

Dentistry (English)			
Bachelor	TR-NQF-HE: Level 6	QF-EHEA: First Cycle	EQF-LLL: Level 6

Course Introduction and Application Information

Course Code:	UNI272		
Course Name:	Nanobiotechnology		
Semester:	Fall		
Course Credits:	<div>ECTS</div> <div>5</div>		
Language of instruction:	English		
Course Condition:			
Does the Course Require Work Experience?:	No		
Type of course:	University Elective		
Course Level:	<div>Bachelor</div> <div>TR-NQF-HE:6. Master`s Degree</div> <div>QF-EHEA:First Cycle</div> <div>EQF-LLL:6. Master`s Degree</div>		
Mode of Delivery:	E-Learning		
Course Coordinator:	Doç. Dr. PINAR ÇAKIR HATIR		
Course Lecturer(s):	Dr. Öğr. Üyesi Pinar ÇAKIR HATIR		
Course Assistants:			

Course Objective and Content

Course Objectives:	To give students the basic concepts of nanotechnology and to provide their understanding in biotechnology applications.
Course Content:	Introduction to Nanotechnology Carbon-Based Nanomaterials Fabrication of Nanomaterials

Classification of Nanomaterials
 Characterization of Nanomaterials
 Polymer Nanoparticles and Hydrogels
 Drug Delivery Systems
 Natural Nanomaterials and Biomimicry
 Nanobiosensors
 Nanobiomaterials
 Biolabeling
 Lab-on-a-Chip
 Microscopy
 Medical Applications of Nanobiotechnology

Learning Outcomes

The students who have succeeded in this course;

- 1) Understands the basic knowledge of nanobiotechnology.
- 2) Explains the use of nanomaterials in biotechnology and understands the importance of nanostructures in the design of biomaterials such as drug-carrying systems, artificial organs, and tissue scaffolds, etc.
- 3) Understands the importance of nanotechnology for biomedical applications.

Course Flow Plan

Week	Subject	Related Preparation
1)	Introduction to Nanotechnology	Literature search
2)	Carbon-Based Nanomaterials	Literature search
3)	Fabrication of Nanomaterials	Literature search
4)	Classification of Nanomaterials	Literature search
5)	Characterization of Nanomaterials	Literature search
6)	Polymer Nanoparticles and Hydrogels	Literature search
7)	Drug Delivery Systems	Literature search
8)	Natural Nanomaterials and Biomimicry	Literature search
9)	Nanobiosensors	Literature search
10)	Nanobiomaterials	Literature search
10)	Nanobiomaterials	Literature search
11)	Biolabeling	Literature search

12)	Lab-on-a-Chip	Literature search
13)	Microscopy	Literature search
14)	Medical Applications of Nanobiotechnology	Literature search

Sources

Course Notes / Textbooks:	Ders kitabı bulunmamaktadır.
References:	<p>1. Hall, J. S. (2005). What's next for nanotechnology. The futurist, 39(4), 28.</p> <p>2. Gazit, Ehud, and Anna Mitraki. Plenty of room for biology at the bottom: an introduction to bionanotechnology. World Scientific, 2013.</p> <p>3. Williams, L. ve Wade Adams, Dr. (2007) Nanotechnology Demystified.</p> <p>4. Goodsell, D. S. (2004). Bionanotechnology: lessons from nature. John Wiley & Sons</p> <p>5. Hatır, P. Ç. (2020). Biomedical Nanotechnology: Why “Nano”? In Biomedical and Clinical Engineering for Healthcare Advancement (pp. 30-65). IGI Global.</p>

Course - Program Learning Outcome Relationship

Course Learning Outcomes	1	2	3
Program Outcomes			
1) Has basic and up-to-date knowledge in the field of dentistry, follows scientific publications, and applies evidence-based data to his/her professional practice.			
2) Knows well and effectively uses devices, tools, and materials specific to diagnosis and treatment in the field of dentistry.			
3) Evaluates the knowledge in the field of dentistry critically, integrates it with the knowledge of disciplines in the field of health, uses it by analyzing and synthesizing it.			
4) Produces projects related to the field of dentistry, can work with other health disciplines, takes part as a member of the research team and evaluates and reports the results obtained at a scientific level.			
5) Uses information that will contribute to the dentistry profession during practice, takes responsibility, and produces solutions in unforeseen situations.			
6) Shares, compares, and exchanges dental knowledge with professional colleagues in social and scientific environments in written, verbal, and visual forms.			
7) Within the framework of social, scientific, and ethical values including patient privacy, communicates with patients and their relatives, knows all the characteristics of the patient, and recommends the most appropriate treatment with a patient-centered approach.			

8) Follows technological developments, participates in national and international studies, and shares and presents own observations, experiences, and research to further advance dental practices.	1	2	3
9) By adopting the principle of lifelong learning throughout the dentistry profession, follows current evidence-based dental knowledge and uses it during his professional practice.			
10) During dental practice, in cases such as abuse and addiction, performs the treatment by exhibiting the behaviors required by social ethics and legal rules, and collects and records the relevant data.			
11) Uses basic and current knowledge in the field of dentistry during professional practice for the benefit of society within the framework of national values and country realities.			
12) In natural disasters and emergency cases, takes the protective measures required by the dentistry profession; performs professional practices that benefit patients and society			
13) Generates ideas regarding health policy in dentistry, prioritizes individual and public health, and carries out preventive and therapeutic medical practices within the framework of scientific, ethical, and quality processes.			
14) Differentiates the signs and symptoms commonly encountered in the dentistry profession, makes a treatment plan and refers when necessary, and manages diseases and clinical situations regarding their urgency and patient priority.			
15) Can assume the leadership responsibility of the team he/she works for, manage it following scientific criteria, and support the professional development of the team.			

Course - Learning Outcome Relationship

No Effect	1 Lowest	2 Average	3 Highest

	Program Outcomes	Level of Contribution
1)	Has basic and up-to-date knowledge in the field of dentistry, follows scientific publications, and applies evidence-based data to his/her professional practice.	
2)	Knows well and effectively uses devices, tools, and materials specific to diagnosis and treatment in the field of dentistry.	
3)	Evaluates the knowledge in the field of dentistry critically, integrates it with the knowledge of disciplines in the field of health, uses it by analyzing and synthesizing it.	
4)	Produces projects related to the field of dentistry, can work with other health disciplines,	

	takes part as a member of the research team and evaluates and reports the results obtained at a scientific level.	
5)	Uses information that will contribute to the dentistry profession during practice, takes responsibility, and produces solutions in unforeseen situations.	
6)	Shares, compares, and exchanges dental knowledge with professional colleagues in social and scientific environments in written, verbal, and visual forms.	
7)	Within the framework of social, scientific, and ethical values including patient privacy, communicates with patients and their relatives, knows all the characteristics of the patient, and recommends the most appropriate treatment with a patient-centered approach.	
8)	Follows technological developments, participates in national and international studies, and shares and presents own observations, experiences, and research to further advance dental practices.	
9)	By adopting the principle of lifelong learning throughout the dentistry profession, follows current evidence-based dental knowledge and uses it during his professional practice.	
10)	During dental practice, in cases such as abuse and addiction, performs the treatment by exhibiting the behaviors required by social ethics and legal rules, and collects and records the relevant data.	
11)	Uses basic and current knowledge in the field of dentistry during professional practice for the benefit of society within the framework of national values and country realities.	
12)	In natural disasters and emergency cases, takes the protective measures required by the dentistry profession; performs professional practices that benefit patients and society	
13)	Generates ideas regarding health policy in dentistry, prioritizes individual and public health, and carries out preventive and therapeutic medical practices within the framework of scientific, ethical, and quality processes.	
14)	Differentiates the signs and symptoms commonly encountered in the dentistry profession, makes a treatment plan and refers when necessary, and manages diseases and clinical situations regarding their urgency and patient priority.	
15)	Can assume the leadership responsibility of the team he/she works for, manage it following scientific criteria, and support the professional development of the team.	

Assessment & Grading

Semester Requirements	Number of Activities	Level of Contribution
Quizzes	5	% 15
Presentation	1	% 15

Midterms	1	% 30
Final Sözlü	1	% 40
total		% 100
PERCENTAGE OF SEMESTER WORK		% 100
PERCENTAGE OF FINAL WORK		%
total		% 100

Workload and ECTS Credit Calculation

Activities	Number of Activities	Workload
Course Hours	12	24
Total Workload		24