STRENGHT OF MATERIALS I

1	Course Title:	STRENGHT OF MATERIALS I	
2	Course Code:	OTO2003	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	2	
6	Semester:	3	
7	ECTS Credits Allocated:	4.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. MURAT YAZICI	
15	Course Lecturers:	Prof. Dr. ALİ DURMUŞ	
16	Contact information of the Course Coordinator:	PROF. DR. MURAT YAZICI BURSA ULUDAĞ ÜNİVERSİTESİ MÜHENDİSLİK FAKÜLTESİ OTOMOTİV MÜHENDİSLİĞİ BÖLÜMÜ TR16059 GÖRÜKLE/BURSA/TÜRKİYE TEL: 90(224) 2942630 FAKS: 90 (224) 2941903 myazici@uludag.edu.tr	
17	Website:		
18	Objective of the Course:	The purpose of this course is to help students apply basic principles of statics for rijid and deformable bodies and develop their engineering intuition for strength and deformation of engineering structures under external loadings. In addition, this course is intended to prepare students to apply design theory and approach that they learn for the mechanics of deformable bodies to complex systems that will be encountered in advanced design courses.	
19	Contribution of the Course to Professional Development:	This course provides the most basic principles for engineers who will work in the field of structural mechanics and material strength.	
20	Learning Outcomes:		
		1	To be able to calculate stress and strain for tensile, compression, shear, torsion, bending and combined strength cases.;
		2	To be able to determine the mechanical properties and material constants of materials by using the engineering stress-strain curve obtained from the tensile test ;
		3	To be able to calculate the stress and strain caused by temperature changes.;
		4	To be able to calculate the circumferential and axial stresses occurring in thin-walled tank exposed to internal pressure.;
		5	To be able to realize the stress transformations for the plane stress state at any point;
		6	To be able to draw shear force and bending moment diagrams.;

	7	To be able to determine the safe beam dimensions by calculating the normal and shear stresses caused by vertical loads on beams.;
	8	To be able to solve torsion problems of solid and hollow shafts.;
	9	
	10	

21	Course Content:

Course Content:

Week	Theoretical	Practice
1	Definitions and content of the lesson	
2	Internal force and stress concept, types of stress, axial loading, tensile test	
3	Normal stress and strain	
4	Shear stress and shear strain	
5	Thermal stresses, general Hooke's Law, unit volume change, constitutive laws.	
6	Thermal stresses, general form of Hooke's Law, constitutive law, Thin wall pressure vessels	
7	Thin wall pressure vessels	
8	Shear force and bending moment diagrams	
9	Pure Bending, dimensioning of beams affected by bending	
10	Plane stress state and plane stress transformations at any point.	
11	Plane stress state and plane stress transformations at any point.	
12	Stresses in combined strength cases	
13	Midterm exams	
14	Textbooks, References and/or Other	I. H. Shames, “Introduction To Solid Mechanics”,Second International Inc. E. J. Hearn,“Mechanics of Materials”,

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	2.00	28.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	25.00	25.00
Others	0	0.00	0.00
Final Exams	1	25.00	25.00
Total Work Load			120.00
Total work load/ 30 hr			4.00
ECTS Credit of the Course			4.00

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		Midterm, final exam

24	**ECTS / WORK LOAD TABLE**

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	4	5	5	4	5	4	5	5	4	5	5	5	0	0	0	0
ÖK2	5	4	4	5	4	5	5	4	5	4	5	5	0	0	0	0
ÖK3	5	4	4	5	4	5	5	4	5	5	5	4	0	0	0	0
ÖK4	4	5	4	5	4	5	4	5	4	5	4	5	0	0	0	0
ÖK5	4	4	5	5	5	5	5	5	5	4	5	4	0	0	0	0
ÖK6	4	5	5	4	4	4	4	5	5	4	5	5	0	0	0	0
ÖK7	4	5	4	5	5	5	5	5	5	5	5	5	0	0	0	0
ÖK8	5	4	5	4	5	4	5	5	5	4	5	5	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	**1 very low**		**2 low**			**3 Medium**			**4 High**			**5 Very High**				