

## COURSE OUTLINE

### (1) GENERAL

<b>SCHOOL</b>	SCHOOL OF SCIENCES		
<b>ACADEMIC UNIT</b>	DEPARTMENT OF MATHEMATICS		
<b>LEVEL OF STUDIES</b>	POSTGRADUATE <b>Studies in Mathematics</b>		
<b>COURSE CODE</b>	<b>A4</b>	<b>SEMESTER</b>	
<b>COURSE TITLE</b>	POSTGRADUATE ALGEBRA		
<b>INDEPENDENT TEACHING ACTIVITIES</b>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
	3	10	
<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>
<p>Understanding Sylow theorems and having the ability of classifying finite groups of small order. Understanding normal series of groups. Understanding Rings and Ideals.</p> <p>Free modules, injective and projective modules: understanding the differences and being able to give examples. Understanding of Nullstellensatz.</p>
<b>General Competences</b>
<p>Search for analysis, and synthesis of data and information</p> <p>Team work</p> <p>Working independently</p> <p>Production of free, creative and inductive thinking</p>

### (3) SYLLABUS

<p>Groups, subgroups and groups actions on sets, Sylow Theorems, classification of finite groups, nilpotent and soluble groups, normal and subnormal series.</p> <p>Rings, ideals, polynomial rings, prime and principal ideals, primary decomposition.</p> <p>Modules, homomorphisms and exact sequences, free modules and vector spaces, projective and injective modules, Hom and duality.</p> <p>Noether rings and modules, ring extensions, Dedekind domains, Hilbert's Theorem (Nullstellensatz).</p>
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### (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>	<i>Activity</i>	<i>Semester workload</i>

	Lectures	39
	Independent study	148.5
	Assignments	62.5
	Course total (25 per ECTS)	<b>250</b>
<b>STUDENT PERFORMANCE EVALUATION</b>	<p>Student evaluation is done in Greek through a written examination which includes short-answer equations and problem solving.</p> <p>For students with disabilities, evaluation takes place via oral exams.</p>	

**(5) ATTACHED BIBLIOGRAPHY**

1. T.W. Hungerford, Abstract Algebra: An introduction, Saunders.