

MM 503 Advanced Dynamics				MECHANICAL ENGINEERING DEPARTMENT					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project/Field Study	Homework	Other	Total	Credit	ECTS credit
1,2	42				46	100	188	3	7.5
Language	Turkish								
Compulsory / Elective	Optional								
Prerequisites	-								
Course Contents	Hamilton's principle. Generalized variables. Lagrange's equation. Rigid body dynamics and systems with gyroscopic effects. Gyroscopic effects on spinning shafts and critical speeds. Gyro-compass, inertial navigation. Vibration of systems with time varying and non-linear characteristics.								
Course Objectives	Teaching how to obtaining sysytem equation and Rigid body dynamics and systems with gyroscopic effects								
Learning Outcomes and Competences	Learning how to apply Hamilton's principle. Generalized variables. Lagrange's equation to dynamic systems.								
Textbook and /or Reference	Advanced Engineering Dynamics / J. H. Ginsberg / TA 352 G55. 2. Methods of Analytical Dynamics / L. Meirovitch / QA 846 M45. 3. Analytical Dynamics / H. Baruh / QA 845 B38. 4. Classical Mechanics / H. Goldstein / QA 805 G6. 5. Adv. Dynamics: Modelling and Analysis / D'Souza and Garg / QA 805 D79								
Assessment Criteria					If any, mark as (X)		Percentage (%)		
	Midterm Exams				X		50		
	Quizzes								
	Homeworks				X		10		
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam				X		40		
Instructors	Prof. Mehmet EROGLU, Prof. Sefaatdin YUKSEL								
Week	Subject								
1	Basic Considerations								
2	Particle Kinematics								
3	Relative Motion								
4	Kinematic of Rigid Bodies								
5	Eulerian Angles								
6	Eulerian Angles								
7	Impulse-Momentum-Work Energy Principles								
8	Generalized Coordinates								
9	Holonomic and Nonholonomic								
10	Hamilton's Principle								
11	Lagrange's Equations								
12	Further Concepts in Analytical Mechanics								
13	Gyroscopic Effects								
14	Spinning Shafts								