Course Specifications

General Information

Course name	Advanced Database Systems
Course number	ITCS4303
Faculty	
Department	
Course type	Major Needs
Course level	4
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - Principles of distributed database systems, including design and architecture, query processing, transaction management, locking, recovery, and Replication

2 - An overview of how a distributed database system works collaboratively

3 - The latest advances in distributed database

Intended Learning Outcomes

Knowledge and Understanding	* a1. Explain architecture and design tradeoffs of all aspects of distributed database management systems * a2. Describe an application based upon the distributed database * a3. Discuss database management systems concepts * a4. Explain the principles and techniques of a number of application areas informed by the research directions of distributed database systems
Intellectual Skills	* b1. Explore distributed database design methods and techniques * b2. Recognize the structural and functional differences between classic and modern distributed database architectures * b3. Develop distributed database application that suits specific architectures * b4. Identify a range of solutions and critically evaluate and justify proposed design solutions * b5. Solve distributed database problems with pressing commercial or industrial constraints * b6. Generate an innovative design to solve a problem containing a range of commercial and industrial constraints
Professional Skills	* c1 Provide hand-on experience programming portions of a distributed database management system * c2 Examine issues of distributed query execution, including optimization, transaction management, and fault tolerance
General Skill	* d1 student should be able toCollaborate effectively within multidisciplinary team * d2. Student should be able to work in stressful environment and within constraints * d3. Student should be able to communicate effectively * d4. Student should be able to demonstrate efficient IT capabilities * d5. Student should be able to lead and motivate individuals * d6. Student should be able to manage tasks and resources

Course Contents

1 - Introduction Levels of distribution transparency
2 - Distributed database design, mapping users' transactions to distributed level. Optimization of accesses strategies
3 - The management of distributed transactions
4 - Distributed concurrence control, recovery in distributed database
5 - Replication
6 - Commercial systems. The SDD 1 system

Teaching and Learning Methods

1 - Lectures
2 - Tutorial Exercises
3 - Practical Exercises

Students Assessment

Assessment Method	TIME	MARKS
Midterm Exam	6th week	20
Lab	During 16 weeks	20
Class Work	During 16 weeks	10
Final Exam	16th week	50

Books and References

Course note	From Lecturers Office
Essential books	Principles of Distributed Database Systems, Second Edition © 1999 M. Tamer ?zsu and Patrick Valduriez
Recommended books	Distributed Database Management Systems , Copyright © 2010 IEEE Computer Society, Saeed K. Rahimi, Frank S. Haug

Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
introduction Levels of distribution transparency	1	a1, a3			d1-d6
Distributed database design, mapping users' transactions to distributed level. Optimization of accesses strategies	2-4	a1-a3	b1, b2, b4	c1, c2	d1-d6
The management of distributed transactions	5-6	a1-a3		c1, c2	d1-d6
,Distributed concurrence control recovery in distributed database	7-9	a1, a2		c2	d1-d6
Replication	10-12	a1, a2		c1, c2	d1-d6
Commercial systems. The SDD 1 system	13-14	a4	b3-b6	c1, c2	d1-d6