TQF 3 Course Specifications

Section 1 General Information

1. Course code and course title

    Thai   EGCI 321   ระบบฐานข้อมูล

    English EGCI 321   Database Systems

2. Number of credits   4(4-0-8)

3. Program and type of subject

    3.1 Program   Bachelor of Engineering (Computer Engineering)

    3.2 Type of Subject   Major Course (Required Major)

4. Course Coordinator and Course Lecturer

    4.1   Course Coordinator   Asst. Prof. Dr. Tanasanee Phienthrakul

    4.2   Course Lecturer   Asst. Prof. Dr. Tanasanee Phienthrakul

5. Trimester/ Year of Study

    5.1 Trimester   First or Second trimester / for 3rd – 4th year Computer Engineering

    5.2 Course Capacity   Approximately 20 students

6. Pre-requisite   EGCI 221 Data Structures and Algorithms

7. Co-requisites   None

8. Venue of Study   Mahidol University, Salaya campus

Section 2 Goals and Objectives

1. Course Goals

After successful completion of this course, students will be able to gain an in-depth understanding of relational database theory, design a relational database for applications, and implement database systems for related applications.

2. Objectives of Course Development/Revision

2.1 Course Objectives

Student will be able to apply the knowledge from lecturer and additional research with the ideas received from analysis and synthesis to set up solutions / precautions to benefit individuals and their community.

2.2 Course-level Learning Outcomes: CLOs

By the end of the course, students will be able to (CLOs)

1. CLO1: Understand the relational database theory.
2. CLO2: Design the relational database for applications.
3. CLO3: Implement the database system for related applications.

Section 3 Course Management

1. Course Description

(Thai) แบบจำลองแบบเอนทิตี-ความสัมพันธ์แบบจำลองขอมูลเชิงสัมพันธ์ การออกแบบฐานขอมูลเชิงตรรกะและเชิง
กายภาพ ภาษาในการสอบถามข้อมูล การขึ้นตอกันของข้อมูลและการทำให้เป็นบรรทัดฐาน รายการเปลี่ยนแปลง การ
กู้ระบบขัดของ การควบคุมการทำงานพรอมกัน ความมั่นคงของระบบฐานขอมูล ฐานขอมูลอินเทอร์เน็ต

(English) The entity-relationship model, the relational data model; logical and physical database design, a query language, data dependencies and normalization; the transaction, the crash recovery, the concurrency control; the internet databases

2. Credit hours per trimester

Lecture (Hour(s))	Laboratory/field trip/internship (Hour(s))	Self-study (Hour(s))
48 hours 4 hours x 12 weeks)	0 hours (0 hours x 12 weeks)	96 hours (8 hours x 12 weeks)

3. Number of hours that the lecturer provides individual counseling and guidance.

1 hours / week

Section 4 Development of Students' Learning Outcome

1. Short summary on the knowledge or skills that the course intends to develop in students (CLOs)

   By the end of the course, students will be able to

   1. CLO1: Understand the relational database theory.

   2. CLO2: Design the relational database for applications.

   3. CLO3: Implement the database system for related applications.

2. Teaching methods for developing the knowledge or skills specified in item 1 and evaluation

methods of the course learning outcomes

Course Code	Teaching methods	Evaluation Methods
CLO1	Interactive Lecture	Written Examination
CLO2	Interactive Lecture, Individual Assignment, Group discussion, Group Assignment	Written Examination, Quiz, Individual Evaluation, Group Evaluation
CLO3	Interactive Lecture, Individual Assignment, Group discussion	Written Examination, Quiz, Individual Evaluation

Section 5 Teaching and Evaluation Plans

1. Teaching plan

Week	Topic	Number of Hours		Teaching Activities/ Media	Lecturer
		Lecture Hours	Lab/Field Trip/Internship Hours		
1	Database Architecture	4	-	Interactive Lecture, Individual Assignment	Interactive Lecture, Individual Assessment
2	E-R Model	4	-	Interactive Lecture, Group discussion, Group Assignment	Interactive Lecture, Group Assessment
3	Relational Model	4	-		
4	Relational Algebra	4	-		
5	Functional Dependencies	4	-		
6		4	-		
7	Normalization	4	-		Interactive Lecture, Midterm Assessment
8	SQL-Data Definition Language SQL-Data Manipulation Language	2	2	Interactive Lecture, Individual Assignment	Interactive Lecture, Individual Assessment
9	SQL-Data Query Language	2	2		
10	Data Transaction	2	2	Interactive Lecture, Individual Assignment	Interactive Lecture, Quizzes, Individual Assessment
11	Crash Recovery and Concurrency Control	4	-		
12	Database Security	4	-		
13	Examination	-	-	Written Examination	Final Assessment
	Total	42	6		

2. Plan for Assessing Course Learning Outcomes

     2.1 Assessing and Evaluating Learning Achievement

a. Formative Assessment

The assessment tools such as assignments, quizzes, and exam are used to evaluate student's understanding by their ability to understand the relational database theory. For the design parts, students should be able to show how the relational database are designed systematically for some kinds of applications. The assessments are made through their group assignments. Then, all students will discuss to choose the best design and implement it. The ability to implement the database system is assessed via assignment and exams.

b. Summative Assessment

(1) Tools and Percentage Weight in Assessment and Evaluation

Learning Outcomes	Assessment Methods	Assessment Ratio (Percentage)	
CLO1: Understand the relational database theory.	Individual Assignment	20	30
	Midterm Examination	10	
CLO2: Design the relational database for applications.	Individual Assignment	5	35
	Group Assignment	10	
	Midterm Examination	20	
CLO3: Implement the database system for related applications.	Individual Assignment	10	35
	Final Examination	25	
Total			100

(2) Grading System

Grade	Achievement	Final Score (% range)	GPA
A	Excellent	90-100	4.0
B+	Very Good	85-89	3.5
B	Good	80-84	3.0
C+	Fairly Good	75-79	2.5
C	Fair	70-74	2.0
D+	Poor	65-69	1.5
D	Very Poor	60-64	1.0
F	Fail	Less than 60	0.0

(3) Re-examination (If course lecturer allows to have re-examination)

    <u>N/A - (Not applicable with MUIC)</u>

3. Student Appeals

The student wishing to appeal according to grading result must submit a written and signed appeal form personally to the academic affair unit. It is prohibited to assign another person to appeal on one's behalf. The written appeal form is then sent to the program director and chair of department. The final decision is transferred for approval by the faculty committee. The result of appeal then is informed to the student.

Section 6 Teaching Materials and Resources

1. Textbooks and/or other documents/materials

    1) Ramakrishnan R, Gehrke J. Database management *systems*. 3rd ed. New York (NY): McGraw-Hill; 2003.

    2) Date CJ. *An introduction to database systems.* 7th ed. Boston (MA): Addison-Wesley; 2000.

2. Recommended textbooks and/or other documents/materials

    1) Elmasri R, Navathe SB. *Fundamentals of database systems*. 5th ed. Boston (MA): Addison-Wesley; 2006.

    2) Garcia-Molina H, Ullman JD, Widom J. *Database systems: the complete book*. Upper Saddle River (NJ): Prentice Hall; 2002.

3. Other Resources (If any)

    Website: W3School, http://www.w3schools.com/sql/default.asp

Section 7 Evaluation and Improvement of Course Management

1. Strategies for evaluating course effectiveness by students

    1.1 Evaluation of peers by students

    1.2 Student evaluation

        1.2.1 Course content

        1.2.2 Course management

        1.2.3 Suggestions

        1.2.4 Overall opinions

2. Strategies for evaluating teaching methods

    2.1 Student evaluation

    2.2 Presentation

3. Improvement of teaching methods

    Use evaluation from 1 and 2 for course improvement.

4. Verification process for evaluating students' standard achievement outcomes in the course

    Analysis of students' learning outcomes using scores from each CLOs for evaluation.

5. Review and plan for improving the effectiveness of the course

    Review the course before trimester starts, before each teaching period and review course contents every 3 years.

Appendix

Alignment between Courses and Program

Table 1 The relationship between course and Program Learning Outcomes (PLOs)

Database Systems	Program Learning Outcomes (PLOs)					
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
EGCI 321	R				R	R

Note: Indicate the level of CLOs by letter I, R, P or M. Using the information as shown in the Curriculum Mapping of TQF2

Table 2 The relationship between CLOs and PLOs

EGCI 321	Program Learning Outcomes (PLOs)					
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1: Understand the relational database theory.						6.1
CLO2: Design the relational database for applications.	1.6				5.3, 5.4	
CLO3: Implement the database system for related applications.						6.2

Table 3 The description of PLOs and Sub Los of the course

PLOs	SubPLOs
PLO1. Analyze ethical impacts of computer usage to personals, organizations, social, and the rights and value of others.	1.6 Analyze the regional and international impact of their designed work in personal level, organizational level and social level
PLO5. Perform good communication skills with various groups of peoples and facilitate team members in various problem-solving situations both as a leader and a follower.	5.3 Show unity, enthusiasm, collaboration as a part of a team
	5.4 Show respect and understand responsibility as a part of a team as a leader and a follower
PLO6. Create a related computer engineering development based on information technologies in mathematics or applied statistics.	6.1 Choose information technology tools properly for computer engineering development.
	6.2 Create a related computer engineering development based on selected tools.