

# Database System

北京交通大学软件学院

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Download materials from

Course platform

Or

<ftp://202.205.101.168>

UserID: Class Materials    pwd:rj13

# Introduction to the Course

## **Students:**

**Junior at fall semester**

## **Prerequisite:**

**Java or VC, Data Structure**

## **For Practice Course:**

**Install one kind of DBMSs such as the latest version of Oracle, MySQL, SQL Server before the third week.**

# Grades

**Average performance : (compose 50 %)**

◆ Test1 ( **10 pts** ) : introduction & relational database.

◆ Test2 ( **25 pts** ) : SQL.

◆ Test3 ( **15 pts** ) : Normalization & DB design.

**Final exam: (compose 50 %) , Open-book exam**

	Test 1	Test 2	Test 3
Time	4	11	14
Max score	10	25	15
coverage	Introduction& Relational database	SQL	Normalization & DB design

# Textbook and references

- 1 Thomas Connolly, Carolyn Begg. Database Systems : A Practical Approach to Design, Implementation, and Management. (5th Edition) Electronic Industry Publisher. (电子工业出版社) 2012. 1
2. Jeffrey D.Ullman, Jennifer Widom. A First Course in Database Systems (third edition), China machine press, 2008.8.1.
3. 王珊，萨师煊。《数据库系统概论》（第5版），高等教育出版社, 2014.9 (for Chinese students)
- 4.王珊 《数据库系统概论（第5版）习题解析与实验指导》 高等教育出版社 2015年7月

# Content

## Chapter 1 Introduction to Database Systems

- ◆ Basic concepts
- ◆ Development History of Data Management Technology
- ◆ Data Model
- ◆ Architecture of Database System
- ◆ Data Independence

## Chapter 2 Relational Database

- ◆ Relational Data Model
- ◆ Relation Integrity

# Content

## Chapter 3 SQL

**3.1 Introduction to SQL**

**3.2 Data Definition Statements**

**3.3 Data Query Statements**

**3.4 Data Modification Statements**

**3.5 Views**

**3.6 Programmatic SQL**

- ◆ Stored Procedure

- ◆ Constraints and Trigger

- ◆ SQL/CLI

- ◆ ODBC and JDBC

# Content

## Chapter 4 Theory for Relational Database

- ◆ Problems
- ◆ Functional Dependency
- ◆ Armstrong's axioms
- ◆ The Process of Normalization

## Chapter 5 Database Design

- ◆ Database Development Lifecycle
- ◆ Entity/Relationship Model
- ◆ Enhanced Entity-Relationship Model
- ◆ From E/R Diagrams to Relations



# Content

## Chapter 6 Database Security

- ◆ Concepts
- ◆ Privileges (权限)
- ◆ Grant (赋予权限)
- ◆ Revoke (收回权限)

## Chapter 7 Concurrency Control

- ◆ Concept and Characteristics of Transaction
- ◆ 3 Potential Problems Caused by Concurrency
- ◆ Serializability (可串行化)
- ◆ Locking & 2PL
- ◆ Granularity of Data Items
- ◆ Isolation Levels

# Content

## Chapter 8 Database Recovery

### 8.1 Failure

### 8.2 Transactions and Recovery

### 8.3 Recovery Facilities (恢复机制)

**Backup, Log files, Checkpoint**

### 8.4 Recovery Techniques (恢复技术)