

## 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 <b>Course Title</b>	电子信息材料与器件 Electronic Information Materials and Devices
2.	授课院系 <b>Originating Department</b>	材料科学与工程系 Department of Materials Science and Engineering
3.	课程编号 <b>Course Code</b>	MSE356
4.	课程学分 <b>Credit Value</b>	3
5.	课程类别 <b>Course Type</b>	专业核心课 Major Core Course
6.	授课学期 <b>Semester</b>	秋季 Fall
7.	授课语言 <b>Teaching Language</b>	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） <b>Instructor(s), Affiliation &amp; Contact</b> (For team teaching, please list all instructors)	钟锦辉 副教授 材料科学与工程系 zhongjh@sustech.edu.cn Jinhui Zhong, Associate Professor Department of Materials Science and Engineering zhongjh@sustech.edu.cn
9.	实验员/助教、所属学系、联系方式 <b>Tutor/TA(s), Contact</b>	待公布 To be announced
10.	选课人数限额(可不填) <b>Maximum Enrollment</b> (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	MSE001 材料科学与工程基础 Fundamentals of Materials Science and Engineering				
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

本课程是一门工科专业核心课，主要目标是培养学生了解和掌握电子信息材料与器件的基本概念、原理及其应用基础，以及常用的电子信息材料及其特性，将电子信息材料与器件的前沿进展与材料物理的基本原理有机结合，拓宽学生的专业知识面，激发学生的专业兴趣和构建合理的知识结构。

This course is a professional core course for engineering. The main goal is to train students to understand and master the basic concepts, principles and application foundations of electronic information materials and devices. It is organically combining the cutting-edge progress of electronic information materials and devices with the basics of material physics principles, aiming to broaden students' professional knowledge, stimulate students' professional interest and construct a reasonable knowledge structure.

#### 16. 预达学习成果 Learning Outcomes

本课程将介绍电子信息材料与器件的基本原理和应用，并与最新的专业领域前沿进展相结合。学生学习本课程后将达成以下学习成果：1) 掌握典型电子信息材料的性质和应用；2) 掌握基础电子器件的功能及电路应用；3) 理解材料性质和器件应用之间的内在关系。

To introduce the principles and applications of typical electronic information materials and devices with the most recent advances. By the end of this course, the students should (1) be able to describe the properties and applications of typical electronic information materials; (2) be able to define the function of basic devices for circuits; (3) Understand how the properties of materials are related to device applications.

#### 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.)**

本课程主要讲授电子信息材料与器件的概念、原理及其应用基础，涵盖了电子信息材料和器件的基本原理和新概念，常用的电子信息材料及其特性，以及下一代电子信息材料的前沿进展，教学安排如下：

第一章：绪论 (2 学时)

第二章：电导和热导材料 (8 学时)

第三章：半导体材料 (8 学时)

第四章：半导体器件（8学时）

第五章：电介质材料与器件（8学时）

第六章：磁性与超导材料及器件（6学时）

第七章：光学材料与器件（8学时）

This course covers the general concepts, principles and applied basics of typical electronic information materials and devices. The focus will be the introduction of a variety of common electronic materials and their properties, and the research frontier of the next-generation electronic materials. The main contents include:

Chapter 1: Introduction (2 credit hours)

Chapter 2: Electronic Conductivity and Thermal Conductivity Materials (8 credit hours)

Chapter 3: Semiconductors (8 credit hours)

Chapter 4: Semiconductor Devices (8 credit hours)

Chapter 5: Dielectric Materials and Devices (8 credit hours)

Chapter 6: Magnetic and Superconductivity Materials and Devices (6 credit hours)

Chapter 7: Optical Materials and Devices (8 credit hours)

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

1. S.O.Kasap, Principles of Electronic Materials and Devices (Forth Edition), Mc Graw Hill, 2018, ISBN 978-1-259-25355-3;
2. S.O.Kasap 著, 汪宏等译, 电子材料与器件原理 (第三版), 西安交通大学出版社, 2009, ISBN 978-7-6505-3155-7;
3. S.O.Kasap 著, 王进祥 选译, 电子材料与器件 (第四版), 清华大学出版社, 2018, ISBN 9787302510291.

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 <b>Attendance</b>		5		
课堂表现 <b>Class Performance</b>				
小测验 <b>Quiz</b>		15		
课程项目 <b>Projects</b>				
平时作业 <b>Assignments</b>		20		
期中考试 <b>Mid-Term Test</b>		20		
期末考试 <b>Final Exam</b>		40		
期末报告 <b>Final Presentation</b>				
其它 (可根据需要 改写以上评估方 式)				

Others (The above may be modified as necessary)

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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**

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