
	FACULTY OF ENGINEERING COURSE SYLLABUS FORM	Doküman Kodu	MF.FR.003
		Yayın Tarihi	06.09.2024
		Revizyon No	0
		Revizyon Tarihi	0
		Gizlilik Sınıfı	Hizmet içi

NE 415 – INDUSTRIAL APPLICATIONS OF NANOTECHNOLOGY				
Course Code	Course Name			Semester
NE 415	INDUSTRIAL APPLICATIONS OF NANOTECHNOLOGY			Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Summer <input type="checkbox"/>
Hours			Credit	ECTS
Theory	Practice	Lab	3	5
3	0	0		


Course Details	
Department	Nanotechnology Engineering
Course Language	English
Course Level	Undergraduate <input checked="" type="checkbox"/> Graduate <input type="checkbox"/>
Mode of Delivery	Face to Face <input checked="" type="checkbox"/> Online <input type="checkbox"/> Hybrid <input type="checkbox"/>
Course Type	Compulsory <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
Course Objectives	To provide students with comprehensive knowledge on how nanotechnology is applied across various industries, and to evaluate the opportunities, challenges, and future trends of nanotechnology in real-world applications.
Course Content	Overview of nanotechnology in industry; nanomaterials for coatings, electronics, and energy; nanotechnology in medicine and pharmaceuticals; applications in textiles, food, and agriculture; environmental nanotechnology; nanosafety and regulatory aspects; case studies from industrial sectors; commercialization pathways and future trends.
Course Method/ Techniques	Lecture <input checked="" type="checkbox"/> Question & Answer <input checked="" type="checkbox"/> Presentation <input checked="" type="checkbox"/> Discussion <input checked="" type="checkbox"/>
Prerequisites/ Corequisites	
Work Placement(s)	

	FACULTY OF ENGINEERING COURSE SYLLABUS FORM	Doküman Kodu	MF.FR.003
		Yayın Tarihi	06.09.2024
		Revizyon No	0
		Revizyon Tarihi	0
		Gizlilik Sınıfı	Hizmet içi

Textbook/References/Materials
Textbook: <ul style="list-style-type: none"> - Nanotechnology: Principles and Practices by Sulabha K. Kulkarni - Nanotechnology for the Energy Challenge by Javier García-Martínez - Selected review papers and case studies from industry journals and reports


Course Category				
Mathematics and Basic Sciences	<input type="checkbox"/>		Education	<input type="checkbox"/>
Engineering	<input checked="" type="checkbox"/>		Science	<input type="checkbox"/>
Engineering Design	<input type="checkbox"/>		Health	<input type="checkbox"/>
Social Sciences	<input type="checkbox"/>		Profession	<input type="checkbox"/>

Weekly Schedule		
No	Topics	Materials/Notes
1	Introduction to Industrial Nanotechnology	Overview, motivation
2	Nanomaterials: Types and Functional Properties	Nanoparticles, nanocomposites
3	Nanotechnology in Coatings and Surface Engineering	Industrial case studies
4	Applications in Electronics and Semiconductors	Nanoscale devices
5	Nanotechnology in Energy Sector	Solar, batteries, fuel cells
6	Medical and Pharmaceutical Applications	Drug delivery, diagnostics
7	Nanotechnology in Textiles and Packaging	Smart fabrics, barriers
8	Midterm Exam	
9	Food and Agriculture Applications	Nanocarriers, sensors
10	Environmental Nanotechnology	Water purification, remediation
11	Health, Safety and Risk Assessment	Toxicology, workplace safety
12	Regulatory and Ethical Issues	Global regulations
13	Commercialization and Patents	Tech transfer, IP
14	Case Studies from Industry	Nanotech companies
15	Future Trends and Emerging Markets	Forecast and innovation
16	Final Exam	

	FACULTY OF ENGINEERING COURSE SYLLABUS FORM	Doküman Kodu	MF.FR.003
		Yayın Tarihi	06.09.2024
		Revizyon No	0
		Revizyon Tarihi	0
		Gizlilik Sınıfı	Hizmet içi

Assessment Methods and Criteria		
In-term studies	Quantity	Percentage
Attendance		
Lab		
Practice		
Fieldwork		
Course-specific internship		
Quiz/Studio/Criticize		
Homework		
Presentation / Seminar	1	20%
Project		
Report		
Seminar		
Midterm Exam	1	30%
Final Exam	1	50%
	Total	100%
Contribution of Midterm Studies to Success Grade		50%
Contribution of End of Semester Studies to Success Grade		50%
	Total	100%

ECTS Allocated Based on Student Workload			
Activities	Quantity	Duration (Hrs)	Total Workload
Course Hours	14	3	42
Lab			
Practice			
Fieldwork			
Course-specific Work Placement			
Out-of-class study time	14	2	28
Quiz/Studio/Criticize			
Homework			
Presentation / Seminar	1	10	10
Project			
Report			
Midterm Exam and Preparation for Midterm	1	20	20
Final Exam and Preparation for Final Exam	1	25	25
Total Workload			125
Total Workload / 25			125/25
ECTS Credit			5

	FACULTY OF ENGINEERING COURSE SYLLABUS FORM	Doküman Kodu	MF.FR.003
		Yayın Tarihi	06.09.2024
		Revizyon No	0
		Revizyon Tarihi	0
		Gizlilik Sınıfı	Hizmet içi

Course Learning Outcomes	
No	Outcome
L1	Explain industrially relevant nanomaterials and their functional properties.
L2	Analyze applications of nanotechnology across different sectors such as energy, electronics, and healthcare.
L3	Evaluate benefits, limitations, and safety concerns related to industrial use of nanotechnology.
L4	Interpret key regulatory, environmental, and ethical issues in nanotechnology deployment.
L5	Examine case studies to assess commercialization strategies of nanotech innovations.

Contribution of Course Learning Outcomes to Program Competencies/Outcomes												
<i>Contribution Level: 1: Very Slight, 2: Slight, 3: Moderate, 4: Significant, 5: Very Significant</i>												
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	Total
L1	5	4	3	4	3	2	3	3	3	2	2	
L2	4	5	4	4	3	3	4	4	3	3	3	
L3	3	4	4	5	4	3	3	4	5	4	4	
L4	3	3	2	4	3	2	3	4	5	4	5	
L5	3	4	4	4	3	4	4	4	4	5	5	
Total												