

## COURSE OUTLINE

### (1) GENERAL

<b>SCHOOL</b>	SCHOOL OF SCIENCES		
<b>ACADEMIC UNIT</b>	DEPARTMENT OF MATHEMATICS		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE PROGRAM		
<b>COURSE CODE</b>		<b>SEMESTER</b>	<b>G</b>
<b>COURSE TITLE</b>	DYNAMIC PROGRAMMING		
<b>INSTRUCTOR</b>			
<b>INDEPENDENT TEACHING ACTIVITIES</b>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
	3	4,5	
<b>COURSE TYPE</b>	Specialised general knowledge		
<b>PREREQUISITE COURSES:</b>	NO		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	GREEK		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	YES		
<b>COURSE WEBSITE (URL)</b>	<a href="http://www.math.aegean.gr/index.php/en/academics/undergraduate-programs">http://www.math.aegean.gr/index.php/en/academics/undergraduate-programs</a>		

### (2) LEARNING OUTCOMES

<b>Learning outcomes</b>
The basic aim of the course is the understanding of the Dynamic programming method which is based on the optimality principle. We are presented and analyzed various models that can be constructed and analyzed using the method of dynamic programming. Suitable algorithms of dynamic programming are presented and analyzed for the numerical solution for the computation of the optimal policy.
<b>General Competences</b>
Working independently. Team work. Working in an interdisciplinary environment.

### (3) SYLLABUS

Finite-time horizon models. Dynamic programming equation. Algorithm for various problems of maximizing the expected reward or minimizing the expected cost. The secretary problem. The problem of optimal market gain. Optimal control of epidemic processes. Single vehicle routing problem. The problem of minimum routing. Deterministic finite-time horizon models.	
Infinite-time horizon models. Randomized and stationary policy. The discount factor. Optimality equation. The policy-iteration algorithm. The method of successive approximations. A model for a machine replacement and a model for inventory control. Examples.	
<b>TEACHING MATERIAL DISTRIBUTION</b>	The teaching material of the course is uniformly distributed during the semester.

### (4) TEACHING and LEARNING METHODS - EVALUATION

<b>DELIVERY</b>	Face-to-face	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b>	Communication with students via e-mail	
<b>TEACHING METHODS</b>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	39
	Independent study	73,5

	Course total (25 per ECTS)	<b>112,5</b>
<b>COURSE COMMITMENTS</b>	Attending course is not obligatory.	
<b>STUDENT PERFORMANCE EVALUATION</b>	Student's evaluation is done in Greek through a written examination which includes short-answers questions and problem solving. For students with disabilities, evaluation takes place via oral exams.	

**(5) ATTACHED BIBLIOGRAPHY**

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| <ol style="list-style-type: none"> <li>1. Εισαγωγή στην Επιχειρησιακή Έρευνα, 10<sup>η</sup> έκδοση, T.A. Hamdy.</li> <li>2. Εισαγωγή στην Επιχειρησιακή Έρευνας, 10<sup>η</sup> έκδοση, Hillier F.S., Lieberman, G.J., Διαμαντίδης Α. (επιμέλεια).</li> </ol> |
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