VIP Syllabus • Fall 2026

Vertically Integrated Projects Program • vip.gatech.edu

GT Methane Experiment

Meetings
ES&T L1114
Thursday @ 11 AM

Instructors
Greg Huey
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404-384-9533

Office Hours
Huey, ES&T 3130
Th and Fr afternoon

Each team will determine working times, designated as "sub-team meetings." Students are responsible for participating in their team and sub-team meetings. If you miss any meeting, you are responsible for knowing what occurred in that meeting, typically by discussing it with other team members. An excused absence does not relieve you of that responsibility.

About VIP

The Vertically-Integrated Projects (VIP) Program operates in a research and development context. Undergraduate students that join VIP teams earn academic credit for their participation in design/discovery efforts that assist faculty and graduate students with research and development issues in their areas of expertise.

The teams are:

Multidisciplinary - drawing students from all disciplines on campus;
Vertically-integrated - maintaining a mix of sophomores through PhD students each semester;
Long-term - each undergraduate student may participate in a project for up to three years and each graduate student may participate for the duration of their graduate career.

The continuity, technical depth, and disciplinary breadth of these teams are intended to:

- Provide the time and context necessary for students to learn and practice many different professional skills, make substantial contributions to the project, and experience many different roles on a large, multidisciplinary VIP team.
- Support long-term interaction between the graduate and undergraduate students on the team. The graduate students mentor the undergraduates as they work on VIP projects embedded in the graduate students' research.
- Enable the completion of large-scale projects that are of significant benefit to faculty members' research programs.

Learning Objectives

Through VIP students will:

- Learn and practice professional skills;
- Make substantial contributions to the team project;
- Experience different roles on a large, multidisciplinary team.

Team Focus

The GT Methane Experiment is focused on understanding the sources of methane in the Atlanta urban area. This semester foci are to start collecting CO and to analyze ethane/methane/^{13}C methane data , already collected. **You will need to develop some proficiency in either PYTHON or Igor (I recommend buying a student license for $75) to be successful in this class.**

Semester Overview

The first 3 weeks will focus on intro to methane and basic data skills. After that we will focus on presenting data, reduction, and analyses**.**

Grading

You will be judged on both skills and research products.

Skills

1) Basic Data – CSV files, concatenation, time series plotting and simple analyses
2) Quality Checking Data – reviewing time series data and comparing to basic metrics
3) Web design –
4) Data Analysis – comparison of chemical and meteorological parameters, generating HYSPLIT back trajectories and dispersion modeling, deriving emissions and identifying sources from inventories, advanced methods such as ML/AI and inverse modeling.
5) Operation of CO instrument, flow and sensitivity calibration
6) Dealing with data stream from CH_4 instruments

Results

1) Data Sets
2) Published Web sites
3) Analyses
4) Presentations
5) Mentorship of colleagues

Documentation and records

a. VIP Notebook – digital or paper
b. Code (via GT GitHub) if team is developing software
c. Website
d. Data and or Macros on Dropbox

Grading Scale

A – Criteria for B plus an advanced skill or multiple results

B – Criteria for C plus a demonstrated result

C – Demonstration of criteria for a D and basic Data Analysis Skills (csv files, plotting, etc.)

D – Demonstration of team interaction and contributions
F – No demonstration of any skills or team contributions