COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF MATHEMATICS		
LEVEL OF STUDIES	UNDERGRADUATE PROGRAM		
COURSE CODE	**311-0330**	**SEMESTER**	**F**
COURSE TITLE	MATHEMATICAL LOGIC		
INSTRUCTOR			

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
	4	6

COURSE TYPE	Special background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://www.math.aegean.gr/index.php/en/education/undergraduate-programs

(2) LEARNING OUTCOMES

Learning outcomes
The course covers the basic material of Mathematical Logic and an introduction to Logic Programming. After the completion of the course the students will have the ability to: 1. Understand and use the notions and methods of Sentential Logic and of First-Order Logic. 2. Understand and appreciate the importance and value of formal mathematical proof across the field of mathematics. 3. Understand and use, with mathematical precision and formality, the various symbolic mathematical expressions. 4. Understand the importance of the axiomatic method and work with basic examples of axiomatic (first-order) theories and their models. 5. Develop simple programs using the language of Prolog.
General Competences
Working independently. Team working. Working in an interdisciplinary environment.

(3) SYLLABUS

The course covers the semantic and syntactic side of Mathematical Logic, focusing on Sentential Logic and First-Order Predicate Logic. In the first part of the course, regarding Sentential Logic, we study basic notions such as sentences, valuations, truth tables, tautologies, logical implication, normal forms, formal proofs. We present the relevant Theorems of Compactness and Completeness.

In the second part, we study First-Order Predicate Logic and notions such as formulas, first order structures, formal theories, formal proofs and models. We present the relevant Compactness and Completeness theorems for first-order logic.

In the final part of the course, we give an introduction to the principles of Logic Programming, with a focus on the language of Prolog.

TEACHING MATERIAL DISTRIBUTION	The teaching material of the course is uniformly distributed during the semester.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY</td><td>Face-to-face lectures.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td><td>Communication with students via e-mail.
Uploading course material on moodle system.</td></tr>
<tr><td>TEACHING METHODS</td><td><table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>52</td></tr><tr><td>Independent Study</td><td>98</td></tr><tr><td>Course total (25 per ECTS)</td><td>150</td></tr></table></td></tr>
<tr><td>COURSE COMMITMENTS</td><td>Attending course is not obligatory.</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>Student's evaluation is done in Greek through a written examination. For students with disabilities, evaluation takes place via oral exams.</td></tr>
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(5) ATTACHED BIBLIOGRAPHY

1. Γ. Μητακίδης, Από τη λογική στο λογικό προγραμματισμό και την Prolog.
2. J.L. Bell and M. Machover, Course in Mathematical Logic.
3. J.R. Shoenfield, Mathematical Logic.
4. H. Enderton, A Mathematical Introduction to Logic.