Basic data of the subject	
Academic unit:	**Faculty of Engineering and Informatics** **Applied Informatics**
Title of the subject:	**Database**
Level:	**Bachelor**
Course Status:	**Obligatory**
Year of studies:	**I**
Number of hours per week:	**3**
Value of Credits - ECTS:	**5**
Time / location:	
Course lecturer:	**Prof.Ass.Dr.Dhuratë Hyseni**
Contact details:	Dhurate.Hyseni@ushaf.net
Course Description:	*This course provide students with the knowledge of database (DB) theory elements, principles of DB projection and programmatic implementation, database models, data normalization and normal forms. Also, students are introduced to the capabilities of database management systems (DBMS), purposes of tables and queries; various tools of data management for databases, SQL language syntax and essential expressions. After the analysis of respective topics students receive independent work assignments. For assignments students can use literature. During the practical activities database development stages are implemented using MySQL and PHP tools. In the process of the individual assignments students perform all particular stages of DB creating.*
Objectives of the course:	*This module familiarizes students with key concepts and issues related to database management systems, relational data model and relational databases. Course focuses on the skills needed to design relational databases and database design using the entity-relationship data model; on the relational algebra, relational query language SQL and the fundamentals of the data protection. Student will be able to design and implement moderate sized databases, program queries in SQL and understand the basics of data protection.*
Expected learning outcomes:	*Upon successful completion of this course, student will be able to:* • *Define basic concepts of databases* • *Describe main parts of database management systems* • *Explain principles of data modelling* • *Explain and understand syntax and semantics of the SQL* • *Explain and understand basic principles of database protection* • *Apply the knowledge about data modelling to simple practical examples*

	• *Use relational algebra and SQL in problem solving* • *Execute function and store procedures in to SQL*

Contribution to the student load (which must correspond with learning outcomes)			
Activity	**Hour**	**Day/Week**	**In total**
Lectures with numerical exercises	3	15	45
Internship			
Contacts with teacher / consultations			
Field exercises			
Midterm, seminars and projects.	3	2	6
Homework			
Self-learning time student (at the library or at home)	3	15	45
Final preparation for the exam	7	2	14
Time spent on evaluation (tests, quiz and final exam)			
Projects and presentations.	3	5	15
Total			**125**

Teaching methodology:	
Assessment methods:	*Test 1, Test 2, Attendance and Activity.* *Final exam: 100%*
The ratio of theory and practice:	70% theory with exercises and 30% laboratory work..
Literature	
Basic Literature:	1. *Abraham Silberschatz, Henry F. Korth, S. Sudarshan (2011.), Database System Concepts, McGraw-Hill*
Additional Literature:	2. *Thomas Connolly, Thomas M. Connolly, Carolyn E. Beg (2014.), Database Systems, Addison-Wesley*
Designed learning plan	
Week:	**Lectures and exercises to be held**
Week one:	*Introduction to the course. Introduction to databases; Relational data model. Relational data model (continued), relational operations, relational algebra.*
Week two:	*Missing information, NULL values.*
Week three:	*Relational Query Language - SQL.*
Week four:	*Introduction to relational database design, functional dependencies; Normal forms, normalization Normal forms, normalization.*
Week five:	*Introduction to physical organization, indexes, B-trees; Database integrity, integrity constraints, integrity rules.*
Week six:	*Temporary and virtual tables.*
Week seven:	*Test 1*
Week eight:	*Triggers and stored procedures.*
Week nine:	*Fundamentals of query optimization. Introduction to ER model.*

Week ten:	*Entity-relationship data model; Entity-relationship model design.*
Week eleven:	*Database management systems, transactions.*
Week twelve:	*Database recovery. Database security.*
Week thirteen:	*Concurrency control.*
Week fourteen:	*NoSQL databases. Big data.*
Week fifteen:	*Test 2*
Academic policies and rules of conduct	
Regular attendance of lectures and exercises is necessary, as well as active participation with discussion and solution of tasks. Not impeding the progress required for learning using mobile phones turned off or in silent mode.	