南方科技大学 SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY

# 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 | **区块链基础与实践 Blockchain Essentials and Practices** |
| 2. | 授课院系<br>Originating Department | 信息系统与管理工程系 Department of Information Systems & Management Engineering |
| 3. | 课程编号<br>Course Code | MIS332 |
| 4. | 课程学分 Credit Value | 3 |
| 5. | 课程类别<br>Course Type | 专业选修课 Major Elective Courses |
| 6. | 授课学期<br>Semester | 秋季 Fall |
| 7. | 授课语言<br>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）<br>Instructor(s), Affiliation& Contact （For team teaching, please list all instructors） | 杨玉坤，商学院，yangyk@sustech.edu.cn<br>Yukun Yang, Business School |
| 9. | 实验员/助教、所属学系、联系方式<br>Tutor/TA(s), Contact | 待公布 To be announced |
| 10. | 选课人数限额(可不填)<br>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 | 无，NA |
| 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. | 不限，no restrictions |

## 教学大纲及教学日历 SYLLABUS

**15. 教学目标 Course Objectives**

本课程从区块链的基础知识出发，带领学生由浅入深地了解区块链技术及相关衍生产品，并在此技术上讨论区块链技术在不同行业中的应用，分析区块链如何推动公司在 Web 3.0 中的创新。将区块链理论知识与实践结合，带领学生进行智能合约和去中心化应用的开发。

This course begins by covering the basics of blockchain technology and gradually leads students to comprehend the technology and its various forms. It also delves into the utilization of blockchain in a variety of industries and evaluates how it can drive corporate innovation in Web 3.0. This course also combines blockchain knowledge with practices and guides students to develop smart contracts and decentralized applications.

**16. 预达学习成果 Learning Outcomes**

- 了解区块链作为大数据存储的关键技术。
- 了解区块链带来的新范式和框架。
- 了解区块链的技术和加密构成。
- 从跨行业用例中了解区块链的潜在影响。
- 学习如何开发和部署智能合约。
- 了解区块链应用的发展趋势。
- 设计并执行区块链解决方案。

- Understand blockchain as a type of big data storage technology.
- Understand the new paradigm and frameworks brought by blockchain.
- Understand the technological and cryptographic components of blockchain.
- Project the potential impacts on blockchain from use cases across industries.
- Learn how to create and deploy smart contracts.
- Learn from the industry leaders about the trends of blockchain applications.
- Design and execute blockchain-supported solutions.



**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.)**

**模块 I. 区块链简介**

**Module I. Introduction to Blockchain**

第 1 周：理论（2 学时）区块链的基本概念和分类；讨论（2 学时）案例讨论介绍

Week 1: Lecture (2 hours). Basic concepts and types of blockchain; Discussion (2 hours) Case: Intro to Case Studies

第 2 周：理论（2 学时）区块链的历史；讨论（2 学时）案例：比特币

Week 2: Lecture (2 hours). History of blockchain; Discussion (2 hours) Case: Bitcoin

**模块 II. 区块链的关键技术**

**Module II. Key Technologies of Blockchain**

第 3 周：理论（2 学时）区块链的常见框架及运行机制；讨论（2 学时）案例：以太坊

Week 3: Lecture (2 hours). Common frameworks and operating mechanisms of blockchain; Discussion (2 hours) Case: Ethereum

第 4 周：理论（2 学时）区块链协议和算法；讨论（2 学时）案例：Hyperledger Fabric

Week 4: Lecture (2 hours). Blockchain protocols and algorithms; Discussion (2 hours) Case: Hyperledger Fabric

第 5 周：理论（2 学时）中心化和去中心化治理；讨论（2 学时）案例：EOS

Week 5: Lecture (2 hours). Centralized and decentralized governance; Discussion (2 hours) Case: EOS

第 6 周：理论（2 学时）区块链的衍生：中继链、平行链；讨论（2 学时）案例：Polkadot

Week 6: Lecture (2 hours). Derivatives of blockchain: Relay, Parachains; Discussion (2 hours) Case: Polkadot

**模块 III. 区块链产品开发**



**Module III. Blockchain Product Development**

第 7 周：理论（2 学时）智能合约 I；实验（2 学时）了解区块链的开发环境

Week 7: Lecture (2 hours). Smart contracts; Lab (2 hours) Blockchain development environment

第 8 周：理论（2 学时）智能合约 II；实验（2 学时）创造和部署智能合约

Week 8: Tutorial (2 hours). Smart contracts and decentralized applications; Lab (2 hours) Create and deploy smart contracts

第 9 周：理论（2 学时）去中心化应用；实验（2 学时）开发去中心化应用

Week 9: Lecture (2 hours). Blockchain security and smart contract audits; Lab (2 hours) Develop DApps

第 10 周：理论（2 学时）区块链安全体系与智能合约审查；实验（2 学时）审查智能合约

Week 10: Lecture (2 hours). Blockchain security and smart contract audits; Lab (2 hours) Examine smart contracts

**模块 IV. 区块链在行业中的发展和应用**

**Module IV. The Development and Application of Blockchain across Industries**

第 11 周：理论（2 学时）去中心化金融和区块链应用；讨论（2 学时）案例：央行数字货币

Week 11: Lecture (2 hours). DeFi and blockchain application; Discussion (2 hours) Case: Central Bank Digital Currency

第 12 周：理论（2 学时）区块链在凭证领域的应用；实验（2 学时）制作属于你自己的 NFT

Week 12: Lecture (2 hours). Application of blockchain in credentials; Lab (2 hours) Create your own NFT

第 13 周：理论（2 学时）区块链、大数据和 AI；实验（2 学时）生成式 AI 与区块链

Week 13: Lecture (2 hours). Blockchain, big data, and AI；Lab (2 hours) Generative AI and blockchain

**模块 V. 区块链的未来展望**

**Module V. The Future of Blockchain**

第 14 周：理论（2 学时）全球区块链格局；讨论（2 学时）政府规划和生态图谱

Week 14: Lecture (2 hours) The global blockchain landscape; Discussion (2 hours) Government planning and ecological maps

第 15 周：理论（2 学时）区块链的技术挑战和未来发展；辅导（2 学时）课程回顾及项目答疑

Week 15: Lecture (2 hours). Technology challenges and the future of blockchain; Tutorial (2 hours) Course review and project Q&A

第 16 周：理论（2 学时）小组项目汇报；讨论（2 学时）小组项目汇报

Week 16: Lecture (2 hours). Group project presentations; Discussion (2 hours) Group project presentations



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

魏翼飞，《区块链原理、架构与应用（第 2 版）》，清华大学出版社。

邱炜伟，李伟，《区块链技术指南 》(Blockchain: A Beginner's Guide)，电子工业出版社。

## 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 | | 20 | | |
| 小测验 Quiz | | | | |
| 课程项目 Projects | | 30 | | |
| 平时作业 Assignments | | 30 | | |
| 期中考试 Mid-Term Test | | | | |
| 期末考试 Final Exam | | | | |
| 期末报告 Final Presentation | | 10 | | |
| 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**

教学负责人签字：
日期：