课程大纲
COURSE SYLLABUS

1.	**课程代码/名称** **Course Code/Title**	现代物理实验 Modern Physics Experiments
2.	**课程性质** **Compulsory/Elective**	专业选修课 Major Elective Courses
3.	**课程学分/学时** **Course Credit/Hours**	2/48 (16 理论 lecutre + 32 实验 lab project)
4.	**授课语言** **Teaching Language**	Chinese 中文
5.	**授课教师** **Instructor(s)**	崔德虎 Cui Dehu
6.	**先修要求** **Pre-requisites**	集成电路工艺实践 Silicon VLSI Technology, Fundamentals, Practice and Modelling

7. 教学目标
Course Objectives

课程为博士研究生专业核心课。通过该门课程的学习，学生们可学习集成电路的工艺、表征等知识，并能熟练使用集成电路工艺所使用的基本仪器，达到理论与实践相结合的目的。课程考核方式为课程报告 50%，课程实验 50%。讲授 16 学时，实验 32 学时。

This lecture focuses on the basic features of the silicon integrated circuits manufacture， including their distinctions and common underlying principle. Such as: CMOS Technology, lithography, etching, various deposition techniques, vacuum technology, evaporation, ion implantation, epitaxy, chemical vapour deposition, plasma, film analysis.

8. 教学方法
Teaching Methods

讲授 Lectures，习题/辅导/讨论 Tutorials，实验项目 Lab Project

9. 教学内容
Course Contents

Section 1 (2 hours)	晶体生长：晶圆片制造与硅晶圆片的基本特性，圆片的准备和规格 Crystal Growth, Wafer fabrication and basic properties of silicon wafer
Section 2 (2 hours)	半导体制造——洁净室、晶圆片清洗与吸杂处理 Semiconductor manufacturing, clean rooms, wafer cleaning and guttering;
Section 3 (2 hours)	光刻 Lithography;
Section 4 (2 hours)	热氧化和 Si-SiO2 界面 Thermal oxidation and Si/Sio2 interface
Section 5 (2 hours)	扩散，离子注入；Dopant diffusion;Ion implantation;
Section 6 (2 hours)	薄膜淀积；Thin film deposition
Section 7 (2 hours)	刻蚀 Etching;
Section 8 (2 hours)	后端工艺 Back-end technology

	Lab Project (32 hours)	要求学生掌握电子器件的基本实验步骤. Students should master the fundamental principles of electronic materials and devices.
10.	课程考核 Course Assessment	
	①考试；②分数构成。 出勤及课堂表现 Attendance and class performance 10% 期末考试 Final exam 40% 课程项目及报告 Project and presentation 50%	
11.	教材及其它参考资料 Textbook and Supplementary Readings	
	Silicon VLSI Technology, Fundamentals, Practice and Modelling 超大规模集成电路工艺技术：理论，实践及模型。	