Database Systems

Syllabus Number 3B222
Special Subjects
Elective 2 credit

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1. Course Description

In this course, you will learn about database, a mechanism which enables to effectively store and retrieve data. Specifically, you will learn the following.
* Information models and systems
* Database systems
* Data modelling and relational databases
* SQL, a relational database language
* Design of databases and operations of data

These serve as a basis for knowledge and skills on DP4C and DP4M. Each class is comprised of a lecture by the lecturer, an activity to work on a task or practice to operate a databese by yourself.

2. Course Objectives

The goal of this course is to understand basic concepts about databases necessary complex information processing and fundamental mechanisms of database systems, so that you will be able to utilize them. You will be required to acquire the following skills when completing the course.
* You can explain concepts about databases and relational models.
* You can perform queries for data retrieval from a database system by using SQL, a relational database language.
* You can explain design of a database such as normalization and its background, and concepts of an entity-relationship model.
* You can explain concepts of transactions and some methods to recover faults.

In each class, you will receive instructions from the lecturer, make explanation about learning materials by yourself, and answer quizzes.

3. Grading Policy

Your grade will be assessed based on the score of the mastering examination and evaluations of tasks (quizzes and option tasks in classes). To earn the credits, you must satisfy the following three conditions.
(1) You must attend the specified number of or more classes.
(2) You must pass all tasks (quizzes in every class).
(3) You must obtain the score equal to or higher than the qualifying score (60%).
You will receive elucidations and evaluations in the LMS.

4. Textbook and Reference

Textbook
Masatoshi Yoshikawa IT Text Basics of Databases, ISBN 978-4-274-22373-0 Ohmsha

5. Requirements(Assignments)

You will receive instructions for preparation for each class on the LMS. Check learning goals and create brief explanations to key questions of each class while following the instructions. A task will be provided in each class, which must be completed before the next class.

6. Note

This course covers subgoal 4-4 in learning-education goals of the JABEE program. The mastering examination may be changed to a mastering report.

7. Schedule

[1] Concepts of Databases
[2] Relational Databases (1) (Relation and its basic terms, and concepts)
[3] Relational Databases (2) (Relational schemata, and relational databases)
[4] Relational Algebra (1) (Operations in relational algebra)
[5] Relational Algebra (2) (Relational algebra expressions)
[6] SQL(1) (SQL and queries)
[7] SQL(2) (Updating operations, subqueries, and aggregate functions)
[8] SQL(3) (Practice to operate a database system)
[9] Design of Conceptual Schemata (1) (Data dependency, and information lossless decomposition)
[10] Design of Conceptual Schemata (2) (Standardization)
[11] Design of Conceptual Schemata (3) (RE models)
[12] Data Storing and Query Processing
[13] Transaction (1) (Transaction, and concurrency control)
[14] Transaction (2) (Fault recovery)
[15] Mastering Examination and Review of the Classes