课程详述

COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	**课程名称 Course Title**	**数据库原理 Database Principle** **（本课程的正式名称应为“数据库系统原理”）** **(The formal title of this course should be “Principles of Database Systems”)**
2.	**授课院系 Originating Department**	计算机科学与工程系 Department of Computer Science and Technology
3.	**课程编号 Course Code**	CS307
4.	**课程学分 Credit Value**	3
5.	**课程类别 Course Type**	专业基础课 Major Foundational Courses
6.	**授课学期 Semester**	春季 Spring
7.	**授课语言 Teaching Language**	英文 English 中英双语 English & Chinese
8.	**授课教师、所属学系、联系方式（如属团队授课，请列明其他授课教师）Instructor(s), Affiliation& Contact （For team teaching, please list all instructors）**	程京德，教学教授，计算机科学与工程系，chengjd@sustech.edu.cn Jingde Cheng, Teaching Professor, Department of Computer Science and Technology, chengjd@sustech.edu.cn
9.	**实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact**	朱悦铭，教学实验员，计算机科学与工程系，zhuym@sustech.edu.cn Yuming Zhu, Teaching laboratory technician, Department of Computer Science and Technology, zhuym@sustech.edu.cn
10.	**选课人数限额(可不填) Maximum Enrolment （Optional）**	

11. 授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other（Please specify）	总学时 Total
学时数 Credit Hours	32		32		64

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	CS102A 计算机程序设计基础 A Introduction to Computer Programming A CS203 数据结构与算法分析 Data Structures and Algorithm Analysis
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	
14. 其它要求修读本课程的学系 Cross-listing Dept.	

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

本课程的正式名称应为“数据库系统原理”。“数据库系统原理”课程的教学目标为：通过讲授数据库系统的基本概念和原理，让学生了解数据库系统的目的、基本工作原理、系统结构、使用维护、应用领域。

The formal title of this course should be “Principles of Database Systems”. The teaching objectives of the course are: to teach students the basic concepts and principles of database systems, so that they can understand the purpose, basic working principles, system architecture, use and maintenance, application fields of database systems.

16. 预达学习成果 Learning Outcomes

“数据库系统原理”课程的预达学习成果为：让学生掌握从一个数据库应用系统的立项、系统需求分析和定义、数据需求分析和定义、数据模型设计、数据库概念（逻辑）模式设计、数据库视图（外部）模式设计、 数据库物理（内部）模式设计、数据库开发、数据库应用系统开发，到实际运行维护所设计开发的数据库应用系统的能力。

The learning outcomes of the course are: students can master the project establishment for a database application system, system requirement analysis and definition, data requirement analysis and definition, data model design, database conceptual (logic) schema design, database view (external) schema design, database physical (internal) schema design, database development, database application development, and actual operation and maintenance of the developed database application system.

17. 课程内容及教学日历 （如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）

Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

1. Database System: What Is It?

   什么是数据库系统？
2. Database System: Why Study It?

   为什么要学习研究数据库系统？
3. Database System Concepts

   数据库系统概念
4. Database System Architecture

   数据库系统结构
5. Relational Databases and the Relational Model

   关系数据库与关系模型
6. Relational Algebra

   关系代数
7. Relational Calculus

   关系演算
8. SQL: Data-Definition Language

   SQL：数据定义语言
9. SQL: Data-Manipulation Language

   SQL：数据操作语言
10. SQL: Advanced Topics

    SQL：高级课题
11. Database Design Methodology

    数据库设计方法论
12. The Entity–Relationship Model

    实体关系模型
13. Relational Database Design

    关系数据库设计
14. Database Application Design

    数据库应用设计
15. Database Application Development

    数据库应用开发
16. Review

    总复习

实验教学大纲

实验 1. 软件安装（Mysql,psql,datagrip）

实验 2. 数据库与文件

实验 3. 数据库设计（Database design）

实验 4. 基础 SQL 语句，单表查询

实验 5. 复杂 SQL 语句，多表查询一

实验 6. 复杂 SQL 语句，多表查询二

实验 7. 开窗方法

实验 8. 项目中期指导

实验 9. 数据库函数设计

实验 10. 数据库触发器

实验 11. 索引

实验 12. 数据库目录文件

实验 13. 事务处理与隔离级别

实验 14. ER 图

实验 15. JDBC

实验 16. 项目指导与展示

Syllabus of Lab

Lab 1. Software Installing (Mysql, Mysql workbench, psql, datagrip)

Lab 2. Database and File

Lab 3. Database Design

Lab 4. Simple Queries in single table

Lab 5. Complex Queries from multiple tables 1

Lab 6. Complex Queries from multiple tables 2

Lab 7. Window Function

Lab 8. Guidance of Project in Mid-term

Lab 9. Procedure in database

Lab 10. Trigger in database

Lab 11. Index

Lab 12. Information schema

Lab 13. Transaction and Isolation Levels

Lab 14. ER-diagram Design

Lab 15. JDBC

Lab 16. Guidance of Project and Presentation

18. **教材及其它参考资料 Textbook and Supplementary Readings**

A. Silberschatz, H. F. Korth, and S. Sudarshan, “Database System Concepts,” McGraw-Hill, 2010 (6th Edition).

J. D. Ullman & J. Widom, “A First Course in Database Systems,” Pearson, 2008 (3rd Edition).

T. M. Connolly & C. E. Begg, “Database Systems: A Practical Approach to Design, Implementation, and Management, Pearson, 2015 (6th Edition).

R. Elmasri and S. B. Navathe, “Fundamentals of Database Systems,” Pearson, 2016 (7th Edition).

D. M. Kroenke & D. J. Auer, “Database Processing: Fundamentals Design, and Implementation,” Pearson, 2012 (12th Edition).

C. J. Date, “An Introduction to Database Systems,” Pearson, 2000 (7th Edition), 2004 (8th Edition).

课程评估 ASSESSMENT

19.

评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		10%		
课堂表现 Class Performance		10%		
小测验 Quiz				
课程项目 Projects		30%		
平时作业 Assignments		20%		
期中考试 Mid-Term Test				
期末考试 Final Exam		30%		
期末报告 Final Presentation				
其它（可根据需要改写以上评估方式） Others (The above may be modified as necessary)				

20. 记分方式 **GRADING SYSTEM**

☑ A. 十三级等级制 **Letter Grading**
☐ B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 REVIEW AND APPROVAL

21. **本课程设置已经过以下责任人/委员会审议通过**
This Course has been approved by the following person or committee of authority