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**	**智能制造系统技术** **Intelligent Manufacturing System Technology**
2.	**授课院系** **Originating Department**	机械与能源工程系 Department of Energy and Mechanical Engineering
3.	**课程编号** **Course Code**	ME357
4.	**课程学分 Credit Value**	3
5.	**课程类别** **Course Type**	专业核心课 Major Core 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）**	路冬 机械与能源工程系 lud@sustech.edu.cn Dong Lu Department of Mechanical and Energy Engineering lud@sustech.edu.cn
9.	**实验员/助教、所属学系、联系方式** **Tutor/TA(s), Contact**	
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	48				48
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.					

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，使学生了解智能制造技术在新一代工业革命中的重要作用，了解智能制造的发展趋势、标准化历程和典型制造模式。重点学习智能制造系统的主要模型、使能技术、关键装备、组织形式、运行管理等。为学生将来从事智能制造相关的学习、研究打下良好的基础。

Through the study of this course, students will understand the important role of intelligent manufacturing technology in the new generation of industrial revolution. Understand the development trends, standardization process and typical manufacturing models of intelligent manufacturing. Focus on learning the main models, enabling technologies, key equipment, organizational forms, operation management, etc. of intelligent manufacturing systems. It will lay a good foundation for students to engage in future study and research related to intelligent manufacturing.

16. 预达学习成果 Learning Outcomes

通过本课程的学习使学生对“什么是智能制造？”、“什么是智能制造系统？”、“智能制造系统如何运转？”等问题有了自己的认识及答案。 让学生将来从事与智能制造相关的工作时具备一定的知识储备和技术支撑。

Through the study of this course, students will have their own understanding and answers to questions such as "What is intelligent manufacturing?", "What is an intelligent manufacturing system?", "How does an intelligent manufacturing system operate?". Let students have certain knowledge reserves and technical support when engaging in work related to intelligent manufacturing in the future.

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.)

课程内容 **Contents**	教学要求 **Teaching Requirements**	学时分配 **Hours**
绪论 • 智能制造发展趋势 • 智能制造标准化发展 • 智能制造模式 • 本课程的性质、任务和主要内容 • 课程安排与考核标准 Introduction ➢ Development trends of intelligent manufacturing ➢ Development trend of intelligent manufacturing standardization	• 了解智能制造发展趋势 • 了解智能制造标准化发展 • 了解典型智能制造模式 • 了解本课程的性质、任务和主要内容 • 了解课程安排与考核标准 ➢ Understand the development trends of intelligent manufacturing ➢ Understand the development trend of intelligent manufacturing standardization ➢ Understand the Intelligent manufacturing model	4

➢ Intelligent manufacturing model ➢ The objectives, outcomes and main topics of this course ➢ Schedules and grading policies	➢ Understand the importance of this course to mechanical engineering ➢ Understand the objectives, expected outcomes, main topics, schedules and grading policies of this course	
智能制造系统模型 • 系统、系统科学与系统工程 • 智能制造系统标准化参考模型 • 智能制造能力成熟度模型 Intelligent manufacturing system model ➢ Systems, systems science and systems engineering ➢ Intelligent manufacturing system standardized reference model ➢ Intelligent manufacturing capability maturity model	• 了解系统、系统科学与系统工程概念 • 理解智能制造系统标准化参考模型 • 理解智能制造能力成熟度模型 ➢ Understand the concepts of systems, systems science, and systems engineering ➢ Understanding the Standardized Reference Model for Intelligent Manufacturing Systems ➢ Understanding the model of Intelligent manufacturing capability maturity	8
智能制造系统使能技术 • 工业物联网技术 • 工业大数据技术 • 数字孪生技术 • 机器学习技术 • 信息安全技术 Enabling technology of Intelligent manufacturing system ➢ Industrial Internet of Things Technology ➢ Industrial big data technology ➢ Digital twin technology ➢ Machine learning technology ➢ Information security technology	• 学习工业物联网技术 • 学习工业大数据技术 • 学习数字孪生技术 • 学习机器学习技术 • 学习信息安全技术 ➢ Learn the technology of Industrial Internet of Things ➢ Learn the technology of Industrial big data ➢ Learn the technology of digital twin ➢ Learn the technology of Machine learning ➢ Learn the technology of information security	10
智能制造系统关键装备 • 智能传感系统 • 智能数控机床 • 智能机器人 • 智能物流装备 Key equipment of intelligent manufacturing system ➢ Intelligent sensing system ➢ Intelligent CNC machine tools ➢ Intelligent robot ➢ Intelligent logistics equipment	• 学习智能传感系统 • 学习智能数控机床 • 学习智能机器人 • 学习智能物流装备 ➢ Learn intelligent sensing system ➢ Learn intelligent CNC machine tools ➢ Learn intelligent robot ➢ Learn intelligent logistics equipment	10
智能制造系统组织 • 智能单元 • 智能车间 • 智能工厂 Intelligent Manufacturing System Organization ➢ Intelligent unit ➢ Intelligent workshop ➢ Intelligent factory	• 学习智能单元 • 学习智能车间 • 学习智能工厂 ➢ Learn intelligent unit ➢ Learn intelligent workshop ➢ Learn intelligent factory	8
智能制造系统运行 • 设备智能维护 • 质量智能控制 • 智能生产计划 • 智能生产调度 Intelligent manufacturing system operation ➢ Intelligent equipment maintenance ➢ Intelligent quality control ➢ Intelligent production planning ➢ Intelligent production scheduling	• 了解设备智能维护 • 学习质量智能控制 • 学习智能生产计划 • 了解智能生产调度 ➢ Understand intelligent equipment maintenance ➢ Learn intelligent quality control ➢ Learn intelligent production planning ➢ Understand intelligent production scheduling	4
智能制造系统典型模式 • 智能加工系统 • 智能装配系统 Typical models of intelligent manufacturing systems ➢ Intelligent processing system	• 学习智能加工系统 • 学习智能装配系统 ➢ Learn intelligent processing system ➢ Learn intelligent assembly system	4

➢ Intelligent assembly system		

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

1. 张洁, 吕佑龙, 汪俊亮, 张朋. 智能制造系统模型、技术与运行, 机械工业出版社, 2023 年 3 月第 1 版. ISBN: 978-7-111-71962-5.
2. 周济, 李培根. 智能制造导论, 高等教育出版社, 2021 年 6 月第 1 版. ISBN: 978-7-04-055595-0.
3. 李培根, 高亮. 智能制造概论, 清华大学出版社, 2021 年 5 月第 1 版. ISBN: 978-7-302-57907-6.

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		20		
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments		30		
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