DESCRIPTION OF A STUDY COURSE – SYLLABUS

Title of a course	**Databases**				
Head of course	**PhD Marin Kaluža, College Professor**				
Study programme	**Professional undergraduate study Telematics**				
Status of a course	Obligatory				
Year of study	2.	**Semester**	III	**ECTS credits**	6
Teaching plan (L + E + S+ Pr)	3L+3E				

Goals of a course

Acquiring knowledge and competences on the procedures of conceptual and logical data modelling. Acquiring knowledge and competences on the processes of creating relational databases. Acquiring competencies in the application of SQL in managing structure and data in a relational database.

Conditions for enrolling course

No conditions

Learning outcomes on a level of a study programme which includes course

Outcome 4: Use computer principles and methods related to the architecture and organization of computers and computer networks.
Outcome 5: Use computer principles and methods related to programming languages, databases, and operating systems.
Outcome 6: Design and implement desktop, web and mobile computer applications and computer programs for microcomputers and microcontrollers, with or without a database.
Outcome 10: Analyse and implement an information system in the field of telematics.
Outcome 15: Participate in teamwork and independently present professional content in written and spoken form in Croatian and English.

Expected learning outcomes on a level of a course

1. Explain concepts related to data modelling.
2. Identify and extract elements from a system description for the purpose of constructing a data model.
3. Apply the EV method to design a conceptual data model, construct a logical relational data model, and perform the normalization process.
4. Describe the physical structure of a database and explain the differences between a traditional file organization and the DBMS database organization.
5. Use SQL to manipulate the data and structure in databases.
6. Explain the process and distinguish database development steps.
7. Investigate some of the offered specific capabilities and applications of database systems, and present the results of research learning.

Content of a course

Theory of databases. Databases modelling using ER method. Notation types of ER model. The concept of functional interdependence. Interdependence in relational databases. The key of relational scheme. Entity integrity. External key. Referential integrity. “File sharing” and DBMS architecture of databases. Types of program systems for database users (standalone, client-server, web). Types of data (logical, physical). Redundancy, anomalies, decomposition. Normalization through decomposition and normal forms (1NF, 2NF, 3NF i BCNF). Codd's rules and outline of their application. Relational algebra, relational operators. Rissanen's principle of reversibility. Introduction into SQL. DDL, DML, DQL and DD. Joining relations: natural joining, external joining of relations. Horizontal division of relation (group by). Data integrity (referential integrity – cascade, restriction, zeroing). The right to access a database.

Teaching modes	☒ lectures ☐ auditory exercises ☒ seminars and workshops ☐ distance learning	☒ individual assignments ☐ multimedia and network ☐ laboratory ☐ supervisor’s work

	☐ field classes	☐ other _____
Comments		
Students' obligations		
Grading, evaluation and monitoring of students' work continuously during lectures and exams		

Grading is based upon evaluation of course's learning outcomes' adoption. Grading is performed continuously during lectures and/or during exam, in compliance with the provisions of Regulation on the assessment of students.

Continuous check-up:

Outcomes	Theoretical exam (written exam)	Practical exam 1 Data Modelling (exam on computer)	Practical exam 2 SQL (Computer Exam)	Practical exam 3 SQL (Computer Exam)	Seminar work and presentation (group work)	Threshold	Max
Outcome 1	**10%**					**5%**	**10%**
Outcome 2		**5%**				**2,5%**	**5%**
Outcome 3	**5%**	**10%**	**5%**			**10%**	**20%**
Outcome 4	**10%**					**5%**	**10%**
Outcome 5			**10%**	**15%**		**12,5%**	**25%**
Outcome 6	**10%**					**5%**	**10%**
Outcome 7					**20%**	**10%**	**20%**
Percentage of ECTS	**2,1**	**0,9**	**0,9**	**0,9**	**1,2**		
Total	**35%**	**15%**	**15%**	**15%**	**20%**	**50 %**	**100 %**

A student has passed the exam if he has acquired a percentage of credits for each learning outcome higher or equal to defined threshold.

Exam term:

Outcomes	Theoretical part (oral / written exam)	Practical part data modeling (exam on computer), SQL (exam on computer)	Seminar work and presentation	Max
Outcome 1	**10%**			**10%**
Outcome 2		**5%**		**5%**
Outcome 3	**5%**	**15%**		**20%**
Outcome 4	**10%**			**10%**
Outcome 5		**25%**		**25%**
Outcome 6	**10%**			**10%**
Outcome 7			**20%**	**20%**
Percentage of ECTS	**2,1**	**2,7**	**1,2**	
Total	**35%**	**45%**	**20%**	**100 %**

A student has passed the exam if he has acquired a percentage of credits for each learning outcome higher or equal to defined threshold.

Grading:

A student has passed the exam if he has acquired at least 50% of anticipated credits of a specific learning outcome.

If a student has passed learning outcomes of all courses, the accomplished credits (percentages) of all passed learning outcomes are being added, while the final grade is defined upon following table:

Range of credits (percentages)	Numerical grade	ECTS grade
90,00 – 100,00	Excellent (5)	A
75,00 – 89,99	Very good (4)	B

	60,00 – 74,99	Good (3)	C	
	50,00 – 59,99	Sufficient (2)	D	
	0,00 – 49,99	Insufficient (1)	F	

Obligatory literature

1. Kaluža, Marin: Sustavi baza podataka, Skripta, Veleučilište u Rijeci, Rijeka, 2008.
2. Materials used in lectures and exercises from the Database courses; available on Moodle.

Additional literature

1. Pavlić, M.: Oblikovanje baza podataka, Sveučilište u Rijeci, Rijeka, 2011.
2. Pavlić, M: Informacijski sustavi, Sveučilište u Rijeci, Rijeka, 2009.