SUBJECT DESCRIPTION FORM

Subject Title: Web Database Technologies and Applications

Subject Code: COMP5323

Credit Value: 3

Pre-requisite:

Database Systems (COMP 503) or
Database Systems and Management (COMP5111) or equivalent
[waived for MSc in Software Technology students]

Recommended background knowledge:

Familiar with C/C++, Java, ASP or PHP.

Mutual Exclusions:

Web Database Technologies and Applications (COMP532)

Learning Approach:

42 hours of class activities including - lecture, tutorial, lab, workshop seminar where applicable

Assessment:

Continuous Assessment	45%
Test, and Examination	55%

Objectives:

1. To enable students with principles and knowledge of web databases and semistructured data in the Internet environment;
2. To teach students with sound techniques in designing and querying web database;
3. To provide detailed examples of how advance techniques are being applied in web database applications now and the near future.

Learning Outcomes:

After completing the subject, students should be able to:

1. become familiar of the core components of Web databases;
2. design and develop semi-structure data models for Web databases and perform queries on them;
3. identify and describe the different design approaches or algorithms adopted in Web databases; and
4. compare, select and develop software programs or techniques for web database applications.

The Department reserves the right to update the syllabus contents. Please note that the learning approach for the same subject could vary slightly due to different delivery modes.

Keyword Syllabus:

Introduction to Web Database Systems
Review of relational, object-oriented, and XML databases.

Semistructured Data
XML basics, the simple API for XML, parsing XML, W3C document object model, SAX parsing, , XML graph model.

XML Data Modeling
DTD and XML Schema.Native XML databases, transforming XML data to relations, and storing XML data in relational databases.

Querying of Web Databases
XPath, XQuery, XQL, XML-QL, unQL, grouping with nested queries, binding elements and contents, querying attributes, joining elements by value, tag variables, mediators for data integration, distributed evaluations, query processing and evaluations.

Typing and Indexing
Schema formalisms, Datalog, extracting schemas from data, data guides, inferring schemas from queries, attribute multiplicity, path constraints in semistructured data, XML schema, XML views, modelling data types, indexing and extending databases in XML.

Web Transactions Management
Serializing relational query results in XML, prefetching and caching, XML transaction servers.

Web Database Systems
Using XML with relational databases, XML support in MS/SQL and Oracle, compressing XML objects, XMill, Web intermediary, and XML wrappers. .

Web Services and Applications
Dynamic media contents composition, B2B and B2C e-commerce applications, web services, UDDI, EDI applications, ebXML, VBL, PML and education applications.

Indicative reading list and references:

Web Data Management Practices: Emerging Techniques and Technologies, By Athena Vakali, George Pallis; Idea Group Inc (IGI), 2007.
XML Data Management (Native XML and XML-Enabled Database Systems),Chaudhri, Rashid and Zicari; Addison Wesley, 2003.
Web Data Management, Bhowmick, Madria, WK Ng; Springer, 2004
JP Morgenthal, 2001, *Enterprise Application Integration with XML and Java 1/e*, Prentice Hall, Hewlett, New York.

ACM Transactions on Information Systems
IEEE Transactions on Knowledge and Data Engineering
ACM Transactions on Database Systems
Information Processing and Management
WWW Conference Proceedings
VLDB, SIGMOD, ICDE Conference Proceedings