课程大纲
COURSE SYLLABUS

1.	**课程代码/名称** **Course Code/Title**	高级数据库系统/ Advanced Database System
2.	**课程性质** **Compulsory/Elective**	专业核心课 Major core course
3.	**开课单位** **Offering Dept.**	计算机科学与工程系 Department of Computer Science and Engineering
4.	**课程学分/学时** **Course Credit/Hours**	3/48
5.	**授课语言** **Teaching Language**	英文 English
6.	**授课教师** **Instructor(s)**	唐博
7.	**开课学期** **Semester**	春季 Spring
8.	**是否面向本科生开放** **Open to undergraduates or not**	是 Yes
9.	**先修要求** **Pre-requisites**	（如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.） CS307/ 数据库原理 Principles of Database Systems

10. 教学目标
Course Objectives

（如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.）
《高级数据库系统》课程将深入探讨数据库内核原理与系统实现，结合实际应用场景，全面分析不同技术方案的优缺点，帮助学生掌握核心技术并有效将技术与应用结合。课程还将讲解学术论文中的前沿知识，指导学生阅读和理解相关文献，培养他们在主流数据库系统中快速复现学术技术方案的能力，确保理论与实践紧密结合，应用前沿技术解决实际问题。

The “Advanced Database System” course will explore in-depth database kernel principles and system implementation, combine with practical application scenarios, comprehensively analyze the advantages and disadvantages of different technical solutions, help students master the core technology and effectively combine the technology with applications. The course will also explain the cutting-edge knowledge in academic papers, guide students to read and understand related literature, cultivate their ability to quickly reproduce academic technical solutions in mainstream database systems, ensure the close integration of theory and practice, and apply cutting-edge technologies to solve practical problems.

11. 教学方法
Teaching Methods

（如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.）
理论课 48 学时
Lectures 48 credit hours

12. 教学内容

Course Contents
（如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.）

Section 1	介绍 Introduction
Section 2	事务基础理论和并发管理 Transaction Theory and Concurrency Management
Section 3	前沿的事务管理 Cutting-edge transaction management
Section 4	高效的事务管理机制 Efficient transaction management mechanism
Section 5	查询处理基础理论和模型 Basic theory and model of query processing
Section 6	查询优化的核心技术 Core techniques of query optimization
Section 7	前沿的查询优化 Cutting-edge query optimize
Section 8	查询优化器的性能优化 Performance Optimization of Query Optimizer
Section 9	执行引擎原理及执行计划 Execution engine principle and execution plan
Section 10	执行引擎策略 Execution engine strategy
Section 11	前沿执行引擎 Cutting-edge execution engine
Section 12	执行引擎模块的优化 Optimization of Execution Engine Modules
Section 13	存储系统的基本概念与存储引擎类型 Basic Concepts of Storage Systems and Types of Storage Engines
Section 14	存储管理技术 Storage Management Techniques
Section 15	前沿存储系统 Cutting-edge Storage system
Section 16	存储模块的性能优化 Performance Optimization of Storage Modules

13. 课程考核
Course Assessment

（①考核形式 Form of examination；②.分数构成 grading policy；③如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.）

课程项目 60% + 考勤 10% + 期末考试 30%+
Projects 60% + Attendance 10% + Final Exam 30%

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

1. Silberschatz, A., Korth, H. F., & Sudarshan, S. (2021). *Database System Concepts（数据库系统概念）(7th ed.)*. 机械工业出版社