课程大纲
COURSE SYLLABUS

1.	**课程代码/名称** **Course Code/Title**	**海洋电化学腐蚀防护及工程应用** **Marine electrochemical corrosion protection and engineering applications**
2.	**课程性质** **Compulsory/Elective**	专业选修 Elective
3.	**课程学分/学时** **Course Credit/Hours**	3/48
4.	**授课语言** **Teaching Language**	中文 (英文课件，中文讲解) Chinese (PPT slides in English, lecture in Chinese)
5.	**授课教师** **Instructor(s)**	宋光铃 Song Guang-Ling
6.	**是否面向本科生开放** **Open to undergraduates or not**	否 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 No

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.）

1. 了解必要的电化学原理
2. 理解海洋腐蚀机理与防护技术
3. 了解海洋能源与资源的电化学利用
4. 为热门研究打下基础

1. Understand basic electrochemistry principles
2. Comprehend marine corrosion mechanisms and protection techniques
3. Understand electrochemical utilization of marine resources
4. Lay foundation for future research on hot topics

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.）

1. 课堂教学
2. 实验室参观演示（腐蚀实验室建成后）
3. 简单腐蚀实验家庭作业
4. 就感兴趣的问题进行文献阅读、讨论与演讲

1. Lecturing in class
2. Literature survey, discussion and summary
3. Simple corrosion pracs as homework
4. Literature survey, discussion and presentation on some interesting topics

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	前言

		Introduction (marine corrosion definition & damage)
	Section 2	电化学基本原理 Basic electrochemistry principles
	Section 3	海洋环境腐蚀性 Corrosivity of marine environments (influencing factors, atmospheric/splashing/tidal/immersion/buried zones)
	Section 4	海洋自然腐蚀类型 Basic types of marine natural corrosion
	Section 5	海洋环境的加速腐蚀、其它自然和极端环境的腐蚀 Marine environment-facilitated corrosion and corrosion in other natural environments (different zone-accelerated, SCC, Fatigue, erosion, cavitation, corrosion in soil and atmosphere，and some extreme conditions)
	Section 6	金属的海水腐蚀 Marine corrosion of metals (carbon steels, stainless steels, metallic alloys)
	Section 7	复合材料的海水破坏 Marine degradation of composites (reinforced concrete, CFRP， organic coating covered metals)
	Section 8	海洋腐蚀测量技术，实验室参观与演示(腐蚀实验室建成后) Marine corrosion monitoring and measurements, lab tour and demonstration (after the lab is ready)
	Section 9	期中辩论会（计分期中成绩） Debate
	Section 10	海洋结构的防腐设计、耐蚀合金选择、表面处理技术 Anticorrosion structure design, selection of corrosion resistant alloys, and surface treatments
	Section 11	防腐涂层 Anticorrosion coatings（organic, inorganic, metallic coatings）
	Section 12	腐蚀的电化学保护 Electrochemical protection
	Section 13	电催化与海水制氢、制氧、制氯、海上光电 offshore Electro-catalysis, production of hydrogen, oxygen, chlorine from seawater, and photoelectrochemistry
	Section 14	海洋防污与海水电化学净化 marine antifouling and electrochemical purification of seawater
	Section 15	就热门问题，邀请专家报告 Invited presentation on hot topics
	Section 16	特定题目报告和演讲(可以结合自己的研究课题，设计腐蚀解决方案，探讨可能性)（计分期终成绩） reports and presentation on specific topics
11.	**课程考核** **Course Assessment**	
	（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.）

1. 考核形式：针对海洋腐蚀专题进行辩论和报告
2. 分数构成：20% 课堂问答 +30% 期中辩论 +50% 期终报告和演讲
1. Exam: debate and report on a marine corrosion topic
2. Grading policy: 20% discussion + 30% middle-term debate + 50% final report + presentation

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

- K. Chandler, **Marine and Offshore Corrosion**, Butterworths, 1985