



**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
KİM716	Polymer Chemistry	1-2	E	2+0+0		5	Turkish

**COURSE INFORMATION**

<b>Course Catalog Description (Content)</b>	Polymer definition and basic concepts: Synthesis of polymers, classification of polymers, nomenclature of polymers, physical properties of polymers, chemical properties of polymers, stereospecific order in polymers. The concept of molecular weight in polymers: Types and determination of molecular weight, fractionation of polymers. Stepwise polymerization and its kinetics, polyamides, polyesters, polyurethanes, other condensation polymers. Addition polymerization and its kinetics, some addition polymers. Copolymer definition and types, copolymerization relation, reactivity ratio, copolymer composition, some copolymers
<b>The Aim of the Course</b>	Giving the basic chemical and technological concepts that occur during the synthesis, characterization and transformation of industrial products such as plastics, rubbers, fibers, paints, adhesives and many more, which are widely used in all areas of our daily life, and orienting the student to interdisciplinary work.
<b>Course Level</b>	Bachelor degree
<b>Course Language</b>	Turkish
<b>Teaching method</b>	(X) Formal ( ) Online ( ) Mixed/Hybrid
<b>Teaching Staff of the Course</b>	Prof. Dr. Ramazan COŞKUN, Prof. Dr. Ali DELİBAŞ, Asst. Prof. Dr. Hatice ARI
<b>Prerequisite Course(s) of the Course</b>	-
<b>Learning Outcomes from the Course</b>	1- Can learn the basic principles of polymer chemistry. 2- Can learn polymerization and characterization methods. 3- Know the structure-property relationship in polymers. 4- They can also have information about the physical, chemical, mechanical and electronic properties of the polymer. 5- Can determine the usage area of polymers according to their structural properties.

**COURSE CONTENT**

Week	Theory	Practice/Laboratory
1	General Topics in Polymer Chemistry: Monomer, Polymer, Polymer Chains, Linear, Branched and Cross-linked Polymers, Synthesis of Polymers, Stereochemistry of Polymers, Crystal Structure of Polymers	
2	History, nomenclature and development of polymers	
3	Stereochemistry of polymers, thermal properties, glass transition temperature	
4	Factors affecting glass transition temperature and crystallinity	

5	Solubility, molar mass types and fractionation of polymers	
6	Methods for determining the molar mass of polymers, numerical properties	
7	Last group analysis, light scattering, ultracentrifuge viscosity and gel permeability methods	
8	Stepwise polymerization reactions, kinetics, time dependence of polymerization degree	
9	Initiation of radical addition polymerization	
10	Chain reaction	
11	Radical addition polymerization kinetics	
12	Ionic polymerization, anionic and cationic polymerization	
13	Copolymerization	
14	Mechanical properties	
15	Final Exam	

### Course Learning Resources

1. Polimer Kimyası: Mehmet Saçak, Gazi Kitabevi, 2004, Ankara, Türkiye.
2. Polymers: chemistry and physics of modern materials: J.M.G. Cowie, Blackie, London.
3. Polymer Chemistry: M.P. Stevens, Oxford University Press, 1990, Oxford

### 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	2	28
Practice			
Forum/ Discussion Application			
Reading	14	2	28
Internet Scanning, Library Study	14	2	28
Material Design, Application			
Report Preparation			
Presentation Preparation	2	4	8
Presentation	2	3	6
Final Exam	1	1	1
Preparation for the Final Exam	4	7	28
Diğer (Belirtiniz: Ev Ödevi)			
Total Workload			127
Total Workload / 25 (s)			127/25

ECTS Credits of the Course		≈5				
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	