Database Syllabus

I. COURSE INFORMATION:

CS 649 Database Management Systems Fall 2014

Course Schedule: Thursday 6 - 8:35 PM Classroom: Cook Lab (LLC 207)

Instructor: Prof. Ping-Tsai Chung

Course Web Site: http://blackboard.liu.edu/

Textbook: (Required) Fundamentals of Database Systems, R. Elmasri and S. B. Navathe, 6th Edition,   ISBN-10: 0136086209, ISBN-13: 9780136086208, Addison Wesley, 2011.

(Reference) Database Design, Application Development, & Administration, M. V. Mannino, 3rd Edition, ISBN 0-07-294220-7, McGraw-Hill/Irwin, 2007.

Contact Information - Office Room: LLC 206 Office Hours: Wednesday& Thursday 5:00 ~ 6:00 PM or by appointment

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Course Description:
This course is designed for both Computer Science graduate students and MBA students in Management Information Systems (MIS) concentration. Topics covered in this course include four major parts. Part I - Introduction and Fundamentals: **Relational Database Management Systems**. Part II - **Entity Relationship (E-R) Modeling.** Part III - **the Structured Query Language –SQL** in Oracle and Microsoft Access.
PART IV - **Normalization techniques.** PART V - **Transaction Processing Concepts, Database Recovery Techniques.** Students are expected to exercise an *ER Assist Tool* to be familiar with the E-R Modeling technique and to complete a hand-on project using SQL in *Oracle* Relational Database Management System Environment.

Prerequisites: It is assumed that students have some Computer Concepts such as CS 601 and CS 605.

Objective:

The objective of this course is to provide graduate students an overview of Database Management Systems techniques. In particular, the Database techniques will be focused in Relational Database Management Systems, Developments and Applications.

Student Learning Goals:

(O.1) Students will have a solid background in **Relational Database Management Systems** for both academic study and professional developments areas.

(O.2) Students will be able to analyze business requirements and apply **Entity Relationship (E-R) Modeling** techniques to develop database applications.

(O.3) Students are expected to exercise an *ER Assist Tool* to be familiar with the E-R Modeling techniques.

(O.4.) Students will be familiar with **SQL – Schema Definition, Constraints, Queries and Views** in both *Oracle* and *Microsoft Access.*

(O.5) Students will develop a hand-on project using SQL hand-on project using SQL in *Oracle* Relational Database Management System Environment.

(O.6.) Students will be familiar with Database **Normalization techniques and apply** Database Normal Forms into Practical Database Design.

(O.7) Students will be understand important Database system concepts including Transaction Processing Concepts, Database Recovery Techniques

Course Grading: Class Participation & Attendence, Assignments/Project: 40%, Midterm: 30%, Final: 30%

Note 1 (Grading Grid for Final Grades): 90% and higher (A), 75% – 89.99% (B), 60 - 74% (C), below 60% (F)

Note 2 (Classroom) : All face-to-face classes will meet at Cook Lab (LLC 207) in Computer Science Department.

Note 3 (Class Attendence): Student should attend all classes include all lectures, examinations.

Note 4 (Homework/Project Submissions): All homeworks and final project should be submitted through internet, please forward your homework to me at pchung@liu.edu before the specified deadline. No late homework will be accepted.

DEVELOPMENT ENVIRONMENT: All students will need to access the *Oracle 11 g Database Express Edition.* Also, students could access the *ER Assist Tool* in our labs.

II. COURSE SCHEDULE:

We are developing the following five modules for CS 649.

Module 1: Introduction and Fundamentals: **Relational Database Management Systems**. (This module will be implemented in Blended Learning format).

Module 2: Entity Relationship (E-R) Modeling (This module will be implemented in Blended Learning format).

Module 3: the Structured Query Language-SQL in Oracle and Microsoft Access (This module will be implemented in Blended Learning format).

Module 4: Normalization techniques (This module will be implemented in Blended Learning format).

Module 5: Transaction Processing Concepts, Database Recovery Techniques (This module will be implemented in online Learning format).

Schedule	Module	Topics Covered	Resources	Assignments
(1) Sept. 4	**Module 1: Introduction and Fundamentals: Relational Database Management Systems.**	**Introduction -** File System and Databases; Database Management System Functions; Database System Concepts and Architecture	Ch 1.1 ~ 1.8, Ch 2.1 ~ 2.6 Additioal notes will be post at Blackboard	
(2) Sept. 11		**Lab Tour -** Distribute the accounts to Students and	Online notes and Discussions	**Homework 1**

		Discuss the Lab Environment – Introduce Oracle SQL * Plus		
(3) **Sept. 18**		**Relational Database Model** - Tables, Keys, Integrity Rules,	Ch 3.1 ~ 3.3 Online notes and Discussions	
(4) **Sept. 25**		Create database Tables for a Dabase and Insert data records	Online Discussions	
(4) **Oct. 2**	**Module 2: Entity Relationship (E-R) Modeling.**	**Entity Relationship (E-R) Modeling** and Relational Database Model; Enhanced Entity-Relationship (EER) Model **Distribute Term Project sheet to student**	Ch 7.1 ~ 7.7, 3.9, Ch 8.1 ~8.5 Notes and Discussions	**Homework 2**
(5) **Oct. 9** (6) **Oct. 16**		Relational Database Design by ER - and EER-to-Relational Mapping. Project Discussions – Midterm Exam Contents will be discussed in the Class	Ch 9.1 ~ 9.2 Notes and Project Discussions	
(6) **Oct. 23**		ER Modeling using *ER-Assist Tool* Class Review & Term Project	Online Discussions	

		Discussion		
(7) **Oct. 30**	In Class **Midterm Exam**			
(8) **Nov. 6**	**Module 3: the Structured Query Language-SQL.in Oracle and Microsoft Access.**	**SQL – Schema Definition, Constraints, Queries and Views** **& Midterm Exam Discussion**	Ch 4.1 ~ 4.5 Online notes and Discussions	**Homework 3**
(9) **Nov. 13**		**More on SQL**	Ch 5.1 ~ 5.5 Online notes and Discussions	
(10) **Nov. 20**		SQL & Term Project Discussion	Online Discussions	
(11) **Dec. 4**	**Module 4: Normalization techniques.**	**Normalization -** Normal Forms: 1NF, 2NF, 3NF, BCNF, 4NF	Ch 15.1 ~ 15.5 Online notes and Discussions	**Homework 4**
(12) **Dec. 11**		Normalization techniques & **Class Review** – Final Exam Contents will be discussed in the Class	Online Discussions	
Implementing this Module completely through	**Module 5: Transaction Processing Concepts, Database Recovery Techniques.**	**Transaction Processing Concepts** **Database Recovery**	Online notes and Discussions & Term	

online		Techniques	Project Discussions	
		Practical Database Design Methodology	Ch 10.1 ~10.2 Online notes and Discussions & Term Project Discussions	
(13) **Dec. 18**	In Class **Final Exam**			
	Term Project Due by the week of Dec. 15			