Study program	Level of studies		First cycle
	Study program name		**Physics and Informatics Education**

Course name	DATABASES			
Course ID	Semester	Course status	ECTS credits	L+E
CS240	**V**	**MANDATORY**	**6**	**3+2**

Lecturer	
Aims and intended learning outcomes	The course aims to familiarize students with entities, relations, models, SQL database language, logical design and database integrity. The above concepts are necessary for students to understand the working principles of databases and information systems. In addition, students will be familiar with the methodology of solving problems in relational databases. Through the mentioned subject, students will master the use of the SQL language through independent work on laboratory exercises as a means for designing and implementing a small information system, as well as training students to develop such and similar techniques.

Course content

- Relational data model; Formalisms of the relational model; Relational algebra; Relational calculus;
- Relational query languages. SQL Query language; Views; SQL standards
- Logical dependencies; Functional dependence; Ambiguous dependencies;
- Normal forms (NF): First normal form; Second normal form; Third normal form; Other normal forms;
- Boyce-Codd normal form;
- Fourth normal form; Fifth normal form
- Structures and algorithms. Sequential representation.
- Direct organization.
- Index representation; Network representation.
- Transaction management. –
- Data integrity; Transactions and integrity; Locking protocols.
- Logical padlocks; Physical padlocks; Distributed databases.

Student workload (hours)		Grading	
Lectures and Exercises	75	Assessment method	Points
Exam preparation	75	Midterm exam	5
		Homework	5
		Projects	40
		Seminar	5
Total	150	Final exam	45
		Total	100

Literature

[1] Lecture notes
[2] S. Alagić, Relacione baze podataka,Svijetlost, Sarajevo 1985.
[3] C.J. Data, An Introduction to Database Systems, Addison-Wesly, 1989.
[4] B.C.Desiai, An Introduction to Database Systems. West Publishing Company 1997.
[5] A.J.Fabbri,A.Robert Schwab. Practical Database Managment,PWs Kent Publishing Company 1999.
[6] F.R.McFadden, J.A.Hoffer. Database Managment. Publishing Company 1998.
[7] C.Ricardo, Database Systems.Macmillan Publishing Company 1999.
[8] J.D. Ullman, Principles of Database Systems. Computer Science Press,1980.
[9] N. Wirth, Algoritams + Data Structure = Programs, Prentece Hall, 1976.
[10] P.B. Davis. Database Systems. Macmillan Computer Science, 1996.
[11] The SQL Quide to Oracle. Addison Wesley,1996.
[12] R.F. Lans. Introduction to SQL. Addison Wesley, 1993.
[13] M.Džaković. ORACLE SQL.Tehnička knjiga, 2005

Remarks