ABDULLAH GÜL UNIVERSITY
GRADUATE SCHOOL OF ENGINEERING & SCIENCE
ADVANCED MATERIALS AND NANOTECHNOLOGY PROGRAM
COURSE DESCRIPTION AND SYLLABUS

Course Title	Code	Semester	T+L Hours	Credit	ECTS
NANOSCIENCE AND NANOTECHNOLOGY	AMN-502	FALL	3 + 0	3	10

Prerequisite Courses	none

Type	Compulsory
Language	English
Coordinator	Asst. Prof. Ali Duran
Instructor	Asst. Prof. Ali Duran
Adjunt	none
Aim	This course aims to raise awareness about nano term, and present the fundamentals, present and future potentials of nanoscience and the latest developments in nano scale materials and devices.
Learning Outcomes	• Learning fundamentals of nanotechnology and nanomaterials. • Learning the basics of nanocharacterization. • Learning recent applications of nanotechnology. • Having general knowledge for choosing proper processes, materials and technology for nanofabrication.
Course Content	• Introduction to nanoscience and nanotechnology • General survey of nanoscience and nanotechnology • Physical and chemical properties of nanomaterials • Nanowires • Synthesis of nanomaterials • Characterization of nanomaterials • Introduction to nanosystems and nanodevices • Carbon nanotubes • Environmental applications • Nanofabrication techniques • Nano news • Recent applications of nanotechnology

WEEKLY TOPICS AND PRELIMINARY STUDY

Week	Topic	Preliminary Study
1	Introduction to nanoscience and nanotechnology	Lecture Notes and Slides, The Relevant Articles from the Literature
2	General survey of nanoscience and nanotechnology	Lecture Notes and Slides, The Relevant Articles from the Literature
3	Physical and chemical properties of nanomaterials	Lecture Notes and Slides, The Relevant Articles from the Literature
4	Nanowires	Lecture Notes and Slides, The Relevant Articles from the Literature
5	LFW	
6	Synthesis of nanomaterials	Lecture Notes and Slides, The Relevant Articles from the Literature
7	Characterization of nanomaterials	Lecture Notes and Slides, The Relevant Articles from the Literature
8	Mid Term Exam Week	
9	Spring Break	
10	Introduction to nanosystems and nanodevices	Lecture Notes and Slides, The Relevant Articles from the Literature
11	Carbon nanotubes	Lecture Notes and Slides, The Relevant Articles from the Literature

12	Environmental applications	Lecture Notes and Slides, The Relevant Articles from the Literature
13	Nanofabrication techniques	Lecture Notes and Slides, The Relevant Articles from the Literature
14	Nano news	Lecture Notes and Slides, The Relevant Articles from the Literature
15	Recent applications of nanotechnology	Lecture Notes and Slides, The Relevant Articles from the Literature
16	Final Exam Week	Final Exam

SOURCES	
Lecture Notes	Lecture Notes and Slides The Relevant Articles from the Literature
Other Sources	**Course Textbook:** 1. Ventra M.Di., S. Evoy, J.R.H. Jr. (2004), Introduction to Nanoscale Science and Technology, Springer Science + Business Media, Inc. **Additional Materials:** 1. Bhusban, B. (2010), Springer Handbook of Nanotechnology, Springer Handbooks. 2. Cui, Z. (2008), Nanofabrication: Principles, Capabilites and Limits, Springer.

COURSE MATERIALS SHARING	
Documents	Lecture notes, slides and relevant articles from the literature
Group project assignments & presentation	Students will be given 1 assignment
Exams	1 Midterm and 1 Final Exam

EVALUATION SYSTEM		
SEMESTER STUDY	**NUMBER**	**CONTRIBUTION (%)**
Midterm	1	25
Group project assignments & presentation	1	25
SUB-TOTAL		50
Contribution of Semester Study		50
Contribution of Final Exam	1	50
TOTAL		100

Course Category	
Sciences and Mathematics	20%
Engineering	80%
Social Sciences	0%

RELATIONSHIPS BETWEEN LEARNING OUTCOMES AND PROGRAM QUALIFICATIONS							
No	Program Qualifications	Contribution Level				
		1	2	3	4	5
1	Accessing knowledge, evaluating and interpreting information by doing scientific research in the field of Advanced Materials and Nanotechnology					x
2	Ability to use science and engineering knowledge for development of new methods in Advanced Materials and Nanotechnology					x
3	To be able to understand and analyze materials by using basic knowledge on Advanced Materials and Nanotechnology					x
4	Design and implement analytical, modeling and experimental research					x
5	Solve and interpret the problems encountered in experimental research					x
6	Considering scientific and ethical values during the collection and interpretation of data				x	
7	Integrating knowledge of different disciplines with the help of scientific methods, and			x		

	completion and implementation of scientific knowledge using data					
8	To gain leadership ability and responsibility in disciplinary and interdisciplinary team works					x
9	To be able to contribute to the solution of social, scientific and ethical problems encountered in the field of Advanced Materials and Nanotechnology					x
10	To be able to define, interpret and create new information about the interactions between various discipline of Advanced Materials and Nanotechnology					x

*Increasing from 1 to 5.

ECTS / WORK LOAD TABLE			
Activities	Number	Duration (Hours)	Total Work Load
Course Length (includes exam weeks: 16x total course hours)	16	3	48
Out-of-class Study Time (Pre-study, practice)	16	6	96
Internet search, library work, literature search	16	5	80
Presentation	1	26	26
Midterm	1	25	25
Final Exam	1	25	25
Total Work Load			300
Total Work Load / 30			300/30
Course ECTS Credit			10