

COURSES DESCRIPTION

1. GENERAL

SCHOOL	School of Environment, Geography and Applied Economics		
DEPARTMENT	Geography		
LEVEL OF STUDY	Undergraduate		
COURSE CODE		SEMESTER	5th (E)
COURSE TITLE	Geospatial Databases		
INDEPENDENT TEACHING ACTIVITIES If credits are awarded for separate components of the course (e.g., lectures, laboratory exercises, etc.), indicate the weekly teaching hours and the corresponding credits. If the credits are awarded for the course as a whole, indicate the weekly teaching hours and the total number of ECTS credits.		WEEKLY TEACHING HOURS	ECTS CREDITS
Lectures		3	5
The organization of teaching and the teaching methods used are described in detail in Section 4.			
COURSE TYPE Background, General Knowledge, Scientific Area, Skills Development	Scientific Area and Skills Development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes, in English through meetings.		
COURSE WEBPAGE (URL)	https://eclass.hua.gr/		

2. EXPECTED LEARNING OUTCOMES

Learning Outcomes

Upon successful completion of the course, students will be able to:

- understand the fundamental concepts of geospatial databases and spatial database management systems
- recognize the distinctive characteristics of geographic data and spatial relationships
- design conceptual and logical models for geospatial databases
- implement and manage spatial databases using PostgreSQL/PostGIS
- formulate and execute spatial queries and perform spatial analyses
- integrate geospatial data into Geographic Information Systems (GIS)
- evaluate and optimize the performance and capabilities of geospatial database management systems

General Competences

- Search for, analysis and synthesis of data and information, using the necessary technologies
- Use of Information and Communication Technologies (ICT)
- Working in an interdisciplinary environment
- Production of new research ideas
- Teamwork
- Adaptation to new technological developments

3. COURSE CONTENTS

The course typically includes the following sequence of lectures:

- Introduction to geospatial databases.
- Spatial data types and standards.
- Geospatial database design and modeling.
- PostgreSQL and PostGIS.
- Spatial queries and SQL functions.
- Spatial indexing and query optimization.
- Integration with the Python 3 programming language.
- Applications of geospatial databases.

In addition, four (4) laboratory sessions are conducted, during which students apply in practice the concepts presented in the lectures.

4. TEACHING AND ASSESSMENT METHODS

MODE OF DELIVERY Face-to-face, distance learning, etc.	• Eight (8) face-to-face lectures • Four (4) laboratory sessions involving practical exercises
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) Use of Information and Communication Technologies (ICT) in teaching, laboratory education, and communication with students.	• Use of electronic presentations and digital educational material during lectures. • Use of the e-Class platform for the distribution of lecture notes, assignments, announcements, and communication with students. • Laboratory training using PostgreSQL and PostGIS for the design, development, and management of geospatial databases. • Use of the Python 3 programming language and appropriate libraries for connecting to geospatial databases and processing spatial data.
TEACHING ORGANIZATION The teaching methods and organization are described in detail below. Lectures, seminars, laboratory practice, fieldwork, literature review and analysis, tutorials, internship (work placement), clinical practice, artistic workshops, interactive teaching, educational visits, project work, assignment writing, artistic creation, etc. The student's workload for each learning activity, including the hours of guided and independent study, is specified so that the total semester workload complies with the ECTS standards.	Activity Semester Workload (Hours) Lectures 26 Lecture preparation 13 Project / Weekly assignments 55 Independent study 38 Total Course Workload 132

STUDENT PERFORMANCE EVALUATION Description of the assessment procedure Language of assessment, assessment methods, formative or summative assessment, multiple-choice tests, short-answer questions, essay-type questions, problem-solving, written assignments, reports, oral examinations, public presentations, laboratory work, clinical examination, artistic performance, or other forms of assessment. The assessment criteria are clearly specified and communicated to students at the beginning of the semester, together with information on where they can be accessed.	Language of Assessment: Greek (English upon request). Assessment Methods Course project: 50% Final written examination: 50%, including: • Essay-type questions • Questions requiring critical and analytical thinking The assessment criteria are announced at the beginning of the semester.
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5. RECOMMENDED BIBLIOGRAPHY

1. [50662846] Elmasri, R., & Navathe, S. B. Fundamentals of Database Systems. Diavlos Publications.
2. [94702113] Papadopoulos, A. N., Tzouramanis, T., Gounaris, A., & Manolopoulos, I. Database Systems (2nd Edition). New Technologies Publications.
3. [102070677] Silberschatz, A., Korth, H. F., & Sudarshan, S. Database System Concepts (7th Edition). H. Giourdas Publications.