

## ■ CE54 - Classical Mechanics

### GENERAL

<b>SCHOOL</b>	EXACT SCIENCES		
<b>DEPARTMENT</b>	MATHEMATICS		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	CE54	<b>SEMESTER</b>	E
<b>COURSE TITLE</b>	CLASICAL MECHANICS		
<b>INDEPENDENT TEACHING ACTIVITIES</b>	<b>WEEKLY TEACHING HOURS</b>	<b>ECTS</b>	
Lectures	4	5	
<b>COURSE TYPE</b>	General Knowledge		
<b>PREREQUISITE COURSES</b>	-		
<b>LANGUAGE OF TEACHING AND EXAMINATIONS</b>	Greek/English		
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	YES		
<b>COURSE WEBSITE (URL)</b>	<a href="http://eclass.uowm.gr/">http://eclass.uowm.gr/</a>		

### LEARNING OUTCOMES

<b>Learning Outcomes</b>
<p>With the completion of the learning process, the students will be able to:</p> <ul style="list-style-type: none"> <li>• know basic categories of mechanical systems and their fundamental principles (laws of conservation and principles of minimum action)</li> <li>• analyze with systematic and documented mathematical methodologies, fundamental classes of mechanical systems,</li> <li>• apply basic methods of the calculus to basic engineering problems, having acquired a valuable background in the relevant mathematical theories,</li> <li>• apply modern methods based on the theory of dynamical systems, for the analysis</li> </ul>

of flows defined by systems of classical mechanics, having been introduced to basic concepts of dynamics.

### General Competencies

- Search, analysis and synthesis of data and information, using the necessary technologies.
- Making decisions.
- Promotion of free, creative and inductive thinking.

### CONTENT OF THE COURSE

Newton's equation for point mass system, conservative forces, conservation laws (energy, angular momentum, linear momentum) and Galilean transformations. Elements of theory of variations. Lagrange Mechanics: Generalized positions and velocities, Lagrangian function and integral of action, D'Alembert's principle, Hamilton's principle, Euler-Lagrange equations.

### TEACHING AND LEARNING METHODS - EVALUATION

<b>TEACHING METHOD</b>	In the classroom.	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b>	e-Lectures. Use of e-class. Communication through face-to-face discussions and e-mails.	
<b>TEACHING ORGANIZATION</b>	<b>Activity</b>	<b>Semester Workload</b>
	Lectures	52 hours
	Projects	42 hours
	Individual Study	31 hours
	Course Total (25 hours per ECTS)	125 hours
<b>STUDENT EVALUATION</b>	Projects 10%. Progress-Exam 20%. Written final examination 70%.	

### RECOMMENDED BIBLIOGRAPHY

1. Modern Theoretical Mechanics, K. Tsiganos, Stamouli Publications. (Greek)

2. Classical Mechanics, S. Pnevmatikos, Scientific and Technological Publications A.G. Pnevmatikos. (Greek)
3. Theoretical Mechanics, Petros Ioannou, Theoharis Apostolatos, University of Athens Property Development and Management Company. (Greek)