

## (085700) 环境科学与工程学科 2023 级全日制硕士研究生培养方案

### 2023 Full-time Master Program for Environmental Science and Engineering

#### 一、基本信息 Basic Information

院系名称 School	中英国际低碳学院 China-UK Low Carbon College	适用年级 Grade	2023 级 Class		
适用专业 Major	资源与环境（低碳环境方向） Resource and Environment (Low Carbon Environment)	标准学制 Duration	2.5 年 Years		
学习形式 Study Mode	全日制 Full time				
项目类型 Program Type	专业型 Professional				
培养层次 Program Level	硕士生 Master Student				
最低学分 Min Credit	30	最低 GPA 学分 Min GPA Credit	19	最低 GPA Min GPA	2.7

#### 二、专业领域简介 Introduction

全球气候变化深刻影响着人类的生存和发展,是各国共同面临的重大挑战。资源与环境(低碳环境方向)专业旨在通过技术、行政、市场等手段,加快推进绿色低碳发展进程,解决温室气体及相关污染物排放过量等问题,增强人类应对气候变化的能力。本专业与化学、生物学以及社会学等多学科相交叉,以相关环境问题为研究对象,利用有关基础学科的原理、方法和工程技术实施具体的规划、管理和工程措施,实现自然资源合理利用、清洁生产、废物资源化与能源化、污染防治、环境保护和质量改善,为社会、经济 and 环境的可持续发展提供支撑。

Global climate change has a profound impact on human survival and development, and is a major challenge for all countries. The resources and environment programme (low carbon environment direction) aims to speed up the process of green and low carbon development, solve the problem of excessive emission of greenhouse gases and related pollutants, and enhance human's ability to cope with climate change by means of technology, administration, market and other means. This major is interdisciplinary with chemistry, biology, sociology and other disciplines, taking relevant environmental issues as research objects, and using the principles, methods and engineering technologies of relevant basic disciplines to implement specific planning, management and engineering measures, so as to realize the rational use of natural resources, clean production, waste resource and energy, pollution prevention and control, environmental protection and quality improvement, provide support for the sustainable development of society, economy and environment.

学院师资力量雄厚，拥有完善的教学、科研体系和先进的分析测试平台。本专业在全英文授课、国际化办学和产学研合作培养上独具特色，注重学生知识、能力和素质的全面协调发展。

The college has outstanding teaching faculty, comprehensive teaching & research systems and an advanced analysis & testing platform. The programme is conducted in English and features in international educational cooperation and industrial cooperation, and pays attention to the all-round development of students.

### 三、培养目标 Program Objective

学生在系统学习环境工程学科专业知识的基础上，进一步学习并掌握低碳环境、碳金融以及碳管理等方面的专业知识，了解低碳环境领域国内外的发展现状、发展动态和国际学术研究的前沿，能够熟练运用相关学科的技术和方法解决环境工程的实际问题。

同时，引导学生夯实理论基础、磨练分析能力、提升解决问题的水平，成为具有创新思维、前瞻意识、战略眼光和国际视野，面向世界、面向未来的高端工程复合型人才。

On the basis of studying the professional knowledge of environmental engineering discipline systematically, students should further learn and master the professional knowledge of low-carbon environment, carbon finance and carbon management etc., understand domestic and foreign development status, trends and the leading edge of international academic research as regards low-carbon environment field, and being able to use the technologies and methods of related disciplines to solve practical problems in environmental engineering proficiently.

Meanwhile, consolidate the theoretical foundation, temper the analysis capacity and improve the level of matter settling, leading the students to become high-end engineering inter-disciplinary talents that facing the world and future with creative thinking, forward-looking awareness, strategic insight and international vision.

### 四、培养方式及学习年限 Training Mode and Study Duration

本项目采用全日制学习、导师制培养模式；新生入学后两周内经师生互选确定导师。

学制为二年半。其中，所有学生第一年在上海交通大学按规定修读课程。第二经选拔被英国爱丁堡大学录取的学生，将前往爱丁堡大学进行为期一年的课程修读；未通过的学生，则在交大完成第二年规定的相应课程和论文工作。最后半年，所有学生在交大继续完成论文工作。

This programme will adopt Full-time cultivation mode and the Tutorial System. The tutors of LCC

students will be determined within two weeks from the entrance through the mutual elections between tutors and students.

Students are supposed to finish their study within 2.5 years. In the first year, students study at LCC of SJTU and can apply to study at the UoE during the second year if they meet its entry requirements. In the final half year, students are required to finish their thesis in SJTU.

## 五、课程学习要求 Course Requirement

1. 须修读完成不少于 30 学分，其中 GPA 学分不少于 19，GPA 不低于 2.7 方能进入论文开题阶段等后续过程，课程原则上要求在第一学年完成。

Students are required to acquire at least 30 credits, including 19 credits in GPA courses. If final GPA points are no less than 2.7, students are allowed to start writing their research proposal. Courses are required to finish in the first year in principle.

2. 赴爱丁堡大学学习的学生须完成爱丁堡大学相应专业规定的学分课程。

Students who are admitted to study at the UoE in the second year should finish relevant courses as required.

3. 各类课程具体要求如下：

The specific requirements are as follows:

课程类别 Course Type	学分要求 Min Credits	门数要求 Min Courses	GPA 学分要求 Min GPA Credit	备注 Note
公共基础课 General Courses	6	/	/	/
专业基础课 Program Core Courses	11	/	/	/
专业前沿课 Program Frontier Courses	7	/	/	/
专业选修课 Program Elective Courses	4	/	/	/

## 六、培养过程要求 Training Requirement

	普博生 Doctoral Student after Master's	直博生 Doctoral Student after Bachelor's	硕博连读生 Combined Master- Doctoral Student	学术型硕士 Academic Master	全日制专业型硕士 Full-time Professional Degree Master
资格(综合) 考试 Qualifying (comprehensive ) Examination	有 Yes	有 Yes	有 Yes	无 No	无 No
开题报告 Thesis Proposal	有 Yes	有 Yes	有 Yes	有 Yes	有 Yes
年度报告(论 文中期考核) Annual Report (Thesis Mid- term Examination)	有 Yes	有 Yes	有 Yes	无 No	无 No
预答辩 Pre-Defense	有 Yes	有 Yes	有 Yes	无 No	无 No
答辩 Thesis Defense	有 Yes	有 Yes	有 Yes	有 Yes	有 Yes
实践实习环节 Practice / Internship	无 No	无 No	无 No	无 No	有 Yes

## 七、学术成果要求 Requirement on Academic Achievements

1. 对于第二年在交大的学生，须以第一作者发表至少发表 1 篇 SCI 或 2 篇中文核心期刊论文；

1. For the students that study in SJTU during the second academic year, it is required to publish at least 1 SCI paper or 2 Chinese Core Journals papers as the first author.

2. 对于第二年赴爱丁堡大学的学生，须以第一作者发表至少 1 篇中文核心期刊论文并提交 1 篇英文项目报告。

2. For the students that study in the University of Edinburgh during the second academic year, it is required to publish at least 1 Chinese Core Journals paper as the first author and submit 1 piece of English Project Report.

\* 关于学术成果的规定，以相应学科学位委员会当年的具体要求为准。

\* The regulations on academic achievements are subject to the specific requirements of corresponding Academic Degree Committee in that year.

## 八、学位论文 Thesis/dissertation work

1. 上海交通大学环境工程专业学位论文强调应用性研究，课题应来源于企业或生产实际；硕士学位论文需按照《上海交通大学博士、硕士学位论文撰写指南》撰写，学位论文答辩与学位申请按照《上海交通大学关于申请授予硕士专业学位的规定》执行。论文通过答辩获上海交通大学工学学位；

1. The school of Environmental Science and Engineering in SJTU emphasizes applicability and practicability of the dissertation, as a result, students' dissertation directions are supposed to stem from the practical experience or enterprises. If students pass the dissertation defence, they can get a master degree from SJTU.

2. 爱丁堡大学按照碳金融、碳管理、地理能源、可持续能源系统、能源-社会与可持续发展等专业要求。论文通过答辩获爱丁堡大学理学学位。

2. Students who study in the UoE in the second year need to meet the requirements UoE makes.

## 九、课程设置 Courses

详见下页 Please refer to the next page.

撰稿人签字：

日期：

校稿人签字：

日期：

审核人签字：

日期：

主管院长签字：

院系公章

日期：

说明：

1. 培养方案制定完成并经院系学位委员会审核通过后，全日制请将本表格电子版(word)发送至 SherryLi327@sjtu.edu.cn, 非全日制请将本表格电子版(word)发送至 jshen@sjtu.edu.cn;

2. 请在新研究生教育管理信息系统完成新培养方案的申请，并在审核通过后将本表格的纸质版（签字盖章）送交研究生院存档。

课程类别 Category	课程代码 Course Code	课程名称 Course Name		学分 Credit	授课语言 Language*	开课学期 Semester	可以 计算 GPA	必须 计算 GPA	备注 Note	
		中文 Chinese	English 英文							
公共基础课 General Courses	FL6001	学术英语	English for Academic Purposes	2	英文 in English	春季 Spring	是 Yes	是 Yes	必修 Compulsory 6 学分 at least 6 credits	
	MARX6001	中国特色社会主义理论与实践研究	The Theory and Practice of Socialism in China	2	中文 in Chinese	秋季 Autumn	是 Yes	是 Yes		
	MARX6003	自然辩证法概论	Dialectic of Nature	1	中文 in Chinese	春季 Spring	是 Yes	是 Yes		
	GE6001	学术写作、规范与伦理	Academic Writing, Standards and Ethics	1	英文 in English	春季 Spring	是 Yes	是 Yes		
	<b>GE6003</b>	<b>实验室安全教育</b>	<b>Laboratory Safety Education</b>	<b>0.5</b>	<b>中文 in Chinese</b>	<b>春季 Spring</b>	<b>否 No</b>	<b>否 No</b>		
专业基础课 Program Core Courses	MATH6015	最优化方法	Fundamentals and Theory for Optimization Methods	3	英文 in English	春季 Spring	是 Yes	是 Yes	必修 Compulsory 数学类课程, 五选二, 学分 $\geq 5$ Mathematics Courses, Select 2 out of 5, at least 5 credits	
	MATH6004	计算方法	Numerical Analysis	3	英文 in English	秋季 Autumn	是 Yes	是 Yes		
	STAT6001	基础数理统计	Fundamental Mathematical Statistics	3	英文 in English	秋季 Autumn	是 Yes	是 Yes		
	MATH6014	最优估计及系统建模	Optimal Estimation and System Modeling	2	英文 in English	春季 Spring	是 Yes	是 Yes		
	MATH6008	偏微分方程数值方法	Numerical Methods for Partial Differential Equations	3	英文 in English	春季 Spring	是 Yes	是 Yes		
	ENVR7102	环境管理	Environmental Management	2	英文 in English	春季 Spring	是 Yes	是 Yes	必修 Compulsory 学分 $\geq 6$ At least 6 credits	
	ENVR6151	环境法学	Environmental Law	2	英文 in English	夏季 Summer	是 Yes	是 Yes		
	ENVR7104	环境经济学	Environmental Economics	2	英文 in English	秋季 Autumn	是 Yes	是 Yes		
	ENVR6150	“城市矿产”的处理技术	Processing Technology of "City Mineral"	3	英文 in English	秋季 Autumn	是 Yes	是 Yes		
	PE6607	碳中和政策及技术	Carbon Neutrality Policy and Technology	2	英文 in English	秋季 Autumn	是 Yes	是 Yes		

	ENVR7004	水污染控制理论与技术	Theories and Technology of Water Pollution Control	3	英文 in English	春季 Spring	是 Yes	是 Yes	三选二 Select 2 out of 3	
	ENVR7005	大气污染控制理论与技术	Theories and Technology of Air Pollution Control	2	英文 in English	春季 Spring	是 Yes	是 Yes		
	ENVR7006	废弃物的处理与资源化	Solid Waste Disposal And Recycling	2	英文 in English	春季 Spring	是 Yes	是 Yes		
专业前沿课 Program Frontier Courses	GE6012	学术报告会	Seminar	2	英文 in English	秋季 Autumn / 春季 Spring	否 No	否 No	必修 Compulsory	学分≥7, 《碳经济学》需预先修读《环境经济学》 At least 7 credits. In order to choose Carbon Economics you need to study Environmental Economics in advance.
	ENVR8150	碳核算	Carbon Accounting	2	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective	
	ENVR8151	碳经济学	Carbon Economics	2	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective	
	ENVR8153	商业与气候变化	Business and Climate Change	2	英文 in English	春季 Spring	否 No	否 No	选修 Elective	
	ENVR7103	产业生态学	Industrial Ecology	2	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective	
	ENVR8152	低碳管理决策	Low Carbon Management Decision	2	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective	
	ENVR8154	碳资源循环学	Carbon Resources Cycle	2	英文 in English	春季 Spring	否 No	否 No	选修 Elective	
	ENVR8163	联合国可持续发展目标	Sustainable Development Goals of the United Nations	2	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective	
	PE8609	氢能与氢能技术	Hydrogen and Hydrogen Energy Technologies	2	英文 in English	春季 Spring	否 No	否 No	选修 Elective	
	PE8611	电池系统建模与仿真	Battery System Modeling and Simulation	2	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective	
	PE8613	碳中和燃料	Net Zero-Carbon Fuels	2	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective	
PE8615	电化学原理与电池技术	Fundamentals of Electrochemistry and Battery Technologies	3	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective		
专业选修课	GE8001	专业实践	Practice in Specialty	1	英文 in English	夏季 Summer	否 No	否 No	必修 Compulsory	学分≥4
	ENVR8155	低碳能源与气候变化	Low Carbon Energy and Climate Change	2	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective	At least 4 credits



Program Elective Courses	ENVR7012	碳资源循环科学与技术前沿	Advanced Carbon Cycle Science and Technology	2	英文 in English	春季 Spring	否 No	否 No	选修 Elective
	<b>ENVR8165</b>	<b>净零碳城市的基础设施</b>	<b>Infrastructure for Net-zero Carbon Cities</b>	2	<b>英文 in English</b>	<b>秋季 Autumn</b>	<b>否 No</b>	<b>否 No</b>	<b>选修 Elective</b>
	ENVR8157	地球资源地质学	Geology for Earth Resources	1	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective
	ENVR8158	地质能源的石油地质学	Petroleum Geology for GeoEnergy	1	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective
	PUM8010	城市发展与管理	Urban Development & Management	3	英文 in English	春季 Spring	否 No	否 No	选修 Elective
	ENVR8160	建筑环境评估	Building Environment Assessment	2	英文 in English	春季 Spring	否 No	否 No	选修 Elective
	ENVR8162	现代环境分析技术	Modern Techniques of Environmental Analysis	3	英文 in English	秋季 Autumn	否 No	否 No	选修 Elective
	<b>ENVR8164</b>	<b>新兴废弃可再生碳资源利用</b>	<b>Emerging Waste Carbon Resource Utilizations</b>	1	<b>英文 in English</b>	<b>秋季 Autumn</b>	<b>否 No</b>	<b>否 No</b>	<b>选修 Elective</b>
	<b>PE8617</b>	<b>低碳技术中的界面科学</b>	<b>The Interface Science in Low Carbon Systems</b>	2	<b>英文 in English</b>	<b>秋季 Autumn</b>	<b>否 No</b>	<b>否 No</b>	<b>选修 Elective</b>