

University of Colorado at Denver  
College of Architecture & Planning  
Urban and Regional Planning

**AIR QUALITY PLANNING AND POLICY**

URP 6686-002 [Call # 40075]

Summer 2002

**Carol E. Lyons and W. Gale Biggs**

**SYLLABUS**

The purpose of the course is to introduce students to air quality issues and to provide a framework for solving air pollution problems from technical, regulatory, and planning perspectives. The principal areas addressed are: transportation; industry; small and dispersed sources.

The goal of the course is to provide an overview of air pollution science, an introduction to current issues in air quality management, approaches to controlling and reducing air pollution, and a framework for evaluating air pollution concerns. In addition to class discussion, presentation, and reading, the course will include guest speakers on important local issues.

1. The air pollution problem

Why is air pollution a problem?

Historical background, health, aesthetics, climate

Characteristics of air pollution -- types, categories, effects

Criteria pollutants (including particulate matter and ozone)

Hazardous air pollutants

2. Air pollution problem solving approaches

Methods: regulatory, technical

Source types: transportation, industrial, dispersed

3. Current Issues in air pollution

Local issues; Visibility; Global climate change; Acid precipitation

Risk assessment

#### 4. Planning for air quality

Mobile sources / transportation vs. stationary sources  
Transportation planning; transportation policy options  
Stationary source control options and policy

**Tuesdays, 5:05 to 9:15 p.m., UCD Building, 14th & Larimer, May 28 to July 30, 2002**

#### Class Outline

##### May 28, 2002

Class introduction  
Introduction to meteorology  
Dynamics  
Atmospheric inversions  
Local flows

Mobile sources (cars, trucks, planes, trains, lawn mowers....)  
Stationary sources

##### July 2

Air pollution control theory  
Indoor air quality  
Air quality regulations  
Air toxics  
Air pollution control policy

##### June 4

History of air pollution  
Introduction to air pollution -- definitions  
Health effects  
Criteria pollutants

##### July 9

Air quality planning  
Urban vs. non-urban  
Transportation planning

##### June 11

Atmospheric chemistry  
Ambient air monitoring:  
Sampling; analysis and measurement

##### July 16

Air quality in Colorado  
Visibility; the Denver brown cloud

##### June 18

More on meteorology  
Urban meteorology  
Air pollution modeling; dispersion modeling  
Air pollution transport

##### July 23

Regional and international issues  
Global climate change (global “warming”?)  
Stratospheric ozone depletion (the “ozone hole”)  
Acid deposition (“acid rain”)

##### June 25

Air pollution sources: Combustion; sources, emissions, sampling; control strategies

##### July 30

Student project presentations

Planning discussions

NOTE: The schedule may be revised due to outside schedule requirements.

### Instructors

#### **Carol E. Lyons**

Phone: 303-388-5211 fax: 303-388-3209

E-mail: CarolLyons@peakpeak.com

President, Bridges Unlimited LLC, Engineering and Environmental Consulting, 761 Newport Street, Denver, CO 80220

#### **W. Gale Biggs**

Phone: 303-494-4288 fax: 303-499-6033

E-mail: WGBiggs@att.net

W. G. Biggs Associates, P.O. Box 3344, Boulder, CO 80307

You may call us with questions and comments. Please be reasonable about calling; we work full time too. Do not call before 8:00 a.m. or after 9:00 p.m.

### Student Responsibilities

#### 1. Weekly reading assignments

There are weekly reading assignments in the textbook and in outside articles. A complete list of reading assignments will be distributed at the first class. You are responsible for reading and digesting the reading assignments prior to class. Do not try to memorize the details in the reading. The main goal is to determine and understand the overall main concepts.

The outside articles will be provided in two identical notebooks on reserve at the Auraria campus library. You may borrow one of the notebooks anytime the library is open. There will be special instructions to allow you to take a notebook out of the library long enough to make photocopies if you wish.

Reading assignments in both the textbook and additional articles are to be completed prior to class.

Textbook: FUNDAMENTALS OF AIR POLLUTION, R. W. Boubel, D. L. Fox, D. B. Turner, A. C. Stern, Academic Press, 1994.

The textbook should be purchased. Be sure you purchase the current edition. Past editions are obsolete.

**First class reading assignment!!!**

The following pages are assigned to be read PRIOR to the first class!!!

Textbook, Chapter 17, pages 243 to 272.

2. Quizzes

There will be short, ten- to fifteen-minute quizzes (unannounced) at the beginning of several classes. Quizzes will cover material in any or all of the reading assignments due on or before the day of the quiz, or on material covered in class before the quiz. The intent of the quizzes is to make sure that you have understood the key concepts. Memorization is not expected. All material covered in class may be included on quizzes.

3. Papers / projects

Term paper and student presentation assignments will be made at the first class meeting. The term paper will be a two-part research project on a major local issue with air quality and planning aspects. Each student will investigate the air quality issues (Part A) and related planning strategies (Part B). Students will be assigned in pairs to a project. However each student will prepare an individual paper for each part or contribute to a joint paper, and each student will participate in the final presentations.

Students will be able to choose from a variety of local and current issues to investigate\|. Due to the short summer semester, topic choices and team assignments will be made no later than the third class.

4. Class participation

The class includes students with a wide variety of backgrounds. The class is open to questions and discussion at all times. Your participation is expected in the form of intelligent questions and contributions of relevant information.

**MISSED CLASSES:** It is recommended that you do not miss any classes. If you have to miss one, it is YOUR responsibility to make up all the material. Please contact the instructor ahead of time (if possible).

5. Final                    There will be no mid term or final exam.

## 6. Grades

There will be a total of 200 points possible for determining your grade.

Quizzes =	100
Paper 1 =	40
Paper 2 =	45
Presentation =	15
Total =	200

If the student needs to make up a missed quiz, a short paper (2-3 pages) can be done on one of the subjects covered in the quiz. Check with one of the instructors for a specific topic and instructions.

## 7. Guest Speakers

Guest speakers may provide special lectures during the classes. Students are encouraged to prepare questions before class for the guest speakers (as well as for the regular instructor) and take advantage of the special expertise the speakers bring to the class.

The guest speakers will address subjects that are part of the course syllabus. Discussion in class with guest speakers, as well as with the regular instructor, should remain focused on air quality issues.