



Instructor Information	Class Times
Instructors: Asst.Prof. Sanan Srakaew (sanan.sra@mail.kmutt.ac.th) Ekkachai Wiwantanaphiruk (ekkachai.wiw@kmutt.ac.th) Website: https://www.leb2.kmutt.ac.th/ Office Hours: Mon: 10.30-12.30, or with an appointment. TA.: Kawin Chinpong, Nathanon Theptakob	Lectures: Mon 8:30 – 12:20, Zoom https://thairen.zoom.us/j/4976849195 Meeting ID 497 684 9195 Lab HDS: Mon 13:30 – 12:20, 1112-3 Lab RC: Mon 15:30 – 17:30, 1112-3

Course Objectives

The key objective of this course is to provide students hands-on experiences in database concepts focusing on database design and the development of applications that use databases. A project-based approach will be exploited.

The Computer Engineering Department has a new mission to use innovative hands-on, active learning techniques to develop 5 distinct student characteristics:

1) Self-Learner

- prepare readings before class for group discussion/quiz
- self-study for doing projects

2) Creative Designer/Modeler

- create models for projects and assignments of real-life problems

3) Practitioner

- projects and assignments with real-life type problems.

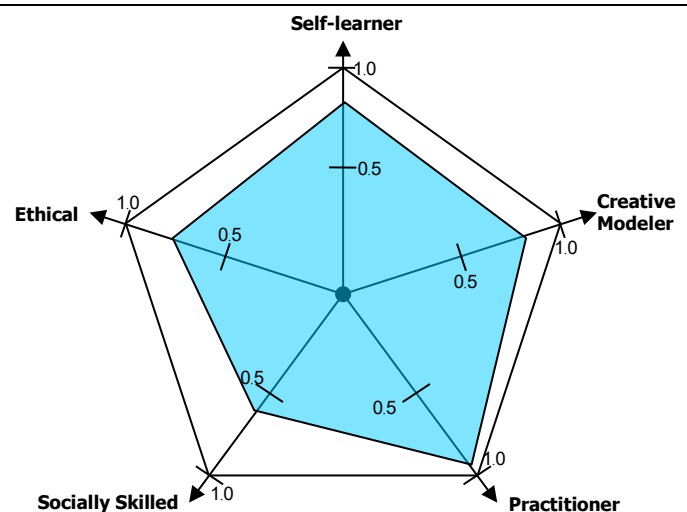
4) Socially Apt

- working in teams of 4 on projects
- participating in group discussion

5) Ethical

- focus on the importance of ethics and individual integrity

The shaded area in the graph is the goal of this course to develop you in each dimension. **Ethics** is a key characteristic we would like all our students to possess.



Five Desired Characteristics of CPE Students

Ethics means that any work you submit for credit is to be your work. For homework assignments and projects, general discussion with your classmates regarding the requirements or the approach to be taken is permitted.

Homework assignments and/or reports are due prior to the class time. Your submitted assignments/reports must be yours. **Class attendance** is very important. Showing up late causes 10% deducted in in-class exercises. Cell-phones must be **turned off** before you come to class and not allowed to use during class time. They are disruptive and annoying. If we hear a cell-phone ringing during a quiz, I will assume you are cheating. **Laptop** usage is for assigned classwork. **Facebook, Messenger, Line** and **game playing** are prohibited. If we see you playing game or using Facebook, Messenger, Line you will be asked to leave the room.

Course Description

This course introduces database concepts focusing on database design and the development of applications that use databases. Topics covered will include relational databases, SQL, database system analysis, database design and implementation, concepts in database performance and tuning, and NoSQL databases.

Course Learning Outcomes

1. Understanding of database concepts both relational and NoSQL databases and concepts in Enterprise Resource Planning.
2. Students should be able to design and implement a web application with a database.
3. Able to write technical reports and give presentations.
4. Able to work as a team to build a practical project.

Required Texts

- Kroenke D.M. and Auer D.J., Database Processing: Fundamentals, Design, and Implementation, Pearson, 14th Edition.

Grading Policy

Final grades are based on performance indicated by student in-class exercises, lab reports, homework assignments, quizzes, projects, mid-term, and final exam grades. The final grade will be calculated according to the following weights:

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| 1. Homework and Lab Work. | 20% |
| 2. Project 1. Application Design. | 10% |
| 3. Project 2. Application Development. | 15% |
| 4. Mid-term exam + Quiz Scores. | 25% |
| 5. Final exam + Quiz Scores. | 25% |

CPE 231 Schedule (tentative)

Week#	Lectures	Labs	Lab Assignments
1 (Aug 10)	Class overview. Introduction to Information System. Database Concepts.		
2 (Aug 17)	A Practical Introduction to Database Design. The Relational Data Model. SQL SELECT and JOINS	Install PostgreSQL (PGAdmin) SQL SELECT and JOIN	Lab Assignment 1 QUERY Select and Join Due Week 3
3 (Aug 24)	Data Modeling. Additional SQL: Insert, Delete, Update	SQL INSERT DELETE UPDATE	
4 (Aug 31)	More on SQL: SELECT statement and Querying. Simple JOINS.	Learning Python Code of Lab 2 (CRUD api)+ Due Lab Assignment 1	Lab Assignment 2 Python Code Add Receipt and Payment Method Due Week 5
5 (Sep 7)	Database Design. The object relation model (ORM). Data models in python: dictionary, pickle, shelve.	Learning Python Code of Lab 2 (CRUD api)	
6 (Sep 14)	Types of forms and relations. ER-Diagram with cardinality and referential integrity actions Data Modeling with the E-R Model. Transforming Data Models into Database Designs	Learning Python Code of Lab 3 + Due Lab Assignment 2	Lab Assignment 3 Python Code Add Receipt and Payment Method to Database (Postgres Database) Due Week 7
7 (Sep 21)	SELECT with Aggregate Functions. Complete Database Application Design: Specifications, Forms, Reports, Tables, Relations, RI-Actions. Components of ERP Systems.	Learning Python Code of Lab 3	
Sep 28 – Oct 6	Midterm Period (Midterm on 28 September 2020)		
8 (Oct 12)	Design the User Interface Specifications for a Database Application. Project 1: Application Design with Reports	Due Lab Assignment 3	

9 (Oct 19)	The Relational Model and Normalization. Database Design Using Normalization. In-class Problem: Data Modeling for a Survey Form. Check that it is BCNF.		
10 (Oct 26)	Using SQL Statements to Create Tables. SQL for Database Construction and Applications.	Learning Django framework for Create Report of Lab 4	Lab Assignment 4 Due Week 10
11 (Nov 9)	Multi-User Databases. Database Logs. Concurrency Control with Locking and Error Handling. BeginTrans, Commit, Rollback statements.	Due Lab Assignment 4	
12 (Nov 16)	ERP and Hospital Management Systems	Learning Frontend (HTML & CSS)	Lab Assignment 5 Due Week 14
13 (Nov 23)	Database Access Standards: ODBC, OLE DB, ADO, JDBC. XML and JSON. Database Security. Non-SQL Databases	Learning Backend on Django	
Nov 30- Dec 11			