

COURSE		GEOSPATIAL DATABASE		
LECTURER		Assoc. Prof. Admir Mulahusić Ph.D.		
STUDY	STATUS	SEMESTER	NUMBER OF LESSONS L+E	ECTS
B – G	Compulsory	5	3+3	5
OBJECTIVES				
<ul style="list-style-type: none"> □ Understanding basic models of geospatial databases. □ Develop necessary techniques and skills in using systems for managing geospatial databases. 				
LEARNING OUTCOMES				
<ul style="list-style-type: none"> • Understanding the terms related to geospatial databases. • Independent analysis by use of geospatial databases. 				
COURSE CONTENT				
<p>Introduction to Databases: definition , history , goals , languages , architecture. Data models: fundamentals, relational, network, hierarchical. Information systems, conventional systems, geospatial database systems. Evolution of geoinformation systems. DBMS - database management system. Logical data organization. Database evolution. The properties of an object- relational and semi-structured models. The basic functionality of DBMS. Abstract data types . Three-tier architecture. Basic characteristics of DBMS. GIS. Interoperability. Modelling. E/R model. Entity sets. E/R diagram. A set of relations. Multiplication of binary E/R relations. Three-valued relations: One to One relations. Many to one relation. Many to many relations. Roles. Relations' attributes. Diagrams with relations'. Semi-structured data types and data - Web GIS . Subclasses (in E/R diagrams , object- oriented subclasses). Keys. Keys in the E/R diagrams. A weak entity set. Relational model. Basic concepts. E/R diagrams. Functional dependencies. Forming a relational database schema. SQL: simple queries, merge, subqueries, the operation of the complete relations, changes in the content database, defining relational schemas, views. Object-oriented (OO) analysis and design. OO paradigm of software processes. OO approach to software development. UML - goals. UML diagrams. Diagrams of the development cycle. The life cycle of systems development. SDLC phases of planning, SDLC analysis phase, design phase of the SDLC, the SDLC phases of implementation, SDLC phase support. Waterfall model of SDLC's. Object modeling using class diagrams. Association. Generalization. Polymorphism. Aggregation and composition. Inheritance. Limitations and disadvantages of the relational model. Object-oriented concepts. Normalization - normal forms. Modeling and implementation of applicative specific operations. Unconformity of programming languages. Object model. Object-oriented concepts. Object identity. The structure of an object. Attributes-reference to other objects. Class. Specification of object persistence. Complex objects. The hierarchy of objects (types). ODL (Object Definition Language). Inheritance. Structured objects. Literals.</p>				
RECOMMENDED LITERATURE				
<ol style="list-style-type: none"> 1. Z. Galić (2006): <i>Geoprostorne baze podataka</i>, Golden Marketing – Tehnička knjiga, Zagreb. 2. J. Ullman, J. Widom (2002): <i>A First Course in Database Systems</i>, Prentice Hall. 3. S. Shekhar, S. Chawla (2003): <i>Spatial Databases: A Tour</i>, Prentice Hall. 				
Examination:				
Exam is in a written form:				
<ul style="list-style-type: none"> - First midterm exam is organized in the 8th week of classes. - End-of-term exam is organized in the period of the final exam (and second final exam for students who do not pass end-of-term exam in the term of the final exam), and is accessed only by students who have passed first midterm exam. - Final exam is organized according to the academic calendar, and accessed by students who did not pass first midterm exam and students who are not satisfied with the success at the first midterm exam. - Second final exam is organized according to the academic calendar, and accessed by students who did not pass first midterm exam, students who are not satisfied with the success at the first midterm exam, as well as students who are not satisfied with the success at the final exam. - Supplementary exam is organized according to the academic calendar, and is accessed by all students who have not passed the exam in the term of the final and second final exam exam. 				
A prerequisite for taking the exam is school attendance, as well as accepted all exercises by the assistant.				