

## ■ CE77 - Differential Geometry II

### GENERAL

<b>SCHOOL</b>	EXACT SCIENCES		
<b>DEPARTMENT</b>	MATHEMATICS		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	CE77	<b>SEMESTER</b>	G
<b>COURSE TITLE</b>	DIFFERENTIAL GEOMETRY II		
<b>INDEPENDENT TEACHING ACTIVITIES</b>	<b>WEEKLY TEACHING HOURS</b>	<b>ECTS</b>	
Lectures	4	6	
<b>COURSE TYPE</b>	Scientific Field		
<b>PREREQUISITE COURSES</b>	Infinitesimal Calculus I-IV Linear Algebra I-II Differential Geometry I		
<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>Upon successful completion of the course, the students:</p> <ul style="list-style-type: none"> <li>• will be able to define maps on a differentiable surface and check whether a representation is differentiable,</li> <li>• will be able to calculate the reciprocal derivative of a vector field,</li> <li>• will be able to calculate the geodesic curves of simple surfaces,</li> </ul>

- will be familiar with basic surfaces of constant curvature.

### General Competencies

- Search for, analysis and synthesis of data and information, with the use of the necessary technology.
- Individual work.
- Production of free, creative and inductive thinking.

### CONTENT OF THE COURSE

Maps, local coordinate systems and manifold atlases. Basic examples.  
 Differentiable mappings between manifolds, differential mapping.  
 Vector fields, parallel transport, reciprocal derivative.  
 Function of length, geodesic curves, definition and examples.  
 Gauss-Bonnet theorem.  
 Surfaces of constant curvature.

### TEACHING AND LEARNING METHODS - EVALUATION

<b>TEACHING METHOD</b>	In the classroom.	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b>	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
	Individual Study	98 hours
	Course Total (25 hours per ECTS)	150 hours
<b>STUDENT EVALUATION</b>	Written final examination 100%.	

### RECOMMENDED BIBLIOGRAPHY

1. B. Papantoniou, Differentiable manifolds, University Press of Patras, 2013 (Greek).
2. Barrett O' Neil, Elementary Differential Geometry, Third Edition, ITE Publications, University Press of Crete, 2005. (Greek)
3. A. Pressley, Elementary Differential Geometry, Third Edition, ITE Publications,

University Press of Crete, 2011. (Greek)

4. A. Arvanitoyeorgos, Elementary Differential Geometry, Association of Greek Academic Libraries, 2015. (Greek)