YEDİTEPE UNIVERSITY
FACULTY OF ENGINEERING

COURSE DESCRIPTION FORM
2019/2020-1

COURSE INFORMATON				
Course Code	**MSN 532**	**Course Title**	**Selected Topics in Materials Science and Nanotechnology**	
Semester	*Credits*	*ECTS*	*C +P + L Hour*	Prerequisites
Fall	3	10	3+0+0	-

Language of Instruction	**Course Level**	**Course Type**
English	Graduate	Elective

Course Coordinator	Asst. Prof. Dr. Nebahat ARAL
Instructors	Asst. Prof. Dr. Nebahat ARAL
Assistants	-
Goals	The goal of the course is to give information about new developments and special topics in materials science and nanotechnology. It is aimed to gain knowledge about the recently prominent research areas and selected research topics.
Content	Selected topics in materials science and nanotechnology will be evaluated by doing research and discussing. With the participation of experts/researchers, it will be possible to consolidate the knowledge. Besides, research studies and scientific articles on the subjects will be shared and discussed. In addition to that, students are expected to present their literature suvey about the selected topics.
Contribution of the Course to the Professional Education	Students will be able to use their knowledge in future research and development studies by having a vision on recent topics of research in materials science and nanotechnology.

Course Learning Outcomes	**Detailed Program Outcomes**	**Teaching Methods**	**Assessment Methods**
To obtain information about current selected research topics. To be able to evaluate the basic knowledge, applications, and scientific studies on the subject.	1a, 6c, 8a	1, 2, 6	A
To consolidate their knowledge by attending seminars of experts/scientist about selected field.	8a, 11b	9	A
To be able to prepare a literature survey on a research topic. To acquire the ability to convey knowledge through presentation.	7d	6	G

Teaching Methods:	1: Lecture by instructor, 2: Lecture by instructor with class discussion, 3: Problem solving by instructor, 4: Use of simulations, 5: Problem solving assignment, 6: Reading assignment, 7: Laboratory work, 8: Term research paper, 9: Presentation by guest speaker, 10: Sample Project Review, 11: Interdisciplinary group working, 12: …
Assessment Methods:	A: Written exam, B: Multiple-choice exam C: Take-home quiz, D: Experiment report, E: Homework, F: Project, G: Presentation by student, H: …

COURSE CONTENT

Week	Topics	Study Materials
1	Introduction	Textbook-Lecture Notes
2	Recent Developments in Materials Science	Textbook-Lecture Notes
3	Recent Developments in Nanotechnology	Textbook-Lecture Notes
4	Smart Materials	Textbook-Lecture Notes
5	Invited Speaker - Smart Materials	-
6	Nanofibers: Production and Applications	Textbook-Lecture Notes
7	Invited Speaker - Nanofibers	-
8	Midterm I	Textbook-Lecture Notes
9	Polymers and Biomaterials	Textbook-Lecture Notes
10	Invited Speaker - Polymers and Biomaterials	-
11	Materials and the Environment	Textbook-Lecture Notes
12	Invited Speaker - Materials and the Environment	-

13	Term Project Presentation	-
14	Term Project Presentation	-
15	Final	Textbook- Lecture Notes

RECOMMENDED SOURCES	
Textbook	Ashby, M. F. (2012). Materials and the environment: eco-informed material choice. Elsevier. Rachid Bouhfid, Abou el Kacem Qaiss, Mohammad Jawaid (2020) Polymer NanocompositeBased Smart Materials From Synthesis to Application, Elsevier.
Additional Resources	

MATERIAL SHARING	
Documents	
Assignments	
Exams	

ASSESSMENT		
IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Midterm I	1	20
Term Project	1	40
Total		**60**
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		40
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		60
Total		**100**

COURSE CATEGORY	Field Course

COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES		
No	Program Learning Outcomes	check √
1a	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline,	√
1b	Ability to use theoretical and applied knowledge in these areas in complex engineering problems.	
2a	Ability to identify, formulate, and solve complex engineering problems,	
2b	Ability to select and apply proper analysis and modeling methods for this purpose.	
3a	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result,	
3b	Ability to apply modern design methods for this purpose.	
4a	Ability to devise, select and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice.	
4b	Ability to employ information technologies effectively.	
5a	Ability to design experiments for investigating complex engineering problems or discipline specific research questions,	
5b	Ability to conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions.	
6a	Ability to work efficiently in intra-disciplinary teams,	
6b	Ability to work efficiently in multi-disciplinary teams,	
6c	Ability to work individually.	√
7a	Ability to communicate effectively in Turkish, both orally and in writing,	
7b	Knowledge of a minimum of one foreign language,	
7c	Ability to write effective reports and comprehend written reports, prepare design and production reports,	
7d	Ability to make effective presentations,	√
7e	Ability to give and receive clear and intelligible instructions.	
8a	Recognition of the need for lifelong learning, ability to access information, ability to follow developments in science and technology,	√
8b	Ability to continue to educate him/herself.	
9a	Consciousness to behave according to ethical principles and professional and ethical responsibility.	
9b	Knowledge on standards used in engineering practice.	
10a	Knowledge about business life practices such as project management, risk management, change management.	
10b	Awareness in entrepreneurship and innovation.	

10c	Knowledge about sustainable development.	
11a	Knowledge about the global and social effects of engineering practices on health, environment, and safety,	
11b	Knowledge about contemporary issues of the century reflected into the field of engineering.	√
11c	Awareness of the legal consequences of engineering solutions.	

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION

Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration	14	3	42
Hours for off-the-classroom study (Pre-study, practice)	14	8	112
Midterm I	1	12(10+2)	12
Term Project	1	60	60
Final	1	15 (2+13)	15
Total Work Load			241
Total Work Load / 25 (h)			9,64
ECTS Credit of the Course			10

Prepared by: Asst. Prof. Dr. Nebahat ARAL	Preparation date: 15/12/2020