Module Specification – (Programme Specs Ver. 5) 2019/20

Module Code: 19CSIS05I	**Title:** Database II	
Level: 5	**Modular weight:**10	**Faculty/Dept.:** ICS
Pre-requisite modules: CSIS03C		
Reassessment: *No restrictions*		
Module Leader: Assoc. Prof. Doaa Elzanfaly		
Semester taught: One		
Date of latest revision: April 2017		

Aims

This module aims to give students in depth knowledge about database systems implementation techniques that covers: database storage management and tuning, database system architecture, indexing techniques, query processing and optimization, transaction processing concepts, concurrency control techniques, database recovery techniques, database security and authorization, enhanced data models for advanced applications, temporal databases, and emerging technologies and applications.

Intended Learning Outcomes

On completion of this module students should be able to:

Knowledge and Understanding

1. Identify the fundamental techniques and methods applied for data storage and retrieval including hashing, file indexing, and query processing and optimisation techniques. [A12]
2. Explains the concepts of transaction processing, concurrency control, and database recovery from failures, security against different threads and authentication and how these concepts are employed in modern database systems.[A4]
3. Apprise recent trends and advances in the area of data management systems. [A10]

Intellectual Skills

4. Evaluate different alternatives for query processing and optimization. [B5]
5. Examine database recovery mechanisms and discuss how they could be used to recover a database from various types of disasters. [B2], [B8]
6. Apprise issues related to database performance monitoring, tuning and reliability. [B2], [B11]

Practical and Professional skills

7. Report general database State, workload, and performance. [C10]
8. Organise the database administration tasks including security issues and recovery mechanisms. [C11]

General and Transferable skills

9. Develop an analytical approach for problem solving. [D9]
10. Apply critical reasoning to issues through independent thought and informed judgement.[D9]

Employability

This module will provide opportunities for students to:

1. Find information in different formats from a range of local or remote data sources.[B.3.2]
2. Generate imaginative ideas that can be applied to different situations. [C.2.1]
3. Make decisions by determining the best course of action and evaluating different options based on logic and fact in order to present solutions. [C.2.5]
4. Demonstrate determination to get things done and to constantly looking for better ways of doing things.[C.2.6]

Indicative Content

- Database file organisations: Heap, ordered, and hashed files of records.
- Retrieving Data from storage using different indexing techniques
- Query processing and optimization techniques.
- Database tuning and physical design issues.
- Database transaction processing.
- Protocols for concurrency control in database.
- Database recovery protocols.
- Database security and authentication.
- Emerging database technologies and applications.

Methods of Learning, Teaching and Assessment

Total student effort for the module: xx hours on average over one semester.

Type of session	Typical Student Effort		
	Typical number in the semester/s	Typical hours per week	Total hours
Lecture	12	2	24
Tutorial	-	-	-
Laboratory	12	2	24
Private study			52

Assessment

Assessment Type	Weight %	ILOs Assessed	Exam Semester	Exam/ Written Coursework Length
Two In-lab tests	40%	4-10	2	30 min. each
One unseen written exam.	60%	1-6	2	120 minutes

Methods of Feedback

In response to assessed work:

- Each assignment is returned to the student with an individual written feedback on the accompanying feedback form.
- Generic exam feedback will be given on the e-learning system.

Developmental feedback generated through teaching activities:

- Dialogue between students and staff in workshops and Labs

Indicative Reading List

- Ramez Elmasri and Shamkant B. Navathe. Database Systems: Models, Languages, Design and Application Programming, 6th Edition, Pearson (2011)
- Connolly, T. and Begg, C., "Database Systems: a Practical Approach to Design, Implementation and Management", 6th Edition, Addison-Wesley, (2015).