

## 课程大纲

### COURSE SYLLABUS

1.	<b>课程代码/名称</b> <b>Course Code/Title</b>	<b>MSE5026 先进光源导论 Introduction to advanced light source</b>
2.	<b>课程性质</b> <b>Compulsory/Elective</b>	专业选修课
3.	<b>课程学分/学时</b> <b>Course Credit/Hours</b>	3/48
4.	<b>授课语言</b> <b>Teaching Language</b>	英文/English
5.	<b>授课教师</b> <b>Instructor(s)</b>	冯军教授
6.	<b>是否面向本科生开放</b> <b>Open to undergraduates or not</b>	是
7.	<b>先修要求</b> <b>Pre-requisites</b>	大学物理, general physics
8.	<b>教学目标</b> <b>Course Objectives</b>	
	<p>This class introduces the broad field of electron based light source (so-called advanced light source) and their applications to the senior undergraduate and graduate students. The number of advanced light sources like synchrotron radiation light source and free electron laser light source now exceeds 100 with more than 100000 scientists per year who use them as essential tools of their research programmes around the world. The advanced light source's excellence is acknowledged by outstanding scientific record with directly contributing to work leading to many Nobel Prizes in physics, chemistry, and biology. In China, both Beijing high energy photon source and Shanghai free electron laser light source are fully funded under construction phase. And Shenzhen light source, Dongguan South light source, Hefei light source and Wuhan light source are in the study phase. This class is designed for students who have been exposed to material science; physics, chemistry as well as biology, and wish to have a basic understanding of electron based light source and its application in science research. The main purpose is to reveal basic principle and general knowledge, experimental technique, and instrumentation and detecting technology associated with the light source based on electrons moving at high speed.</p>	
9.	<b>教学方法</b> <b>Teaching Methods</b>	
	老师讲授, 文献阅读, 课堂讨论	
10.	<b>教学内容</b> <b>Course Contents</b>	
	<b>Section 1</b>	先进光源总论 (2 学时) Introduction of advanced light source(3 Credit hours)
	<b>Section 2</b>	先进光源理论 (6 学时) theory of advanced light source (6 Credit hours)
	<b>Section 3</b>	先进光源系统构成 (6 学时) configuration of advanced light source (6 Credit hours)
	<b>Section 4</b>	先进光源实例分析 (6 学时) Example of advanced light source (6 Credit hours)
	<b>Section 5</b>	先进光源光束传输 (6 学时) Advanced light source beamline (6 Credit hours)

	<b>Section 6</b>	X-射线和物质相互作用 (6 学时) x-ray interaction with mater (6 Credit hours)
	<b>Section 7</b>	先进光源实验方法 1 (6 学时) experimental techniques of advanced light source part 1(6 Credit hours)
	<b>Section 8</b>	先进光源实验方法 2 (6 学时) experimental techniques of advanced light source part 2 (6 Credit hours)
	<b>Section 9</b>	学术讨论 (4 学时) Discussion (6 Credit hours)
<b>11.</b>	<b>课程考核 Course Assessment</b>	
	Attendance: 10% Class performance: 10% Projects: 10% Mid-term test: 15% Final exam: 25% Final presentation: 30%	
<b>12.</b>	<b>教材及其它参考资料 Textbook and Supplementary Readings</b>	
	There are no required textbooks. Course notes will be provided and weekly reading will be assigned. The reference readings are composed of the publications of the famous research laboratories in the world like Lawrence Berkeley National Laboratory, Argon National laboratory and Brookaven national laboratory in USA, ESRF in Europe,etc.	