

课程大纲

COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	Neuronal Technology and Devices
2.	课程性质 Compulsory/Elective	Elective
3.	课程学分/学时 Course Credit/Hours	3 Credit/48Hours
4.	授课语言 Teaching Language	Chinese & English
5.	授课教师 Instructor(s)	Jianbo Tang
6.	是否面向本科生开放 Open to undergraduates or not	NA
7.	先修要求 Pre-requisites	<p>(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>NA</p>
8.	教学目标 Course Objectives	<p>(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>This course aims to train the students to critically evaluate neuronal related technologies and methodologies, and equip them for a career in neuro-engineering and technology development. The course also aims to develop the capacity of graduate students to quickly and efficiently digest scientific literature; to question the underlying assumptions of the work; to evaluate the potential and limitations of a new technology; to discuss the impact of new discoveries, and practice for presentation in the class.</p> <p>本课程旨在训练学生以批判性地思维认识和评估相关技术和方法, 使他们具备从事脑科学相关技术开发的基本知识。此外, 该课程旨在提高研究生快速有效地消化科学文献的能力, 锻炼学生质疑作品的基本假设, 评估新技术的潜力和局限性, 讨论该新发现的影响, 以及做课堂展示报告的能力。</p>
9.	教学方法 Teaching Methods	<p>(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>课堂讲授+项目设计+演讲 Lecture, class projects, and students presentation</p>
10.	教学内容 Course Contents	<p>(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>
	Section 1	Introduction of Neuroscience
	Section 2	Introduction of Neuroscience
	Section 3	Historical overview of neuronal technology and devices

Section 4	Medical Brain Imaging - Electroencephalography (EEG)
Section 5	Medical Brain Imaging - MRI&fMRI
Section 6	Medical Brain Imaging - MRI&fMRI
Section 7	Medical Brain Imaging - fNIRS
Section 8	Medical Brain Imaging - fNIRS
Section 9	Medical Brain therapy/stimulation – tDCS and DBS
Section 10	Medical Brain therapy/stimulation –TMS
Section 11	Medical Brain therapy/stimulation – Photo modulation
Section 12	Medical Brain therapy/stimulation – focused ultrasound
Section 13	Pre-clinical Brain Imaging – Two photon microscopy
Section 14	Pre-clinical Brain Imaging – Optical coherence tomography
Section 15	Pre-clinical Brain Imaging – functional ultrasound
Section 16	Pre-clinical Brain Modulation - Optogenetics
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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>40%课后作业, 阅读 5-8 篇课程中讨论的科研论文并完成总结报告; 20%课堂表现, 积极参与课堂讨论, 适时提问; 40%学习汇报, 由 2-3 人组成学习小组, 自期中后开始做课堂报告 (口头+幻灯片展示); 团队展示综合表现 20%, 每人完成一份所参与的团队项目中个人所贡献部分的学习报告 20%。</p> <p>40% Homework : write summaries for 5 to 8 discussed papers. 20% Class Participation and Quizzes on class readings. 40% Project report (20% for written mini-review, 20% for presentation).</p>
12. 教材及其它参考资料 Textbook and Supplementary Readings	
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