ENGR 4510.901G Introduction to Air Quality and METR 4653 Air Pollution Meteorology and Modeling Spring 2013 - Syllabus*

General Information:

This unique course ad is cross-listed between the Engineering and Meteorology Department. Important aspects of air quality will be covered, including air quality legislation, major sources and effects of air pollutants, monitoring, atmospheric dispersion, and air-quality modeling. An overview of various atmospheric circulation and weather systems will be presented and their relevance to pollutant dispersion will be illustrated. Special emphasis will be put on the processes within the atmospheric boundary layer where most of the pollution problems occur.

Several guest lectures by experts in the field will be given to tie the course material to real-word problems. You will learn about specifics of air quality legislation and how it is applied in practice, the permitting process, and oil-rig operations.

A mix of standard lectures and in-class problem solving exercises will be offered

Instructor:

Dr. Petra Klein, School of Meteorology, NWC 5339, Tel. 325-1631, e-mail: pkklein@ou.edu Office hours: on M, W after class (4.20pm-5.00pm) or by appointment

Time and place:

MW 3:00-4:15 pm, STRC 1030

Recommended textbook:

K. Wark, C.F. Warner, W.T. Davis, 1998: Air Pollution - Its Origin and Control. Third Edition, Addison Wesley Longman, Inc.

Additional Literature:

R.D. Griffin, 2007. Principles of Air Quality Management. Taylor & Francis Group, CRC Press. T. Godisch, 2004. Air Quality. Lewis Publishers, CRC Press.

J. H. Seinfeld, S. Pandis, 1997: Atmospheric Chemistry and Physics: From Air Pollution to Climate Change. John Wiley & Sons.

K. B. Schnelle, Jr., P. R. Dey, 2000. Atmospheric Dispersion Modeling Compliance Guide. McGraw Hill.

R.B. Stull, 2000: Meteorology for Scientists and Engineers. Brooks/Cole.

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Reading Assignments:

The preliminary schedule given below presents an overview of the topics covered in this class and shows the textbook chapters relevant to each lecture. Additional material will be given in the lecture notes and will be handed out in class or posted on D2L. It is expected that the student is proactive and reads all relevant material (in particular the textbook chapters) before and/or after the lectures, even when no formal reading assignment is given. This is very important in order to comprehend the extensive material covered in this class.

Web Sites

You can find the main web site for this class on the OU Desire2Learn system (<u>learn.ou.edu</u>). ENGR 4510.910G has been combined with METR 4653. Important course materials (lecture notes, assignments, grades, etc.) and announcements will be posted on this site. Please become familiar with this site and check it frequently.

Grading:

Homework Assignments (4-5)	20%
2 In-class Exams	25% (each)
Final Exam	30%

The final will be a comprehensive exam. An excuse for missing an exam must be provided to the instructor before each exam begins. Late homework will not be accepted. All exams are closed book exams (textbooks and lecture notes cannot be used), but students are allowed to prepare and use their own notes (maximum 2 pages long).

Important Dates

1st In-Class Exam:	Wednesday, February 20, 2013
2nd In-Class Exam:	Wednesday, April 03, 2013
Final Exam:	Thursday, May 9, 2013, 4.30-6.30pm

Attendance and Make-up Policy

In this class, participation will be strongly encouraged. Note that some material will be available only during class. For both of these reasons, I expect 100% attendance to be the norm, but I will not check attendance and will not give points for attendance. Only under extraordinary circumstances make-ups will be given if an exam is missed. You MUST notify me BEFORE the exams. Sickness will be accepted as an excuse only if accompanied by a note from a physician.

Other Important Policies

Reasonable Accommodation: The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the professor as early in the semester as possible. **Students with disabilities must be registered with the Disability Resource Center prior**

to receiving accommodations in this course. The Disability Resource Center is located in Goddard Health Center, Suite 166, phone 405/325-3852 or TDD only 405/325-4173.

Academic Misconduct: All provisions of the Norman Campus Academic Misconduct Code shall apply in cases of academic dishonesty. Academic misconduct is defined as "any act that improperly affects the evaluation of a student's academic performance or achievement." All faculty at the University of Oklahoma expect academic integrity from each student. Misconduct such as plagiarism, fabrication, and fraud, as well as attempting to commit such acts or assisting others in so doing, will not be tolerated. Students are responsible for knowing the academic misconduct code, which is included in the student code (http://judicial.ou.edu/images/stories/student_codebook.pdf). All instances of alleged academic misconduct will be thoroughly investigated and action will be taken according to the rights and responsibilities under the academic misconduct code described at http://www.ou.edu/provost/integrity-rights/.

Schedule and topics

A tentative schedule including a list of topics is attached and also available on D2L. This schedule provides an orientation but is still subject to change.

Date	Event	Instructor	Topic/Comments	TB chapters
Tuesday, January 1, 13				
Wednesday, January 2, 13				
Thursday, January 3, 13				
Friday, January 4, 13				
Saturday, January 5, 13				
Sunday, January 6, 13				
Monday, January 7, 13				
Tuesday, January 8, 13				
Wednesday, January 9, 13				
Thursday, January 10, 13				
Friday, January 11, 13				
Saturday, January 12, 13				
Sunday, January 13, 13				
Monday, January 14, 13	Begin of classes	P. Klein	Intro lecture	1
Tuesday, January 15, 13				
Wednesday, January 16, 13	Lecture 2	P. Klein	Types of Air Pollutants	1
Thursday, January 17, 13				
Friday, January 18, 13				
Saturday, January 19, 13				
Sunday, January 20, 13				
Monday, January 21, 13	Martin Luther King Day	no classes		
Tuesday, January 22, 13				
Wednesday, January 23, 13	Lecture 3	P. Klein	Effects of air pollution	1
Thursday, January 24, 13				
Friday, January 25, 13				
Saturday, January 26, 13				
Sunday, January 27, 13				
Monday, January 28, 13	Lecture 4	Theresa Pella/Censara	Regulatory aspects	2
Tuesday, January 29, 13				
Wednesday, January 30, 13	Lecture 5	Theresa Pella/Censara	Regulatory aspects	2
Thursday, January 31, 13				

Date	Event	Instructor	Topic/Comments	TB chapters
Friday, February 1, 13				
Saturday, February 2, 13				
Sunday, February 3, 13				
Monday, February 4, 13	Lecture 6	P. Klein	Sources of Air Pollution	1
Tuesday, February 5, 13				
Wednesday, February 6, 13	Lecture 7	P. Klein	Sources of Air Pollution	1
Thursday, February 7, 13				
Friday, February 8, 13				
Saturday, February 9, 13				
Sunday, February 10, 13				
Monday, February 11, 13	Lecture 8	P. Klein	Air Pollution Control	5,6
Tuesday, February 12, 13				
Wednesday, February 13, 13	Lecture 9	P. Klein	Air Pollution Control	7,8
Thursday, February 14, 13				
Friday, February 15, 13				
Saturday, February 16, 13				
Sunday, February 17, 13				
Monday, February 18, 13	Lecture 10	P. Klein	Review Session	
Tuesday, February 19, 13				
Wednesday, February 20, 13	Exam 1	P. Klein		
Thursday, February 21, 13				
Friday, February 22, 13				
Saturday, February 23, 13				
Sunday, February 24, 13				
Monday, February 25, 13	Lecture 11	Chuck Layman/Censara	Air Quality Permitting	
Tuesday, February 26, 13				
Wednesday, February 27, 13	Lecture 12	P. Klein	Atm. Systems and Pollutant Transport	3
Thursday, February 28, 13				

Date	Event	Instructor	Topic/Comments	TB chapters
Friday, March 1, 13			······	
Saturday, March 2, 13				
Sunday, March 3, 13				
Monday, March 4, 13	Lecture 13	P. Klein	Atm. Systems and Pollutant Transport	3
Tuesday, March 5, 13				
Wednesday, March 6, 13	Lecture 14	P. Klein	Atmospheric Stability	3
Thursday, March 7, 13				
Friday, March 8, 13				
Saturday, March 9, 13				
Sunday, March 10, 13				
Monday, March 11, 13	Lecture 15	P. Klein	Meteorological measurements data processing	other sources
Tuesday, March 12, 13				
Wednesday, March 13, 13	Lecture 16	P. Klein	Atmospheric Dispersion	4
Thursday, March 14, 13				
Friday, March 15, 13				
Saturday, March 16, 13	Spring Break			
Sunday, March 17, 13	Spring Break			
Monday, March 18, 13	Spring Break			
Tuesday, March 19, 13	Spring Break			
Wednesday, March 20, 13	Spring Break			
Thursday, March 21, 13	Spring Break			
Friday, March 22, 13	Spring Break			
Saturday, March 23, 13	Spring Break			
Sunday, March 24, 13	Spring Break			
Monday, March 25, 13	Lecture 17	P. Klein	Gaussian diffusion models - theory	4
Tuesday, March 26, 13				
Wednesday, March 27, 13	Lecture 18	P. Klein	Plume Rise and Deposition	4
Thursday, March 28, 13				
Friday, March 29, 13				
Saturday, March 30, 13				
Sunday, March 31, 13				

Date	Event	Instructor	Topic/Comments	TB chapters
Monday, April 1, 13	Lecture 20	P. Klein	Review Session	
Tuesday, April 2, 13				
Wednesday, April 3, 13	Exam 2	P. Klein		
Thursday, April 4, 13				
Friday, April 5, 13				
Saturday, April 6, 13				
Sunday, April 7, 13				
Monday, April 8, 13	Lecture 21	Ron Hensley/Censara	Drilling Rig Operations	other sources
Tuesday, April 9, 13				
Wednesday, April 10, 13	Lecture 22	Ron Hensley/Censara	Drilling Rig Operations	other sources
Thursday, April 11, 13				
Friday, April 12, 13				
Saturday, April 13, 13				
Sunday, April 14, 13				
Monday, April 15, 13	Lecture 23	Laura Worthen Lodes/SAIC	тво	
Tuesday, April 16, 13				
Wednesday, April 17, 13	Lecture 24	TBD	Guest Lecture or Fieldtrip to DEQ	other sources
Thursday, April 18, 13				
Friday, April 19, 13				
Saturday, April 20, 13				
Sunday, April 21, 13				
Monday, April 22, 13	Lecture 25	P. Klein	Overview of EPA Models	other sources
Tuesday, April 23, 13				
Wednesday, April 24, 13	Lecture 26	P. Klein	EPA Models - AERMOD	other sources
Thursday, April 25, 13				
Friday, April 26, 13				
Saturday, April 27, 13				
Sunday, April 28, 13				
Monday, April 29, 13	Lecture 27	P. Klein	Urban Air Quality and Photochemical Pollution	9
Tuesday, April 30, 13				

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