



Dumlupınar University

Faculty of Engineering
Materials Science and Engineering

131918608 2D Nano-Sheets(Tech.Elec. VI)					
Semester	Course Code	Course Name	L+P	Credit	ECTS
8	131918608	2D Nano-Sheets(Tech.Elec. VI)	3	3	5

Language of Instruction:

Turkish

Course Level:

Faculty

Work Placement(s):

No

Department / Program:

Materials Science and Engineering

Course Type:

Seçmeli

Goals:

The aim of course is to pull attention of students to 2D nanosheets and to inform recently developments about this type of nanomaterials.

Teaching Methods and Techniques:

With this course, the students will be informed about the definition of 2D materials as well as their synthesis and characterization methods.

Prerequisites:

Course Coordinator:

Associate Prof.Dr. Hilmi YURDAKUL

Instructors:

Associate Prof.Dr. Hilmi YURDAKUL

Assistants:

Recommended Sources

Textbook	: 1.Nanotubes and Nanosheets: Functionalization and Applications of Boron Nitride and Other Nanomaterials, by Ying (Ian) Chen, Feb 24, 2015
Resources	: 2.Graphene: Fundamentals and emergent applicationsDec 25, 2012 by Jamie H. Warner and Franziska Schaffel
Documents	: 3.Two-Dimensional Carbon: Fundamental Properties, Synthesis, Characterization, and Applications (Pan Stanford Series...Apr 9, 2014 by Wu Yihong
Assignments	: Graphene Science Handbook: Nanostructure and Atomic ArrangementMay 3, 2016 by Mahmood Aliofkhazraei and Nasar Ali
Exams	: Web sayfasına PDF formatında yüklenecektir Ders sırasında verilecektir

Course Category

Mathematics and Basic Sciences	: 25	Education	:	
Engineering	: 25	Science	:	25
Engineering Design	: 25	Health	:	
Social Sciences	:	Field	:	

Course Content

Week	Topics	Study Materials	Materials
1	The definition of 1D, 2D and 3D dimensions		
2	Why are required to 2D materials		
3	First 2D material and its history		
4	What is graphene?		
5	The production routes of graphene		
6	Examination of mechanical and thermal properties of graphene		
7	Examination of electrical and optic properties of graphene		
8	Introduction to inorganic graphene-type 2D materials		
9	Midterm exam		
10	Production routes of inorganic graphene-type 2D materials		
11	Examination of electrical and optic properties of inorganic graphene-type 2D materials		
12	Examination of electrical and optic properties of electrical and optic properties of graphene		
13	The characterization of 2D materials via microscopic techniques		
14	The characterization of 2D materials via non-microscopic techniques		

Recommended Optional Programme Components

131917133 Nanomaterials

131918135 Material Characterization

131915503 Malzeme Biliminde Elektron Mikroskopları

Course Learning Outcomes

No Learning Outcomes

C01	At the end of this course, the student; 1. Defines the organic and inorganic based 2D materials.
C02	2. Can be answered following questions: What is 2D materials? What is graphene? What is the graphene's production methods? What is the inorganic-based materials to analogous of
C03	3. Can be learned to response the following questions: What are the common production methods of 2D based organic and inorganic materials? How can be produced 2D materials ch

Program Learning Outcomes

No Learning Outcome

P01	Engineering graduates with sufficient theoretical and practical background for a successful profession and with application skills of fundamental scientific knowledge in the engineering practiced
P03	Engineering graduates with the necessary technical, academic and practical knowledge and application confidence in the design and assessment of machines or mechanical systems or industrial pro
P02	Engineering graduates with skills and professional background in describing, formulating, modeling and analyzing the engineering problem, with a consideration for appropriate analytical solutions in
P05	Ability of designing and conducting experiments, conducting data acquisition and analysis and making conclusions
P06	Ability of identifying the potential resources for information or knowledge regarding a given engineering issue
P04	Engineering graduates with the practice of selecting and using appropriate technical and engineering tools in engineering problems, and ability of effective usage of information science Technologies
P10	Engineering graduates with well-structured responsibilities in profession and ethics
P08	Ability for effective oral and official communication skills in Turkish Language and, at minimum, one foreign language
P07	The abilities and performance to participate multi-disciplinary groups together with the effective oral and official communication skills and personal confidence
P13	Having enough level of general culture (Mother language, foreign languages, history etc)
P12	Consciousness for the results and effects of engineering solutions on the society and universe, awareness for the developmental considerations with contemporary problems of humanity
P11	Engineering graduates who are aware of the importance of safety and healthiness in the project management, workshop environment as well as related legal issues
P09	Engineering graduates with motivation to life-long learning and having known significance of continuous education beyond undergraduate studies for science and technology

Assessment		
In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	0	%20
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%60
Total		%100

ECTS Allocated Based on Student Workload			
Activities	Quantity	Duration	Total Work Load
Course Duration	16	3	48
Hours for off-the-c.r.stud	16	3	48
Assignments	1	1	1
Presentation	0	0	0
Mid-terms	1	30	30
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	30	30
Total Work Load			157
ECTS Credit of the Course			5

Course Contribution To Program														
Contribution: 1: Very Slight 2:Slight 3:Moderate 4:Significant 5:Very Significant														
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	
All	5	4	5	3	3	5	4	5	4	4	3	4	5	
C01	5	4	5	3	3	5	4	5	4	4	3	4	5	
C02	5	4	5	3	3	5	4	5	4	4	3	4	5	
C03	5	4	5	3	3	5	4	5	4	4	3	4	5	