Database System Plan

Agenda

1. Course Description

2. Textbook

3. Course Prerequisites

4. Course Objectives

5. Contents Overview

6. Class Sections

7. Assessment

- At the heart of today's web-based software applications, there are well-designed database systems enabling rich functionality.

- This course trains students to build such systems, by teaching database concepts and then the practical work of database system design and implementation.

❖ The Database System is important because

① The **database system** is arguably the most important development in the field of software engineering.

② The **database** is now the underlying framework of the information system (IS).

③ **Database technology** has been one of the causes for many important developments in software engineering.

④ The **database language** is a non-procedural language.

🔷 Database language is a non-procedural language

    I.   Procedural languages specify *how* the output is to be obtained

    II.   Non-procedural languages describe only *what* output is to be obtained.

    III.   SQL is an international standard for database manipulation

    IV.   SQL is 4GL (fourth-generation language)

- 1GL – machine language
- 2GL – assembly language
- 3GL – high-level languages
- 4GL – non-procedural languages

● The course is relatively difficult because

    I.   Confusing Terminology

- Same thing, different terms
- Different things, same terms
- Language translation makes it worse

    II.   Many DBMSs

- Support standard SQL, but extend SQL
- SQL standard is abstract

    III. DB technology

- Demanding

- Thomas M. Connolly, et al. *Database Systems: A practical approach to Design, Implementation, and Management.* **5th Edition** ISBN: 0321523067 Addison-Wesley, 2009
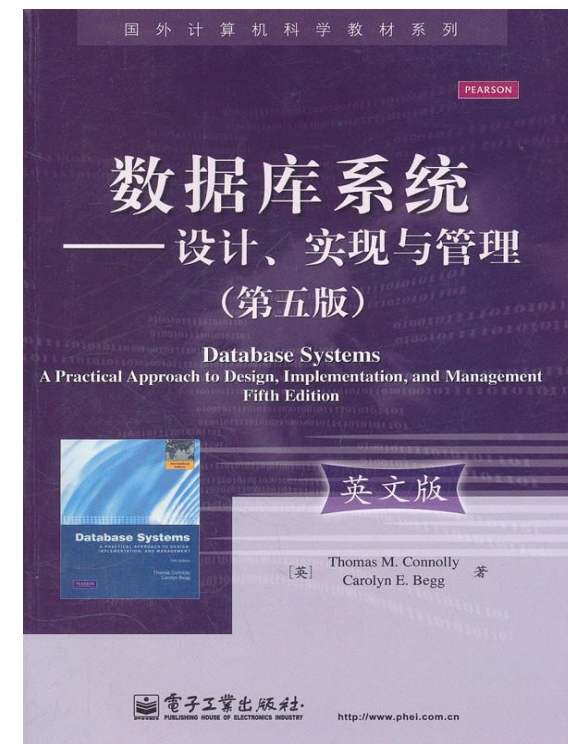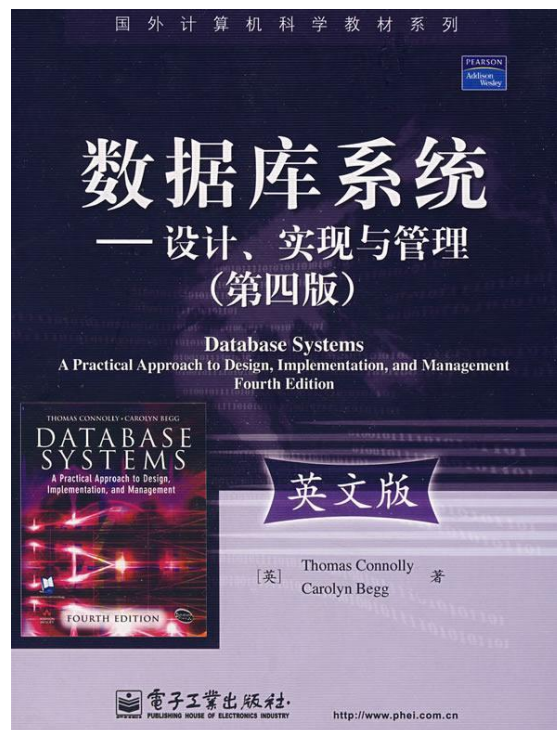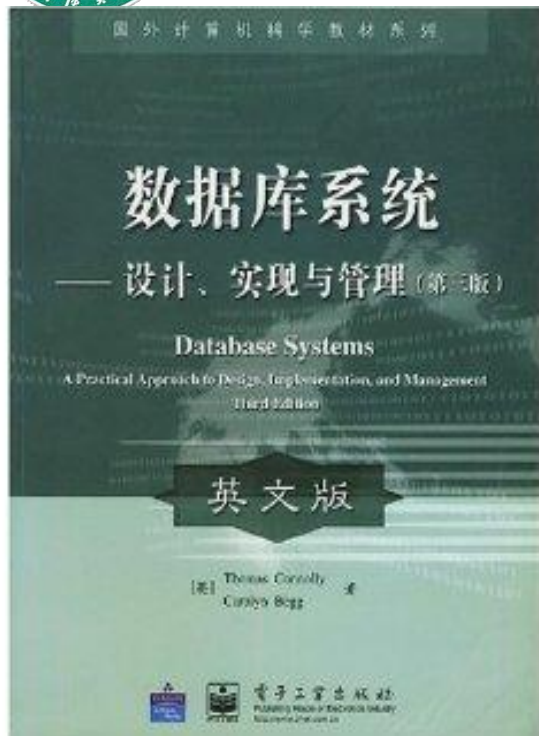
OR

- Thomas M. Connolly, et al. *Database Systems: A practical approach to Design, Implementation, and Management.* **4th Edition** ISBN: 0321210255 Addison-Wesley, 2004

OR

- Thomas M. Connolly, et al. *Database Systems: A practical approach to Design, Implementation, and Management.* **3rd Edition** ISBN: 0201708574 Addison-Wesley, 2001

- Data Structures

⬥ Students will

① Become familiar with fundamental DBMS concepts and what a database system is

② Learn to use SQL

③ Learn to design database systems

④ Learn to design and manage transactions

⑤ Learn to improve query performance

⑥ Gain exposure to future trends in databases

Students will be able to **PRODUCE**

① Database designs that support a given application

② Data models using E-R diagrams

③ Sound schema designs using normalization

④ Web-based database applications using SQL and JSP/Servlets

5.Contents Overview

- You should learn five units
  - Unit 1. Database Systems
  - Unit 2. Complete SQL
  - Unit 3. Database Design
  - Unit 4. Transaction and Indexes
  - Unit 5. Current Trends
- There will be
  - Nine Multiple Choice Quizzes
  - Several practical exercises
  - One mid-term exam
  - One final exam

6.Class Sections 1

- Section 1 Introduction to Databases

- Section 2 The Relational Model

- Section 3 Relational Algebra and QBE

- Section 4 SQL: Data Definition

- Section 5 SQL: Data Manipulation

- Section 6 SQL: Views, Integrity Constraints, and Data Control

- Section 7 Embedded SQL

- Section 8 Web Databases

6.Class Sections 2

- Section 9　Database System Design

- Section 10 Entity-Relationship Models

- Section 11 Enhanced Entity-Relationship Models

- Section 12 Mapping from ER Models to Relational Models

- Section 13 Normalization

- Section 14 Transaction Management

- Section 15 Non-Relational Data Models

- Section 16 Data Warehousing, OLAP, and Data Mining

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7.Assessment

Assessment	%	Week
Attendance & Questions	10	Randomly in class
Multiple Choice Quizzes	10	A week after the end of sections
Exercises	10	A week after the end of sections
Mid-term Exam	20	After Section 8
Final Exam	50	Examination period

Questions?