COURSE SYLLABUS FORM

American University of Beirut
Faculty of Arts and Sciences
Department : Computer Science

Course Number and Title: CMPS 378, Advanced Database Applications

1. Course Learning Outcomes

- Read, understand, discuss and criticize a research paper.

- Write XML documents that conform to their schema.
- Query XML documents.
- Compare different approaches to store and retrieve XML documents in databases.
- Describe some XML-based applications.
- Compare different approaches of XML schema evolution and integration.

- Explain the processus of building and maintaining a data warehouse.
- Describe OLAP operations.
- Explain some data mining tasks.
- Compare different algorithms for mining association rules.
- Describe some data mining applications.

2. Resources Available to Students

This is a graduate course in advanced database applications. It is research-oriented and covers some of the current hot research topics in databases. For each topic, we first present the basics from one of the textbooks, and then study different new aspects from research papers.

- *Database System Concepts*, by A. Silberschatz, H. Korth, S. Sudarshan. McGraw-Hill, Fourth edition, 2002.
- *Database Management Systems*, by J. Gehrke, R. Ramakrishnan. McGraw-Hill, Third edition, 2003.
- Latest research papers published in the proceedings of international database conferences (VLDB, SIGMOD, ICDE, ER, DASFAA, CAISE, DEXA, OOIS, EC-WEB, …).

3. Grading Criteria

Quizzes: 30%
Research paper presentation: 30%
Final exam: 40%

4. Schedule

Week	Topic	Activities	Assignments
1	**XML:** background, structure of XML data.	lecture	
2	XML document schema (DTD, XML-Schema).	lecture	
3	XML query languages (Xpath, Xquery), XML API.	lecture	
4	Comparison of concepts in XML and relational database systems. Storage and Retrieval of XML data in relational databases.	Research presentations	
5	Storage and Retrieval of XML data in object databases. XML applications (1).	Research presentations	
6	XML applications (2). XML benchmarks.	Research presentations	
7	XML schema evolution. XML schema integration.	Research presentations	
8	**Decision Suppport Systems:** introduction, data warehouses.	lecture	
9	OLAP.	lecture	
10	Data mining (association rules).	lecture	
11	Data mining (sequential paterns, classification rules).	lecture	
12	Maintenance of data warehouses. Algorithms for mining association rules.	Research presentations	
13	Data mining applications.	Research presentations	
14	Maintenance of discovered association rules. Storage issues for data mining.	Research presentations	
15	Mining association rules in XML data.	Research presentations	

5. Course Policy (if any)

A student who misses an exam (quiz or final) must submit a valid excuse (e.g. medical report from the AUB infirmary), within two weeks from the date of the exam, in order to have a make-up exam; otherwise, he/she will get a grade of zero.
Cheating during the exams will result in a grade of zero and it can result in a warning from the Dean's Office.