and complex analysis.			X		
3	To have a comprehension of computer programming and chemistry.			X		
4	To have a comprehension of the importance and practice of good ethical standards.				X	
5	To have a recognition of contemporary issues in science and its applications.					X
6	To have an ability to construct theoretical models, solve problems, design and conduct experiments, as well as to analyze and interpret data.				X	
7	To have an ability to demonstrate their understanding of at least one advanced topic in theoretical or experimental chemistry.				X	
8	To have an ability to function on multi-disciplinary teams					X
9	To have an ability to effectively communicate information in both written and verbal form				X	
10	To have a recognition of the need for and an ability to engage in life-long learning.					X
11	To have an ability to use modern scientific techniques, skills, and computing tools necessary for chemistry practice.					X

*1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

Contribution of Course Learning Outcomes to Program Outcomes	At the end of this course the student should be able to understand chemistry concepts which are generally understood in the scientific and engineering multidisciplinary community. Students should develop problem solving abilities and enhance critical thinking and improve their written communication skills.

ECTS / WORKLOAD TABLE

Activities	**Number**	**Duration (Hour)**	**Workload (Hour)**
Course Hours (Including Exam Week: 16 x Total Hours)	15	3	45
Laboratory	-	-	-
Application	-	-	-
Special Course Internship (Work Placement)	-	-	-
Field Work	-	-	-
Study Hours Out of Class	15	2	30
Presentations / Seminar	-	-	-
Project	-	-	-
Homework Assignments	10	2	20
Quizzes	3	1	3
Midterms / Oral Exams	2	9	18
Final / Oral Exam	1	9	9
		Total Workload	**125**
		Total Workload/25	**5**