课程详述

COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	**课程名称** **Course Title**	**环境监测 Environmental Monitoring**
2.	**授课院系** **Originating Department**	环境科学与工程学院 School of Environmental Science and Engineering
3.	**课程编号** **Course Code**	ESE212
4.	**课程学分** **Credit Value**	3
5.	**课程类别** **Course Type**	专业核心课 Major Core Courses
6.	**授课学期** **Semester**	春季 Spring
7.	**授课语言** **Teaching Language**	英文 English
8.	**授课教师、所属学系、联系方式（如属团队授课，请列明其他授课教师）** **Instructor(s), Affiliation& Contact（For team teaching, please list all instructors）**	唐圆圆　环境科学与工程学院　　0755-88015460 Yuanyuan Tang,　School of Environmental Science and Engineering
9.	**实验员/助教、所属学系、联系方式** **Tutor/TA(s), Contact**	待公布 To be announced
10.	**选课人数限额(可不填)** **Maximum Enrolment（Optional）**	

11. 授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other（Please specify）	总学时 Total
学时数 Credit Hours	30	2	0	0	32

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	先选课 Co-requisites: 化学原理 General Chemistry, 化学原理实验 General Chemistry Laboratory, 大学物理 General Physics
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	无 N/A
14. 其它要求修读本课程的学系 Cross-listing Dept.	无 N/A

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

环境监测是环境科学与工程专业的必修专业核心课之一，是后续专业课程的基础课。环境监测是通过对影响环境质量因素的代表值的测定，准确、及时、全面地反映环境质量现状及变化趋势，是环境保护工作的重要基础和有效手段。通过本课程的学习，使学生掌握环境监测的基本概念、基本原理及相关法规，了解环境监测方法、技术及发展趋势。培养学生综合应用多种方法处理环境监测实践问题的能力，为将来的环境科学与工程研究、环境保护工作培养专业人才。

Environmental Monitoring is a core course for students who study Environmental Science and Engineering as their major. Learning Environmental Monitoring is also important for students to find effective ways for environment protection. This course will introduce the theories and technologies for environmental monitoring, including the knowledge about environment pollution, methods to determine the level of substances in the environment, and principles of equipment used during environmental monitoring processes.

16. 预达学习成果 Learning Outcomes

通过本课程的学习，学生掌握环境监测的基本概念、基本原理及相关法规，监测方法的科学原理和技术关键、各类监测方法的特点及适用范围等一系列理论与技术问题；掌握监测方案设计，优化布点、样品的采集、运输及保存，样品的预处理和分析测定、监测过程的质量保证、数据处理与分析评价的基本技能；了解环境监测新方法、新技术及其发展趋势。

Students will learn the concept and principles of Environmental Monitoring, and they will also be trained to carry out environmental monitoring for a specific area.

17. 课程内容及教学日历 （如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）
Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

第 1 章 绪论 2 学时

1.1 环境问题和环境监测

1.2 环境监测的目的和任务

1.3 环境监测的内容及分类

1.4 环境监测的特点和进展

1.5 监测技术及发展趋势

1.6 环境标准体系内容简介

第 2 章 水质监测 8 学时

2.1 概述

2.2 水样的采集和保存

2.3 水样的预处理

2.4 水样物理指标的测定

2.5 金属和类金属化合物的测定

2.6 非金属无机物的测定

2.7 有机化合物的测定

2.8 底质检测

2.9 活性污泥性质的测定

第 3 章 大气和废气监测 6 学时

3.1 基本知识概述

3.2 大气样品的采集

3.3 标准气体的配制

3.4 气态和蒸汽态物质的测定

3.5 颗粒物的测定

3.6 污染源的监测

3.7 室内空气质量监测

第 4 章 固体废物 4 学时

4.1 固体废物的定义和分类

4.2 固体废物样品的采集和制备

4.3 有害特性的监测方法

4.4 生活垃圾和卫生保健机构废物的监测

第 5 章 土壤质量监测 4 学时

5.1 土壤基本知识

5.2 土壤环境质量监测方案

5.3 土壤样品的采集与加工管理

5.4 土壤样品的预处理

5.5 土壤污染物的测定

第 6 章 环境污染生物监测 2 学时

6.1 水环境污染生物监测

6.2 空气污染生物监测

6.3 土壤污染生物监测

6.4 生物污染监测

6.5 生态监测

第 7 章 噪声监测 2 学时

7.1 噪声概述

7.2 声音的量度及相关计算

7.3 噪声的表征

7.4 噪声测量仪器

7.5 噪声监测

第 8 章 环境中放射性污染监测 2 学时

8.1 基础知识

8.2 环境中的放射性

8.3 放射性辐射防护标准

8.4 放射性测量实验室

8.5 放射性监测

第 9 章 总结及小组项目报告 2 学时

Chapter 1 Introduction 2 h

1.1 Environmental problems and environmental monitoring

1.2 The objectives of environmental monitoring

1.3 The content and classification of environmental monitoring

1.4 The characteristics and progress of environment monitoring

1.5 Developing tendency of technologies for environmental monitoring

1.6 An introduction to environmental standards

Chapter 2 Water Quality Monitoring 8 h

2.1 Introduction to water environment

2.2 Water samples collection and preservation

2.3 Pre-treatment for water samples

2.4 Determination of physical index

2.5 Determination of metallic and submetallic compounds

2.6 Determination of non-metallic inorganic compounds

2.7 Determination of organic compounds

2.8 Determination of sediments

2.9 Determination of properties for activated sludge

Chapter 3 Air Quality and Waste Gas Monitoring 6 h

3.1 Introduction to basic knowledge

3.2 Air samples collection

3.3 Preparation of standard gas

3.4 Determination of gaseous and vapor state substances

3.5 Determination of particulate matter

3.6 Monitoring of pollution sources

3.7 Monitoring of indoor air quality

Chapter 4 Solid Waste Monitoring 4 h

4.1 Definition and classification of solid waste

4.2 Sampling and preparation of solid waste

4.3 Methods to monitor harmful characteristics

4.4 Monitoring for municipal solid waste and wastes from health care institutions

Chapter 5 Soil Quality Monitoring 4 h

5.1 Basic knowledge of soil

5.2 Program for soil quality monitoring

5.3 Collection and processing of soil samples

5.4 Pre-treatment of soil samples

5.5 Determination of soil pollutants

Chapter 6 Biological Monitoring of Environmental Pollution 2 h

6.1 Biological monitoring for water environment pollution

6.2 Biological monitoring for air pollution

6.3 Biological monitoring for soil contamination

6.4 Biological monitoring for biological contamination

6.5 Ecological monitoring

Chapter 7 Noise Monitoring 2 h

7.1 An overview of the noise

7.2 Measurement of sound and the related calculation

7.3 The characterization of noise

7.4 Instrument for noise measurement

7.5 Noise monitoring

Chapter 8 Radioactive Contamination Monitoring 2 h

8.1 Basic knowledge

8.2 Radioactivity in the environment

8.3 Standards for radiological protection

8.4 Radioactivity measurement laboratory

8.5 Radioactivity monitoring

Chapter 9 Conclusion and Group Project Report 2 h

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

1、奚旦立, 孙裕生. 2010, 环境监测 (第四版). 高等教育出版社.

2、陈玲, 赵建夫. 2004. 环境监测 (第二版). 化学工业出版社.

3、国家环保总局水和废水监测分析方法编委会. 2002. 水和废水监测分析方法(第四版).环境科学出版社

4、国家环保总局水和废水监测分析方法编委会. 2002. 空气和废气监测分析方法(第四版).环境科学出版社

5、J. F. Artiola, I. L. Pepper, M. L. Brusseau. 2004. Environmental Monitoring and Characterization. Elsevier Academic Press.

6、C. Sawyer. P. McCarty. G. Parkin. 2003. Chemistry for Environmental Engineering and Science (5th ed). McGraw-Hill Education.

课程评估 ASSESSMENT

19.

评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		5%		
课堂表现 Class		5%		

Performance				
小测验 Quiz	0.5 h	5%		
课程项目 Projects				
平时作业 Assignments		5%		
期中考试 Mid-Term Test				
期末考试 Final Exam	2 h	50%		
期末报告 Final Presentation	0.5 h/group	30%		
其它（可根据需要改写以上评估方式） Others (The above may be modified as necessary)				

20. 记分方式 **GRADING SYSTEM**

☑ A. 十三级等级制 **Letter Grading**
☐ B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 REVIEW AND APPROVAL

21. **本课程设置已经过以下责任人/委员会审议通过**
This Course has been approved by the following person or committee of authority