COURSE PROFILE

Course Name	Code	Semester	Term	Theory+PS+Lab (hour/week)	Local Credits	ECTS
Database Management Systems	IT520	Spring		3 + 0 + 0	3	8

Prerequisites	None

Course Language	English
Course Type	Departmental Elective
Course Lecturer	Assist. Prof. Dr. Gülay Ünel
Course Assistant	Murat Kaya
Course Objectives	This course aims to provide fundamentals of relational databases. It presents basics of the relational model and database design, and internals of the database systems including query evaluation, query optimization, transaction processing, concurrency control, and recovery.
Course Learning Outcomes	Upon successful completion of the course, students will be able to: • understand the fundamentals of relational database systems, • design and implement methods for key database management activities such as indexing, query processing, and query optimization, • understand the basics of transaction processing, concurrency control, and recovery.
Course Content	Fundamentals of relational databases. Entity-relationship modeling. Relational model. Data description and query languages. Normal forms and database design. Data layout, buffer systems, file management, indexing techniques (tree-based and hashing). Query processing methodology, implementation of relational operators, external sorting, query optimization. Transaction models, concurrency control algorithms, database recovery.

COURSE CONTENT

Week	Subjects	Related
1	Overview (relatioal algebra, SQL)	Chapters 1,3,4
2	Overview (relatioal algebra, SQL)	Chapters 1,3,4
3	Storage and Indexing	Chapter 8
4	Storage and Indexing	Chapter 8
5	Storage and Indexing	Chapter 9
6	Storage and Indexing	Chapter 10
7	Storage and Indexing	Chapter 11
8	Query Processing	Chapters 12,13,14
9	Query Processing	Chapters 12,13,14
10	Query Processing	Chapters 12,13,14
11	Query Optimization	Chapter 15
12	Transaction Management, Concurrency Control	Chapter 16,17
13	Transaction Management, Recovery	Chapters 16,18
14	Final Project Presentation	

Course Textbook	R. Elmasri, S. B. Navathe, Database Systems: Models, Languages, Design and Application Programming , Pearson, 6th Edition
Recommended References	

Semester Requirements	Number	Percentage of Grade
Attendance/Participation		
Laboratory		
Application		
Special Course Internship (Work Placement)		
Quizzes/Studio Critics		
Homework Assignments		
Presentation		
Project	1	40
Seminar/Workshop		
Midterms/Oral Exams	1	30
Final/Resit Exam	1	30
Total	3	100

PERCENTAGE OF SEMESTER WORK	2	70
PERCENTAGE OF FINAL WORK	1	30
Total	3	100

Course Category	Core Courses	
	Major Area Courses	X
	Supportive Courses	
	Media and Management Skills Courses	
	Transferable Skill Courses	

COURSE'S CONTRIBUTION TO PROGRAM

#	Program Qualifications / Outcomes	* Level of Contribution				
		1	2	3	4	5
1	An ability to use the theoretical and applied foundations in mathematics and basic sciences acquired in the undergraduate level to the solutions of problems in information technology area					X
2	An ability to analyze a graduate level problem, identify and define the computing requirements appropriate to its solution, to understand, select and use appropriate technology, tools, standards, protocols, building blocks, and components to solve the problem					X
3	An ability to propose, analyze, design, develop, test and maintain an information technology system including software solutions, security model, computer and network infrastructure, information systems etc. to solve graduate level information technology problems			X		
4	An ability to analyze and communicate local and global impact of computing on individuals, organizations and society; and the ability to apply information technology techniques, skills, and tools for regular computing practices as well as to improve effectiveness of current methodologies			X		
5	An ability to effectively communicate in oral and written media with all kinds of related audiences, prepare documentation for this purpose; and acquire academic writing skills in a foreign language		X			
6	An ability to understand and teach professional, ethical, legal, and social issues and responsibilities of information technology profession and research		X			
7	An ability to gain knowledge and conduct research on topics inside and outside the requirements of the information technology profession, and the ability to lead and work within heterogeneous teams of people from different research areas to accomplish interdisciplinary research		X			
8	An ability to engage in life-long learning and professional development for personal improvement to follow contemporary information technology research				X	

*1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION

Activities	Number	Duration (Hours)	Total Workload
Course Hours (Including Exams)	14	3	42
Tutorials			
Laboratory			
Application			
Special Course Internship (Work Placement)			
Field Work			
Study Hours Out of Class	14	4	56
Presentations / Seminar	2	1	2
Project	1	54	54
Preparatory reading	14	3	42
Homework Assignments			
Quizzes			
Midterm Exams	1	2	2
Final / Resit Exam	1	2	2
		Total Workload	200

COURSE CATEGORY

ISCED GENERAL AREA CODES	GENERAL AREAS	ISCED BASIC AREA CODES	BASIC EDUCATIONAL AREAS	
1	Education	14	Teacher Training and Educational Sciences	
2	Humanities and Art	21	Art	
2	Humanities and Art	22	Humanities	
3	Social Sciences, Management and Law	31	Social and Behavioural Sciences	
3	Social Sciences, Management and Law	32	Journalism and Informatics	
3	Social Sciences, Management and Law	38	Law	
4	Science	42	Life Sciences	
4	Science	44	Natural Sciences	
4	Science	46	Mathematics and Statistics	
4	Science	48	Computer	60
5	Engineering, Manufacturing and Civil	52	Engineering	40
5	Engineering, Manufacturing and Civil	54	Manufacturing and Processing	
5	Engineering, Manufacturing and Civil	58	Architecture and Structure	
6	Agriculture	62	Agriculture, Forestry, Livestock, Fishery	
6	Agriculture	64	Veterinary	
7	Medicine and Welfare	72	Medical	
7	Medicine and Welfare	76	Social Services	
8	Service	81	Personal Services	
8	Service	84	Transport Services	
8	Service	85	Environment Protection	
8	Service	86	Security Services	