AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Theory of Continous Media								
Course Code	MME620		Couse Level	Third Cycle (Doctorate Degree)					
ECTS Credit	9	Workload	225 *(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), Demonstration, Discussion								
Name of Lecturer(s)									

Prerequisites & Co-requisities	
Language Requisite	Yes

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading	
1	Nonlinear Theory of Continuous Media, A. Cemal Eringen

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	6	2	112
Assignment	7	6	3	63
Project	2	8	4	24
Midterm Examination	1	10	3	13

Final Examination	1	10	3	13
			Total Workload (Hours)	225
			[Total Workload (Hours) / 25*] = **ECTS**	9
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	1. be able to use tensor analysis both in Cartesian and curvilinear coordinate systems;
2	2. be able to apply and evaluate the most common stress, strain and deformation measures;
3	3. 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
4	4. describe the fundamental balance equations and conservation laws for a deformable body
5	5. be able to explain the fundamental results in the general theory of constitutive relations

Programme Outcomes *(Mechanical Engineering (English) Doctorate)*	
1	1. In Mathematics, natural sciences and mechanical engineering, department has the sufficient infrastructure; the ability to use the theoretical and practical information for engineering solutions
2	2. The ability to identify, define, and solve the formula for complex engineering problems; the ability to select and apply for the appropriate analytical methods and modelling techniques
3	3. To meet desired needs of a system, system component, or process, analysing and designing skill under realistic constraints; in this respect, the ability to apply the methods of modern design
4	4. The ability to use and choose modern techniques and tools for required engineering applications and; the ability to use information technology effectively
5	5. The ability to design the experiment, collect the data for the experiment and interpret to analysing results
6	6. The ability to use computer software and hardware information, access to information and other information sources
7	7. The ability to work individually and with multidisciplinary teams effectively, taking responsibility self-confidence for complex situations
8	8. The ability to communicate with foreign colleagues by having high level of foreign language knowledge in the field of engineering
9	9. Monitoring the science and technology developments and the ability to renew itself with innovative ideas constantly
10	10. Professional and ethical responsibility awareness
11	11. Having an adequate information and awareness in the subjects of occupational safety, occupational health, social security rights, quality control and management issues of environmental protection
12	12. The ability to appreciate the effects of engineering solutions and applications in universal and social dimensions
13	13. The ability to be enlightened to the experts or non-expert audience groups on the issues related with engineering problems and solutions written and oral
14	14. The ability to have adequate knowledge and skills in the project development and application, manage the activities planning, including the projects to the employees having the responsibility of the project by increasing vocational awareness

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	3	5	3	3	3
P2	4	4	4	4	4
P3	5	3	5	5	5
P4	5	3	5	5	5
P5	4	4	4	4	4
P6	3	5	3	3	3
P7	3	5	5	3	4
P8	4	4	4	4	5
P9	5	3	5	5	5
P10	5	3	4	5	4
P11	4	4	3	4	3
P12	3	5	5	3	5
P13	4	5	4	4	4
P14	5	4	3	5	3