1.1.1 Geographic Information Systems

GENERAL

SCHOOL	Engineering
ACADEMIC UNIT	CIVIL ENGINEERING
LEVEL OF STUDIES	Undergraduate
COURSE CODE	ΣΥΓ007

COURSE CODE	ΣΥΓ007	**SEMESTER**	7th

COURSE TITLE	Geographic Information Systems

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**
	4	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialization Course
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	

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*
Upon completing this course students should be able to recognize the qualitative and quantitative dimensions of spatial data and geographic information systems, effectively utilize individual quantitative methods and techniques of geographic analysis and gain proficiency in Geographic Information System (GIS) software.

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	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*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…*

The course contributes in the acquisition of the following skills:
- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Adapting to new situations
- Decision-making
- Working independently
- Project planning and management
- Respect for the natural environment

SYLLABUS

Introduction to Geographic Information Systems (GIS). Main concepts in GIS. Geodetic reference systems - projection systems. Spatial analysis and methodology. Entity representation: vector and raster models. Spatial and semantic data. Representation of vector and raster data. Topological data structure and analysis. Database structure and management - Database management systems. Thematic mapping. Cartographic rendering – spatial data visualization. Analysis in GIS. Pre-analytical processes. Vector data analysis. Grid element analysis. Spatial analysis methods [Point distributions: analysis of spatial patterns, Continuous surface distributions: analysis of spatial interpolation, Discontinuous surface distributions: analysis of surfaces as polygons - points]. Spatial sampling and sampling types. Integrated spatial approach. GIS - Spatial analysis and design.

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*	Powerpoint presentations, e-learning platform for educational material

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	52
	Individual study	48
	Practice/exercises	30
	Course total (26 hours workload per ECTS credit)	*130*

| **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. | Final wtitten examination (100%)
-open ended questions
-problem solving
OR
Final writtn examination (70%) assignment - optional (30%) |

ATTACHED BIBLIOGRAPHY

[In Greek]. Κουτσόπουλος, Κ., 2017. «Γεωγραφικά Συστήματα Πληροφοριών και Ανάλυση Χώρου», 1η Έκδοση, ΕΚΔΟΣΕΙΣ ΔΙΣΙΓΜΑ ΙΚΕ, ISBN: 978-618-5242-11-4.

[In Greek]Κουτσόπουλος, Κ., Ανδρουλακάκης, Ν., 2011. «Γεωγραφικά Συστήματα Πληροφοριών με το ArcGIS 10», 1η Έκδοση, Α. ΠΑΠΑΣΩΤΗΡΙΟΥ ΣΙΑ Ι.Κ.Ε., ISBN: 978-960-491-030-4.

[In Greek]. Τσουχλαράκη, Α., Αχιλλέως, Γ., Κουργιαλάς Ν., 2019. «Μαθαίνοντας τα GIS στην πράξη: Το ArcGIS 10.5», 3η Έκδοση, ΕΚΔΟΣΕΙΣ ΔΙΣΙΓΜΑ ΙΚΕ, ISBN: 978-618-5242-57-2.

[In Greek]. Τσούλος, Λ., Σκοπελίτη, Α. Στάμου, Λ., 2016. Χαρτογραφική Σύνθεση και Απόδοση σε Ψηφιακό Περιβάλλον, Ελληνικά Ακαδημαϊκά Ηλεκτρονικά Συγγράμματα και Βοηθήματα - Αποθετήριο "Κάλλιπος", ISBN: 978-960-603-271-4.