

课程大纲

COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	EEE5001 半导体光电子学器件导论 EEE5001 Introduction to semiconductor electronic and optoelectronic devices
2.	课程性质 Compulsory/Elective	选修 Elective
3.	课程学分/学时 Course Credit/Hours	3 学分/48 学时 3 credit/48 hours
4.	授课语言 Teaching Language	中英双语 Chinese and English
5.	授课教师 Instructor(s)	陈晓龙 Chen Xiaolong
6.	先修要求 Pre-requisites	无
7.	教学目标 Course Objectives	
	<p>通过本课程的学习，让学生深层次的了解和掌握半导体电子和光电器件的结构和工作原理，其中包括：</p> <ol style="list-style-type: none"> 1. 让学生了解半导体电子和光电器件的最新研究进展。 2. 让学生掌握半导体的深层次物理性质，包括电子能带结构，光学性质和电子输运性质。 3. 让学生掌握核心的半导体电子和光电器件的工作原理：如 PN 结，场效应晶体管，光电探测器，太阳能电池，发光二极管，电光调制器和激光器。 <p>This course aims at letting students learn and grasp the structures and operating principles of semiconductor electronic and optoelectronic devices, including:</p> <ol style="list-style-type: none"> 1. Let students know the latest research progress on electronic and optoelectronic devices. 2. Let students grasp the physical properties of semiconductors, including the electronic band structure, optical properties and electronic transport properties. 3. Let students grasp the operating principles of semiconductor devices, including PN junction, field-effect transistor, photodetector, solar cell, light-emitting diode, electro-optical modulator and lasers. 	
8.	教学方法 Teaching Methods	
	以幻灯片展示为主，结合短视频等多媒体展示为辅。 Using PowerPoint slides as main tech to teach, accompanied with short-video and other multimedia approach.	
9.	教学内容 Course Contents	
	Section 1	绪论 Introduction
	Section 2	半导体物理基础 Fundamental physics of semiconductors
	Section 3	半导体光学性质 Optical properties of semiconductors
	Section 4	半导体电学性质 Electronic properties of semiconductors
	Section 5	PN 结 PN junction
	Section 6	场效应晶体管 Field-effect transistor
	Section 7	光电探测器和太阳能电池 Photodetector and solar cell
	Section 8	电致发光二极管 Light-emitting diode
	Section 9	电光调制器 Electro-optical modulator
	Section 10	半导体激光器 Lasers
10.	课程考核 Course Assessment	

课堂测验（10%）+期中考试（40%）+期末考试（50%）
In-class quiz (10%)+Mid-term exam (40%)+Final exam (50%)

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

光子器件物理（第二版），庄顺连，电子工业出版社
Optical properties of Solids (Second edition), Mark Fox, OXFORD
Introduction to solid state physics (Eight Edition), Charles Kittel, WILEY
半导体物理学（第七版），刘恩科，电子工业出版社