



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Hydrogels							
Course Code		KİM640		Couse Level		Third Cycle (Doctorate Degree)			
ECTS Credit	10	Workload	250 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		This lecture is designed to provide a solid background for students who intend to go on to the graduate study and a thorough background in the fundamentals of hyhdrogels							
Course Content		Xerogels and hydrogels, crosslinking, multifunctional crosslinkers, synthesis of homopolymeric and copolymeric hydrogels, synthesis of homopolymeric and copolymeric hydrogels, using of synthetic hydrogels in biomedicine, pharmacy, veterinary, controlled drug release systems, hydrogels as biomaterials, hydrogels and sorption, water treatment, heavy metal and dye removal by hydrogels, controlled release of fertilizers and drugs by hydrogels in agriculture, applications as ion exchanging process							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	60
Assignment	4	20

Recommended or Required Reading

1	Hydrogels for Medical and Related Applications, ACS Symposium series Ed.; R. F. Gould
2	Physical Chemistry of Macromolecules, S. F. SUN
3	Introduction to Physical Polymer Science, L. H. SPERLING

Week	Weekly Detailed Course Contents	
1	Theoretical	Xerogels and hydrogels
2	Theoretical	Crosslinking, multifunctional crosslinkers
3	Theoretical	Synthesis of homopolymeric and copolymeric hydrogels
4	Theoretical	Synthesis by high energy ionization radiation/? rays
5	Theoretical	Interpenetrating polymer networks (IPN's)
6	Theoretical	Using of synthetic hydrogels in biomedicine, pharmacy, veterinary
7	Theoretical	Using of synthetic hydrogels in other fields
8	Intermediate Exam	Midterm exam
9	Theoretical	Controlled drug release systems
10	Theoretical	Hydrogels as biomaterials
11	Theoretical	Hydrogels and sorption, Water treatment
12	Theoretical	Heavy metal and dye removal by hydrogels
13	Theoretical	Controlled release of fertilizers and drugs by Hydrogels in agriculture
14	Theoretical	Ion-exchange applications
15	Theoretical	Chromatographic applications, processing of solvent extraction by hydrogels
16	Final Exam	FINAL EXAM

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	3	42
Assignment	6	0	9	54
Reading	1	0	97	97
Quiz	4	2	4	24
Midterm Examination	1	12	2	14



Final Examination	1	16	3	19
Total Workload (Hours)				250
[Total Workload (Hours) / 25*] = ECTS				10
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	Xerogels and hydrogels, Crosslinking, multifunctional crosslinkers
2	Synthesis of homopolymeric and copolymeric hydrogels
3	Hydrogel synthesis by high energy ionization radiation/? rays
4	Using of synthetic hydrogels in biomedicine, pharmacy, veterinary, controlled drug release systems
5	Hydrogels as biomaterials
6	Hydrogels and sorption
7	Water treatment, heavy metal and dye removal by hydrogels
8	Controlled release of fertilizers and drugs by Hydrogels in agriculture
9	Applications as ion exchanging process
10	Chromatographic applications, processing of solvent extraction by Hydrogels

Programme Outcomes (Chemistry Doctorate)

1	Depending on the master degree competences, develops, insights and innovates current and advanced knowledge and/or research in proficiency level.
2	Gains high skill levels in using research methods in the field of his/her study.
3	Comprehends the interaction between disciplines related to his/her field. Reaches to original results using his/her expertise in order to analyze, synthesize and evaluate new and complicated ideas.
4	Enlarges the boundaries of his/her field of knowledge by publishing at least one research paper in national and/or international peer-reviewed journals.
5	Defends his/her original opinions related to his/her field before authority and communicates effectively illustrating his/her competence.
6	May communicate and debate written, orally and visually in European Language Portfolio level C1.
7	Follows the developments in computer software and information and communication technologies developed for his/her research area and uses these in order to solve research problems.
8	Collaborates for scientific research with national and international research teams.
9	Contributes to the course of creation and maintenance of knowledge based society and by introducing the scientific, social and cultural developments to the society he/she is living in.

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
P1	5	5	5	5	5	5	5	5	5	5
P2	5	4	5		3	3	3	3	4	
P3	5	4	5		3	3	3	3	3	
P4	5	4	4		3	3	3	3		
P5	5	3	5		3	3	3	3		
P6	5	3								
P8				4						
P9	4	4								

