

课程大纲 COURSE SYLLABUS

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| 1. | 课程代码/名称 Course Code/Title | 计算电磁学 Computational Electromagnetics |
| 2. | 课程性质 Compulsory/Elective | Electiv |
| 3. | 课程学分/学时 Course Credit/Hours | 3/48 |
| 4. | 授课语言 Teaching Language | 中文 |
| 5. | 授课教师 Instructor(s) | Associate Professor Zhen Gao |
| 6. | 是否面向本科生开放 Open to undergraduates or not | No |
| 7. | 先修要求 Pre-requisites | (如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) 无 |
| 8. | 教学目标 Course Objectives | (如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) The main goal of this course is to make the students familiar with the basic electromagnetic theory and concepts. Another major goal of this course is to provide students with the development history of the frontier research fields of electromagnetic waves、 photonic crystals、 metamaterials、 plasmonics and topological photonics in the past decades, thus they can understand the past, present and future of the frontier reach fields of electromagnetic waves. |
| 9. | 教学方法 Teaching Methods | (如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) To reach the first goal, I will introduce and derive the basic electromagnetic theory from the Maxwell equations throughout this course. To achieve the second goal, the basic concepts and milestones of the research fields of photonic crystals、 metamaterials、 plasmonics and topological photonics will be reviewed in detail. |
| 10. | 教学内容 Course Contents | (如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) |
| | Section 1 | The basic theory of electromagnetic waves |

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| | Section 2 | Photonic crystals: molding the flow of light |
| | Section 3 | Metamaterials: control electromagnetic waves |
| | Section 4 | Plasmonic: break the diffraction limit |
| | Section 5 | Topological photonics: robust manipulation of electromagnetic waves |
| | Section 6 | |
| | Section 7 | |
| | Section 8 | |
| | Section 9 | |
| | Section 10 | |
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| 11. | 课程考核 Course Assessment | |
| | <p>(① 考核形式 Form of examination; ②. 分数构成 grading policy; ③ 如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)</p> <p>Homework: 20% Final Presentation:80%</p> | |
| 12. | 教材及其它参考资料 Textbook and Supplementary Readings | |
| | <p>Jin Au Kong, Electromagnetic wave theory (2005, Second Edition); John D. Joannopoulos, Steven G. Johnson, Joshua N. Winn, Robert D. Meade, Photonic Crystals: Molding the Flow of Light (2008, Second Edition)</p> | |