



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Nanobiotechnology							
Course Code		BYK521		Couse Level		Second Cycle (Master's Degree)			
ECTS Credit	3	Workload	75 (Hours)	Theory	2	Practice	0	Laboratory	0
Objectives of the Course		Learning the concepts of bionanotechnology and nanobiotechnology, understanding of nanotechnological products and their uses, comparison of bionanoimaging systems and researching bionanotechnological developments in professional fields							
Course Content		Nanotechnology applications in biomedicine, the future and use of nanobiotechnology in diagnosis and treatment of diseases, nano / molecular communication, molecular transport, hybrid structures of nano-materials and biological molecules in medical and biotechnological applications.							
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	40
Final Examination	1	60

### Recommended or Required Reading

1	Principles Of Nanotechnology Molecular-Based Study of Condensed Matter in Small Systems:G Ali Mansoori
2	Nanotechnology: Fundamentals And Applications:Manasi karkar

Week	Weekly Detailed Course Contents	
1	Theoretical	Bionanotechnology and Nanobiotechnology
2	Theoretical	Introduction to nanotechnology: Micro dimension and constraints, Definition and importance of nanoscale, Materials produced with nanotechnology
3	Theoretical	Nano-scale biological association in nature
4	Theoretical	Molecular and Chemical Basics of Interaction in Nanometric Biological Coalescence, Molecular Recognition and Formation of Biological Structures
5	Theoretical	Biological self-assembly merger and its application in nanotechnology
6	Theoretical	Nanomaterials inspired by nature
7	Theoretical	Bionanotechnology and application areas
8	Intermediate Exam	Quiz
9	Theoretical	Bionanotechnology and application areas
10	Theoretical	Bionano imaging (Use of biofunctional nanoparticles in Raman Spectroscopy and Surface Plasmon Spectroscopy)
11	Theoretical	Bionano imaging (Use of biofunctional nanoparticles in Raman Spectroscopy and Surface Plasmon Spectroscopy)
12	Theoretical	Applications of bionanotechnology in biological analysis, use of quantum particles in biological marking, usage of gold particles as biobarcode
13	Theoretical	Bionanotechnology and biomaterials
14	Theoretical	Bionanotechnological approaches in cancer treatment and stem cell applications
15	Theoretical	Future expansions of bionanotechnology and nanotoxicology

### Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	1	3	56
Assignment	1	3	16	19
Total Workload (Hours)				75
[Total Workload (Hours) / 25*] = ECTS				3

\*25 hour workload is accepted as 1 ECTS



**Learning Outcomes**

1	To understand the terms and applications of bionanotechnology and nanobiotechnology
2	To learn bionanomaterials and their types
3	To learn the usage and importance of bionanomaterials in occupational field
4	Understanding bionano imaging and its usage areas
5	Examination of current bionanobiotechnological developments and awareness of their usability in professional field

**Programme Outcomes** (*Biochemistry (Medical) Master*)

1	To have basic theoretical knowledge about biochemistry and to help understanding biochemistry
2	To have the basic laboratory knowledge, apparatus and methods used in biochemistry
3	Analysis: To be able to analyze information critically
4	Synthesis: To be able to synthesize and adapt the knowledge in the field from different directions
5	Evaluation: To critically evaluate research in the field

**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	4	5	5	5	5
P2	4	4	5	4	4
P3	5	5	4	5	5
P4	5	4	4	4	4
P5	4	4	4	4	4

