AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Theory of Continous Media								
Course Code	MCE522		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	194 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The aim of this course is to enable graduate students to understand the fundamental law of physicsapplicable to a continuous medium and to develop the liner theory. This course will provide students with an introduction to Cartesian tensors, a study of stress at a point in a continuum, the analysis of deformation and kinetics, and the fundamental laws of mechanics.								
Course Content	Vectors and Tensors in Cartesian Coordinates, Stress, Deformation and Kinematics,General Principles, Balance Equations.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Case Study, Individual Study, Problem Solving								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	40
Assignment	5	20
Term Assignment	1	10

Recommended or Required Reading	
1	J. N. Reddy, An Introduction to Continuum Mechanics, Cambridge University Press, the 1st edition, ISBN-10 –521-87044-5, ISBN-13 978-0521-87044-3.
2	Y. C. Fung, A First Course in Continuum Mechanics, Third Edition, Prentice-Hall, 1994, QA808.2 .F85 1994.

Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction, Index Notation of a Vector
2	Theoretical	Vectors and Cartesian Tensors
3	Theoretical	Vectors and Cartesian Tensors
4	Theoretical	Vectors and Cartesian Tensors
5	Theoretical	Body Force and Surface Forces
6	Theoretical	Principal axes, invariants, Mohr’s circle
7	Theoretical	Analysis of Deformation in a Continuum
8	Theoretical	Analysis of Deformation in a Continuum
9	Intermediate Exam	Midterm exam
10	Theoretical	Eulerian Forrms of the Basic Physical Laws
11	Theoretical	Eulerian Forrms of the Basic Physical Laws
12	Theoretical	Application to Solids
13	Theoretical	Application to Solids
14	Theoretical	Balance Equations
15	Theoretical	Balance Equations
16	Final Exam	Final exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	5	0	4	20
Term Project	1	20	10	30
Midterm Examination	1	25	2	27

Final Examination	1	31	2	33
			Total Workload (Hours)	194
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	be able to understand essential background on continuum mechanics
2	be able to use tensor analysis both in Cartesian and curvilinear coordinate systems
3	be able to apply and evaluate the most common stress, strain and deformation measures
4	be able to explain and apply fundamental conception as the deformation gradient, displacement gradient, material and local time derivatives, rate of deformation and stress tensor
5	describe the fundamental balance equations and conservation laws for a deformable body
6	be able to explain the fundamental results in the general theory of constitutive relations
7	describe and apply the general equations for some kind of fluid and elastic bodies and be familiar with some advanced constitutive relations
8	Be able to solve simple boundary value problems for fluids and solids
9	gain mathematical and physical restrictions on material theories
10	understand scientific articles with continuum mechanical formulation

Programme Outcomes *(Civil Engineering Master)*	
1	To be able to develop expertise knowledge in a Civil engineering area founded on their graduate competence.
2	To be able to use the theoretical and practical expertise knowledge gained in their specialty area.
3	To be able to use the information, problem solving and / or practical skills from the field, in interdisciplinary studies.
4	To be able to create new knowledge by integrating their knowledge area with the knowledge coming from different disciplines; and solve problems that need expertise by using scientific research methods
5	To be able to solve the problems related to his/her area by using appropriate research methods
6	To be able to devise a problem in their specialty area, develop a solution methodology, solve the problem, and interpret the results and take action if necessary
7	To be able to criticize the knowledge in their specialty area, guide the learning process, and independently direct high level studies
8	To be able to systematically communicate the recent developments in their specialty area and their own studies to groups both inside and outside their specialty area, orally, in writing and visually
9	To be able to use computer software at a level required by their specialty area with drawing upon information and communication technology at a high level
10	To be able to introduce scientific, technological, social and cultural advancements in the field of civil engineering and to contribute to the process of being an information of the society and to sustain it.
11	To be conscious of professional and ethical responsibility and contribute to the establishment of this consciousness.
12	To be able to protect social, scientific, and ethical values during collection, interpretation, and dissemination stages of the data associated with their specialty area; instruct and supervise these values
13	To be able to use at least one foreign language in a level to follow current developments related to the field.

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

	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
P1	3	4	3	5	4	5	4	3	4	4
P2	3	4	3	4	3	3	4	5	4	4
P3	3	4	5	5	4	4	4	5	5	3
P4	3	3	5	4	4	3	4	5	3	3
P5	4	5	5	4	3	4	4	4	5	5
P6	3	4	4	4	4	5	3	4	4	4
P7	4	3	3	5	5	4	3	5	4	4
P8	3	4	5	5	5	3	4	4	3	4
P9	3	3	5	4	4	3	3	3	5	4
P10	4	5	5	4	4	4	5	4	3	3
P11	3	4	4	4	4	3	4	5	5	4
P12	3	4	3	5	5	3	4	3	4	3
P13	3	4	3	5	5	3	4	3	4	3