

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	生物医学光学实验 Biomedical Optics Laboratory				
2.	授课院系 Originating Department	生物医学工程系 Department of Biomedical Engineering				
3.	课程编号 Course Code	BMEB 324				
4.	课程学分 Credit Value	2				
5.	课程类别 Course Type	专业选修课 Major Elective Courses				
6.	授课学期 Semester	春季 Spring				
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)	吴长锋 生物医学工程系 wucf@sustech.edu.cn Changfeng Wu Department of Biomedical Engineering wucf@sustech.edu.cn				
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			64		64

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	同修（先选）：生物医学光学 Co-requisite: Biomedical Optics
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	无 None
14. 其它要求修读本课程的学系 Cross-listing Dept.	

教学大纲及教学日历 SYLLABUS

15. **教学目标 Course Objectives**

通过本课程的学习，学生能搭建基本的组织光学实验仪器、对组织光学的基本原理和典型成像系统有较为深刻的认识。

The course teaches students so that they can build up optial setups in biomedical optics, and understand the basic concepts of light-tissue interactions, fundamental principles and typical imaging system in biomedical optics.

16. **预达学习成果 Learning Outcomes**

通过对本课程的学习，使学生能够搭建基本的光学仪器，深刻了解各种光学仪器的原理，为设计生物医学光子学成像和检测仪器和从事光学研究打下坚实的基础。

By offering lectures and labs, we expect that the students will 1) build up some basic optical setups in biomedical optics; 2) understand fundamental principles of optical instrumentation; The course will lay foundation for students to purse graduate study or develop careers related to the field of biomedical optics.

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 Lab 1	了解生物医学光学中的光学元器件：光源、光电探测器等 Introduction to commonly used optical components in Biomedical Optics	(4 学时)
实验二 Lab 2	自制简易光栅光谱仪 Buildup of grating spectrometer	(4 学时)
实验三 Lab 3	透射光谱法测量物质吸光特性 Measurement of the light absorbing property with transmission spectrometer	(4 学时)
实验四 Lab 4	散射光谱法测量血氧饱和度 Measurement of pulse oxygen saturation with scattering spectrometer	(4 学时)
实验五 Lab 5	生物医学光学偏振测量——调试偏振成像装置 Polarization imaging	(4 学时)
实验六 Lab 6	生物医学荧光探针实验观测——纳米材料对荧光检测的影响 Biomedical fluorescence probe experimental observation	(4 学时)
实验七 Lab 7	生物医学荧光成像实验——调试荧光显微成像装置 Fluorescence microscopy	(4 学时)
实验八 Lab 8	生物医学荧光光谱分析实验——调试荧光光谱分析装置 Fluorescence spectral analysis	(4 学时)
实验九 Lab 9	生物医学干涉测量——调试光纤干涉仪 Fiber optic interferometer	(4 学时)
实验十 Lab 10	弱相干干涉测量 Low coherence interferometry	(12 学时)
实验十一 Lab 11	光学相干层析成像及应用 Optical coherence tomography (OCT) imaging and its application.	(4 学时)
实验十二 Lab 12	化学发光实验 Chemi-luminescence experiment	(4 学时)
实验十三 Lab 13	光纤传感器 Fiber sensor	(4 学时)
实验十四 Lab 14	激光散斑成像 Laser speckle contrast imaging	(4 学时)

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

《生物医学光子学》，主编：骆清铭，张镇西；人民卫生出版社，2018

《光学》，编著：赵凯华，钟锡华；北京大学出版社，2017

《Biomedical Optics: Principles and Imaging》，Lihong V. Wang, A John Wiley & Sons Inc. publication 2009

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		5		
课堂表现 Class Performance		10		
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments		85		
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