

**Department of Biomedical Chemical and Environmental Engineering
COLLEGE OF ENGINEERING AND APPLIED SCIENCE**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 2, 2015

The Department of BCEE is pleased to offer the following research project for the summer of 2015. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

PROJECT TITLE: Understanding Trends in Cincinnati's Air Pollution (UTICAP)

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Project Description

The primary objective of this summer research project will be to understand and quantify spatial and temporal trends in air pollution in the urban core of Cincinnati. The project will entail a combination of data collection and analysis, field work and potentially, modeling. The project can be broken into two major components:

Air pollution dataset development

- Compile data from other research (esp. previous research from UC), and regulatory monitoring stations to build a time series data set of air pollution in Cincinnati.
- Process raw data to a form suitable for use in analyzing/visualizing spatio-temporal variability (e.g. via the use of Matlab).
- Use of models (EPA based Chemical Mass Balance and Positive Matrix Factorization), to estimate contributions from various sources to air pollution in Cincinnati.

Evaluation of portable air quality monitors

- Measure air pollutants using small, portable monitors and evaluate their performance. This will include, setting up the monitors, processing and analyzing data.
- Use techniques (e.g. wind rose plots, interpolation) to quantify spatial trends in air pollutants.