课程大纲
COURSE SYLLABUS

1.	**课程代码/名称** **Course Code/Title**	**MSE，材料表面与界面 Materials Surface and Interface**
2.	**课程性质** **Compulsory/Elective**	专业核心课
3.	**课程学分/学时** **Course Credit/Hours**	3 学分/48 学时
4.	**授课语言** **Teaching Language**	英文/English
5.	**授课教师** **Instructor(s)**	于严淏
6.	**是否面向本科生开放** **Open to undergraduates or not**	是
7.	**先修要求** **Pre-requisites**	本科生：MSE328材料物理、MSE301材料化学

8. **教学目标**
Course Objectives

This course will cover fundamental principles related to surface energy, surface reaction, interfacial bonding, atom diffusion, nucleation and growth, surface defects, and wettability. It will also cover the synthetic methods for interfacial designs such as self-assembly, physical vapor deposition, chemical vapor deposition, atomic layer deposition , and molecular layer deposition. This course will foster undergraduates' interests on interface science. All students will gain a comprehensive view on the surface and interfacial phenomena and be prepared for a variety of related researches such as soft electronics, optoelectronics, batteries, catalysis, composites, and biomaterials.

9. **教学方法**
Teaching Methods

This course will emphasize interdisciplinary teaching. For example, discussing connections between different concepts, and the different roles of one concept in varied contexts. Lectures will be carefully chosen based on the research backgrounds and interests of students. Students will actively participate in literature reviews and topic presentations. Special cares will be given to undergraduates to ensure they can follow the class.

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	Introduction
Section 2	Basic Concepts
Section 3	Liquid Surface I
Section 4	Liquid Surface II
Section 5	Solid Surface
Section 6	Solid-Gas Interface
Section 7	Solid-Liquid Interface I
Section 8	Solid-Liquid Interface II
Section 9	Midterm Presentation (Literature Report for Undergraduates)

	Section 10	Midterm Presentation (Literature Report for Undergraduates)
	Section 11	Metal Surface
	Section 12	Ceramic Surface and Interface
	Section 13	Polymer Surface and Interface
	Section 14	Interface in Composites
	Section 15	Surface and Interface in Biomaterials
	Section 16	Surface and Interface in Nanomaterials
	Section 17	Final Exam
11.	**课程考核** **Course Assessment**	
	Graduates: Homework/Attendance 20%; Midterm Presentation 30%; Final Exam 50% Undergraduates: Homework/Attendance 20%; Literature Report 30%; Final Exam 50%	
12.	**教材及其它参考资料** **Textbook and Supplementary Readings**	
	Textbook: 胡福增，陈国荣，杜永娟，材料表界面（第二版），华东理工大学出版社，2008 Intermolecular and Surface Forces. Israelachvili, J.N., 3rd ed. 2011	