



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Materials Science							
Course Code		BSM209		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	3	Workload	74 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The aim of this course is to present the basic fundamentals of materials, miscellaneous characteristic, application and processing for agricultural machinery. The objectives of the course are to give a wide view on alternative materials, to learn basic concepts for selection and to solve some common problems.							
Course Content		Definition and classification of materials Selection of materials Types of materials Metals Ceramics Polymers Composite materials General Properties of Metals Classification of metal Atomic structure and bonding forces in Metal Orientation of the atoms and the crystal lattice systems Cubic lattice system Mechanical test and their features Iron and Features Steels Classification of steels Iron Cementite phase diagram Heat treatments in steel Non-ferrous Metals and Alloys Hot and Cold Forming Polymers Gereal Properties of Plastic Materials Composite (Mixed,United) Materials Corrosion Corrosion Protection							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Demonstration					
Name of Lecturer(s)		Prof. Türker SARAÇOĞLU							

### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	70

### Recommended or Required Reading

1	-Callister, W.D., 1994. Materials Science and Engineering, John Wiley Et Sons, New York, SIBN 0-471-30568-5,811 p. - Keskin, İ., 1991. Malzeme El Kitabı, Ankara, ISBN 975-95433-2-3, 490p -Çakmak, B. Makina Malzeme Bilgisi Ders Notları
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Week	Weekly Detailed Course Contents	
1	Theoretical	Definition and classification of material
2	Theoretical	Selection of materials Types of materials Metals Ceramics Polymers Composite materials General Properties of Metals
3	Theoretical	Classification of metal Atomic structure and bonding forces in Metal Orientation of the atoms and the crystal lattice systems Cubic lattice system
4	Theoretical	Tensile Test Toughness of Metallic Materials - Compactness - Shooter (Pulse) Test Fatigue Test
5	Theoretical	Hardness Tests Static hardness test methods Dynamic hardness test methods
6	Theoretical	Iron and Features Terms of binary iron-carbon
7	Theoretical	Cast Irons
8	Theoretical	Steels Classification of Steels
9	Theoretical	Term exam
10	Theoretical	Classification of steel according to using area Iron - Cementite phase diagram
11	Theoretical	Heat treatments in steel Steel Descriptions
12	Theoretical	Non-ferrous metals and alloys
13	Theoretical	Hot and cold forming
14	Theoretical	Polymers General Properties of Plastic Materials Classification of plastic Comparison of plastics Forming of plastics
15	Theoretical	Composite(Mixed,United) Materials Corrosion Corrosion Protection
16	Theoretical	Final Exam

### Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	2	56
Midterm Examination	1	8	1	9



Final Examination	1	8	1	9
Total Workload (Hours)				74
[Total Workload (Hours) / 25*] = ECTS				3
*25 hour workload is accepted as 1 ECTS				

### Learning Outcomes

1	To give ability of classfying about engineering materials in general
2	To know properties of materials in general
3	To know technical differences between iron and steel
4	To know varieties of steel and steel alloys and their applications in engineering
5	To understand the characteristics of heat treatment

### Programme Outcomes (Dairy Technology)

1	Having sufficient infrastructure in basic sciences and engineering subjects and ability to use the theoretical and applied info instantly in this field.
2	Determining the modern techniques, tools and information technologies required for applications related with his field and ability to use them efficiently
3	Ability for planning, projecting, and designing, following up, analyzing and finding target-driven solutions related with his field
4	Ability to have professional ethic and awareness.
5	Ability to work, decide, express opinions orally and in written individually
6	Ability to participate team studies, taking responsibility, making leadership.
7	Ability to conceive Ataturk's principles and reforms, to communicate in Turkish and foreign language.
8	Ability to comprehend the necessity to learn for a life time, to monitor developments in science and technology and continuously renew himself.
9	Having sufficient level of information about production and quality control of milk and dairy products and also product development, increasing product quality and food security fields.
10	Ability to detect, define, solve problems related with his field and to select and apply suitable methods and modeling techniques for this purpose.
11	To be conscious about workplace applications, worker health, work security and environment subjects, to have knowledge about legal results of the engineering applications related with his subject.

### 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	4	4	4	4	4

