



AYDIN ADNAN MENDERES UNIVERSITY
AYDIN VOCATIONAL SCHOOL
MECHANICAL AND METAL TECHNOLOGY
MACHINERY
COURSE INFORMATION FORM

Course Title	Materials Technology								
Course Code	MKE156			Course Level		Short Cycle (Associate's Degree)			
ECTS Credit	5	Workload	125 (Hours)	Theory	3	Practice	1	Laboratory	0
Objectives of the Course	To know the types of materials used in industrial area, understand the basic characteristics, location and design for the user to select the most suitable materials. Materials classify, microstructure recognize, interpret the Fe-C equilibrium diagram, hardened steel, and to be informed about the standards.								
Course Content	Recognize and classify the materials used in industry. To understand the basic information about the atomic structures and arrangement of materials. For industry to interpret the behavior of iron and nonferrous metals, solidification-melting. Iron and carbon alloys, by allowing his interpretation. Industrial area of non-ferrous metals and alloys are widely used to recognize the user to choose according to their location. To know the standards of steel.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Experiment, Demonstration, Individual Study								
Name of Lecturer(s)	Ins. Alpaslan BAŞARIK								

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	70

Recommended or Required Reading

1	A. Başarık -Malzeme Teknolojisi Ders Notları
---	--

Week	Weekly Detailed Course Contents	
1	Theoretical	Materials used in technical field, Basic concepts about atomic structure, Basic concepts about solidification and melting
2	Theoretical	Solidification and cooling curves of pure and alloyed metals, Dendrite and grain formation during solidification Crystal defects
3	Theoretical	Pure metal, Intermediate phase or compound and solid solution, Standard representations of alloy steels
4	Theoretical	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	Cooling curve and allotropic change of pure iron, Transformation in iron cementite phase diagram and iron cementite phase diagram
6	Theoretical	Smoothing anneal, Normalization anneal, Spherizing anneal, Stress relieving anneal
7	Theoretical	Hydration hardening, Martensitic structure, Isothermal conversion diagrams, Tempering
8	Theoretical	Carburizing surface hardening, Nitriding surface hardening, Flame surface hardening, Induction hardening
9	Intermediate Exam	MIDTERM
10	Theoretical	Elastic, plastic deformation and fracture
11	Theoretical	Sample collection, molding, grinding and polishing, etching, structural evaluation with microscopes and microscope
12	Theoretical	The tensile elongation curve obtained after the tensile test
13	Theoretical	Hardness measurement methods, Breaking energy after impact test S-N diagram after fatigue test
14	Theoretical	Visual inspection method, Penetrant fluid inspection method, Ultrasonic inspection method
15	Theoretical	X-ray examination method, Magnetic examination method
16	Final Exam	FINAL EXAM

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
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				

Learning Outcomes

1	Identify and select the materials used in the manufacture of machinery
2	Identify their atomic structure and relative force
3	Have knowldle 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.

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1
P1	5
P2	5
P3	5
P4	4
P5	4
P6	4
P7	5
P8	5
P9	4
P10	4

