

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	数据管理与数据库 Data Management and Databases
2.	授课院系 Originating Department	信息系统与管理工程系 Division of Information Systems & Management Engineering
3.	课程编号 Course Code	MIS205
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	中英双语 English & Chinese
8.	授课教师、所属学系、联系方式 Instructor(s), Affiliation & Contact (For team teaching, please list all instructors)	余捷、副教授 (访问)
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	待公布 To be announced
10.	选课人数限额(可不填) Maximum Enrolment (Optional)	

11. 授课方式 Delivery Method	讲授	习题/辅导/讨论	实验/实习	其它(请具体注明)	总学时
	Lectures	Tutorials	Lab/Practical	Other (Please specify)	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				
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	MIS302 大数据管理与 ERP Big Data Management and ERP MIS303 大数据治理与商业模式 Big Data Governance and Business Model				
14. 其它要求修读本课程的学系 Cross-listing Dept.	无 None				

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

通过本课程的学习，学生能够了解数据系统理论、数据库设计与实现技术、数据库管理技术，能够有效使用现有的数据库管理系统和软件开发工具，以及掌握数据库结构的设计和数据库应用系统的开发方法。

By studying this course, the students should master the basic concepts of database systems theory, database design and implementation technology, database management technology, and can effectively use the existing database management system and software development tools, as well as master the method of database structure design and the database management system development.

16. 预达学习成果 Learning Outcomes

1. 了解适用于大多数产品的数据库系统的一般原则；
2. 与关系和面向对象的数据库处理相关的术语和基本概念；
3. 关系数据库的设计与实现；
4. 使用专业数据库管理软件例如PostgreSQL和MS Access

1. Understanding general principles of database systems that apply to all (certainly most) products you are likely to deal with;
2. The terminology and fundamental concepts associated with the relational and object-oriented database processing;
3. The design and implementation of a relational database;
4. The application of SQL using PostgreSQL and MS Access.

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.)

The outline below represents a tentative roadmap for the course. We may deviate from it depending on interest and time.

理论（32 学时）

第一周：数据库概论（2 学时）

基于文件的数据库系统、数据库历史、数据库管理系统 (DBMS)

第二周：数据库架构(2 学时)

三层结构、ANSI-SPARC 架构、数据库语言、数据模型、DBMS 的组件及远程处理功能

第三周：关系模型(2 学时)

概念、属性、键、完整性约束、关系和视图

第四周：关系代数(2 学时)

关系语言、关系代数

第五周：SQL 数据操作(2 学时)

数据操作语言

第六--七周：SQL 的数据定义(4 学时)

主要介绍了 SQL 中的数据定义。

第八周：实体关系模型(2 学时)

统一建模语言(UML)

第九周：数据库的规划和设计(2 学时)

数据库应用生命周期、数据库管理系统的选择、数据库管理

第十--十一周：标准化(4 学时)

定义、目的、术语、标准形式类型、案例

第十二--十三周：面向对象的实践(4 学时)

面向对象的概念、术语、面向对象的建模技巧、面向对象的数据模型和数据库管理系统、面向对象数据库管理系统声明、对象管理架构、公共对象请求代理架构

第十四周：事务管理(2 学时)

事务、并发处理、备份和恢复

第十五周：新兴趋势数据库技术(2 学时)

Web 数据管理、XML、Web 挖掘、大数据管理、Mango 数据库

实验(32 学时)

Lab1(2 学时):数据库管理系统应用程序, 安装的数据库管理系统和介绍数据类型

Lab2(2 学时):SQL 基础知识和操纵(Select 语句)

Lab3-4(4 学时):SQL 操作(连接、插入、更新和删除)

Lab5(2 学时):如何定义数据库、表、视图和数据的完整性。

Lab6-7(4 学时):通过 visio 软件学习 UML

Lab8(2 学时):MS Access 中的事务和锁

Lab9(2 学时):MS Access 中的数据库备份和恢复

Lab10-11(4 学时):Mango DB 实践

Lab12-13(4 学时):NoSQL 实践

Lab14(2 学时):MS Access 综合应用

Lab15(2 学时):团队项目一

Lab16(2 学时):团队项目二

Lecture (32 credit hours)

Week 1. (2 credit hours) Introduction to Database

File-based Systems/ History of Database/Database Management Systems (DBMS)

Week 2. (2 credit hours) Database Architecture

Three-Level /ANSI-SPARC Architecture/Database Languages/Data Models/Functions of DBMS/Components of DBMS/Teleprocessing

Week 3. (2 credit hours) Relational Model

Concept/Property/Key/Integrity Constraint/Base Relation & View

Week 4. (2 credit hours) Relational Algebra

Relational Languages/Relational Algebra

Week 5. (2 credit hours) SQL-Data Manipulation

Data Manipulation Language (DML)

Week 6-7. (4 credit hours) SQL – Data Definition

Mainly introduces the data definition by SQL.

Week 8. (2 credit hours) Entity-Relationship Model

Unified Modelling Language (UML)

Week 9. (2 credit hours) Database Planning and Design

Database Application Lifecycle/DBMS Selection/Database Administration

Week 10-11. (4 credit hours) Normalization

Definition/Purpose/Terminology/Types of Normal Form/Examples

Week 12-13. (4 credit hours) Object Oriented Practice

Object-Oriented Concepts/Terminology/Object-Oriented Modeling Tips/Object-Oriented Data Models and DBMSs/OODBMS Manifesto/Object Management Architecture/Common Object Request Broker Architecture

Week 14. (2 credit hours) Transaction Management

Transaction/Concurrent Processing/Backup and Recovery

Week 15. (2 credit hours) Emerging Trends in Database Technology

Web Data management, XML, Web mining, Big Data Management, Mango Database

Labs: The following labs may not be in the same week as the lectures, but as topics that will be covered throughout the module.

Lab (32 credit hours)

Lab1 (2 credit hours) : DBMS application, install of Database Management Systems and data type

Lab2 (2 credit hours) : SQL basics and manipulation (Select Statement)

Lab3-4 (4 credit hours) : SQL manipulation (Joins, Insert, Update and Delete)

Lab5 (2 credit hours) : Definition of database, table, view and Data Integrity.

Lab6-7 (4 credit hours) : UML, through VISIO software

Lab8 (2 credit hours) : Transaction and Lock in Access

Lab9 (2 credit hours) : Database Backup and recovery in Access

Lab10-11 (4 credit hours) : Mango DB practice

Lab12-13 (4 credit hours) : NoSQL practice

Lab14 (2 credit hours) : Comprehensive Application by MS Access

Lab15 (2 credit hours) : Group Project I

Lab16 (2 credit hours) : Group Project II

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

- Thomas M. Connolly, Carolyn E. Begg. Database Systems: A practical Approach to Design, Implementation and Management, Sixth Edition. Publishing house of electronics industry.

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				
小测验 Quiz				
课程项目 Projects		40		
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam		50		
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

