

# **WIP** **VERTICALLY INTEGRATED PROJECTS** **SPRING '25 SHOWCASE**

VIP courses engage students in long-term, large-scale, multidisciplinary projects guided by faculty mentorship. Students earn credit over several semesters as they work on research or team-based competitions. Students from all years and majors work collaboratively generating new knowledge and addressing real-world challenges.

**THURSDAY MAY 1 | 5 TO 7 PM**

**41 COOPER SQUARE  
RECEPTION 7-8 PM, LL101**



Scan for  
project descriptions  
and to RSVP

# GELMAN FOYER

# VIP

VERTICALLY  
INTEGRATED  
PROJECTS  
SPRING '25  
SHOWCASE

## CHEM-E-CAR

### STUDENTS

Conor Andrews  
Matthew Chang  
Kathy Chen  
Kaden Gim  
Jeremy Lugo  
Derek Ly  
Allen Rakhimov  
Sikder Sakhawat  
Radu Vararean

### FACULTY

Amanda Simson (ChE)  
Abhishek Sharma (ChE)  
Jennifer Weiser (ChE)

The AIChE Chem-E-Car team is tasked with building a shoebox-sized car to drive a precise distance. The car has to be powered and controlled by chemical reactions and dead reckoning alone. This year, our Chem-E-Car, "Hook, Line, and Zinc-Air" is powered by a Zinc-Air battery and controlled by the brightness of the glowing Luminol reaction. Chem-E students get to learn and use techniques of CAD, fabrication, electronics, controls systems, reaction engineering, project management, technical communication, and most importantly, teamwork!

## CHEM-E SUSTAINABILITY

### STUDENTS

Sydney Ampofo  
Susanna Denny  
Abigail Lin  
Sivan Spiel

### FACULTY

Amanda Simson (ChE)  
Abhishek Sharma (ChE)  
Jennifer Weiser (ChE)

The sustainability team is preparing for the 2026 OpenAir Carbon Removal Challenge, with the potential opportunity to be selected for the Carbon Unbound conference. This challenge calls for new processes, approaches, and prototypes to remove carbon from the land, water, or air. To accomplish this, students will design a small-scale screw reactor to pyrolyze coffee grounds and produce biochar. For the final showcase, the team will present a reactor system shown through illustrations and modelling.

## ARCHITECTURAL ACOUSTICS

### STUDENTS

Dylan Clark  
Erika Gregory  
Jonas Margono  
Jaemi Yoon

### FACULTY

Melody Baglione (ME)

Our project measures and analyzes the acoustic performance of campus spaces: Gelman Foyer, Civic Projects Lab, Foundation 3rd Floor Lobby, and the Colonnade. We examine the existing sound conditions and identify areas for improvement, creating proposals for acoustic treatments aimed at improving speech clarity and minimizing excessive noise. Low-cost, eco-friendly acoustic panels will be tested to evaluate their effectiveness in improving acoustic quality. We are using acoustic modeling software to better understand how different configurations of acoustic panels or other treatment methods affect these spaces.



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# ROOM LL101



## INTELLIGENT GROUND VEHICLE COMPETITION

### STUDENT

Wilson Jiminez

### FACULTY

Michael Giglia (ME)

Students working on the Intelligent Ground Vehicle Competition (IGVC) augment the design of a commercial electric vehicle for autonomous driving. This year the team is preparing for the F1/10th competition, an autonomous vehicle competition with scale model cars. Students push the limits building the microcontroller framework and abstracting out the hardware layer while minimizing coding additions. Work showcased this year includes implementing I2C, SPI and other drivers in the hardware abstract layer (HAL) for the STM32 microcontroller.

## MOTORSPORTS

### STUDENTS

Sheikh Islam  
Dylan Qiu  
Andrew Lunyk  
Ishaan Zaveri  
Megan Lin  
Santiago Helbig

### FACULTY

Kamau Wright (ME)

In the VIP Motorsports course, students of the Cooper Union Motorsports team work to design and build an F1 style race car. This car must satisfy guidelines and rulesets published by FSAE, in preparation for racing the car at the Michigan EV Competition. The VIP built capacity for the team. Classes taught members about the event, safety procedures and design processes, promoted project management and teamwork, reinforced completion and organization of design documentation, and supported execution of mechanical and electrical tasks. The team laid significant foundations in electrical and mechanical design knowledge. Examples of the team's capacity for innovative design are the custom battery modules and an adjustable pedal system.

## SOLAR DECATHLON

### STUDENTS

Fabiha Anjum  
Aidan Brady  
Ruslana Bukalo  
Valerie Casas  
Jenny Chen  
Jerry Chen  
Kevin Cho  
Danielle Chiu  
Tasfia Ebneybelal  
Vito Di Gregorio  
Erin Jyung  
Sreevarshini Karthikeyan  
Sanamdeep Kaur  
Rachel Kong

Christina Kundu  
Abby Lee  
Sabrina Li  
Christopher Lin  
Catherine Lopez  
Isabel Ma  
Erik Murdock  
Zephaniah Odidika  
Christian Raimondo  
Philip Ramirez  
Kevin Sebastian  
Jeremy Wu  
Larry Zeng  
Matviy Zhachek

### FACULTY

Melody Baglione (ME)  
Tommy Schaperkotter (AR)  
Cosmas Tzavelis (CE)  
David Wootton (ME)

### INDUSTRY PITCH PRESENTATION AT 5:30 PM

The Solar Decathlon VIP forms a multidisciplinary team of architecture and engineering students who engage with community, government, and industry partners to create innovative building designs that address real-world issues related to climate change, affordability, and environmental justice. The current team is working with the NYC School Construction Authority on a net-zero design of the Hillbridge Academy campus on Staten Island, proposing a new public high school, retrofit elementary and intermediate schools, and retrofit of a historic chapel into a community space. The team showcased their design in the U.S. Department of Energy Design Challenge April 26-27 at the National Renewable Energy Lab in Golden, CO.

# VERTICALLY INTEGRATED PROJECTS SPRING '25 SHOWCASE

## SOLAR DISTRICT CUP: RENEWABLE SOLUTIONS FOR THE LOWER EAST SIDE

### STUDENT

Isaac Amar

### FACULTY

Melody Baglione (ME)

In New York City, buildings account for 70% of greenhouse gas emissions, making renewable energy solutions essential for achieving net-zero climate action goals. As part of the U.S. Department of Energy's Solar District Cup collegiate design competition, an interdisciplinary team of mechanical and electrical engineers is developing solar-plus-storage solutions for 14 buildings in Manhattan's Lower East Side. For this Vertically Integrated Project (VIP), a battery optimization model that incorporates detailed economic and operational factors employs stochastic predictive control techniques. This model manages demand charges, optimizes time-of-use energy costs, and accounts for battery degradation. These features improve both the economic feasibility and operational reliability of renewable energy solutions.



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**LOBBY**

# VIP

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## INTERACTIVE DRONES

**STUDENTS**

Marco Chen  
Somin Lee

**FACULTY**

D.M. Luchtenburg (ME)

The goal of this project is to interact with a swarm of drones using body movement. The user can command the swarm to follow preprogrammed motion dictated by specific gestures or steer the drones in (quasi) real time. Preprogrammed motions include planetary orbits and mass-spring system behavior. This project leverages body tracking algorithms, dynamics, feedback control, and simulation techniques.

## BIOENGINEERING

**STUDENTS**

Nolan Griffith  
Wongee Hong  
Lamiah Khan  
Jaehyeon Park  
Ayla Rinsky Bryant  
Jacob Shron  
Diego Toribio  
Antonio Velez  
Sadia Rahman

Lillian Routgauger

Jaeho Cho

Mekhi Vazquez

Kayla Lee

Cameron Tardy

Sophia Klymchuk

Asmi Shirsat

Ayushi Bhattacharjee

**FACULTY**

Jennifer Weiser (ChE)

Sam Keene (EE)

Mili Shah (MA)

This interdisciplinary VIP will focus on building models for biological systems and finding creative solutions to common problems in healthcare. Students typically work in teams with outside collaborators to develop new tools to address medical problems. Our goal is to build computational or physical systems that can integrate with current standards of care and enhance patient outcomes. Example projects include biomaterials and integrating machine learning for early detection of cognitive impairment in collaboration with the Icahn School of Medicine at Mount Sinai (ISMMS), and body tracking systems with the National Institute of Standards and Technology (NIST).

## COOPER SATELLITE LAUNCH INITIATIVE (CUBESAT)

**STUDENTS**

Joseph Chico

Adin Sacho-Tanzer

Jay Williams

Devin Zhang

**FACULTY**

Michelle Rosen (ME)

The Cooper Satellite Launch Initiative (CubeSat) is an interdisciplinary team devoted to designing, building, and testing a small satellite and its associated support systems. The current project, InkSat, aims to study the efficacy of e-ink as a thermal regulation system in a space environment. This project involves experimental design, dynamic modeling and control, electronics design, and communications development. A ground station for transmitting and receiving signals from the satellite is also in development. As the project's goal is to launch the satellite, space mission design and design for launch and space conditions are key considerations.



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