# EAST WEST UNIVERSITY

**Department of Computer Science and Engineering**
**Course Outline for CSE 464 Advance Database System**
**Spring 2018 Semester**

## Course Information

**Course**: **CSE 464 Advance Database System (Section 1)**
**Credit Hours**:3
**Pre-requisite**: CSE 301 Database Systems

## Instructor Information

**Instructor**: **Mohammad Rezwanul Huq, PhD, Assistant Professor, CSE Dept.**
**Office**: 629
**Tel. No.**: 09666775577 (hunting) Ext: 372
**E-mail**: mrhuq@ewubd.edu
**TA:** TBA

## Class Routine & Office Hours

| Day | 08:30-10:00 | 10:10-11:40 | 11:50-01:20 | 01:30-03:00 | 03:10-04:40 | 04:50-06:20 |
|---|---|---|---|---|---|---|
| **Sunday** | **Office Hour** | CSE 301 (2) AB1-802 | CSE 464 (1) Room 222 | **Office Hour** | CSE 301 (3) AB2-204 | |
| **Monday** | | | | **Office Hour** | CSE 301 (4) AB1-802 | CSE 301 (3) LAB Room 529 (till 18:50) |
| **Tuesday** | **Office Hour** | CSE 301(2) AB1-802 | CSE 464 (1) AB2-204 | **Office Hour** | **Office Hour** | |
| **Wednesday** | | | | **Office Hour** | CSE 301 (4) AB1-802 | CSE 301 (4) LAB Room 530 (till 18:50) |
| **Thursday** | | CSE 301 (2) LAB Room 534 (till 12:10) | | **Office Hour** | CSE 301 (3) Room 213 | |

## Course Outcome (CO)

This course will expand upon what you learned in CSE 301 (Database Systems) and introduce various other advanced topics, including query processing and optimization, concurrency control protocols, data warehouses, information retrieval, object-relational database and distributed database. This course will help you to expand your knowledge base so that you have a better understanding of the field.

Students successfully completing this course should be able to:

1. **Apply** and **analyze** different query processing and query optimization techniques.
2. **Explain** and **compare** the principles and practices of concurrency control protocols and information retrieval techniques.
3. Critically **analyze** and **evaluate** modeling and development methods in Object-Relational Databases.
4. Critically **compare, analyze** and **evaluate** methods/technologies in developing data warehousesand distributed database.

## Course Contents & Teaching Schedule

| Week | Lecture Topic(s) | Teaching Material and References |
|---|---|---|
| 1 | Overview of the course and Reviewing Relational Algebra and Basics of SQL | Lecture and Textbook (KorthCh. 2, 3, 6) |
| 2 | Query Processing for selection and join operations | Lecture and Textbook (KorthCh. 12) |
| 3 | Query Optimization Techniques | Lecture and Textbook (KorthCh. 13) **Assignment 1** |
| 4 | Concurrency control protocols | Lecture and Textbook (Korth Ch. 15) |
| | **Mid-Term I Exam** | |
| 5 | Data Warehousing | Lecture and Textbook (KorthCh. 20, Han) **Assignment 2** |
| 6 | Informational Retrieval | Lecture and Textbook (KorthCh. 21) |
| 7 | Introduction to Object-Relational Database | Lecture and Textbook(Korth Ch.22) |
| | **Mid-Term II Exam** | |
| 8 | Object-Oriented Oracle | Lecture and Textbook(Rahayu) **Assignment 3** |
| 9 | Concepts of Distributed Database | Lecture and Textbook(Tamer Ch.1) |
| 10 | Design of Distributed Database: Horizontal and Vertical fragmentation. Paper Presentation. | Lecture and Textbook(Tamer Ch.3) |
| 11 | Review | |
| | **Final Exam** | |

## Learning Outcomes

- ***Knowledge and understanding***
  - Understand basic concepts of query processing and optimization techniques.
  - Understand different concurrency control protocols and information retrieval techniques.
  - Understand major issues involved in object-relational database.
  - Understand basic concepts of data warehouses and distributed database.
- ***Cognitive skills (thinking and analysis)***
  - Be able to apply advanced concepts of a database system appropriately.
  - Be able to evaluate methods to develop an object-relational database.

- Be able to compare and contrast different methods in designing and developing data warehouses and distributed database.

- ***Communication skills (personal and academic)***
  - Individual assignments and group assignments (presentation) involve receiving clear instructions, designing and writing an effective report and making an effective presentation.

- ***Practical and subject specific skills (Transferable Skills)***
  - Be able to apply, analyze and evaluate advanced database concepts and methods.

## Teaching Materials/Equipment

**Textbook:**

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan,*Database System Concepts*, McGraw-Hill Education (6th edition)
2. M. Tamer Ozsu, Patrick Valduriez, *Principles of Distributed Database Systems*, Springer (3rd edition).
3. Jiawei Han, Micheline Kamber and Jian Pei, *Data Mining Concepts and Techniques*, The Morgan Kaufman Series in Data Management Systems (3rd edition).
4. J. W. Rahayu, D. Taniar and E. Pardede, *Object-Oriented Oracle*, IRM Press.

**Teaching Materials:**Textbook, Lectures, Slides*, Computers and Software**.

**Teaching-Learning Method:**Lectures, Discussions, Assignments, Presentations.

** Lecture Slides will be made available to the students during the class. They can be also downloaded from* ***http://thiscourse.com/ewubd/cse464/fa16/***

*** List of related software is given below:*

| Software Name | Link |
|---|---|
| Oracle Database 11g Express Edition | http://www.oracle.com/technetwork/database/database-technologies/express-edition/overview/index.html |
| Oracle SQL Developer | http://www.oracle.com/technetwork/developer-tools/sql-developer/downloads/index.html |

## Assessment Weightage (Evaluation and Grading Policy)

The relative contributions of exams, lab work, and reports are as follows:

| Course Part | % of Mark |
|---|---|
| Theory | |
| Class Participation | 5% |
| Class Tests (best two of three) | 10% |
| Assignments | 10% |
| Paper Presentation | 10% |
| Mid-Term I Exam | 20% |
| Mid-Term II Exam | 20% |
| Final Exam | 25% |

## Student Learning Time (SLT)

Student Learning Time (SLT) can be divided into: Face to Face (36 hours), Independent Learning (78 hours) and Assessment (6 hours). The detailed breakdown is as follows:

| NO. | TEACHING AND LEARNING ACTIVITIES | STUDENT LEARNING TIME (SLT) |
|---|---|---|
| 1. | Lecture | 36 hours (1.5 hours × 24 lectures) |
| 3. | Review lessons after lecture (including preparation for exams) | 72 hours (36 hours× 2 hour study time) |
| 5 | Carry outAssignments | 6 hours (3 Assignments × 2 hours) |
| 7. | Carry out Paper Presentation | 1.5 hours |
| 8. | Carry out Mid Term and Final Exams | 4.5 hours |
| | **TOTAL SLT** | 120 hours |
| | **CREDIT = SLT/40** | 3.0 |

*Note: 40 notional hours = 1 credit*

**Details:**

- Group Assignments (presentation) must be done in a group of 3.
- STRICTLY NO COPYING from other groups/individuals.
- Late assignment suffers a penalty rate of 20% per day, up to 5 days (weekends count towards the 5 days). Assignments that are more than 5 days late are penalized by 100%.
- **Failing Grade:** Plagiarism, absenteeism, lack of preparation, and lack of effort will result in a failing grade.

## Grading System

| Marks (%) | Letter Grade | Grade Point | Marks (%) | Letter Grade | Grade Point |
|---|---|---|---|---|---|
| 97-100 | A+ | 4.00 | 73-76 | C+ | 2.30 |
| 90-96 | A | 4.00 | 70-72 | C | 2.00 |
| 87-89 | A- | 3.70 | 67-69 | C- | 1.70 |
| 83-86 | B+ | 3.30 | 63-66 | D+ | 1.30 |
| 80-82 | B | 3.00 | 60-62 | D | 1.00 |
| 77-79 | B- | 2.70 | Below 60 | F | 0.00 |

## Exam Dates

| Exam | Section 1 |
|---|---|
| Mid-Term I | 11 February 2018 |
| Mid-Term II | 08 February 2018 |
| Final Exam | 07 February 2018 |

## Academic Code of Conduct

**Academic Integrity**

Any form of cheating, plagiarism, personation, falsification of a document as well as any other form of dishonest behavior related to obtaining academic gain or the avoidance of evaluative

exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties up to and including suspension and expulsion.**

**Special Instructions**

- Students **MUST WEAR dresses** in conformity with the **dress code of EWU** within the lecture/lab classes and examination hall.
- Students are expected to attend all classes, labs and examinations.
- Students will not be allowed to enter into the classroom after 15 minutes of the starting time.
- For plagiarism, the grade will be automatically become zero for that exam/assignment.
- There will be **NO make-up examinations**. In case of emergency, you MUST inform me within 48 hours of the exam time. Failure to do so will mean that you are trying to take UNFAIR advantage and you will be automatically disqualified. Also proper medical certificate (if applicable) has to be presented on the next class you attend.
- You MUST have at least 80% class attendance to sit for the final exam.
- All mobile phones MUST be turned to silent mode during class, lab and exam period.
- There is **zero tolerance for cheating** at EWU. Students caught with cheat sheets in their possession, whether used or not used, and/or copying from cheat sheets, writing on the palm of hand, back of calculators, chairs or nearby walls, etc. would be treated as cheating in the exam hall. The only penalty for cheating is expulsion from EWU.