

Subject Description Form

Subject Code	DSAI2202
Subject Title	Database Principles
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisite: COMP1010 Computational Thinking and Problem Solving Exclusion: COMP2411
Objectives	The objective of this subject is to provide students with a fundamental understanding of database principles, focusing on database design, development, and management. Students will gain hands-on experience in designing relational databases, writing complex queries using SQL, and understanding the trade-offs involved in database storage and retrieval. The course will also introduce modern databases in AI-related applications.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: (a) understand database management systems and apply essential tools and techniques; (b) comprehend database design principles, including data modeling and normalization; (c) analyze and select appropriate database solutions for various applications; (d) work effectively in teams to complete database projects and communicate technical findings.
Subject Synopsis/ Indicative Syllabus	1. Introduction to Database Systems: role of databases in applications, and components of database management systems 2. Data Modeling and Database Design: entity-relationship (ER) model, and normalization 3. Relational Model and Query Languages: relational structures and constraints, relational algebra, and SQL 4. Transaction Management and Security: concurrency control, recovery mechanisms, database security and integrity constraints 5. Modern Database Architectures and Trends: NoSQL databases, distributed and cloud-based database architectures, scalable storage solutions for AI applications
Teaching/Learning Methodology	This subject emphasizes both theoretical and practical aspects of database principles. Lectures will introduce key concepts, while tutorials and laboratory sessions will reinforce learning through hands-on exercises and case studies. Students will complete individual and group assignments, projects, and presentations to enhance their understanding of database development in real-world scenarios.

Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
			a	b	c	d
	1. Assignments, Tests and Projects	70%	√	√	√	√
	2. Examination	30%	√	√	√	
	Total	100 %				
	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: The assessment methods are designed to evaluate students’ theoretical understanding and practical skills in database principles. The assignments and projects will test students’ ability to apply their knowledge to solve real-world database problems, while the final examination will assess their conceptual understanding and problem-solving skills.					
Student Study Effort Expected	Class contact:					
	▪ Lectures				26 Hrs.	
	▪ Tutorials/Labs				13 Hrs.	
	Other student study effort:					
	▪ Assignments, Tests, Projects, Exams				80 Hrs.	
	Total student study effort				119 Hrs.	
Reading List and References	1. Silberschatz, A., Korth, H. F., & Sudarshan, S. <i>Database System Concepts</i> , 7th Edition, McGraw-Hill, 2020. 2. Elmasri, R., & Navathe, S. B. <i>Fundamentals of Database Systems</i> , 7th Edition, Pearson, 2016. 3. Ramakrishnan, R., & Gehrke, J. <i>Database Management Systems</i> , 3rd Edition, McGraw-Hill, 2002.					