



YOZGAT BOZOK UNIVERSITY FACULTY OF ARTS AND SCIENCES
CHEMISTRY DEPARTMENT COURSE PLAN

Course Code	Course Title	Semester	Course Type (C/E)	T+A+L (Time/Week)	Credit	ECTS	Course Language
KİM363	PHYSIOCHEMISTRY I	SPRING	C	4+0+0		6	Turkish

COURSE INFORMATION

Course Catalog Description (Content)	General Concepts; The Concept of Temperature and Thermometry; Work, Heat, Reversible and Irreversible Processes; Thermochemistry; Second Law of Thermodynamics; Entropy; Third Law of Thermodynamics, Standard Absolute Entropies, Entropy and Probability; Free Energy, Spontaneity and Balance; Thermodynamic State Functions and Chemical Equilibrium in Systems with Changing Composition.
The Aim of the Course	The student learns the basic concepts of thermodynamics and can solve related problems.
Course Level	Bachelor degree
Course Language	Turkish
Teaching method	(X) Formal () Online () Mixed/Hybrid
Teaching Staff of the Course	Prof. Dr. Dr. Ramazan COŞKUN, Prof. Dr. Ali DELİBAŞ, Asst. Prof. Dr. Hatice ARI
Prerequisite Course(s) of the Course	-
Learning Outcomes from the Course	<ol style="list-style-type: none">1- The student can have information about the system, its properties, energy and energy types, temperature and thermometry.2- The student will have information about work, heat, reversible and non-reversible processes and can make calculations.3- The student can apply the laws of thermodynamics to chemical and physical processes.4- Student can calculate enthalpy, entropy, Gibbs free energy changes and equilibrium constants of chemical reactions.5- Student can use thermodynamic state functions in systems with varying composition.6- The student can make chemical balance calculations.

COURSE CONTENT

Week	Theory	Practice/Laboratory
1	General Concepts (System and System Properties; Energy and Energy Types)	
2	The Concept of Temperature and Thermometry	
3	Work, Heat, Reversible and Irreversible Processes (Work and Heat; Joule Experiment; Expansion of a Gas; Maximum and Minimum Work; Internal Energy and First Law of Thermodynamics)	
4	Work, Heat, Reversible and Irreversible Processes (Full and Incomplete Differentials; Equations of State for Ideal Gases; Heat Capacitances; Joule Thomson Effect; Isothermal Changes; Adiabatic Changes)	
5	Thermochemistry (Application of the First Law of Thermodynamics to Chemical Reactions; Measurement of Reaction Heats; Molar Enthalpy Values, Hess's Law; Heats of Combustion)	

6	Thermochemistry (Change of Reaction Heats with Temperature; Neutralization Heats of Acids and Bases; Heats of Formation of Ions; Differential Heats of Dissolution and Dilution; Bond Enthalpies)	
7	Second Law of Thermodynamics	
8	Entropy (Change of Entropy in Pressure, Temperature and Volume)	
9	Entropy (Entropy Change in Adiabatic Processes; Total Entropies in Reversible and Isothermal Changes; Total Entropies in Irreversible Changes; Entropy of an Ideal Gas)	
10	Third Law of Thermodynamics, Standard Absolute Entropies	
11	Entropy and Probability	
12	Free Energy, Spontaneity and Balance	
13	Thermodynamic State Functions in Systems with Changing Composition	
14	Chemical Equilibrium	
15	Final Exam	

Course Learning Resources

1. Atkins, P.W., "Fizikokimya", Trans. Yıldız,S.,Yılmaz,H., Kılıç,E., Bilim Press, Ankara, 2001.
2. Sarıkaya Y., " Fizikokimya ", Gazi Bookstore, Ankara, 2000.
3. Saydan B., Erbil C., Saraç S., " Beta Publishing Publishing, 1999.
4. Cebe M., " Fizikokimya ", Nobel Chemistry, 2006.
5. Yıldız S., " Fizikokimya", Konya, 1998.

ASSESSMENT CRITERIA

Work Activities During the Semester	Number	Contribution
Homework	1	30
Practice		
Forum/ Discussion Application		
Short Exam (Quiz)	2	70
Ratio Of Semester Studies To Semester Success (%)		%40
Ratio of Final to Success (%)	1	%60
Total		%100

COURSE WORKLOAD TABLE

Activity	Total Weeks	Duration (Weekly Hours)	Total Workload
Theory	14	4	56
Practice			
Forum/ Discussion Application			
Reading	14	3	42
Internet Scanning, Library Study	14	3	42
Material Design, Application			
Report Preparation			
Presentation Preparation			
Presentation			
Final Exam	1	2	2
Preparation for the Final Exam	2	4	8
Other(s) (Specify:)			

Total Workload	150
Total Workload / 25 (s)	150/25
ECTS Credits of the Course	≅6
Note: The workload of the course will be determined by the instructor on a per-course basis.	

PROGRAM LEARNING OUTPUTS CONTRIBUTION LEVELS

No	Program Learning Outputs	1	2	3	4	5
1	Gains extensive knowledge about the basic chemical properties of matter and uses this knowledge in daily life, industrial scale, and practical chemistry and shares them with the society.				x	
2	Performs experiments, collects data, interprets, evaluates results, defines problems parallel to current technological developments, produces solutions against problems encountered in the laboratory.					x
3	Calculates and processes chemical information and data.					x
4	Applies her/his knowledge and understanding of chemistry to the solution of unconventional qualitative and quantitative problems.					x
5	Defines and comprehends chemical concepts and theories in Inorganic Chemistry, Organic Chemistry, Physical Chemistry, Analytical Chemistry, Biochemistry.			x		
6	Can conduct research in the light of scientific data on any subject in the field of chemistry.					x
7	Writes, presents, discusses scientific material, and presents it orally to a knowledgeable audience.					x
8	Brings a chemical approach to the solution of environmental problems, makes environmental analyzes and reports.			x		
9	Knows a foreign language at a level to read and understand the basic terms and processes of the chemist profession.			x		
10	Can use computer software and information and communication technologies at the level required by the field.				x	
11	Adapts and transfers the knowledge gained in the field to secondary education.					x
12	Apart from the field of chemistry, she/he gains knowledge in different branches of science that she feels close to.			x		
13	Carries out a study independently, makes group work and gains the awareness of taking responsibility.				x	
14	They can develop a positive attitude towards lifelong learning and constantly renew their professional knowledge and skills.			x		
15	Have sufficient awareness of the universality of social rights, social justice, quality culture and protection of cultural values, environmental protection, occupational health and safety.		x			