

Engineering Student Technology Committee

<http://www.engr.colostate.edu/ESTC>

College of Engineering

Colorado State University

1. Title of Proposal: Equipment acquisition for a new air quality teaching laboratory

2. Proposal Participants:

Primary Contact for Proposal

Name: Jeff Collett _____ E-Mail: collett@atmos.colostate.edu _____

Department/Major: Atmospheric Science _____

Check One: **Faculty** **Staff** **Student**

3. Proposal Abstract (limit to 100 words):

Funding is sought to help equip a new air quality teaching laboratory. The Department of Atmospheric Science and UFFAB recently spent \$95K to construct a dedicated laboratory for educational offerings in the field of air quality. ESTC funding is sought to help equip this laboratory for hands-on air pollution measurement classes including ATS560. ATS560 has historically drawn students undergraduate and graduate students from ATS, ME, and CEE. Enrollment is expected to grow with recent expansions of air quality programs and faculty hires in ME (Professors Volckens and Jathar), CEE (Prof. Carter), and ATS (Professors Pierce, Fischer, and Ravishankara).

4. Proposal Budget

List of items to purchase and cost of each

Item	Cost
Water purification system	\$3600
Analytical balance	\$2400
pH meters and electrodes (3)	\$1350
Laptop PCs (2) and printer	\$3000
Personal Ozone Monitor	\$5500
VOC sampling canisters (5)	\$1500
Total request	\$17,350

Dollar or percentage amount requested from ESTC: ESTC is requested to fund 100% of this request: \$17,350. ATS and UFFAB spent \$95,141 in 2015 to construct the teaching laboratory where the requested equipment will be installed and used.

5. Full description of proposal:

As one of the nation's leading programs in Atmospheric Science, our department offers a large and diverse curriculum designed to prepare graduate students as future leaders in studies of weather, climate and air quality. One critical component of the curriculum is our offering of laboratory-based courses in atmospheric chemistry and air quality. These courses also draw students from elsewhere in COE and across campus. Until recently those courses were offered in space that is also utilized for sponsored research. In 2015 the Department of Atmospheric Science partnered with the University Facilities Fee Advisory Board (UFFAB, a campus-wide student committee that oversees deployment of student facilities fees) to renovate a portion of former Atmospheric Science Library space to create a new air quality teaching laboratory. A total of \$95K was invested in the project, with \$51K paid by the Department of Atmospheric Science and \$44K by UFFAB as illustrated below.

2015 Air Quality Laboratory Construction Renovation Costs

UFFAB _____	\$44,251
Dept funds _____	\$28,430
Dept Head start up funds _____	\$22,460
Total _____	\$95,141

The new lab will be used primarily for the teaching of ATS 560 (Air Pollution Measurement), but will also see use from other courses (e.g., ATS 716, Air Quality Characterization, a team measurement course). ATS560 serves both graduate and undergraduate students. Students commonly enroll from Atmospheric Science, Mechanical Engineering, and Civil and Environmental Engineering. With the growth of Air Quality education and research activities in COE and on campus (e.g., the recent hires of Prof. Volckens and Jathar in ME, the addition of Air Quality and Prof. Carter to CEE), enrollment in this course is expected to grow.

The purpose of this request is to solicit support for the purchase of equipment needed to equip the lab for future course offerings. With the large renovation investment already made by ATS and UFFAB, a relatively modest ESTC investment would facilitate a world class offering of hands-on training in air pollution measurement. Experiments offered in the class include precipitation sampling; sampling of atmospheric aerosol particles and trace gases; measurement of aerosol size distributions; calibration and operation of an ion chromatograph which is then used for aerosol and precipitation composition measurements; measurement of aerosol organic and elemental carbon concentrations; measurement of ozone; sampling of volatile organic

compounds followed by speciation measurement using gas chromatography, and more. Specific equipment and supplies for this funding request are tabulated below.

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