

## 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 <b>Course Title</b>	大气污染与防治 <b>Atmospheric Pollution Prevention and Control</b>
2.	授课院系 <b>Originating Department</b>	环境科学与工程学院 School of Environmental Science and Engineering
3.	课程编号 <b>Course Code</b>	ESE304
4.	课程学分 <b>Credit Value</b>	3
5.	课程类别 <b>Course Type</b>	专业核心课 Major Core Courses
6.	授课学期 <b>Semester</b>	春季 Spring
7.	授课语言 <b>Teaching Language</b>	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） <b>Instructor(s), Affiliation &amp; Contact</b> (For team teaching, please list all instructors)	傅宗玫 / FU, Tzung-May / 环境科学与工程学院 School of Environmental Science and Engineering / 88018872 / fuzm@sustech.edu.cn
9.	实验员/助教、所属学系、联系方式 <b>Tutor/TA(s), Contact</b>	待公布 To be announced
10.	选课人数限额(可不填) <b>Maximum Enrolment (Optional)</b>	

11. 授课方式 Delivery Method	讲授	习题/辅导/讨论	实验/实习	其它(请具体注明)	总学时
	Lectures	Tutorials	Lab/Practical	Other (Please specify)	Total
学时数 Credit Hours	45	2		期中考试(Midterm exam)1学时 期末考试(Final exam) 2学时	48
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	先选课 Co-requisites : 环境化学 Environmental Chemistry , Physical Chemistry 物理化学				
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

1. 牢固掌握: 使学生牢固掌握燃料燃烧污染物的产生量计算, 空气污染物的输送扩散基本模式计算, 以及颗粒物及气体污染物净化的原理、工艺和设备的基本知识。掌握大气颗粒物及气态污染物控制方法、控制技术, 脱硫除尘设备计算等。
  2. 一般掌握: 大气污染控制的有关法规标准体系、污染物在大气中的扩散规律及浓度估算模式、颗粒污染物控制技术基础, 气体扩散、气体吸收、吸附和催化的基本原理以及气态污染控制中的一些问题。
  3. 一般了解: 大气污染的基本知识如大气的组成与大气污染、大气污染物及其来源、大气污染的影响及综合防治。燃料燃烧过程的基本原理、污染物的生成机理, 以及如何控制燃烧以便减少污染物的排放量。大气污染气象学的基本知识, 温室气体和气候变化, 臭氧层破坏问题和致酸前体物与酸雨。
1. Solid capability: calculations of flue gas quantity and composition; calculations of air pollutant diffusion; principles, technologies, and devices for particulate and gaseous pollutant control; calculations of desulfurization and particle removal devices
  2. General capability: national legislations and standards of air pollutant control; processes and models of air pollutant diffusion; fundamentals of particulate matter pollution control methods; principles of gas diffusion, absorption, adsorption, and catalytic reactions; gaseous pollution control
  3. General understanding: basic knowledge on the composition of the atmosphere; sources of air pollutants; impacts and control of air pollution; fundamentals of the combustion process and pollutant production; control of combustion conditions to reduce pollutant emissions; basic knowledge of air pollution meteorology; greenhouse effect; climate change; stratospheric ozone layer destruction; acid rain and its precursors.

#### 16. 预达学习成果 Learning Outcomes

通过本课程的学习, 使学生系统地了解并掌握大气污染控制工程的基本知识, 大气污染气象学基础知识及污染物扩散的基础理论, 大气污染防治的基本概念、基本原理、主要控制设备和典型工艺等, 培养学生分析和解决日益严重的大气污染问题的基本能力, 为学生从事大气污染控制工程设计、系统分析、科学研究及技术管理奠定必要的基础。

Enable students to understand the basic knowledge of atmospheric pollution control engineering, atmospheric pollution meteorology, air pollution diffusion, as well as to understand the basic concept, principles, main devices and technologies of air pollution control. Cultivate analytical and problem solving skills in students to better prepare them for careers in air pollution control engineering, system analyses, scientific research and technological management.

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.)**

Topics	Hours	Reading	Assignment
Ch 1 Introduction	4	NN 1,2,3; HJ 1	Assignment 1
Ch 2 Air Pollution Meteorology	4	NN 5; HJ3	Assignment 2
Ch 3 Air Pollution Concentration Models	2	NN 6; HJ 4	Assignment 3
Ch 4 General Ideas in Air Pollution Control	2	NN 7	Assignment 4
Ch 5 Combustion	2	NN 7; HJ 2	Assignment 5
Ch 6 Nature of Particulate Pollutants	2	NN 8; HJ 5	Assignment 6
Ch 7 Control of Primary Particulates	8	NN 9; HJ 6	Assignment 7, 8
<b>Mid-term exam</b>	1		
Ch 8 Control of Sulfur Oxides	8	NN 11; HJ 8	Assignment 9, 10
Ch 9 Control of Nitrogen Oxides	4	NN 12; HJ 9	Assignment 11
Ch 10 Control of VOCs	3	NN 10; HJ 10	Assignment 12
Ch 11 The Motor Vehicle Problem	2	NN 13; HJ 11	Assignment 13
Ch 12 Indoor Air Quality	2	NN 15	Assignment 14
Ch 13 Air Pollution, Ozone Hole, and Climate Change	2		
Tutorial	2		
<b>Final exam</b>	2		

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

1. 课程教材 Teaching Materials or Textbooks

- (1) 主讲教材: [NN] N. Nevers. Air pollution Control Engineering (3<sup>rd</sup> Ed). Waveland Press, 2016
- (2) 辅助教材: [HJ] 郝吉明、马广大、王书肖主编, 大气污染控制工程 (第三版), 高等教育出版社, 2010

2. 主要参考书目 References for Further Reading

- (1) C. D. Cooper, F. C. Alley. Air Pollution Control: a Design Approach (4<sup>th</sup> Ed). Medtech, 2015
- (2) 吴忠标主编, 大气污染控制工程, 科学出版社, 2013
- (3) 自编课件

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				
课堂表现 Class Performance				
小测验 Quiz	0.5 学时	5%		
课程项目 Projects				
平时作业 Assignments	14 Assignments	20%		
期中考试 Mid-Term Test	1 学时	20%		
期末考试 Final Exam	2 学时	55%		
期末报告 Final Presentation				
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