Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Genetic and Bioengineering Department
2024-2025 Spring Semester

Syllabus

Code/Name	GBM 404 / Nanotechnology
Type	Required
Credit/ECTS	6/6
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/4
Semester	Spring
Classroom	D305
Content	Introduction to Bionanoscience and Bionanotechnology, Nanoscale materials and their nanoscale properties, Nanowires, nanoparticles, nanotubes, nanorobots, Nanomedicine, Nanocarriers for Controlled Release of Bioactive Compounds, Genomics and Bionanotechnology, Molecular Diagnostics and Bionanotechnology, Bionanofabrication and Bionanodevices, Nanoparticles, Molecular Recognition and Bioselective Bionanosensors and Bionanoelectronics.
Prerequisites	-
Textbooks	***Primary*** Bionanotechnology Principles and Applications by Anil Kumar Anal, Published September 30, 2020, by CRC Press ***Secondary*** Recent articles Scientific videos
Objectives	• To describe the importance of nanotechnology in bioengineering • To identify the design and characteristics of nanomaterials • To interpret biosensors and their applications
Course Outcomes	In this course you will be able to: CO1 Memorize the structure, properties, production, and applications of nanomaterials. CO2 Identify the fabrication methods in nanotechnology (bottom-up & top-down) CO3 Recognize the characterization methods in nanotechnology (optical, electrical, AFM, SEM, TEM, etc.) CO4 Explain the basics of the use of nanomaterials in biology CO5 Discuss the use of nanomaterials in ethical perspective

Weekly Schedule of Topics

W	Topic
1	Introduction to nanotechnology
2	Properties of nanomaterials
3	Top-down and bottom-up production methods
4	Biogenic production methods
5	Application in medicine and pharmacology
6	Application diagnostic-sensors
7	Application catalysis-energy
8	Carbon-based nanomaterials

9	Inorganic-based nanomaterials
10	Organic-based nanomaterials
11	Characterization techniques
12	Student Presentation (Targeted therapies from medical perspective, 3D printing to the nanoscale and Upconversion nanomaterials)
13	Student Presentation (Targeted therapies from medical perspective, 3D printing to the nanoscale and Upconversion nanomaterials)
14	Student Presentation (Targeted therapies from medical perspective, 3D printing to the nanoscale and Upconversion nanomaterials)

Professional Contribution	

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	5	4	5	4	5	3	3	5	4	4	5
CO2	5	4	5	4	5	3	3	5	4	4	5
CO3	5	5	5	4	5	3	3	5	4	4	5
CO4	5	3	3	3	4	3	1	2	4	4	5
CO5	0	1	0	0	1	5	5	2	4	5	5

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Special Conditions	Students work in groups for the presentations.
Requirements	Basic knowledge of biochemistry and biomaterials
Course Policy	• Be in the class on time. • English should always be used to communicate with one another. • At least 80% attendance is required, otherwise, a grade of **DZ** will be assigned. • You must be present in class for the presentations, otherwise you will not be graded.
Cheating & Plagiarism	• Copying or letting someone copy your work on exams, assignments, or reports is cheating. • Cutting and pasting text, figures, and tables from web sources or any other electronic source is plagiarism. • The consequence of academic dishonesty is to receive a grade of **FF** for the course.
Evaluation	Midterm 30% Presentation 20% Final Exam 50% Total 100%
Rubric	A rubric will be announced before the presentation sessions. The rubric has 2 main parts for the grading: technical assessment and writing or presentation performance.

Instructor

Name/Surname	Şurhan Göl	Email	surhan.gol@alanya.edu.tr
Room	3rd Floor	Office Hours	Wednesday 10:30-11:15

Prepared by Şurhan Göl on November 10th, 2024.