

**Syllabus**

<b>Code/Name</b>	GBM 404 / Nanotechnology
<b>Type</b>	Required
<b>Credit/ECTS</b>	6/6
<b>Hour per Week</b>	3 (3+0+0)
<b>Level/Year</b>	Undergraduate/4
<b>Semester</b>	Spring
<b>Classroom</b>	D306
<b>Content</b>	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.
<b>Prerequisites</b>	-
<b>Textbooks</b>	<b>Primary</b> Bionanotechnology Principles and Applications by Anil Kumar Anal, Published September 30, 2020, by CRC Press <b>Secondary</b> Recent articles Scientific videos
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• To understand importance of nanotechnology in bioengineering</li> <li>• To gain knowledge about design and characterize of nanomaterials</li> <li>• To interpret biosensors and their applications</li> </ul>
<b>Course Outcomes</b>	In this course you will be able to: CO1 Have knowledge about the structure, properties, production, and applications of nanomaterials. CO2 Design of fabrication methods in nanotechnology (bottom-up & top-down) CO3 Have knowledge about characterization methods in nanotechnology (optical, electrical, AFM, SEM, TEM, etc.)

**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	Midterm exam
9	Carbon-based nanomaterials
10	Inorganic-based nanomaterials

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**Mechanical Engineering Department**  
2023-2024 Spring Semester

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11	Organic-based nanomaterials
12	Characterization techniques
13	Student Presentation (Targeted therapies from medical perspective)
14	Student Presentation (3D printing to the nanoscale)
15	Student Presentation (Upconversion nanomaterials)
16	Final exam

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**Professional  
Contribution**

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**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

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

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<b>Special Conditions</b>	Students work in groups for the presentations.
<b>Requirements</b>	Basic knowledge of biochemistry and biomaterials
<b>Course Policy</b>	<ul style="list-style-type: none"><li>• Be in the class on time.</li><li>• English should always be used to communicate with one another.</li><li>• At least 80% attendance is required, otherwise, a grade of <b>DZ</b> will be assigned.</li><li>• You must be present in class for the presentations, otherwise you will not be graded.</li></ul>
<b>Cheating &amp; Plagiarism</b>	<ul style="list-style-type: none"><li>• Copying or letting someone copy your work on exams, assignments, or reports is cheating.</li><li>• Cutting and pasting text, figures, and tables from web sources or any other electronic source is plagiarism.</li><li>• The consequence of academic dishonesty is to receive a grade of <b>FF</b> for the course.</li></ul>
<b>Evaluation</b>	Midterm 30% Presentation 20% Final Exam 50% Total 100%
<b>Rubric</b>	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.

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**Instructor**

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Name/Surname	Şurhan Göl	Email	surhan.gol@alanya.edu.tr
Room	131	Office Hours	Tuesday 14:30-15:15 and Wednesday 10:30-11:15/15:30-16:15

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Prepared by Şurhan Göl on June 5th, 2024.