ESOGU CIVIL ENGINEERING DEPARTMENT

COURSE INFORMATION FORM

Course Name	Course Code
MATERIALS SCIENCE	**151413552**

Semester	Number of Course Hours per Week		ECTS
	Theory	Practice	
3	3	0	4

Course Category (Credit)				
Basic Sciences	**Engineering Sciences**	**Design**	**General Education**	**Social**
1	3			

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

Prerequisite(s) if any	
Objectives of the Course	To explain the effect of microstructure and the microstructure of materials classified material, crystalline and amorphous structures, introduce mechanical properties of the material to teach the material to teach the physical and chemical properties of the material, water and heat insulation, sound effect, radiation, oxidation and corrosion resistance to external influences, such as harmful and harmful waters give information about the effects of the weather, introducing of metals, ceramics, polymers.
Short Course Content	Interatomic bonding, material microstructure, the effect of microstructure classified material, crystalline and amorphous structures, materials, mechanical properties, physical and chemical properties of materials, technical specifications, materials, water and heat insulation, sound effect, radiation, oxidation and corrosion resistance to external influences, such as the harmful waters and the effects of polluted air, metals, ceramics and polymers.

	Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Knows the microstructure of the material	1, 7	1,2,3,5,6,10	A, D
2	Knows crystal structure and amorphous structures	2, 3	1,2,5,6,10	A, D
3	Knows the mechanical properties of materials	4, 9	1,2,5,6,10	A, D
4	Knows the technological properties of materials	5, 6	1,2,3,5,6,10	A, D
5	Knows the physical properties of materials	5, 6	1,2,3,5,6,10	A, D
6	Recognizes the materials commonly used in civil engineering	8, 10, 11	1,2,5,6	A
7				
8				

***Teaching Methods** **1:**Expression, **2:**Discussion, **3:**Experiment, **4:**Simulation, **5:**Question-Answer, **6:**Tutorial, **7:**Observation, **8:**Case Study, **9:**Technical Visit, **10:**Trouble/Problem Solving, **11:**Induvidual Work, **12:**Team/Group Work, **13:**Brain Storm, **14:**Project Design / Management, **15:**Report Preparation and/or Presentation

****Measuring Methods** **A:**Exam, **B:**Quiz, **C:**Oral Exam, **D:**Homework, **E:**Report, **F:**Article Examination, **G:**Presentation, **I:**Experimental Skill, **J:**Project Observation, **K:**Class Attendance; **L:**Jury Exam

Main Textbook	**Malzeme Bilimi, Prof. Dr. Kaşif ONARAN, Bilim Teknik Yayınevi, 1993.**
Supporting References	Malzeme Bilimi, Prof. Dr. Kaşif ONARAN, Bilim Teknik Yayınevi, 1993. Malzeme Bilimi Prob. ve Çözümleri, Prof. Dr. Kaşif ONARAN, Bilim Teknik Yay, 1993. Malzeme Bilimi Ders Notları, Prof. Dr. Ferruh KOCATAŞKIN, İ.T.Ü. İnş. Fak. Matbaası. Cisimlerin Yapısı ve Özelikleri, Prof. Bekir POSTACIOĞLU, İ.T.Ü. Yayını, 1981. Malzemelerin Yapı ve Özelikleri, Cilt I, İç Yapılar, Cilt III, Mekanik Özelikler, Yazanlar: Moffatt, Pearsall ve Wulff, Çevirenler: K. Onaran ve B. Erman, İTÜ Yayını, 1982 ve 1978. Civil Engineering Materials, Ed. N. Jackson, 1984. The Nature and Properties of Engineering Materials, Zbigniev D. Jastrazebski, 1987. Yapı Mühendislerine Malzeme Bilimi, Prof. Dr. Ferruh KOCATAŞKIN, 1976.
Necessary Course Material	

Course Schedule	
1	Microstructure
2	Crystalline and Amorphous Structures
3	Mechanical properties of materials
4	Mechanical properties of materials
5	Physical and chemical properties of materials
6	Physical and chemical properties of materials
7	Thermal properties
8	Mid-Term Exam
9	Technological properties of materials
10	Technological properties of materials
11	Acoustic properties
12	Durability of materials
13	Metals
14	Ceramics and polymers
15	Composite materials
16,17	Final Exam

Calculation of Course Workload			
Activities	**Number**	**Time (Hour)**	**Total Workload (Hour)**
Course Time (number of course hours per week)	14	3	42
Classroom Studying Time (review, reinforcing, prestudy,….)	14	2	28
Homework	2	10	20
Quiz Exam	1	0	0
Studying for Quiz Exam	1	0	0
Oral exam	1	0	0
Studying for Oral Exam	1	0	0
Report (Preparation and presentation time included)	1	0	0
Project (Preparation and presentation time included)	1	0	0
Presentation (Preparation time included)	1	0	0
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	15	15
Final Exam	1	3	3
Studying for Final Exam	1	10	10
		Total workload	**120**
		Total workload / 30	**4**
		Course ECTS Credit	**4**

Evaluation	
Activity Type	**%**
Mid-term	40
Quiz	
Homework	10
Bir öğe seçin.	
Bir öğe seçin.	
Final Exam	50
Total	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	Contribution
1	Sufficient knowledge of engineering subjects related with mathematics, science and civil engineering; an ability to apply theoretical and practical knowledge on solving and modeling	4
2	Ability to determine, define, formulate and solve complex civil engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.	3
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for	3
4	Ability to develop, select and use modern methods and tools required for civil engineering applications; ability to effective use of information technologies.	3
5	In order to investigate civil engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.	4
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.	2
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language.	2
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.	3
9	Understanding of professional and ethical issues and taking responsibility	3
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.	3
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering	4

LECTUTER(S)				
Prepared by	Prof. Dr.İlker Bekir TOPÇU	Assoc.Prof.Dr.Mehmet CANBAZ		
Signature(s)				

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