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**	**大数据系统架构 Big Data System Architecture**
2.	**授课院系 Originating Department**	计算机科学与工程系 Department of Computer Science and Engineering
3.	**课程编号 Course Code**	CS336
4.	**课程学分 Credit Value**	3
5.	**课程类别 Course Type**	专业选修课 Major Elective 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（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）**	唐博，助理教授，计算机科学与工程系，tangb3@sustech.edu.cn Bo Tang, Assistant Professor, Department of Computer Science and Engineering, tangb3@sustech.edu.cn
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）**	30

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	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

This course firstly introduces the basic concepts and principles of big data system. Students will learn several well-known big data systems: Hadoop, Spark, Flink and Tensorflow. Besides that, students will study the knowledge on big data processing, computation, memory management, and I/O management. Furthermore, this course will give students chances on build a big data system prototype by completing a series of projects, which is a good opportunity to make them fully understand big data.

课程首先介绍大数据系统的概念与原理。学生将学习 Hadoop，Spark，Flink 和 Tensorflow 在内的多个大数据系统。此外学生还将学习大数据处理，计算，系统内存管理，I/O 管理等。课程将安排实验和项目，从而能让学生有机会从零开始构建一个大数据系统。

16. 预达学习成果 Learning Outcomes

On completion of this course, the student should be able to:

- Familiarize with big data systems.
- Familiarize with big data storage, processing, computation.
- Familiarize with IO, storage and file system in the big data system.

Improve the coding ability by finishing the lab exercise and a series of project.

学生完成课程学习后，学生将

熟悉大数据系统

熟悉大数据存储，处理和计算

熟悉大数据 I/O，存储和文件系统

通过课程实验和项目来提高学生的编码能力。

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.)

- Lecture 1: Introduction to Big Data System
- Lab: Setting up your Environment.
- Lecture 2: The MapReduce Programming Paradigm
- Lab: Hadoop MapReduce Programming
- Lecture 3 The Resource Scheduling Scheme
- Lab: Hive Programming
- Lecture 4-5: In-memory Computation System
- Lab: Spark Programming
- Lecture 6-8: Streaming Computation System
- Lab: Flink Programming
- Lecture 9-12: Big Graph Processing System
- Lab: Graph Programming
- Lecture 12-14: Iteration-based Computation Paradigm systems
- Lab: ML / DL programming
- Lecture 15-16: Advanced topics (e.g., cloud-native databases, modern hardware)
- Lab: No lab..

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

None

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				
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects		60%		2 course projects
平时作业 Assignments				

期中考试 **Mid-Term Test**				
期末考试 **Final Exam**				
期末报告 **Final Presentation**		40%		Final report on the system prototype
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
