VIP Syllabus • SPRING 2027

Vertically Integrated Projects Program • vip.gatech.edu

Team Name
Engineering Education for K-12 Students

Instructor(s)
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Office Hours & Location
Monday after class (informally) and email to schedule formally.

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

Engineering Education for K-12 Students is an innovative initiative that bridges the gap between K-12 education and cutting-edge engineering, computing, and design. This interdisciplinary program inspires students to develop their problem-solving and creativity by engaging in practical projects that integrate engineering and core STEM principles, benefiting both teachers and K-12 students.

In this course, you will work in a team to design, build, and test a tangible, hands-on learning tool for K–12 students. Tangible tools are physical objects that learners can touch, manipulate, or interact with—such as manipulatives, kits, sensor-based devices, or hybrid physical–digital systems. Your team will also create a lesson or project plan that incorporates the Engineering Design Process (EDP) and uses the tool to support student learning. Through this process, you will engage in creativity, problem-solving, and hands-on learning while contributing to a collection of educational resources that educators can use to inspire the next generation of engineering innovators.

Class Administration

In-person attendance is mandatory on Mondays, 11 am – 12 pm in Clough RM 323. To enhance engagement, unless presenting, students will not be permitted to look at personal devices during announcements, presentations, or main team discussions. Two scribes will be designated for each main team meeting to take notes. The scribes will take notes and maintain a meeting log. At the end of the semester, the log will be submitted as part of the team participation grade. More details will be presented in class. Other teams may copy and paste these notes into their notebooks.

Canvas will be used for grade-related announcements, assignments, meeting notes, and posting grades. All other sub-team communications will be conducted on Microsoft Teams ("Teams"). **Students are expected to enable MS Teams notifications for their own sub-team's activities** to be alerted when a team member posts.

When you arrive in the classroom, please pick up your attendance sheet from the front table, date and sign it next to your name, and leave it on the table. Nominally, each class meeting will begin with an activity. Anyone arriving after **11:30 am will be counted as "absent"** for the attendance grade unless a formal excuse accompanies the absence. **There is a letter-grade drop in the attendance grade** to account for absences without a formal excuse.

Each student will affiliate with one sub-team and is expected to meet **in person** with that sub-team once per week, outside of class time, at a mutually agreed time. Scribes will be scheduled (to share the load) for sub-team meetings, and their notes will be made available so other sub-team members can paste them into their notebooks.

Semester Overview

Assignments

Assignments in this course are designed to help you practice, implement, and reflect upon a variety of issues relating to engineering teaching and learning. Details of each assignment will be provided throughout the course. These assignments will include Reflections, Ticket out the door, School Visit Presentation, Peer Evaluation, and Capstone Project. Descriptions of these assignments are below. **All assignments will be submitted on Canvas and graded according to the provided Rubric.**

- ***Reflections -*** *Reflection is crucial in teaching and learning, fostering deeper understanding, personal growth, and active ownership of learning, transforming experiences into meaningful insights for continuous improvement. During the semester, you will complete one Reflection assignments about your teaching outreach. (Optional for those taking 1 credit; Required for 2 credits or more).*

- ***Ticket out the Door (TOD) -*** *A "Ticket Out the Door" is a concise response designed to gauge comprehension. This approach facilitates the collection of feedback and the assessment of understanding. During the semester, you will complete tickets out the door at the end of meetings.*

- ***School Visit/Outreach -*** *Throughout the semester, you will be required to attend at least **two** school visits or outreach sessions. During these sessions, you will either facilitate a lesson or assist the teacher with implementing the lesson. After each visit, you will complete a teaching reflection form, which you will have a week to submit. (Optional for those taking 1 credit; Required for 2 credits or more).*

- ***Capstone Project -*** *A culminating assignment where your sub-team will apply what you've learned to design, build, and/or refine an educational technology tool and a classroom lesson using the Engineering Design Process. Over the semester, you will identify a real learning problem, develop a functional prototype, and create a standards-aligned lesson that demonstrates how the tool supports student learning. This project demonstrates your instructional design skills, content knowledge, and understanding of student-centered teaching practice **(more information will be provided).***

- ***VIP Notebook and Class Participation -*** *Throughout the course, you will maintain a notebook that contains your notes, activities, data, conclusions, meeting notes etc. This in part serves as documentation of your participation. Please review the rubric for how your notebook will be graded.*

Grading

The premise of VIP is that teams work on projects. Much like a real-world team, individual members work on different aspects of the project. Team members range from sophomores through graduate students, from first-time participants to students who have been involved for four or more semesters. The number of credits for which a student is enrolled is taken into account in grading. Zero-credit students (reserved for paid participation only) participate in the same grading process.

Assignment Late Submission Policy:
Assignments submitted after the due date will incur a 10% penalty per day of delay. After one week, assignments that remain incomplete will result in a grade of zero.

Your grade is based on three areas and three requirements. Although each student contributes in different ways, you must demonstrate achievements in all three areas below.

1. **Documentation and records (34%)**
    a. VIP Notebook
    b. Reflection (s)
    c. Lesson implementation in school and/or outreach (at least two over the semester) - optional for those taking for 1 credit
    d. Ticket out the door

2. **Personal accomplishments and contributions to your team's goals (33%)**
    a. Class Attendance mandatory
    b. Class and Team Participation
    c. Peer Evaluation (s)

3. **Teamwork and interaction (33%)**
    a. Capstone Project
    b. Team presentation(s)

- As part of the assessment of the above, each student is required to:
    a. Maintain a VIP notebook. Scans of well-maintained VIP notebooks are available on the VIP website and in Canvas. **Each student must understand that if work is not documented in their VIP notebook, "Then you didn't do it"** (i.e., work that is not documented in the notebook will not count toward their grade).
    b. Complete the mid-term peer evaluation. This is a web-based form, and links are available on the VIP website. **Failure to complete the peer evaluation will result in a full letter grade deduction. Late submissions are not accepted.**
    c. Complete the final peer evaluation, which will be available for one week during the week preceding finals. **Failure to complete the peer evaluation will result in a full letter grade deduction. Late submissions are not accepted.**

Performance Assessments

Notes on Documentation

Notebook Maintenance	- The notebook must be a bound notebook, with a sewn or glued binding, such as a composition book or lab notebook. - Your name, your project's name, your contact info, and your team members' contact info must be recorded on the outer or inside cover. - Each page must be numbered, dated, and signed.
To-Do List Maintenance	- Maintain checkboxes for items to be done. - Check-off and date items when done.

Meeting Notes	- For meeting notes, include checkboxes for items for which you are responsible and deadlines for your sub team and the overall team.
Usability	- Will your VIP notebook be of use to people who join the team later and need to refer to it? This includes legibility, intelligible technical and meeting notes, and overall organization.
Overall	- An overall rating of your notebook. (Detailed design notes, design decisions, copies of or pointers to code that you wrote, records of important websites, etc.)
Wiki content	- Wiki content refers to documentation produced online, either through the VIP wiki site, T-square, or other VIP-approved site.
GT GitHub (if student is developing software)	- GitHub code refers to code produced and checked into the GT GitHub or other VIP-approved code repository. The frequency, quantity and quality of contributions are evaluated.

Note: A rubric will be provided for your notebook check and all assignments. However, the course breakdown will be as presented in the rubric below.

Documentation and Records (1/3 of Total)			
Component	**Excellent (100%)**	**Satisfactory (70%)**	**Needs Improvement (50%)**
VIP Notebook	Well-organized, detailed, consistent entries and meets all requirements.	Some entries missing or incomplete and meet some requirements.	Disorganized or rarely updated.
Reflections	Insightful, connected to learning, well-written based on grading criteria of the assignment.	Basic thoughts, loosely connected and missing some components of the criteria.	Vague, off-topic, or minimal effort and missing many elements of the criteria.
Lesson Implementation in school/ outreach	Well-prepared, engaging, reflective, effective, and all required documents are complete, clear, and submitted on time	Delivery issues exist, but the attempt is complete, and documentation is mostly complete, though it may lack small elements or require clarification	Incomplete or poorly executed Missing major components like a lesson plan or reflection, or submitted late with minimal effort
Ticket Out the Door	Regular, thoughtful responses and all completed	Mostly submitted, some shallow, with one missing	Inconsistent or missing
Personal Accomplishments & Team Contributions (1/3 of Total)			
Attendance	Perfect or near-perfect attendance and punctuality	Some absences w/out excuse or late arrivals	Frequent absences/tardies

Class & Team Participation	Engaged in all sessions, leads, supports team, and attend all team meetings	Contributes but occasionally passive and missing some team meetings	Rarely engaged or misses group goals and meetings
Teamwork & Interaction (1/3 of Total)			
Peer Evaluation	Highly rated, and offers useful feedback	Average ratings, feedback present but not thoughtful	Low ratings or lack of participation and feedback
Capstone Project	Major, high-quality contribution; aligns with team vision and meets all project requirements	Solid contribution, mostly aligned with project requirements	Minimal or weak contributions and missing many project requirements
Team Poster Presentation(s)	Polished, clear, shared delivery and team effort	Adequate, some uneven parts and limited team contribution	Poorly delivered or disorganized and lack of team contribution

Grading Scale

Your final grade will be assigned as a letter grade according to the following scale:

A = 90 – 100%; B = 80-89%; C = 70 – 79%; D = 60 – 69%; F = 0- 59%

Academic Honesty

The main principle in VIP academic honesty is that you will not present someone else's work as your own. Tests and specific assignments (homework, lab assignments, etc.) must be your own work. For other work, you are encouraged to consult whatever sources are helpful in learning and understanding the issues associated with the material, but you should always provide appropriate references and citations where such material is included in your VIP notebook, programming code, presentations, etc.

Additionally, to provide a good working environment for all students, you're expected to adhere to the rules given here, posted, or disseminated in class. Academic Honesty is taken seriously, and failure to follow these principles will result in disciplinary actions as stated in the Student/Faculty Handbook.

Accommodations for Students with Disabilities

Georgia Tech offers accommodations to students with disabilities. If you need a classroom accommodation, please make an appointment with the Office of Disability Services (www.disabilityservices.gatech.edu). If you have an accommodation letter from ODS, please provide your team advisor with a copy of your accommodation letter and discuss with them how your accommodations will be applied. This should be done as early as possible in the semester.

Labs and Facilities

VIP has rooms and equipment that are shared by many VIP teams. In order to provide a good working environment, the following rules apply to anyone with access to these rooms and equipment:

1) The room priorities are:
    a. Scheduled team meetings, lectures, and learning modules;

b. Weekly sub-team meetings (multiple groups can use rooms at the same time);
c. Video conferences or special meetings with VIP stakeholders;
d. Other project-related work (multiple groups can use rooms at the same time).

Room schedules can be viewed on the VIP website.

While the above priorities indicate which events take precedence, a good neighbor policy on using the rooms applies. If you need to access computers, equipment, or work on a project in the room while other activities are going on (sub-team meetings, etc.), you are welcome to do so as long as it does not disrupt a scheduled activity. Similarly, multiple groups may use a VIP room at the same time. Also, where it does not disrupt one of the above uses, VIP participants may use the rooms for other activities such as studying.

2) Everyone is expected to pitch in to keep the rooms clean. Food is allowed in the rooms, provided any spills or messes are cleaned immediately. The rooms are monitored by camera, and **staff will pull videos to identify offenders**. Gum is a particular problem, especially in carpeted rooms. Do not place used gum anyplace other than in a trash can.

3) The rooms have equipment both for general use and for specific teams. General use equipment includes the projector in Klaus 1440, and monitors in VL 465 and VL 463B. Other equipment may be for general use or dedicated to a team-specific purpose; some equipment may be general use one semester and assigned to a team another semester. If you are unsure of whether equipment is available for general use, contact the VIP trouble-ticket system at vip-request@ece.gatech.edu. You should only use equipment for the designated purpose. Some equipment may pose personal hazards if used inappropriately!
    a. Equipment owned by the VIP Program may not be removed from a VIP room without completed an equipment loan agreement, which would need to be approved by one of the VIP Directors. To request permission, email vip-request@ece.gatech.edu.
    b. You will be responsible for the replacement cost of any equipment not returned in good condition.
    c. You must be sure you know how to operate the equipment safely. Written approval to use the equipment does not indicate that the team advisor has reviewed equipment use and safety. You are responsible for knowing the hazards and safe operation of any equipment you use.

4) Computer accounts are issued for your use only. You may not share computer accounts with anyone else, even another team member. All computer usage is subject to rules and policies of Georgia Tech, the University System of Georgia Board of Regents, and the State of Georgia. Additionally, you are expected to be considerate of other users. Computer permissions are not authoritative. For example, just because you have file access to something does not indicate that it is appropriate for you to read or modify that file.

5) Buzz-card access to VIP facilities is a privilege contingent on abiding by the above rules. **Buzz-card access is logged, and rooms are video recorded.** Be aware that if there is a problem (theft, vandalism, or simply a mess left in a room), the logs and video records will be consulted. Do not allow unknown people to access VIP facilities. Be sure to secure the facilities (i.e., close the door) when you leave.