

Fundamentals of Database	Code & No:	IS 231
	Credits:	3 (3,0,1)
	Pre-requisite:	CS 110
	Co-requisite:	None
	Level:	5

Course Description:

Database concepts and architecture; data models, database schemes and instances, DBMS and the concept of program-data independence, database languages and interfaces, database models, relational data model and relational algebra, relational model constraints; domains, keys, and integrity constraints, the structured query language (SQL); data definition, queries, update, statements, and views in SQL, database design; functional dependencies, normal forms.

Course Aims:

- 1) Understand the basics and concepts of database systems.
- 2) Design, implement and evaluate a computer-based DB system to meet desired users' needs.
- 3) Use professionally Structured Query Language (SQL) and understand SQL processing.

Student Outcomes (SOs):

- (a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
- (b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- (c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- (d) An ability to function effectively on teams to accomplish a common goal
- (e) An understanding of professional, ethical, legal, security and social issues and responsibilities
- (f) An ability to communicate effectively with a range of audiences
- (g) An ability to analyze the local and global impact of computing on individuals, organizations, and society
- (h) Recognition of the need for and an ability to engage in continuing professional development
- (i) An ability to use current techniques, skills, and tools necessary for computing practice.

(j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. [CS]

(k) An ability to apply design and development principles in the construction of software systems of varying complexity. [CS]

(j) An ability to use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking, and web systems and technologies. [IT]

(k) An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation, and administration of computer-based systems. [IT]

(l) An ability to effectively integrate IT-based solutions into the user environment. [IT]

(m) An understanding of best practices and standards and their application. [IT]

(n) An ability to assist in the creation of an effective project plan. [IT]

Course Learning Outcomes (CLOs):

1. To understand how to use databases in day to day applications.
2. To be familiar with a broad range of data management issues including data integrity and security.
3. Be able to create databases and use complex SQL queries in relational databases.
4. Be able to write and modify SQL query.
5. Be able to design a table by applying suitable normal forms

SOs and CLOs Mapping:

CLO/SO	a	b	c	d	e	f	g	h	i	j	k	l	m	n
CLO1		√												
CLO2		√												
CLO3				√										
CLO4				√										
CLO5									√					

No.	Topics	Weeks	Teaching hours
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1	Database concepts and architecture	1	3
2	Data models, database schemes and instances	1	3
3	DBMS and the concept of program-data independence	1	3
4	Database languages and interfaces	1	3
5	Database models, relational data model and relational algebra, relational model constraints	1	3
6	Domains, keys, and integrity constraints	1	3
7	Structured query language (SQL); data definition, queries	1	3
8	Update, statements	1	3
9	DCL Statements, Views in SQL	1	3
10	Database design	1	3
11	Functional dependencies	1	3
12	Normal forms	1	3
13	Normal forms Examples	1	3
14	Revision	1	3
Total		14	42

Textbook:

- Carlos Coronel, Steven Morris, and Peter Rob, Database Principles: Fundamentals, Design, Implementation, and Management, 10th Edition, Cengage Learning, 2013

Essential references:

- Ramakrishnan, Gehrke, Database Management Systems, Mc Graw Hill, 3rd edition
- Jeffrey D Ulman, Jenifer Widom, A first course in Database Systems, Pearson New International Edition, 3rd edition