IS5413: DATABASE MANAGEMENT SYSTEMS

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Database Management Systems

Subject Code
IS - Information Systems
Course Number
5413

Academic Unit
Information Systems (IS)

College/School
College of Business (CB)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

This course aims to introduce the basic concepts of database systems. It covers the methods and tools for the conceptual and logical design of database applications, and relational database models and languages for the physical design and implementation of database systems.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Explain the role of database users and understand the concepts of database systems, and architectures of database applications.	25			
2	Design a small database application using entity-relationship method and relational database design theory.	50	x	x	
3	Implement the database application using relational database management system (DBMS), write SQL codes and define integrity constraints.	25	x	x	

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Students will learn the concepts relating to databases and database users, DBMS concepts and its architecture, record storage and file organisation, index structures for files.	1	
2	Demonstrations	Students will apply the methods and techniques of database modelling using extended entity-relationship (EER) method, functional dependencies and normalisation for relational databases, relational database design methods and design process.	2	

3	Lab Workshops	Students will learn hands-on skills on developing the relational database model, SQL- a relational database language, and other database models.	3	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Coursework A group project, which includes a project report and presentation, will be allocated to let students apply the modelling concepts and database programming techniques learnt in class to solve practical problems	1, 2, 3	30	-	Yes

Continuous Assessment (%)

30

Examination (%)

70

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

15

Minimum Examination Passing Requirement (%)

35

Additional Information for ATs

Examination
A written examination is developed to assess student's competence level of the taught subjects.

Assessment Rubrics (AR)

Assessment Task

AT1: Coursework (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to explain the role of database users and features of database systems, and architecture of database systems.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
AT1: Coursework (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Capability to design a small database application using entity-relationship method and relational database design theory.

Excellent
(A+, A, A-) High

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(C+, C, C-) Moderate

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Assessment Task
AT1: Coursework (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Capability to implement the database application using relational database management system (DBMS), write SQL codes and define integrity constraints.

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
AT2: Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Ability to explain the role of database users and features of database systems, and architecture of database systems.

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
AT2: Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
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Assessment Task
AT1: Coursework (for students admitted from Semester A 2022/23 to Summer Term 2024)

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Ability to explain the role of database users and features of database systems, and architecture of database systems.

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Marginal
(B-, C+, C) Moderate

Failure
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(B+, B) Significant

Marginal
(B-, C+, C) Moderate

Failure
(F) Not even reaching marginal levels

Assessment Task
AT2: Examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Ability to explain the role of database users and features of database systems, and architecture of database systems.

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Part III Other Information

Keyword Syllabus

- Database environments including the basic concepts, definitions and database approaches. Architectures and components of database systems.
- Database development process and conceptual database design using Enhanced Entity-Relationship approach.
- The relational database model and its languages. Three-layer relational database architecture. Business benefits of the relational database model.
- Logical database design concepts, theory and techniques. Normalisation of relations and business considerations in data normalization.
- Physical database design process and techniques. Designing physical records and de-normalization, file organizations, using and selecting indexes, performance improvements.
- Database Definitive and Data Manipulation Languages in relational database management systems (RDBMS). Techniques in writing SQL statements. Choice of RDBMS from user perspectives.
- Advanced topics on SQL, triggers, stored procedures, embedded SQL, dynamic SQL and XML.

Reading List

Compulsory Readings

	Title
1	Jeffrey A. Hoffer, Ramesh Venkataraman, Heikki Topi. Modern Database Management, 13th Edition by Pearson. (2019).

Additional Readings

	Title
1	Elmasri, R. and Navathe, S.B., Fundamentals of Database Systems, The Benjamin/Cummings, Co. Inc., 7th edition (2022).
2	Silberschatz, A. and Korth, H.F., Database System Concepts, McGraw-Hill, Inc. (2019)