AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Advanced Dynamics								
Course Code	MME533		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	To give the necessary mechanical principles and concepts for the dynamic analysis of finite degree of freedom systems and to teach to obtain equations of motion governing of mechanical systems								
Course Content	Mechanical principles of Mechanical Systems Dynamics. Lagrange Equations. Hamilton Principle. Hamilton Canonical Equations.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Individual Study								
Name of Lecturer(s)									

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

Recommended or Required Reading	
1	L.Meirovitch : “Methods of Analytical Dynamics”, New-York, McGraw-Hill, 1970.
2	D.T.Greenwood : “Principles of Dynamics”, Sec.Ed., New Jersey, Prentice-Hall, 1988.
3	G.R. Fowles / G.L.Cassiday : “ Analytical Mechanics”, 6th Ed. Fort Worth ,Saunders College Publishing,1999.
4	M. Gürgöze, “Analitik Mekaniğe Giriş”, İTÜ Vakfı Yayınları, 2019

Week	Weekly Detailed Course Contents	
1	Theoretical	Mechanical Principles: Genell. Coordination, Degree of Freedom, Bonds, Forces, Systems
2	Theoretical	Mechanical Principles: Principle of Virtual Works, D’Alembert Principle,
3	Theoretical	Mechanical Principles: Lagrange's Principle
4	Theoretical	Lagrange Equations: Deriving, Potential Function, Conservative Systems
5	Theoretical	Lagrange Equations: Examples, Bond Forces
6	Theoretical	Problem Solutions
7	Theoretical	Problem Solutions
8	Intermediate Exam	Midterm
9	Theoretical	Hamilton Principle: Principles of Variation Calculation
10	Theoretical	Principles of Variation Calculation
11	Theoretical	Hamilton Principle: Deriving Hamilton Principle from Lagrange Principle, Deriving Lagrange Equations from Hamilton Principle
12	Theoretical	Hamilton Principle: Application examples
13	Theoretical	Ham. Canonical Equations
14	Theoretical	Problem solutions
15	Theoretical	Problem solutions
16	Final Exam	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	6	3	126
Assignment	7	3	1	28
Midterm Examination	1	20	3	23

Final Examination	1	20	3	23
			Total Workload (Hours)	200
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	Learning the basic concepts of mechanical principles
2	To be able to obtain equations of motion of finite degree of freedom systems
3	Perform dynamic analysis for finite degree of freedom systems
4	To be able to calculate bond forces in mechanical systems
5	To gain skills on nodeling and dynamic analysis for real systems

Programme Outcomes *(Mechanical Engineering Master's Without Thesis)*	
1	To be able to access wide and deep information with scientific researches in the field of Engineering, evaluate, interpret and implement the knowledge gained in his/her field of study
2	To be able to complete and implement “limited or incomplete data” by using the scientific methods
3	To be able to consolidate engineering problems, develop proper method(s) to solve and apply the innovative solutions to them
4	To be able to develop new and original ideas and method(s), to develop new innovative solutions at design of system, component or process
5	To be able to gain comprehensive information on modern techniques, methods and their borders which are being applied to engineering
6	To be able to design and apply analytical, modeling and experimental based research, analyze and interpret the faced complex issues during the design and apply process
7	To be able to gain high level ability to define the required information and data
8	To be able to work in multi-disciplinary teams and to take responsibility to define approaches for complex situations
9	To be able to transfer of the process and results of studies at national and international environments systematic and clear verbal or written
10	To be able to become aware of social, scientific and ethical values guarding adequacy at all professional activities and at the stage of data collection, interpretation, and announcement
11	To be able to become aware of new and developing application of profession and ability to analyze and study on those applications
12	To be able to gain ability to interpret engineering application’s social and environmental dimensions and it’s compliance with the social environment

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