AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Nanobiotechnology and Its Applications								
Course Code	KİM667		Couse Level	Third Cycle (Doctorate Degree)					
ECTS Credit	10	Workload	250 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	This course aims to understand the concept of nanobiotechnology, to learn nanomaterials and to emphasis on biotechnology-medical applications.								
Course Content	Definition and history of nanotechnology, classification and introduction of nanomaterials. Tissue engineering applications of nanomaterials. Biosensor applications of nanomaterials. Use of nanomaterials in controlled drug release. Use of nanomaterials in enzyme immobilization and protein purification. The significance of nanomaterials in implants and artificial organs.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Case Study, Individual Study								
Name of Lecturer(s)	Prof. Deniz AKTAŞ UYGUN								

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	35
Assignment	3	45

Recommended or Required Reading	
1	Brechignac C., Houdy P., Lahmani M. (2006) Nanomaterials and Nanochemistry. Belin, France. ISBN:978-3-540-72992-1
2	Professor Waqar Ahmed. Nanomaterials and Nanotechnology. University of Central Lancashire, UK. ISBN: 978-1-910086-17-9

Week	Weekly Detailed Course Contents	
1	Theoretical	Overview of Nanobiotechnology and Its Applications, Definition and History
2	Theoretical	Classification of Nanomaterials. Investigation of Zero, One, Two, Three Dimensional Nanomaterials
3	Theoretical	Nanomaterials According to Their Composition: Metallic Nanomaterials, Metal Oxide Nanomaterials, Carbon-Based Nanomaterials, Silicon-Based Nanomaterials, Semi-conductive Nanomaterials, Polymeric Nanomaterials
4	Theoretical	Nanomaterials According to Morphology: Quantum Dots, Nanotubes, Nanowires, Nanorods, Nanostapms
5	Theoretical	The Significance of Nanomaterials in Enzyme Immobilization and Protein Purification
6	Theoretical	Use of Nanotechnology in Tissue Engineering
7	Theoretical	Biosensor Applications of Nanomaterials
8	Theoretical	Nanomaterials in Implants and Artificial Organs
9	Theoretical	Nanomaterials in Controlled Drug Release Systems
10	Theoretical	Midterm
11	Theoretical	Examples for Biotechnological Applications of Nanomaterials
12	Theoretical	Examples for Medical Applications of Nanomaterials
13	Theoretical	Examples for Environmental Applications of Nanomaterials
14	Theoretical	Student Presentation on Nanotechnology research
15	Theoretical	Student Presentation on Nanotechnology Research
16	Theoretical	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	3	42
Assignment	7	0	10	70
Midterm Examination	1	64	2	66

Final Examination	1	70	2	72
			Total Workload (Hours)	250
			[Total Workload (Hours) / 25*] = **ECTS**	10
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To learn the concept of nanobiotechnology
2	To have knowledge about the structures and functions of nanomaterials
3	To have knowledge about the applications of nanomaterials in controlled drug delivery systems
4	To have knowledge about the nanobiosensors
5	To have knowledge about the applications of nanomaterials in tissue engineering

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
P1	5	5	5	5	5
P2	4	4	4	4	4
P3	3	3	3	3	3
P5	4	4	4	4	4
P7	3	3	3	3	3