Basic Course Information CS 5750

Course Title: Topics in Database Systems

Units: **3**

C/S Classification #: C-2

Component (select one): **Lecture**

Instructional Mode (select all appropriate choices): **Face-to-Face and Web-Assisted**

Grading Basis (select one): **Graded only**

Repeat Basis (select one): **May be taken only once**

Cross listed Course (if offered with another department):

Dual-listed Course (if offered as lower/upper division or undergraduate/graduate):

Major course/Service course/GE course (select all appropriate choices): **Major Course**

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Date Prepared: **April 2, 2015**

I Catalog Description

**Advanced SQL programming. Trigger and stored procedure. Object-relational and semi-structured modeling and databases. Physical database design. Techniques and algorithms for database design. XML and Web data. Distributed databases. Information integration. Data warehouses. Data mining. Current research topics and technologies in database systems.**

II Required Coursework and Background

Pre-requisite(s): **CS 4350 or consent of instructor**.

III Expected Outcomes

On successful completion of this course, students will be able to **acquire the following knowledge and skills:**

1. **Types of data modeling and database**;
2. **Advanced SQL programming;**
3. **Techniques and algorithms of database design;**
4. **Query languages for object-oriented, object-relational, and XML databases;**
5. **Structure and algorithms of distributed database;**
6. **Applications of data mining and data warehousing;**
7. **Algorithms of data mining (association rules, classification, and clustering).**

Outcomes of this course will build student capacity in each of the following areas as defined by programmatic objectives for the computer science major.

P-SLO 3. An ability to build applications, either individually or in a team, that are robust, reliable, and maintainable.

P-SLO 4. A breadth of advanced knowledge and skills in applied areas of computer science.

IV Instructional Methods

Texts may vary with instructor and over time. Examples of possible texts include:

1. **Hector Garcia-Molina, Jeffery D. Ullman, and Jennifer Widom, Database Systems The Complete Book, Prentice-Hall, 2009.**
2. **Abraham Silberschatz, Henry F. Korth, and S. Sudarshan, Database System Concepts Sixth Edition, McGraw-Hill, 2010.**

1. **Michael Kifer, Arthur Bernstein, and Philip M. Lewis, Database Systems An Application- Oriented Approach Second Edition Addison Wesley, 2004, and the Complete Version, Second Edition, 2005.**

V Minimum Student Material

**Textbook and Notebook**

VI Minimum College Facilities

**A classroom with a projection system, whiteboard, and a computer lab.**

VII Course Outline

**Database system architecture; data modeling using ER, EER, and UML;**

**Functional dependencies and normalization;**

**Techniques and algorithms of database design;**

**Advanced SQL Programming,**

**Object and object-relational databases;**

**Semi-structured modeling and databases, and XML and Xquery language;**

**Distributed Database, Data mining, data warehousing and OLAP.**

VIII Instructional Methods

**Lecture**

**Problem-Solving**

**Discussion**

**Programming projects**

IX Evaluation of Outcomes

A. Student Assessment

**Exams**

**Homework**

**Programming Assignments**

**Presentation**

B. Meaningful Writing Assignment

Students shall produce written solutions that are assigned as homework.

Students are required to write commentaries to major program components of each programming projects.

C. A Matrix of Course Student Learning Outcomes vs Methods of Assessment

If the course is being evaluated for accreditation purposes, approved department accreditation assessment tools will additionally be utilized.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Course Learning Outcomes | Methods of Assessment | | | |
| Homework | Programming Projects | Presentation | Exams |
| **Types of data modeling and database**; | x |  |  | X |
| **Advanced SQL programming;** | x | X |  | X |
| **Techniques and algorithms of database design;** | x | X |  | X |
| **Query languages for object-oriented, object-relational, and XML databases;** | x | X |  | X |
| **Structure and algorithms of distributed database;** | x |  |  | X |
| **Applications of data mining and data warehousing;** | x |  |  | X |
| **Algorithms of data mining (association rules, classification, and clustering).** | X |  | X | X |