COURSE OUTLINE

GENERAL

SCHOOL	Polytechnic
ACADEMIC UNIT	Computer Engineering and Informatics Department
LEVEL OF STUDIES	Undergraduate
COURSE CODE	CEID_NE5288 **SEMESTER** Fall (elective)
COURSE TITLE	Special Topics in Computational Logic

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	WEEKLY TEACHING HOURS	CREDITS
Lectures and tutorials, Laboratory exercises	3(LT), 2(LE)	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		5

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	*skills development*
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/CEID1131/

LEARNING OUTCOMES

Learning outcomes *The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.* *Consult Appendix A* • *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area* • *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B* • *Guidelines for writing Learning Outcomes*
Working knowledge of the syntactic form of propositional formulas, and of the basic properties of their truth values. Understanding of basic questions and problems, concerning formal proofs in Propositional Logic. Knowledge of the most important proof systems for Propositional Logic. Knowledge of computational methods for formal proof discovery. Theoretical skills relevant to logical equivalence of formulas. Skills on designing and analyzing computational methods for logical equivalence problems.

General Competences *Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?*

Search for, analysis and synthesis of data and information, with the use of the necessary technology *Adapting to new situations* *Decision-making* *Working independently* *Team work*	*Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism*

Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*......*
Production of new research ideas	*Others...*
	....

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Production of new research ideas
Criticism and self-criticism
Production of free, creative and inductive thinking

SYLLABUS

Introduction to the basic concepts and techniques of Propositional Logic, emphasizing precise mathematical descriptions of concepts and applications thereof. Examination of the uses of theory to design algorithms for problems of logical equivalence, and to verify their correctness.

Coverage: Syntax and semantics of propositional formulas. Notions of implication and logical equivalence, correlative notions of formal proof. Main proof systems for Propositional Logic, properties of correctness and completeness.

Computational methods for formal proof discovery, applications to problems of logical implication and logical equivalence.

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of course web page to supplement teaching, and to communicate with students	
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	*Activity*	*Semester workload*
	Lectures	26
	Tutorials	26
	Laboratory	13
	Non-directed study	60
	Course total	*125*
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Written take-home examinations (in Greek), including brief questions on theory and problems to be solved. Evaluation is based on: extent of theoretical knowledge, precision and correctness of solutions. Answers to exam questions are discussed extensively in the course tutorials.	

ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*
M. Fitting, "First-Order Logic and Automated Theorem Proving
M. Huth, M.Ryan, "Logic in Computer Science"
- *Related academic journals:*