



COURSE INFORMATION				
Course Code	MSN 524	Course Title	Surface Technologies and Functional Surfaces	
<i>Semester</i>	<i>Credits</i>	<i>ECTS</i>	<i>C + P + L Hour</i>	<i>Prerequisites</i>
Spring	3	10	3 + 0 + 0	-

Language of Instruction	Course Level	Course Type
English	Graduate	Elective
Course Coordinator	Assoc Prof Dr Ahmet TURAN	
Instructors	Assoc Prof Dr Ahmet TURAN	
Assistants	-	
Goals	To give deep understanding about the surfaces of metallic, ceramics and polymeric materials, surface coating techniques and surface characterization methods.	
Content	Surface properties of materials; Surface and surrounding interaction (friction, wear and corrosion); Advanced surface coating technologies; Advances in thermo-chemical heat treatment methods; Advanced Surface characterization methods.	
Contribution of the Course to the Professional Education	Course will give deeper understanding in surface technologies and functional surfaces to graduate students from various backgrounds. Course will help students to learn and compare various surface manipulation methods.	

Course Learning Outcomes	Detailed Program Outcomes	Teaching Methods	Assessment Methods
Ability to describe surfaces of engineering materials and their interaction with the surface and the environment.	1a, 1b	1, 2, 3	A, G
Ability to describe surface protection (coating and manipulation) and characterization of surfaces.	1a, 1b, 2a, 2b, 4a	1, 2, 3	A, 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 to surface science and engineering	Books and lecture notes
2	A brief introduction to tribology	Books and lecture notes
3	Fundamentals of corrosion	Books and lecture notes
4	Advanced surface coating technologies	Books and lecture notes
5	Advanced surface coating technologies	Books and lecture notes
6	Advanced surface coating technologies	Books and lecture notes
7	Advanced surface coating technologies	Books and lecture notes
8	Advanced surface coating technologies	Books and lecture notes
9	Advances in thermochemical heat treatments	Books and lecture notes
10	Advances in thermochemical heat treatments	Books and lecture notes
11	Student presentations	Books and lecture notes
12	Student presentations	Books and lecture notes
13	Student presentations	Books and lecture notes
14	Student presentations	Books and lecture notes
15	Final Exam	Books and lecture notes

RECOMMENDED SOURCES	
Textbook	ASM Metals Handbook: Vol. 5 Surface Engineering, ASM International, 1994.
Additional Resources	Lecture notes and recommended books

MATERIAL SHARING	
Documents	Lecture notes, articles, book
Assignments	Presentations
Exams	Final exam



ASSESSMENT		
IN-TERM STUDIES	NUMBER	PERCENTAGE
Term presentation	1	60
Final exam	1	40
Total		100
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 (lectures)	14	3	42
Off-the-classroom study (prep., and review)	14	6	84
Presentation	1	3	3
Off-the-classroom study for presentation	1	60	60
Off-the-classroom study for the final exam	1	57	57
Final exam	1	3	3
Total Work Load			249



Total Work Load / 25 (h)			9.96
ECTS Credit of the Course			10

Prepared by: Assoc Prof Dr Ahmet TURAN	Preparation date: 24 October 22
--	---------------------------------