

**EAS 6430 | CEE 8823**  
**EXPERIMENTAL METHODS IN AIR QUALITY**

Prof. Rodney Weber and Prof. Jennifer Kaiser

**Description:** This course is an introduction to experimental methods focused on measurements of atmospheric gases and particulates associated with air quality. Upon completion of this course, the student should have knowledge of the theory behind commonly used and research-grade atmospheric instrumentation, as well as practical lab/field skills and data analysis for ambient studies of air pollutants. Students will make measurements in the Ford ES&T penthouse lab of ambient ozone, nitrogen oxides and carbon monoxide and PM<sub>2.5</sub> chemical composition, number distributions and optical properties. Some experiments with more advanced research-grade instruments may also be included.

**Grades:** 6 Lab experiments all of equal grade (i.e., 100/6 = 16.7%).

**Lecture:** There will be 1 lecture per week.

**Labs:** Lab experiments will take place mainly in the ES&T penthouse lab. Sign up for labs will be arranged by TA. Lab reports due dates are shown below. Ideally 2 students per lab group, where each student is expected to submit their own lab report. Note, below is a typical lab schedule, but changes may be made depending on availability of instruments during a particular semester.

Week	Lecture Date	Lecture (Professor)	Lab Available
1	1/6	Class intro (Weber/Kaiser)	
2	1/13	Intro to measurement techniques, Uncertainty, LODs, Error Characterization, Trace gas measurements part 1 (Kaiser)	Measurement of O <sub>3</sub> /NO <sub>x</sub> /CO
3	1/20	None (MLK Holiday)	
4	1/27	Trace gas measurements part 2 (Kaiser)	
5	2/3	Spectroscopy: Fundamental Principles (Kaiser)	HCHO IR
6	2/10	Spectroscopy: Atmos. Instrumentation (Kaiser)	
7	2/17	Measurements of Particle Size Distr. (Weber)	Particle Size Distributions
8	2/24	Particle Size Distributions Theory (Weber)	
9	3/2	Measurements of Particle Composition (Weber)	Particle Composition
10	3/9	Particle Composition Theory (Weber)	
11	<del>3/16</del>	None (Spring Break)	
12	3/23	Measurement of particle optical properties (Weber)	Particle Optics
13	3/30	Optical Properties Theory (Weber)	
14	4/6	Mass Spec: Fundamental Principles (Kaiser)	Mass Spec
15	4/13	Mass Spec: Atmos. Instrumentation (Kaiser)	
16	4/20	Final Lecture for questions to finish labs (Weber/Kaiser)	

**Academic Integrity:** Students are expected to abide by the Georgia Tech Honor Code (<http://www.honor.gatech.edu/>) and to avoid any instances of academic misconduct, including but not limited to: (1) use of material that is wholly or substantially identical to that created or written by another individual or group, and (2) false claims of performance or work that have been submitted by a student. Any student suspected of misconduct will be reported to the Office of Student Integrity.

**Accommodations for Students with Disabilities:** If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu/> to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail the instructors to set up a time to discuss your learning needs.