

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	电子创意设计 II Creative Electronic Design II
2.	授课院系 Originating Department	电子与电气工程系 Department of Electrical & Electronic Engineering
3.	课程编号 Course Code	EES201
4.	课程学分 Credit Value	0.5
5.	课程类别 Course Type	专业选修课 Major Elective Courses
6.	授课学期 Semester	夏季 Summer
7.	授课语言 Teaching Language	中文 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)	徐琳琳, 教学工程师, 电子与电气工程系, xull@sustech.edu.cn 蒋苓利, 教学工程师, 电子与电气工程系, jiangll@sustech.edu.cn 刘毅军, 教学工程师, 电子与电气工程系, liuyj@sustech.edu.cn 庞利会, 教学工程师, 电子与电气工程系, panglh@sustech.edu.cn 刘欢, 教学实验员, 电子与电气工程系, liuh3@sustech.edu.cn Linlin Xu, Teaching engineer, Department of Electrical & Electronic Engineering, xull@sustech.edu.cn Lingli Jiang, Teaching engineer, Department of Electrical & Electronic Engineering, jiangll@sustech.edu.cn Yijun Liu, Teaching engineer, Department of Electrical & Electronic Engineering, liuyij@sustech.edu.cn Lihui Pang, Teaching engineer, Department of Electrical & Electronic Engineering, panglh@sustech.edu.cn Huan Liu, ****, Department of Electrical & Electronic Engineering, liuh3@sustech.edu.cn
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	无 NA
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			16		16
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	无 None				
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	EE317/EE318 电子科学创新实验, EE480 科技创新项目, EE490 毕业设计 EE317/EE318 Advanced Electronic Science Experiment EE480 Projects of Science and Technology Innovation EE490 Thesis(Graduation Project)				
14. 其它要求修读本课程的学系 Cross-listing Dept.	无 None				

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

本课程为实验课程，由电子与电气工程系四个方向教学工程师（试验员）担任教学工作。课程内容按照微电子科学与工程方向、光电科学与工程方向、信息工程方向、通信工程方向安排 4 个专业性实验，每个实验约 4 小时。通过四个方向专业实验，让学生对电子学学科设置有直观的认识，帮助学生进行后续专业选择。此外，通过具体的实验操作，让学生在后续的理论课学习中有更好的指向性，更好的实现理论与实践的结合。

This course is an experiment course, which contents 4 professional experiments: the microelectronic experiment, the photoelectric information experiment, the information engineering experiment, and the communication engineering experiment. Each experiment is about 4 hours. Through these professional experiments in four directions, students can have an intuitive understanding of the discipline settings of the Department of Electrical & Electronic Engineering, and help them make professional choices. In addition, through specific experimental operations, students can have a better orientation in the follow-up theoretical lessons, and better achieve the combination of theory and practice.

16. 预达学习成果 Learning Outcomes

1.通过集成电路逆向工程实验，初步掌握集成电路逆向设计方法。能辨识硅片显微照片中的常见半导体器件，能准确判断显微照片中器件的连接关系，能对提取的电路信息进行初步整理。

2. 通过基于液晶空间光调制器的计算全息成像实验，让学生掌握计算全息图制作的原理和方法，并且能独立动手搭建全息成像的实验光路。

3.初步掌握电磁仿真软件的使用方法,能用仿真软件建模简单的三维电磁模型，能分析建模和仿真过程中的简单问题。

4.通过四路抢答器电路的设计与仿真实验，初步掌握电路仿真软件 Multisim 的使用方法，并能够综合应用所学的数字电路知识，设计合理、可靠、可行的电路。

1.Through the reverse engineering experiment of integrated circuits, the students can have the basic understanding of reverse design method. Students can identify common semiconductor devices in silicon micro-graphs, accurately judge the connection relationship between devices in micro-graphs, and collate the extracted circuit information.

2. Through the experiment of computer-generated holographic imaging based on liquid crystal spatial light modulator, the students will master the principle and method of making a computer-generated hologram, and have the ability to construct the experimental light path of holographic imaging system independently.

3. Be able to use simulating tools to model simple 3D electromagnetic objects, and analyse errors in modelling and simulating.

4. Through the design and simulation experiment of four-way answering responder device circuit, students will be grasp master how to use Multisim. And be able to design reasonable, reliable and feasible circuit based on the basic knowledge of digital circuit.

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.)

实验一（4学时）：集成电路逆向工程

1. 集成电路逆向原理学习；2. 提取解剖照片电路信息，获得电路图

实验二（4学时）：基于液晶空间光调制器的计算全息成像

1. 学习计算全息图制作的原理和方法；2. 动手搭建全息成像的实验光路。

实验三（4学时）：三维电磁仿真实验

1. 三维电磁仿真软件基础；2. 简单模型的建模仿真

实验四（4学时）：四路抢答器电路的设计与仿真

1. 电路仿真软件 Multisim 学习；2. 抢答器电路的设计与仿真

Experiment 1 (4 hours): Reverse Engineering of Integrated Circuits

1. Reverse engineering of of Integrated Circuits principle study; 2. Extract circuit information from Micro-graph and obtain circuit diagrams

Experiment 2 (4 hours): Computer-generated holographic imaging based on liquid crystal spatial light modulator

1. Learning the principle and method of making a computer-generated hologram; 2. Construct the experimental light path of holographic imaging.

Experiment 3 (4 hours): 3D electromagnetic simulating

1. Basics of 3D simulating software; 2. Modeling and simulating of several simple objects

Experiment 4 (4 hours): The design and simulation experiment of four-way answering responder device circuit

1. Learning Multisim Circuit Simulation Software; 2. Design and Simulation of the Answer Responder Circuit

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

无 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		20%		
课堂表现 Class Performance		20%		
小测验 Quiz				
课程项目 Projects		60%		
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam				
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