**上海交通大学硕士研究生课程教学大纲**

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| 课程基本信息（Course Information） |
| 课程代码（Course Code） | X160514 | \*学时（Credit Hours） | 32 | \*学分（Credits） |  2 |
| \*课程名称（Course Name） | （中文）废弃物的处理与资源化 |
| （英文）Solid Waste Treatment and Resource Recovery |
| 课程性质(Course Type) | 必修课 (Compulsory Course) |
| 授课语言(Language of Instruction) | 英语 (English) |
| \*开课院系（School） | 中英国际低碳学院 （China-UK Low Carbon College）  |
| 先修课程（Prerequisite） | 环境科学与工程相关课程 （Environmental Science and Technology） |
| 授课教师（Teacher） | 张景新 (Jingxin Zhang) | 课程网址(Course Webpage) |  |
| \*课程简介（Description） | 本课程为研究生基础必修课，授课内容和形式主要包含以下四个部分：1. 课堂讲解：该部分主要由任课教师介绍固体废弃物处理与资源化相关内容。授课时间2-11周，共30个学时。
2. 团队项目：该部分根据同学们的兴趣分成4-5个小组，每组5-6个成员，针对固体废弃物处理与资源化相关技术进行自由选题、文献检索、撰写研究报告并准备口头报告。前三部分课下进行，口头报告与讨论部分在课堂进行，主要由小组学生依次报告，学生提问和任课教师提问并点评。该部分在第12周完成，共3学时。
3. 学术报告：该部分将邀请国内外知名专家或学者给学生讲述专业相关技术和研究领域前沿，开拓学生国际视野，具体时间待定。
4. 实地考察：该部分将带学生去固体废弃物处理与资源化相关公司或企业进行实地考察学习，例如上海老港垃圾填埋场和上海江桥垃圾焚烧厂，具体时间地点待定。
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| \*课程简介（Description） | 1. Lecture: Will cover the knowledge of solid waste treatment and resource recovery, management practices, advanced waste treatment technologies, and current research efforts (10 weeks, 30 course hours)2. Group project: Solid waste treatment and resource recovery a. 5-6 members in each group (4-5 groups)b. Proposal, including project title, names of the team members, project abstract, background, project objectives & hypothesis, innovation and benefits, research plans, references, deliverables, schedule, and budget (1-2 year project). (3 course hours)3. Academic report: Will invite famous scholars or professors in the field of waste management to do an academic report for our LCC students (To be confirmed). 4. Field trip: Shanghai Laogang landfill, Shanghai Jiang Qiao incineration plant (To be confirmed).   |
| 课程教学大纲（course syllabus） |
| \*学习目标(Learning Outcomes) | 本课程主要介绍固体废弃物处理与资源化相关的内容，主要涵盖当前固体废弃物的发展现状及实践、废弃物的收集、运输与分类、废弃物的产生与特性、废弃物循环利用技术、废弃物的各种处理技术、以及废弃物处置及资源回收技术（如生物质能）。学生首先要了解当前固体废弃物处理与处置所存在的问题、相关处理技术和制度的研究进展和工程应用现状以及国家相关标准和法规。深入学习固体废弃物处理技术和相关设备的工艺流程和工作原理、设计与建造过程、运行与维护、工程化过程管理等知识。团队项目需要学生学习如何开展固废处理与资源化相关项目，包括报告撰写、ppt制作、口头报告以及培养团队合作能力。实地考察让学生接触实际废物处理与处置场的运行、维护、与管理等实践内容。让学生将理论知识与实际应用场景相结合，加深其对知识和实践的学习和理解。学术报告环节将会请国际知名专家和学者介绍固体废弃物处理与资源化国际前沿和应用，开阔学生的国际视野，给学生创造与国际专家和学者交流的机会。This course introduces the concept of solid waste treatment and resource recovery. It covers current practices, waste collection and sorting, characterization, processing, treatment technologies, disposal and resource recovery (e.g. bioenergy). It will supply students with in-depth knowledge on current research and practical progress of waste management, principles of waste management technologies and facilities including design and fabrication, operation and maintenance, engineering, national standard and institutional. The purposes of the group project is learn how to conduct a project of waste treatment and resource recovery and how to build professional connections in the team. Field trip will provide students with practical experiences of operation, processing and management of disposal facilities and industrial plants.  |
| \*教学内容、进度安排及要求(Class Schedule& Requirements) |

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| Week 2 | Overview of Solid Waste Management, Solid Waste Sources, Waste Characterization, and Generation (Current practice and problems, Waste collection and sorting, Waste Recycling, Reuse and Recovery, Sources of generation, characteristics, types, composition, properties and future trend etc.) |  |  |
| Week 3 | Biochemical Conversion Technologies (Waste Pretreatment Technologies, Anaerobic digestion, Composting, Resource Recovery etc.)  | Week 12 | Group Project Presentation & Discussion (Waste management projects, e.g. Anaerobic digestion, Composting, Pyrolysis, Gasification, Incineration, etc., Technology Innovation and Development). |
| Week 4  | Biochemical ConversionTechnologies (Waste Pretreatment Technologies, Anaerobic digestion, Composting, Resource Recovery etc.) | Academic Report (Prof. Wang Chi-Hwa, Professor, National University of Singapore, To be confirmed) |  |
| Week 5 | Biochemical ConversionTechnologies (Waste Pretreatment Technologies, Anaerobic digestion, Composting, Resource Recovery etc.) | Field Trip (Shanghai Laogang landfill or Shanghai Jiang Qiao Incineration Plant etc.) (To be confirmed) |  |
| Week 6 | Thermal Conversion Technologies (Pyrolysis, Gasification, and Incineration etc.) |  |  |
| Week 7 | Thermal Conversion Technologies (Pyrolysis, Gasification, and Incineration etc.) |  |  |
| Week 8  | Thermal Conversion Technologies (Pyrolysis, Gasification, and Incineration etc.) |  |  |
| Week 9 | Resource Recovery from Solid Residues and Biogas/Syngas (Waste to Biochar; Waste to Energy; Use of Bottom Ash, Biogas upgrading technologies, Syngas fermentation etc.)  |  |  |
| Week 10 | Resource Recovery from Solid Residues and Biogas/Syngas (Waste to Biochar; Waste to Energy; Use of Bottom Ash, Biogas upgrading technologies, Syngas fermentation etc.)  |   |  |
| Week 11 | Resource Recovery from Solid Residues and Biogas/Syngas (Waste to Biochar; Waste to Energy; Use of Bottom Ash, Biogas upgrading technologies, Syngas fermentation etc.)  |  |  |

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| \*考核方式(Grading) | 考核方式和成绩占比为：期末考试Final examination（40%）团队项目Group project（35%）家庭作业和出勤率Homework and Class participation（15%）课堂测验Quiz（10%） |
| \*教材或参考资料(Textbooks & Other Materials) | 1. Tchobanoglous, G., H. Theisen and S.Vigil. “Integrated Solids Waste Management.” McGraw Hill.
2. Matthews, P. (ed). A Global Atlas of Wastewater Sludge and Biosolids Use and Disposal, England 1996.
3. T. Scheper, Birgitte K. Ahring. Biomethanation I, II, Springer-Verlag Berlin Heidelberg 2003.
4. Articles from journals and magazines
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| 其它（More） |  |
| 备注（Notes） |  |

备注说明：

1.课程大纲一般为教师网上填写，填写要求会自动提示；对于新开课程，需要填着纸质大纲，并经院系教学委员会或专业委员会通过。

2．带\*内容为必填项。

3．课程简介字数为300-500字；课程大纲以表述清楚教学安排为宜，字数不限。