

ATS 560 (2 Credits)
Air Pollution Measurement
Spring 2017

Instructor: Jeff Collett, 491-8697, collett@atmos.colostate.edu, ATS 117
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Office Hours: by Arrangement

Objectives:

1. Gain experience in several techniques commonly used in experimental air quality monitoring and research.
2. Become familiar with the process of designing, proposing, conducting, and reporting on independent research projects.
3. Learn to work with colleagues in conducting experiments and interpreting experimental data.

Text:

Readings will be provided by the instructor from various sources. These are intended to provide background for the experiments we will conduct. Additional experiment descriptions will be provided detailing procedures for each experiment.

Course Structure and Grading Criteria:

The course is offered for two credits. The class is conducted in a lecture/discussion and lab format and will meet Mondays 1:00-1:50 PM and Wednesdays 1:00-3:40 PM.

Each student is expected to provide a written summary and analysis of each experiment (except where “no report” is indicated) and to turn in a copy of records kept during the conduct of each experiment. Students are encouraged to discuss experiment findings with classmates, but are required to submit their own reports. Each student will be responsible for leading an oral discussion of one experiment following its completion.

Each student is responsible for proposing and completing an independent, individual or group research project. Each student will orally present project findings to the class. Students will also serve as reviewers of proposals submitted by their peers.

Grades will be weighted as follows:

Lab Write-ups:	55%	Project proposal:	15%
Lab Oral Discussion:	10%	Project and report:	20%

Students are expected to spend a minimum of 2 hr effort outside class, for each hour of structured class time, on assigned readings, preparation of lab reports, and conduct of independent projects. This course will adhere to the CSU Academic Integrity Policy as found on the Academic Integrity website (<http://tilt.colostate.edu/integrity/>). At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.

Lab reports are due in class on the discussion date for that lab, unless specified otherwise.

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Spring 2017 Schedule

Week	Date	Lecture (M)	Experiment (W)
1	January 16, 18	Holiday	Intro / Lab Reporting Class Project Intro
2	January 23, 25	Statistics	Lab Safety
3	January 30, February 1	Statistics (cont'd)	Lab #1: pH Measurement
4	February 6, 8	Wet deposition	Lab #1 discussion Lab #2: Precipitation Sampling
5	February 13, 15	Atmospheric Aerosols/Sampling	Lab #3: Aerosol and trace gas sampling
6	February 20, 22	Intro to IC	Lab #4: IC calibration
7	February 27, March 1	Lab #3 Sample Extraction and Analysis	Lab #4 Discussion
8	March 6, 8	Atmospheric Methane: Sources, Concentrations and Measurement Project proposals due	Lab #5: Group methane measurements Lab #3 discussion
9	March 13, 15	Spring Break	
10	March 20, 22	Volatile Organic Compound (VOC) Measurement	Lab #6: VOC canister prep Project proposal reviews due
11	March 27, 29	Methane and VOC Emissions from Colorado Oil and Gas Development	Lab #6: VOC Measurement Lab #2 Discussion
12	April 3, 5	Carbonaceous Aerosols	Lab #7: Carbonaceous aerosol analysis
13	April 10, 12	Lab #6 Discussion	Project
14	April 17, 19	Lab #7 Discussion	Project or Field Trip
15	April 24, 26	Lab #5 Discussion	Project or Field Trip
16	May 1, 3	Project Presentations	Project presentations

Useful references

Air Sampling Instruments, 9th Edition. American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, 2001.

Skoog, D. A.; D. M. West, F. J. Holler, and S. R. Crouch. Fundamentals of Analytical Chemistry. 9th ed., Brooks/Cole Publishing, 2013.

Kulkarni, P., Baron, P.A. and K. Willeke (Editors). Aerosol Measurement Techniques, 3rd Edition. Wiley Interscience, New York, 2011.