IESD 英文课程介绍

Course Description in IESD

第一门外语课（汉语）/Chinese Language

中国概况/China Outlook

课程编号/Course Number: 2070100

开课学期/Semester: Spring/Autumn

教师/ Teacher: 刘丹东/LIU Dandong dandong565@tongji.edu.cn

课程介绍/Course Description

http://is.tongji.edu.cn/cn/ShowPage.aspx?id=22

环境系统与可持续发展/Environmental System and Sustainable Development

课程编号/Course Number: 2050136

开课学期/Semester: 春季学期/Spring

教师/ Teacher:

陆志波/LU Zhibo zhibolu@126.com

Marion Cheatle, former Head of the GEO programme, Branch Chief, Deputy Director and Acting Director of the Division of Early Warning and Assessment (DEWA), United Nations Environment Programme (UNEP), Nairobi, Kenya mecheatle@gmail.com

Lex Brown, Griffith University, Brisbane lex.brown@griffith.edu.au

课程介绍/Course Description

Intergrated Environment Assessment + Topic: Framework and Tools for Sustainable Development: Project-based and Strategic Environmental Assessment.

环境科学概论/ Environmental Science

课程编号/Course Number: 2050143

开课学期/Semester: 秋季学期/Autumn

教师/ Teacher:

牛冬杰/NIU Dongjie samcathy@126.com

徐斌/XU Bin binxu@tongji.edu.cn

王颖/WANG Ying yingwang@tongji.edu.cn

王洪涛/WANG Hongtao wanghongtao010@126.com

课程介绍/Course Description

这门全英文研究生课程设置过程中把为区域和全球，特别是发展中国家培养高水平环境和可持续发展的科学技术、企业和政府管理人才作为发展目标；把培养拔尖创新人才作为崇高使命和责任，所以课程立足于国际化视角，把握环境科学领域的国际前沿知识和实践，确立了“知识、能力、人格”三位一体的人才培养模式。课程力图通过国际前沿环境问题的解决方案以及相关理论知识的讲解，提高学生的分析问题、解决问题的能力，培养学生未来应对国际上重大环境问题的能力。

This course aims to cultivate high-level and sustainable technological, business and government management talents for the region and the world, especially for developing countries. And we regard cultivating top-notch innovative talents as lofty mission and responsibility. Grasping the international frontier knowledge and practicing in the field of environmental science, establish a "knowledge, ability, personality" trinity of personnel training model. The course aims to improve students' ability to analyze and solve problems and to cultivate students' ability to deal with major international environmental problems in the future by explaining solutions to international environmental problems and related theoretical knowledge.

生态经济学/Ecological Economics

课程编号/Course Number: 2050199

开课学期/Semester: 春季学期/Spring

教师/ Teacher:

张静/ZHANG Jing jingzhang@tongji.edu.cn

Margherita Turvani margheri@iuav.it

Young-Woo PARK youngwoo.park@tongji.edu.cn

课程介绍/Course Description

生态经济学是一门利用生态、伦理和经济手段来综合理解和研究具体问题的新兴交叉学科。授课过程中将充分展开互动，激发学生的批判性思维。学生通过学习该课程了解宏观经济学和微观经济学基本概念，掌握生态经济学、环境经济学与自然资源经济学的基本原理，了解制定公共政策的原理与案例，并理解环境可持续发展及相关政策，并在此基础上，具有使用这些概念及理论来分析实际环境问题的能力。

The course of Ecological Economics introduces a true trans-disciplinary science which applies ecological, ethical and economical approaches. The course also aims at introducing basic concepts of microeconomics and macroeconomic, demonstrating the basic principles and practices for students to learn and question; interacting with students' learning to inspire the critical thinking; Students would learn the theory of ecological economics, environmental economics and natural resource economics, learn practical implication of the theory to the policy making, and learn environmentally sustainable development (ESD) and policies for ESD. Furthermore, students have to acquiring the ability of using these concepts and theories to analyze the practical environmental issues.

环境管理与政策/Environmental management and Policy

课程编号/Course Number: 2050136

开课学期/Semester: 秋季学期/Autumn

教师/Teacher: 徐文英/XU Wenying xuwy@tongji.edu.cn

课程介绍/Course Description

环境政策与管理是环境科学的重要分支科学之一，是环境科学与管理学、系统学、规划学、预测学、社会学、经济学以及计算机技术等相结合的产物。它侧重于研究环境规划与管理的理论与方法学问题，是应用性、时间性很强的科学。该专业培养从事环境管理、环境政策、环境保护等方面的高级管理人才。

Environmental policy and management is one of the important branches of environmental science. It is the combination of environmental science and management, systems, planning, forecasting, sociology, economics and computer technology. It focuses on the theoretical and methodological issues of environmental planning and management, and is a highly applied and time-consuming science. This course aims to train senior management personnel in environmental management, environmental policy and environmental protection.

固体废物处理与资源化/ Integrated Solid waste management

课程编号/Course Number: 2050186

开课学期/Semester: 春季学期/Spring

教师/ Teacher：牛冬杰/NIU Dongjie samcathy@126.com

课程介绍/Course Description

《固体废物污染控制与资源化》是高等学校环境工程专业的一门必修课程。本课程要求学生掌握各种固体废物处理与资源化方法与技术，特别是生活垃圾、危险废物、污泥、建筑垃圾等固体废物的减量化、资源化和无害化理论与技术，了解固体废物处理与资源化国内外技术研究与发展现状，各种处理与资源化工程的设计规范、设计方法、工程施工与现场管理等。并能掌握重点技术的初步设计知识。

Integrated Solid Waste Management is a compulsory course for the master students majored in Environmental Engineering. This course gives the student an overview of solid waste management including source minimization, collection, transfer, transport, and disposal technologies for Municipal Solid Waste(MSW), Hazardous Waste (HW) sludges and Construction and Demolition(C&D waste). Principle, methods of separation, landfill, incineration, composting, anaerobic digestion and introduction to disposal facilities will be covered in this course. The students will be embedded the basic design approaches on key technologies.

污水处理的原理与技术/ Wastewater Treatment: Principles and Technology

课程编号/Course Number: 2050188

开课学期/Semester: 秋季学期/Autumn

教师/ Teacher:

李咏梅/LI Yongmei liyongmei@tongji.edu.cn

王林/WANG Lin wanglin@tongji.edu.cn

课程介绍/Course Description

本课程旨在介绍污水处理的理论和现代技术，介绍污水的特性和生物化学处理过程的理论。本课程包括水质、水质污染、微生物动力学、滴滤池、活性污泥法、硝化、脱氮、除磷、厌氧处理、生态治理、有害有机化合物的去向和去除等。通过本课程的学习，要求学生掌握污水处理的基本理论和技术，并了解相关国内外研究趋势。这些知识将帮助学生设计、操作和管理污水处理厂。

This course is designed to introduce the theories and modern technologies for wastewater treatment. It presents a description of wastewater characteristics and the theories of biological and chemical processes. The course includes water quality, water pollution, microbial kinetics, trickling filter, activated sludge process, nitrification, denitrification, phosphorus removal, anaerobic treatment, ecological treatment, removal and fate of hazardous organic chemicals, etc. Through the study of this course, students are required to master the basic theory and technology for wastewater treatment, and to understand the relevant domestic and international research trends. The knowledge will help the students in designing, operation and management of wastewater treatment plants.

给排水工程原理与技术 / Water Supply: Principles and Technology

课程编号/Course Number: 2050189

开课学期/Semester: 春季学期/Spring

教师/ Teacher:

唐玉霖/TANG Yulin tangtongji@126.com

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郭美婷/GUO Meiting guomeiting@tongji.edu.cn

课程介绍/Course Description

本课程旨在介绍饮用水处理的理论和现代技术。介绍饮用水的特点和处理标准，并对技术和工艺的理论进行了阐述。本课程包括混合、絮凝、沉淀、过滤、膜技术以及其他先进技术。这些知识将帮助学生理解和应用饮用水处理厂的设计、操作和管理。

This course is designed to introduce the theories and modern technologies for drinking water treatment. It presents a description of drinking water characteristics and standard and treatment the theories of technology and processes. The course includes coagulation, flocculation, sedimentation, filtration, membrane and advanced technology. The knowledge will help the students in understanding and application of the designing, operation and management of drinking water treatment plants.

大气科学与气候变化 / Atmospheric Science and Climate Change

课程编号/Course Number: 205014901

开课学期/Semester: 春季学期/Spring

教师/ Teacher: 刘颖/LIU Ying liu_ying@tongji.edu.cn

课程介绍/Course Description

学习大气科学基础知识，天气和气候，温室效应；了解气候变化及其研究的发展；了解气候变化国际协议、外交讨论的情况；理解气候变化问题的实质。通过政府间气候变化小组报告，学习气候变化科学基础、对自然环境和人类社会的影响，应对和减缓气候变化的途径和实际问题。了解中国气候变化的基本情况，采取的应对措施和进展。

Study the fundamentals of atmospheric science: weather and climate, greenhouse effect; understand climate change phenomena and the progress of climate change studies; know international agreements and negotiations on climate change; understand the essence of the challenges in climate change response. Based on IPCC Fifth Assessment Report, to study the science of climate change, impacts on natural environmental and human society, approaches and challenges in climate change mitigation and adaptation. Introducing situation of climate change in China, the measures taken and progresses to combat climate change in China.

环境伦理学/Environmental Ethics

课程编号/Course Number:2050141

开课学期/Semester: 秋季学期/Autumn

教师/ Teacher:

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陆壅森/LU Yongsen luyongsen@163.com

张静/ZHANG Jing qhf@tongji.edu.cn

课程介绍/Course Description

本课程主要教育学生如何正确理解树立人与自然的关系。本课程将讲授环境伦理学的产生背景、发展历史、相关概念和理论以及实践，着重探讨人类对于保护生态系统稳定性和完整性的责任问题。课程还将介绍环境管理与政策制定、环境社会学中的应用伦理学等内容。同时，本课程将通过多种类型的实例分析，使学生掌握环境伦理学的基本概念和分析方法，提高将理论应用于实际的能力。

The course is intended to help students to better understand the relationship between human beings and nature. The course will dwell extensively on the background，history，concept , theories and practices of environmental ethics-dealing with issues of responsibility of human beings to conserve the stability and completeness of the ecosystem. The applied ethics in environmental management, policy making and environmental sociology will also be introduced. Specifically, the students will be exposed to various case studies to demonstrate the connections between theory and practice.

文献检索与科技论文写作 / Literature Search and Scientific Writing

课程编号/Course Number:2050211

开课学期/Semester: 秋季学期/Autumn

教师/ Teacher:

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吴一楠/WU Yinan 51n@tongji.edu.cn

课程介绍/Course Description

从一朵花的精致花瓣到一个遥远的星系，科学写作探索并解释了我们的世界是如何运作的。最好的科学写作激发了更深层次的理解，一种奇妙的感觉，或者是一种需要行动的需要。通过研讨会、课堂讨论和课后作业，本课程旨在为学生提供必要的文献检索和科学写作技能，以进一步支持他们的学术报告和论文写作。在本课程中，学生将学习在科学或技术领域向不同的观众提供信息和分析报告的基本技巧。

From a flower's delicate petal to a galaxy's distant glow, science writing explores and explains how our world works. The best science writing inspires a deeper understanding, a sense of wonder or a need to act. Through seminars, in-class discussions, and take-home assignments, this course aims to prepare the students with the necessary literature search and scientific writing skills that further support their academic reports and thesis writings. In this course, the students will learn the basic techniques of searching literature and practice in writing informational and analytical reports to varied audiences in scientific or technical fields.

水资源管理 /Water resource management

课程编号/Course Number: 2050224

开课学期/Semester: 秋季学期/Autumn

教师/ Teacher:

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尹海龙/YIN Hailong yinhailong@tongji.edu.cn

课程介绍/Course Description

本课程旨在将环境工程、环境科学与环境管理方面相关的知识进行系统集成，重点介绍水资源管理的基本框架、基本过程、组织方式、技术体系，以及水需求管理，并分析全球变暖对水资源与供水的影响。在对水质与水量进行分析的基础上，介绍水污染过程控制的一般方法，围绕供水与取水、水政策、流域水资源管理、跨界水管理等进行分析，并对流域管理的方法体系与具体工具进行介绍，同时针对水资源管理的具体案例进行讨论。要求学生系统掌握水资源管理的一般理论与方法。

This course is designed to integrate environmental science, engineering and management to address sustainable water resources management. This course will introduce the working field, process and organization of water resources management. After this course, students are expected to understand the concept and method of water resources management, the effects of global warming on water resources and supplies, water resources quality and supply, water pollution and prevention, water conservation, and watershed components. The fate and transport of pollutants in water will be addressed. Case studies will be used to assist in the development of water quality objectives, risk management and technology selection.

水环境化学/Aquatic Environmental Chemistry

课程编号/Course Number:2050191

开课学期/Semester: 春季学期/Spring

教师/ Teacher:

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课程介绍/Course Description

课程主要介绍自然水体和被污染水体中的水化学以及水和污水处理中的应用化学。本课程涵盖的内容比较广泛，如稀释水溶液中的酸碱反应化学、配位化合物的形成、沉淀和溶解反应、氧化-还原反应等。本课程将有助于学生理解发生在水环境中的化学、地球化学、生物化学过程，并使学生对这些不同过程中的重要部分进行量化分析。课程分类展示了水生态系统中的主要无机和有机污染物，并探讨了水环境中重要过程的机理，为解决水体的环境问题提供坚实的理论基础。

The objectives of the course are to introduce water chemistry that places emphasis on the chemistry of natural and polluted waters and on the applied chemistry of water and wastewater treatment. It provides a comprehensive coverage of the dilute aqueous solution chemistry of acid-base reactions, complex formation, precipitation and dissolution reactions, and oxidation-reduction reactions. It will let the students understand the chemical, geochemical and biochemical processes occurring in aquatic environments and to be able to quantify the importance of the different processes. The course classifies and shows an overview of the main inorganic and organic pollutants in aquatic ecosystems, and demonstrates a solid knowledge about the processes significance for environmental problems in aquatic systems, including the kinetic of such processes.

环境分子微生物学/Environmental Molecular Microbiology

课程编号/Course Number:2050194

开课学期/Semester: 春季学期/Spring

教师/ Teacher:

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课程介绍/Course Description

本门课程主要讲述环境工程相关的微生物学知识以及用于分析微生物群落结构与功能的分子生物学方法。简要介绍常用的分子生物学分析手段，如：16S rRNA基因标记、基因组学、蛋白质组学、微阵列技术以及分子指纹技术等。重点讨论这些技术手段在不同环境中的应用，如：土壤、海水、生物膜、植物以及污水处理工艺中等。本门课程旨在帮助学生利用分子生物学工具增进对微生物群落结构组成和生理生态特征的理解，同时注重学生综合素质的培养，锻炼学生的批判式思维以及对文献资料的归纳总结和整理汇报。

The course provides an introduction to microbiology relevant to environmental engineering and the molecular toolbox currently available for the study of the composition and diversity of microbial communities and their functions. Molecular techniques, such as the use of the 16S rRNA gene as a phylogenetic marker, metagenomics, metaproteomics, microarrays, and molecular fingerprinting are outlined. The application of these approaches is discussed in relation to various environments including soil, marine water, biofilms, plants and wastewater treatment processes. This course intends to help students improve their understanding of the composition, phylogeny, and physiology of microbial communities with molecular tools.

环境信息学/Environmental Informatics

课程编号/Course Number:2050150

开课学期/Semester: 春季学期/Spring

教师/ Teacher:

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张海平/ZHANG Haiping hpzhang@tongji.edu.cn

课程介绍/Course Description

本课程旨在教育学生如何将信息科学应用于环境科学和环境保护。课程主要讲授环境信息学的产生背景、基本概念、理论和实践，包括环境信息系统的组成与功能、环境数据的分类与编码、地理信息系统技术的应用、环境模型的原理与应用等，重点是环境信息系统、地理信息系统技术和环境模型的应用。学生将通过课堂学习和讨论了解环境信息系统的基本概念，掌握环境模型的分析方法，通过实际操作掌握地理信息系统软件的使用。

The course is intended to educate students how to apply the science of information to environmental science and environmental protection. The course will dwell extensively on the background, concept, theory and practice of environmental informatics, including the component and function of environmental information system(EIS), classification and coding of environmental data, application of geographic information system(GIS) and environmental modelling, focusing on the application of EIS，GIS and environmental modelling. The students will learn the basic concepts of EIS and environmental models though lectures and how to use GIS software through practice.

通用试验原则与数据逐层分析/Common Experiment Principles and Step-by-Step Data Processing

课程编号/Course Number:2050210

开课学期/Semester: 秋季学期/Autumn

教师/ Teacher:

于振洋/YU Zhenyang yuzhenyang3227@163.com

课程介绍/Course Description

目前的课程设置是在实验前的实验设计中引入基本的和共同的原理、知识和方法，并逐步从原始数据到对数字、表格和图表的合理表示。在本课程中，学生将学习如何理性地设计生物学和化学相关的实验或测试，以及科学地处理和分析实验数据的技能。通过这门课程，学生们分析和解决问题的技能（例如，在各种过程、组成部分或因素中做出最佳选择）将得到改进。

The current course is set up to introduce basic and common principles, knowledge and methods in the experiment design before experiments and the data processing step-by-step from raw data to rational representation of figures, tables and diagrams. In this course, students will learn how to rationally design biology and chemistry related experiments or tests, and also the skills to scientifically process and analyze the experiment data. Through this course, the students' skills to analyze and solve problems (e.g., make the best choice among various processes, components or factors) will be improved.

环境系统分析/Environmental Systems Analysis (Not available for the year of 2019)

课程编号/Course Number:2050196

开课学期/Semester: 秋季学期/Autumn

教师/ Teacher:

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郭茹/GUO Ru ruguo@tongji.edu.cn

课程介绍/Course Description

本课程致力于培养学生站在系统的角度对环境问题进行分析研究、提出优化的解决办法和合理的工程、政策与管理措施的能力。根据专业的特点，本课程侧重于使学生在掌握有关基本知识和理论的基础上，通过结合案例，学会如何在环境工程中灵活运用系统分析的思想和方法来解决相关的环境问题，形成系统优化的环境工程及管理思想，为学生从事相关环境工程的课题研究和将来从事环境工程、管理、规划、评价等工作做好理论、思想、方法和技术等方面的准备。

This course aims to improve the students' capabilities of analyzing environmental issues in systematical views, proposing optimal solutions, and generating sound policies and management measures. To be consistent with the characteristics of Environmental Program at CESE, not those headachy environmental modeling processes and optimizing solutions, but flexible applications of ideas and methods of environmental systems analysis are emphasized, which are the key points in solve real environmental issues. Shaping thinking mode of systematical optimization in environmental engineering and management for students is the objective of this course. This course is a preparation in theories, ideas, methods, and technologies for student' relevant research works, and future jobs of environmental management, planning, assessment, etc.