Unit of Study: ICT5151 Data and Information Management

Overview

Over the past two decades, data has become a strategic asset for most organizations. Databases are used to store, manipulate, and retrieve data in nearly every type of organization, including business, health care, education, government, and libraries. Database technology is routinely used by individuals on personal computers and by employees using enterprise-wide distributed applications. Databases are also accessed by customers and other remote users through diverse technologies, such as automated teller machines, Web browsers, smartphones, and intelligent living and office environments.

This unit provides a solid foundation for the design, implementation, and management of database systems. It highlights the skills required to identify and model organizational data and information using data modelling techniques. You will learn that the key to successful database implementation is the proper design of databases to fit within a larger strategic view of the data environment. You will also gain the hands-on skills to make them attractive to employers. The main emphasis in this Unit is on a design and implementation of Relational Databases. In addition, this Unit covers Big Data Analytics and NoSQL, including Hadoop technologies.

Course(s)	Graduate Certificate in Information Technology Master of Information Technology
Credit Points	8 credit points
Duration	12 weeks (10 teaching weeks; 1 study week; 1 final assessment week)
Level	Postgraduate Foundational
Student Workload	Students should expect to spend approximately 13 hours per week over 12 weeks (total ling approximate 150 hours) on learning activities for this unit.
Mode(s) of Delivery	On campus, Blended
Pre-Requisites	None
Unit Coordinator	As per current timetable
Contact Information	Consultation: 1 hour scheduled session

Unit Learning Outcomes

On successful completion of this unit, students will be able to:

ULO1 Justify the role that database management system plays in the storage and retrieval of structured, semi-structured, and unstructured data.

ULO2 Model complex business requirements using Entity Relationship methodologies.

ULO3 Design physical databases.

ULO4 Construct appropriate SQL statements to create, query and manipulate databases.

ULO5 Rationalise transaction handling in the context of relational databases.

Weekly Schedule

Detailed information for each week's activities can be found on Unit's Weekly Modules in Canvas.

Week	Topic
Week 1	Structured, semi-structured, and unstructured data Database concepts
Week 2	The Relational data model part 1
Week 3	The Relational data model part 2
Week 4	Entity Relationship (ER) modelling
Week 5	Functional dependencies and normalization
Week 6	Physical database design and querying
Week 7	Database Transactions and ACID properties. Part 1
Week 8	Database Transactions and ACID properties. Part 2
Week 9	Data warehousing XML and JSON technologies for information storage/retrieval NoSQL databases
Week 10	Technologies for big data (e.g., MapReduce and Hadoop)
Week 11	Revision
Week 12	Final Assessments

Assessments

1. All assessments are compulsory.
2. To pass the unit students must:
    - achieve a total of 50% or more of marks offered; and
    - pass all individual invigilated assessments; and
    - have attempted all assessments.

Where one or more of these requirements are not met, the Board of Examiners will consider a student's overall progress towards meeting the unit learning outcomes and any special circumstances before reaching a decision.

3. The Board of Examiners may grant a supplementary assessment where a student:
    - achieves a total of 45% or more; and
    - has passed all individual invigilated assessments in the unit; and
    - has attempted all assessments; and
    - has a recommendation for supplementary assessment by the Unit Coordinator and the Head of Discipline?

Where one or more of these requirements are not met, the Board of Examiners will consider a student's overall progress towards meeting the unit learning outcomes and any special circumstances before reaching a decision. Attendance and engagement in class will be considered. APIC awards common result grades, set out in the Award of Grade Policy.

Detailed information for each assessment can be found on the Unit's Home Page in the Assessment Brief

Assessment Task	Type	Weighting	Due	Length	ULOs
Assessment 1: Quiz In-class activities/quizzes - Students will complete on-line quizzes.	Individual  Invigilated 	20%	Weeks 3, 4, 6, 7	15 minutes each (equiv. 1000 words)	ULO1 ULO2 ULO4 ULO5
Assessment 2: Laboratory Practicum In-class activities - Students will complete in class workshop assessments including situation analyses and practical applications of skills.	Individual  Invigilated 	10%	Weeks 5, 8	500 words	ULO1 ULO2 ULO4 ULO5
Assessment 3: Database Analysis and Design Project Each pair of students will analyse a scenario, create an ER analysis that appropriate represents the system, build a database that implements the design and populate the database with sample data.	Group 	35%	Week 9	20-minute Presentation (equiv. 2000 words) Model diagrams (equiv. 1000 words)	ULO1 ULO2 ULO3 ULO4
Assessment 4: Research Report Students will report on the use of technologies and strategies in modern approaches to the management of semi-structured and unstructured data.	Individual 	35%	Week 10	2500 words	ULO1 ULO3

equiv. – equivalent word count based on the Assessment Load Equivalence Guide.

Course Reserve

Course Reserve includes all required resources and reading material for the unit of study. You can access Course Reserve via APIC Library or via the Course Reserve link on the unit's homepage.

Prescribed text(s):

Coronel, C., Morris, S. (2019) Database Systems: Design, implementation and management (13th ed.). Cengage Learning.

Recommended Readings:

Hoffer, JA, Ramesh, V & Topi, H 2020, *Modern database management*, 13th edn, Global edn, Pearson, New York.

Other Recommended Resources:

Pathak, N 2007, *Database Management System*, Global Media, viewed 10 Sep 2021, E-book Central (ProQuest).

Stair, R, & Reynolds, G 2017, *Fundamentals of Information Systems*, Cengage, viewed 10 Jan 2021, E-book Central (ProQuest).

Olson, DL 2018, *Data Mining Models*, 2nd edn, Business Experts Press, US.

Academic integrity

Ethical conduct and academic integrity and honesty are fundamental to the mission of APIC and academic misconduct will not be tolerated by the College. It is the responsibility of every student to make sure that they understand what constitutes academic misconduct and to refrain from engaging in it. Please refer to APIC's Academic Integrity Policy for further details.

Other Important Information and Links

Special consideration If your academic work is impacted by significant documented illness, hardship, or other adverse circumstances beyond your control, you may make an application for Special Consideration. Please refer to the Assessment Policy for further details.	**Late submission** Penalties apply when work is submitted after the due date without approval. Please refer to the Assessment Policy for information about late submission.
Assessment appeals If you are concerned about a mark you have received for an assessment or final grade, you may apply to formally appeal the grade. Please see the Assessment Policy for further details.	**Award of grades** APIC awards common result grades, set out in the Award of Grade Policy.
Expectations of student conduct Students are expected to conduct themselves in a manner that is consistent with a safe and respectful study environment. More information can be found in the Student Code of Conduct.	**Study resources** APIC Library and Student Learning Support resources and services can be accessed via the Student Lounge or your Dashboard on the OLS (Canvas).

Student Services	Key dates
The Student Services team provides administrative support for students and handles enquiries about enrolment, timetables, important dates and submitting forms. More information can be found on the Student Services page on the OLS (Canvas).	Key dates through the academic year, including teaching periods, census, payment deadlines and exams can be found on the Academic Calendar section of the APIC website.

Changes and Updates to the Unit of Study Guide

This Unit of Study Guide may be updated and amended from time to time. Students will be notified of any changes to the unit via the Online Learning System (Canvas) space for the unit.

This Unit of study Guide was last modified on 13th May 2024.