

#### AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Materials Technology									
Course Code		MKE156		Couse Level		Short Cycle (Associate's Degree)					
ECTS Credit 5 Workload 125 (Hours)		Theory	y	3	Pract	ice	1	Laboratory	0		
Objectives of the Course		To know the to design for the interpret the F	ypes of mater user to select e-C equilibriu	ials use t the mo m diagra	d in ir ost su am, h	ndustrial a itable mate ardened s	rea, un erials. I steel, a	iderstand Materials nd to be	d the basic chasic chasic chasic chasify, mici informed abo	aracteristics, loca ostructure recogut the standards.	ation and nize,
Course Content		Recognize an atomic structu nonferrous me area of non-fe location. To k	d classify the ires and arran etals, solidifica rrous metals now the stand	materia gement ation-me and allo lards of	lls use t of m elting. bys are steel.	ed in indus aterials. Fo Iron and o e widely us	stry. To or indu carbon sed to	underst stry to in alloys, t recogniz	and the basic iterpret the be by allowing his ie the user to o	information about havior of iron and interpretation. In choose according	ut the d ndustrial g to their
Work Placement		N/A									
Planned Learning Activities and Teaching Meth		Methods	Explan	nation	(Presenta	tion), I	Experime	ent, Demonstr	ation, Individual	Study	
Name of Lecturer(s)		Ins. Alpaslan	BAŞARIK								

Assessment Methods and Criteria						
Method	Quantity	Percentage (%)				
Midterm Examination	1	40				
Final Examination	1	60				

### **Recommended or Required Reading**

1 A. Başarık -Malzeme Teknolojisi Ders Notları

Week	Weekly Detailed Cours	e Contents
1	Theoretical & Practice	Materials used in technical field, Basic concepts about atomic structure, Basic concepts about solidification and melting
2	Theoretical & Practice	Solidification and cooling curves of pure and alloyed metals, Dendrite and grain formation during solidification Crystal defects
3	Theoretical & Practice	Pure metal, Intermediate phase or compound and solid solution, Standard representations of alloy steels
4	Theoretical & Practice	Alloys that are soluble in each other in the liquid state, partially soluble and not dissolving in liquid and solid state, Solid state transformations
5	Theoretical & Practice	Cooling curve and allotropic change of pure iron, Transformation in iron cementite phase diagram and iron cementite phase diagram
6	Theoretical & Practice	Smoothing anneal, Normalization anneal, Spherizing anneal, Stress relieving anneal
7	Theoretical & Practice	Hydration hardening, Martensitic structure, Isothermal conversion diagrams, Tempering
8	Theoretical & Practice	Carburizing surface hardening, Nitriding surface hardening, Flame surface hardening, Induction hardening - MIDTERM EXAM (MIDTERM)
9	Theoretical & Practice	Elastic, plastic deformation and fracture
10	Theoretical & Practice	Sample collection, molding, grinding and polishing, etching, structural evaluation with microscopes and microscope
11	Theoretical & Practice	The tensile elongation curve obtained after the tensile test
12	Theoretical & Practice	Hardness measurement methods, Breaking energy after impact test S-N diagram after fatigue test
13	Theoretical & Practice	Visual inspection method, Penetrant fluid inspection method, Ultrasonic inspection method
14	Theoretical & Practice	X-ray examination method, Magnetic examination method

### **Workload Calculation**

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	3	42
Lecture - Practice	14	0	1	14
Assignment	6	0	5	30
Term Project	7	0	1	7
Laboratory	10	0	2	20



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Midterm Examination	1		5	1	6
Final Examination	1		5	1	6
Total Workload (Hours)					125
[Total Workload (Hours) / 25*] = ECTS					5
*25 hour workload is accepted as 1 ECTS					

Learn	ing Outcomes	
1	Identify and select the materials used in the manufacture of machinery	
2	Identify their atomic structure and relative force	
3	Have knowlodle of Iron-Carbon (Fe-C) Equilibrium diagram	
4	Have knowledge about heat treatment applied to steel	
5	Seramikler, Plastikler ve kompozit malzemeler hakkında bilgi sahibi olur	

## Programme Outcomes (Machinery)

1	To be able to know general properties and usage areas of industrial materials and make selection.
2	Design of machine elements.
3	To be able to make production using machining and welding machines without machining.
4	To be able to make measurement and quality control processes with machine tools for measuring and control equipment.
5	To be able to make necessary corrections in order to determine the mistakes by using the necessary non-destructive test methods in welded parts and to eliminate these mistakes.
6	Preventive measures to prevent the occurrence of these faults by preliminarily determining the faults that will occur in the machines as statistical data and to make necessary interventions in case of breakdown.
7	They can make drawings of work pieces on CAD station and apply them on CNC looms. Ability to operate and use CAD / CAM and AUTOCAD package programs.
8	To be able to transfer engineering science and technology to practice by making calculations in the direction of scientific principles.
9	It can repair the elements in pneumatic and hydraulic systems which are indispensable elements of automatic control systems and can regulate their work.
10	The student who is trained as a machine technician during the whole program knows that industrial task definition in the field of work is error finding, problem solving, decision making, planning of functions and activities and they can be achieved by aiming to acquire these characteristics.
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# Contribution of Learning Outcomes to Programme Outcomes 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

	L1	L2	L3	L4	L5
P1	5	3	3	3	3
P2	5	4	5	5	5
P3	5	3	5	4	2
P4	4	5	5	2	4
P5	4	2	5	5	5
P6	4	4	4	4	3
P7	5	5	2	3	5
P8	5	3	3	5	4
P9	4	2	5	4	3
P10	4	4	4	5	5