



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Strength of Materials							
Course Code		BSM204		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	3	Workload	76 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		-The aim this course is to introduce the basic concepts of strength of materials -To present the basic fundamentals of agricultural machines design. -To teach stress and strain formulas -To give important design parameters about basic stresses on selected agricultural machines (Tension, Compression, Shear, Torsion, Deflection, Combined Stresses) -To teach stress and strain relations -To give selection of materials for Agricultural Machines (Criteria for Selection, Endurance-Limit Modifying Factors, Reliability, alternative Solutions -To teach the concepts of safe carrying capacity under critical section and/or critical load conditions. -To teach techniques of sizing or resizing of loaded cross sections, connections and attachments -To give practical information in which such an analysis can be used in a real system.							
Course Content		To introduce the concepts of overall strength of materials. To introduce the machine elements used in general. The basic types of stress. Defining of one, two and three-dimensional state of stress. Tension stress Torsion Combined stress Effect of axial force and the normal stresses of the system of aquations to describe the analytical and Mohr circle and to obtain appropriate material strength for design purpose. Shear-type effects of shear force and shear stres and to introduce the concept of applications for simple problem representation. Transmission systems used in machines. Stress analysis will emerge in beams subjected to bending moment of inertia. Simple bending and cross-section determination. Hyper static problems in axial loaded rods. Thermal stresses and deformations Analysis of the combined strength Buckling of columns Critical stress - frailty relations							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Problem Solving					
Name of Lecturer(s)		Prof. İbrahim YALÇIN							

Prerequisites & Co-requisites

Prerequisite	BSM105/BSM201
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Assessment Methods and Criteria

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

Recommended or Required Reading

1	Mechanical Engineering Design. Mc Graw Hill Book Co. New York, 631p. İnan, M. 1970 (New Edition), Cisimlerin Mukaveti, İstanbul 560p. Srivastava, A.J. et al, 1993. Engineering Principles of Agricultural Machines. ASAE Textbook No.6
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Week	Weekly Detailed Course Contents	
1	Theoretical	To introduce the concept of overall strength of materials.
2	Theoretical	Defining of one,two and three-dimensional state of stress. The basic types of stress Tension stress
3	Theoretical	Shear stress Torsion Combined stress
4	Theoretical	Effect of axial force and the normal stresses of the system.
5	Theoretical	The equations to describe the analytical and Mohr circle and to obtain appropriate material strength for design purpose.
6	Theoretical	The equations to describe the analytical and Mohr circle and to obtain appropriate material strength for design purpose (continued).
7	Theoretical	Shear-type effects of shear force and shear stress and to introduce the concept of applications for simple problem representation
8	Theoretical	Shear-type effects of shear force and shear stress and to introduce the concept of applications for simple problem representation
9	Theoretical	Transmission systems used in machines
10	Theoretical	Stress analysis will emerge in beams subjected to bending moment of inertia.
11	Theoretical	Stress analysis will emerge in beams subjected to bending moment of inertia. (continued).
12	Theoretical	Simple bending and cross-section determination.
13	Theoretical	Hyper static problems in axial loaded rods. Thermal stresses and deformations
14	Theoretical	Analysis of the combined strength Buckling of columns Critical stress - frailty relations



15	Theoretical	Analysis of the combined strength Buckling of columns Critical stress - frailty relations
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	2	56
Midterm Examination	1	8	2	10
Final Examination	1	8	2	10
Total Workload (Hours)				76
[Total Workload (Hours) / 25*] = ECTS				3

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	To use the basic principles of strength of materials and use them in the designed system.
2	Know the basic types of stress and to use design.
3	To be able to analyze stresses in beams under combined axial and eccentric loads and bending
4	To know selection and calculation of shafts.
5	To be able to analyze stresses in two dimensions and understand the concepts of principal stresses and the use of different methods to solve dimensional stress problems.

