# Course Specification

| | |
|---|---|
| **Name of Institution** | Mahidol University |
| **Campus/faculty/department** | Salaya campus<br>Mahidol University International College<br>Science Division |

## Section 1 General Information

**1. Course code and course title**

| | | |
|---|---|---|
| Thai | ICCS 240 | การจัดการฐานข้อมูล |
| English | ICCS 240 | Database Management |

**2. Number of credit** 4 (4-0-8)
(lecture 4 hours – self study 8 hours/ week)

**3. Curriculum and type of subject**

| | |
|---|---|
| 3.1 Curriculum | offered in international curriculum |
| 3.2 Type of subject | Required course, Computer Science |

**4. Responsible faculty member** Full-time faculty members, Mahidol University International College, Mahidol University

**5. Trimester / year of study**

| | |
|---|---|
| 5.1 Trimester | 1,2 / Third year |
| 5.2 Number of students | _____ students |

**6. Pre-requisites** ICCS200 Data Structures and Algorithms, ICCS230 Systems Analysis and Design

**7. Co-requisites** -

**8. Venue of study** Mahidol University, Salaya campus

\

## Section 2 Goals and Objectives

### 1. Goals

This course discusses topics related to the development of relational database systems, which include: data modeling, conceptual database design principles, Structure Query Language programming, model transformation, schema normalization based on functional dependencies and first to fifth normal forms, transactions, concurrency control, recovery, distributed database. Industry-leading database management systems are introduced and used to develop real databases.

### 2. Objectives of development/revision

To provide conceptual knowledge and practical experience of the complete systematic development cycle of real database systems by using the well-known DBMSs.

## Section 3 Course Management

### 1. Course descriptions

การพัฒนาระบบฐานข้อมูลเชิงสัมพันธ์ การจำลองลักษณะข้อมูล หลักการออกแบบฐานข้อมูล การโปรแกรมเอสคิวแอล รูปแบบการโอนถ่ายข้อมูล สกีม่าร์นอร์มอไลเซชั่นในความสัมพันธ์ขั้นที่ ๑ ถึงขั้นที่ ๕ การติดต่อการควบคุมการทำงานพร้อมกัน การกู้คืนข้อมูลแบบกระจายการจัด การระบบอุตสาหกรรมฐานข้อมูล การพัฒนาฐานข้อมูลที่มีอยู่จริง

Development of relational database systems: data modeling, conceptual database design principles, Structure Query Language programming, model transformation, schema normalization based on functional dependencies and first to fifth normal forms, transactions, concurrency control, recovery, distributed database; introduction to industry-leading database management systems; development of actual databases.

### 1. Credit hours / trimester

| Lecture | Additional class | Laboratory / field trip/ internship | Self study |
|---|---|---|---|
| 44 hours | - | - | 88 hours |

| | | | |
|---|---|---|---|
| (4 hour x 11 weeks) | | | (8 hours x 11 weeks) |

**2. Number of hours that the lecture provides individual counseling and guidance**

1 hour / week

## Section 4 Development of Students' Learning Outcome

**1. Expected outcome on students' skill and knowledge**

Students will be able to apply the knowledge from lectures and with the ideas received from analysis and synthesis to set up solutions/ precautions to benefit individuals;

**2. Teaching methods**

Course organized using lecture and assignments.

**3. Evaluation methods**

**1. Morality and Ethics**

***1.1 Expected outcome on morality and ethics***

- ● (1) To posses morality and ethics
- ● (2) To have self-discipline, honesty, kindness, self- responsible and social responsibility
- ● (3) To demonstrate academic ethical behavior
- ● (4) To respect others' rights and be a good listener
- ● (5) To respect rules and regulations
- ○ (6) To have good attitude toward professors/career
- ● (7) To demonstrate Leadership, team player

***1.2 Teaching methods***

Learning Centered Education : Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

(1) Lecture

(2) Assignments

(3) Term Project

***1.3 Evaluation methods***

(1) Written examination

(2) Class attendance

(3) On-time submission of assignments and their quality

(4) Presentation on Term Project

**2. Knowledge development**

***2.1 Expected outcome on knowledge development***

- (1) To posses basic knowledge, theories and concepts towards the understanding of self, society, surrounding in order to be well-rounded person
- (2) To process the knowledge related to principles, theories and practice in the course
- (3) To integrate the knowledge to other related subjects
- ○ (4) To remain current in research and new knowledge

***2.2 Teaching methods***

Learning Centered Education : Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

(1) Lecture

(2) Assignments

(3) Term Project

***2.3 Evaluation methods***

(1) Written examination

(2) Class attendance

(3) On-time submission of assignments and their quality

(4) Presentation on Term Project

**3. Intellectual development**

***3.1 Expected outcome on intellectual development***

- (1) To have systematic and analytical thinking

- (2) To be able to search, consolidate and evaluate ideas and evidence for problem solving
- (3) To be able to apply knowledge and experience to analyze and creatively solve problems both in general and academic

***3.2 Teaching methods***

(1) Lecture
(2) Assignments
(3) Term Project

***3.3 Evaluation methods***

(1) Written examination
(2) Class attendance
(3) On-time submission of assignments and their quality
(4) Presentation on Term Project

**4. Interpersonal relationship and responsibility**

***4.1 Expected outcome on Interpersonal relationship and responsibility***

- (1) To posses good interpersonal relationship skills (self esteem and dignity) and have respect for the rights and value of others
- (2) To possess leadership and initiative in problem solving
- (3) To be constructive team member (in various roles) and be responsible for assignment tasks, professional and society

***4.2 Teaching methods***

(1) Lecture
(2) Assignments
(3) Term Project

***4.3 Evaluation methods***

(1) Written examination
(2) Class attendance
(3) On-time submission of assignments and their quality
(4) Presentation on Term Project

**5. Mathematical analytical thinking, communication skills, and information technology skills**

***5.1 Expected outcome on mathematical analytical thinking, communication skills, and information technology skills***

(1) To be able to select and apply appropriate statistical and mathematical methods to research problems

○ (2) To be able to apply information technology for data gathering, processing, interpreting and presenting information/results

● (3) To have the ability to communicate effectively and select appropriate methods of presentation

***5.2 Teaching methods***

(1) Lecture

(2) Assignments

(3) Term Project

***5.3 Evaluation methods***

(1) Written examination

(2) Class attendance

(3) On-time submission of assignments and their quality

(4) Presentation on Term Project

## Section 5 Teaching and Evaluation Plans

### 1. Teaching plan

| Week | Topic | Hours | Teaching methods/ multimedia | Instructor |
|---|---|---|---|---|
| 1 | Introduction to database | 4 | Lecture | |
| 2 | Data modeling and ER model | 4 | Lecture | |
| 3 | Conceptual database design with ER modeling | 4 | Lecture | |
| 4 | Transformation of ER model to SQL (I) | 4 | Lecture | |
| 5 | Hands-on practice with commercial DBMS | 4 | Lecture | |
| 6 | SQL programming with industrial DBMS (I) | | | |
| 7 | SQL programming with industrial DBMS (II); Transformation of ER model to SQL (II) | 4 | Lecture | |
| 8 | Normalization | 4 | Lecture | |
| 9 | Relational database | 4 | Lecture | |

| | | | | |
|---|---|---|---|---|
| | design: Case studies | | | |
| 10 | Transaction processing, concurrency control | 4 | Lecture | |
| 11 | Crash recovery; Introduction to distributed database | 4 | Lecture | |
| 12 | Final Examination | | | |

**2. Evaluation plan**

| Expected outcomes | Methods / activities | Week | Percentage |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

## Section 6 Teaching Materials and Resources

**1. Texts and main documents**

(1) "Database systems concepts", A.Silberschatz and H.F.Korth, McGraw-Hill

(2) "A First course in Database Systems", J.D. Ullman and J. Widom, Prentice-Hall

(3) "Modern Database Management", J.A. Hoffer, Prentice-Hall

**2. Documents and important information**

**3. Documents and recommended information**

## Section 7 Evaluation and Improvement of Course Management

**1. Strategies for effective course evaluation 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 opinion

2. **Evaluation strategies in teaching methods**

1.1 Student evaluation

1.2 Presentation

3. **Improvement of teaching methods**

Workshop on course improvement with the participation of all lecturers in this course

4. **Evaluation of students' learning outcome**

Analysis of students' learning outcomes using scores from class attendance, group activity and presentation of project and poster presentation

5. **Review and improvement for better outcome**

Meeting of lecturers to review the course before semester starts and before each period of

teaching