

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.

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|-----|---|---|
| 1. | 课程名称 Course Title | 现代电子科学与技术前沿讲座 I Frontier Seminars in Modern Electronic Science and Technology I |
| 2. | 授课院系 Originating Department | 电子与电气工程系 Electrical and Electronic Engineering |
| 3. | 课程编号 Course Code | EE301 |
| 4. | 课程学分 Credit Value | 1 |
| 5. | 课程类别 Course Type | 专业选修课 Major Elective Courses |
| 6. | 授课学期 Semester | 秋季 Fall |
| 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) | 每学期会邀请八位教授 (包括校内和校外的教授), 每位老师作一场两小时的现代电子科学与技术领域的前沿讲座。这八位老师一般涵盖电子系的四个专业方向。 每学期开学时公布。 Eight Professors (including professors from our own department, or from other Universities) are invited in each semester, and each professor conducts a two-hour seminar for a topic in the research area of electronic science and technology. The topics of the eight professors are supposed to cover the 4 majors in the Department of EEE. To be announced at the beginning of each semester. |
| 9. | 实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact | 待公布 To be announced |
| 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 | EE201-17 模拟电路 Analog Circuits 或者 EE202-17 数字电路 Digital Circuits | | | | |
| 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. | 无 NA | | | | |

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

《现代电子科学与技术前沿讲座》是电子系所有四个专业的专业必/选修课，主要向电子与电气工程系学生介绍微电子科学与工程、光电子科学与工程、通信工程、信息工程领域的学科前沿进展等，以激发学生对相关学科的兴趣和热情，拓宽知识面和视野，了解相关学科的最新进展，培养创新精神，加深理解基础理论，了解科学研究的一般规律，提高文献查询文献阅读和文献综述的能力。同时，为学生提供工程伦理方面的教育和训练，帮助学生了解工程研究和实践中的伦理问题，困境，及解决方案。

《Frontier Seminars in Modern Electronic Science and Technology》is a Major required and elective Course Series for all students of the 4 majors in the Department of Electrical and Electronic Engineering. The objective of this series of courses is mainly to introduce to students frontiers of research in the areas of microelectronics science and engineering, optoelectronics science and engineering, communication engineering, and information engineering. This series is expected to motivate students and arouse their interests and passions to the related areas. In addition, the series will broaden students' knowledge and vision, cultivate students' innovative spirits, deepen students' understanding to the basic theories, make students appreciate the latest developments in related disciplines and know the general methodology of scientific research, and improve the ability to read and interpret literature and write review articles. This series of courses is also expected to attract students' attention and thinking on the ethical, societal and environmental impacts of the latest technology development.

16. 预达学习成果 Learning Outcomes

通过本课程，学生预期能够获得以下能力：

1. 运用数学、科学和工程学的知识来理解讲座中所提出的研究问题的原理、目标和方法。
2. 了解并领会讲座中呈现的新兴技术。
3. 与团队成员有效沟通，就讲座中提出的研究课题撰写全面、连贯的报告。
4. 在一个新的研究主题中自学和获取知识，并在团队报告中加以描述。
5. 识别解决、处理工程问题和产品时的伦理和专业责任。
6. 在开发小装置、产品时，考虑工程解决方案对世界、经济、环境和社会等的影响，综合信息，做出合理有效的判断。

7. 使用讲座中讨论的一些基本的伦理道德原则来分析某些工程情况， 判别伦理困境， 并懂得有助于解决这些伦理困境的原理。

By taking this course, students are expected to be able to

1. Apply the knowledge of mathematics, science and engineering to understand the principle, objective and methodology of the research problems presented in the seminars.
2. Know and appreciate the emerging technologies presented in the seminars.
3. Communicate effectively with team members to write a comprehensive and coherent report on a research topic presented in a seminar.
4. Self-study and acquire knowledge in a new research topic and describe it in a team report.
5. recognize the ethical and professional responsibilities in solving and/or dealing with engineering problems and products.
6. make informed judgments in developing experiments, gadgets and products by considering the impact of engineering solutions in global, economic, environmental, and societal contexts.
7. analyze certain given engineering situations using basic ethical and moral principles discussed in the seminar, identify ethical dilemma and know the principles that may help resolve such dilemma.

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.)

《现代电子科学与技术前沿讲座》是专业核心课，主要介绍微电子科学与工程、光电子科学与工程、通信工程、信息工程领域的学科前沿进展，分8个专题讲座。主讲教师均由在某一学科领域长期从事科学研究的学科带头人或学术骨干担任。其主要作用是拓宽学生知识和视野，了解相关学科的最新进展，培育创新精神和启发科研思路，加深理解基础理论的学习在科学研究中的作用，了解科学研究的一般规律，为今后的工作奠定基础。

教学策略与方法建议：

- (1) 由浅入深，通俗易懂，尽量避免使用过多术语和公式，激发学生的兴趣和热情。
- (2) 在介绍个人研究项目的同时，也对相关的研究方向做一个综述。
- (3) 提供足够的信息（如相关文献、数据库、研究团队等）便于进一步的研究。
- (4) 提供个人的联系方式如电邮、办公室号码等便于学生课后联系。

考核方式：

- (1) 出勤率（总分：10）
- (2) 课题报告（总分：60），学生自由分组，每组4-5人。以小组为单位，选择任一电子系学科前沿方向的讲座题目，对该研究领域作综述并展望其未来研究方向，提交一份学术报告，由邀请人进行评分。报告要求用英文书写，字数不少于3000不多于10000，格式规范完整。
- (3) 工程伦理报告（总分：30），学生提交一份个人工程伦理选题相关的报告。

This course includes 8 technical seminars, each seminar conducted by a professor, who is an expert in a particular research area of microelectronics science and engineering, optoelectronics science and engineering, communication engineering, or information engineering.

Teaching strategy and suggested methodology:

1. Motivate students' interests and passions by teaching from fundamental concepts to a conceptual understanding of an advance research topic. The focus is on concepts, principles and overall broad vision and not on complex formulas.
2. Review the related area when introducing and investigating a particular topic.
3. Provide necessary information (such as related literature, database and research teams) for students' self study and report writing.
4. Leave the personal contacts of the lecture (such as email address) for a future interaction with students to achieve the course learning outcomes.

Assessment:

1. Attendance (10%)
2. Research Report (60%): a freely grouped 4-5 students select one topic of the eight seminars, conduct a review of the research area, and submit a review report. A 3,000 to 10,000 word report is required to be written in English.
3. Engineering Ethics Report (30%): a individual report with a topic related with engineering ethics.

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

无 NA

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 | | 10 | | 每次讲座开始前签到 Sign in before each seminar begins |
| 课堂表现 Class Performance | | | | |
| 小测验 Quiz | | | | |
| 课程项目 Projects | | 30 | | 每位学生提交一份工程伦理相关选题的报告 Each student submits a report for a topic related with Engineering Ethics. |
| 平时作业 Assignments | | | | |
| 期中考试 | | | | |

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|---|--|----|--|---|
| Mid-Term Test | | | | |
| 期末考试 Final Exam | | | | |
| 期末报告 Final Report | | 60 | | <p>1. 学生自己分组。每组 4-5 人。每组选择其中一个讲座主题来完成一份期末报告，这个报告应该对该研究领域作综述并展望未来研究方向；</p> <p>2. 期末报告必须用英文提交；</p> <p>1. Students are freely grouped to a team with 4-5 members. Each group chooses one of the seminar topics to accomplish a final report which should review the research areas and anticipate the future prospects of the research topic.</p> <p>2. The final report is expected to be submitted in English.</p> |
| 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