

COURSE DESCRIPTION FORM	
<b>Course Code and Title</b>	CE285 GENERAL MATERIALS SCIENCE
<b>Semester</b>	3
<b>Catalog description</b>	Introduction to micro structures and atoms, Classification of materials, Interatomic bonds, Structures of crystals, Non-crystalized materials, Crystal imperfections -1, Crystal imperfections -2, Mechanical properties -1, Mechanical properties -2, Elastic and plastic deformation -1, Elastic and plastic deformation -2, Dislocations and strengthening mechanisms hardness, Impact, Rapture of materials and fracture mechanics, Creep and fatigue, Structure of polymers with its features and applications
<b>Required reading</b>	W. D. Callister, Materials Science and Engineering: An Introduction
<b>Recommended reading</b>	1) John Wiley James F. Shackelford, Introduction to Materials Science For Engineers, Prentice Hall. 2) KaşifOnaran, MalzemeBilimi, İTÜ yayınları
<b>ECTS</b>	3
<b>Prerequisites and co-requisites</b>	No prerequisite Required attendance to lectures is at least 70%
<b>Compulsory/Elective</b>	Technical course
<b>Language of instruction</b>	English
<b>Aim of course</b>	To give fundamental principles about the structural materials and its application at the fields.
<b>Learning outcomes of the course unit</b>	<ol style="list-style-type: none"> <li>1. Identifying the materials utilized in engineering applications</li> <li>2. Learning common features of the materials frequently used in fields.</li> <li>3. Having the ability of selection between different materials, required for specific engineering applications, by means of engineering knowledge</li> </ol>
<b>Mode of delivery</b>	The mode of delivery of this course is face to face.
<b>Course content</b>	<ol style="list-style-type: none"> <li>1.Introduction to micro structures and atoms and classification of materials</li> <li>2.Interatomic bonds</li> <li>3.Structures of crystals and non-crystalized materials</li> <li>4.Crystal imperfections -1</li> <li>5. Crystal imperfections -2</li> <li>6.Mechanical properties-1</li> <li>7.Mechanical properties-2 and Midterm 1</li> <li>8. Elastic and plastic deformation-1</li> <li>9. Elastic and plastic deformation-2</li> <li>10. Dislocations and strengthening mechanisms hardness</li> <li>11. Midterm 2</li> </ol>

	<b>12. Impact</b> <b>13. Rapture of materials and fracture mechanics</b> <b>14. Creep and fatigue</b> <b>15. Structure of polymers with its features and applications</b>									
<b>Planned learning activities and teaching methods</b>	2 lecture hours per week (2+0) Design and implementation of material Presentation Midterm exam and required works Final exam and required works									
<b>Assessment methods and criteria</b>		Quantity			Percentage (%)					
	Mid-terms	2			45					
	Assignment	4			15					
	Exercises	-			-					
	Projects	-			-					
	Practice	-			-					
	Quiz	-			-					
	Contribution of In-term Studies to Overall Grade %				60					
	Contribution of Final Examination to Overall Grade (%)				40					
	Attendance									
<b>Workload</b>	<b>Efficiency</b>		<b>Total Week Count</b>		<b>Weekly Duration (in hour)</b>		<b>Total Workload in Semester</b>			
	Theoretical Study Hours of Course Per Week		14		2		28			
	Practicing Hours of Course Per Week		14		0		0			
	Reading		14		0		0			
	Searching in Internet and Library		14		0		0			
	Designing and Applying Materials		14		1		14			
	Preparing Reports		14		1		0			
	Preparing Presentation		14		0		0			
	Presentation		14		1		14			
	Mid-Term and Studying for Mid-Term		2		10		20			
	Final and Studying for Final		1		10		10			
	Other		0		0		0			
	Total Workload:						86			
	Total Workload / 25:						3.44			
	ECTS:						3			
<b>Course's contribution to program</b>	No	Program Learning Outcomes				1	2	3	4	5
	1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied knowledge in these areas in complex engineering problems.							X	
	2	Ability to identify, formulate, and solve complex civil engineering problems;							X	

		ability to select and apply proper analysis and modeling methods for this purpose.					
	3	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; ability to apply modern design methods for this purpose.				X	
	4	Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in civil engineering practice; ability to employ information technologies and to use at least one computer programming language effectively.		X			
	5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex civil engineering problems or discipline specific research questions.		X			
	6	Ability to work efficiently in intra-disciplinary and multi-disciplinary teams.	X				
	7	Ability to work individually.					X
	8	Ability to communicate effectively in Turkish, both orally and in writing; ability to write effective reports and comprehend written reports.	X				
	9	Knowledge of English of B1 level according to Common European Framework of Reference.			X		
	10	Prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions.			X		
	11	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.		X			
	12	Consciousness to behave according to ethical principles and professional and ethical responsibility.			X		
	13	Knowledge on standards used in civil engineering practice.			X		
	14	Knowledge about business life practices such as project management, risk management, and change management.	X				
	15	Awareness in entrepreneurship, innovation; knowledge about sustainable development.	X				
	16	Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering.		X			
	17	Awareness of the legal consequences of engineering solutions.	X				
<b>Name of lecturer(s) and contact information</b>		Prof. Dr. Abdussamet ARSLAN, <a href="mailto:aarslan@gazi.edu.tr">aarslan@gazi.edu.tr</a>					