TO: The Faculty of the College of Engineering

FROM: Vertically Integrated Projects (VIP) Program of the College of Engineering

RE: New Undergraduate Course VIP 37910

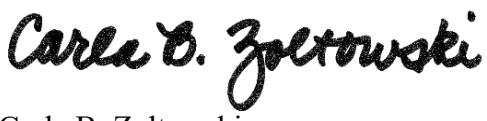
The faculty of the College of Engineering Experiential Learning Curriculum Committee have approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

VIP 47910 – Junior Participation in Vertically Integrated Projects (VIP) Lim
Terms offered Fall, Spring, Summer, Lecture 0, Lab 1, cr. 1.
Requisites, Restrictions, and Attributes: Junior Standing

Description:
This course provides an opportunity for undergraduate students to engage in authentic and extended research and design projects related to active research areas of Purdue faculty members and national, international, and industry-sponsored design challenges. Students will work on interdisciplinary and vertically-integrated teams (first-year through seniors) with faculty and graduate student mentors to address these real-world research and design challenges. Students will participate in a limited number of professional development activities that include topics related to design, research, documentation and technical writing, communication, leadership and teamwork, ethics, project management, intellectual property, information literacy, and introduction to a broad range of applicable research topics, technologies and development tools. Typically offered Fall Spring.

Reason: To support the participation of students in projects at the 1-credit hour level. This course was offered during Fall 2020 and Spring 2021 under temporary course number ENGR 39600.

Signature



Carla B. Zoltowski
Assistant Professor of Engineering Practice, School of Electrical and Computer Engineering
Director, Vertically Integrated Projects (VIP) Program

Required Text(s): None.

Recommended Text(s): None.

Learning Objectives: Students in VIP will make progress on each of the learning outcomes listed below:

i. an ability to apply engineering design to create a product[1] that meets the specified needs of this engineering design experience with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
ii. an ability to develop and conduct experimentation, analyze and interpret data, and use engineering judgment to draw conclusions related to the development of the product of this engineering design experience.
iii. an ability to identify, formulate, and solve complex engineering problems arising from this engineering design experience by applying principles of engineering, science, and mathematics.
iv. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives associated with this design experience
v. an ability to communicate effectively with a range of audiences appropriate to this design experience in both a written report and oral presentation.
vi. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies to complete the engineering design experience associated with this course.
vii. an ability to recognize ethical and professional responsibilities associated with this engineering design experience and make informed judgments which must consider the impact of the product of this engineering design experience in global, economic, environmental, and societal contexts.

Assessment Method for Learning Objectives: Each student will be required to document their individual and project work, contribute to the project goals, and participate effectively as part of the project team. Students will be evaluated individually and as part of their team on the basis of their individual documentation and assignments, participation in weekly lab meetings, project artifacts (e.g., code, prototypes, etc.), presentations (e.g., weekly, midterm, final, and/or poster), project documentation (e.g., final project report, poster, etc.), self-assessment, and peer evaluations.

Lectures: All students in VIP will participate in professional development activities that include design, research, documentation and technical writing, communication, leadership and teamwork, ethics, project management, and intellectual property.

[1] "Product" refers to any device, system, process, software, etc. resulting from this VIP/design experience.

Lab Outline:

Week	Major course milestones
2	Team Organization and Semester Planning
3	Personal Semester Goals
4	Project Proposal (new projects); Project Demonstration (continuing projects)
5	Review of Individual Documentation
8	Peer Evaluation and Self Assessment
9	Progress Report
11	Poster Presentation
15	Final Project Presentation, Team Report; Review of Individual Documentation; Peer Evaluation and Self Assessment

VIP Syllabus Spring 2022
VIP Team: xxxxxx
VIP 17911, 17912, 17920, 27920, 37920, 47920, 47921, 47922
https://engineering.purdue.edu/vip/

Course Information

- **CRN:** see https://engineering.purdue.edu/vip/register
- **Meeting day(s) and time and Instructional Modality**
  - **Lecture**: ASYNC ONLINE
  - **Lab (Team): Instruction Modality**: (Face-to-Face, Hybrid/Hy-Flex, Async-Online, or Sync-Online) *Must match modality listed in the Spring 2022 schedule in myPurdue. See the Office of the Registrar's Instructional Modality document for details on each modality.*
  - **Lab (Team) Meeting day(s) and times**: Class meeting days/times should match the Spring 2022 schedule. For online courses, list any synchronous elements such as office hours.
  - **Lab Meeting Location/Information**: Room information or meeting links
  - **Dates of instruction:** January 10th – April 29th (Finals May 2nd – 7th). Note: Course will not meet on January 17th & March 14th – 19th.
- **Course credit hours:**
  - Two credit hours: VIP 17920, 27920, 37920, 47920, 47921, 47922
  - One credit hour: VIP 17912

Course Description

This course provides an opportunity for undergraduate students to engage in authentic and extended research and design projects related to active research areas of Purdue faculty members and national, international, and industry-sponsored design challenges. Students will work on interdisciplinary and vertically-integrated teams (first-year through seniors) with faculty and graduate student mentors to address these real-world research and design challenges. Students will participate in weekly lectures and professional development activities that include topics related to design, research, documentation and technical writing, communication, leadership and teamwork, ethics, project management, intellectual property, information literacy, and introduction to a broad range of applicable research topics, technologies and development tools.

Contact Information

- VIP Program email: vip@purdue.edu
- **Program Directors and Lecture/Professional Development Instructors**:
  - Prof. Carla Zoltowski (Director): cbz@purdue.edu
  - Dr. Nichole Ramirez (Assistant Director): Email: nramire@purdue.edu
  - Office Hours: By appointment

- **VIP Team *xxxxx* Instructor(s)/Mentor(s):**
  - Name1
    - Email / Phone
    - Office Location
    - Office Hours
  - Name2
    - Email / Phone
    - Office Location

        - Office Hours
    - Etc….

Learning Outcomes:

Students in VIP will make progress on each of the learning outcomes listed below. A student who successfully fulfills the ECE senior design requirements will have demonstrated all of the following outcomes over the two senior design semesters:

i. an ability to apply engineering design to create a product (e.g., device, system, process, software, etc.) that meets the specified needs of this engineering design experience with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

ii. an ability to develop and conduct experimentation, analyze and interpret data, and use engineering judgment to draw conclusions related to the development of the product of this engineering design experience.

iii. an ability to identify, formulate, and solve complex engineering problems arising from this engineering design experience by applying principles of engineering, science, and mathematics.

iv. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives associated with this design experience

v. an ability to communicate effectively with a range of audiences appropriate to this design experience in both a written report and oral presentation.

vi. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies to complete the engineering design experience associated with this course.

vii. an ability to recognize ethical and professional responsibilities associated with this engineering design experience and make informed judgments which must consider the impact of the product of this engineering design experience in global, economic, environmental, and societal contexts.

Software Tools

The software tools will vary based on the project. However, in general, the course and teams will use the following software tools:

- Brightspace: Within Brightspace, you will have access to course announcements, schedules, assignments, grades, feedback, and course resources. *Preferred browser:* ITaP recommends Google Chrome or Mozilla Firefox when accessing Brightspace.
    - For Overall Course Announcements and Professional Development (PD) opportunities: Spring 2022 VIP PD - Merge
    - For lab/team: Spring 2022 VIP *team* - Merge
- WebEx, Zoom, Slack and/or other conferencing/meeting/messaging platforms
- CATME: You will use CATME to submit information used for Peer & Team Evaluations (Link to CATME).
- MS Office: Word, Excel, and PowerPoint.
- Adobe: PDF.
- Qualtrics
- Other for xxxx team (delete if not applicable):

Attendance Policy

Within the VIP course, you will be working in teams on a project. Your project work, both individually and as part of the team, are the most significant aspects of the course. Thus, you are expected to participate in all scheduled (virtual or in-person) VIP team meetings (the lab portion of your VIP course), as well as any sub-team meetings. Meetings will be conducted via in-person or virtually on WebEx, Zoom, or other tool(s) as

designated by your VIP team mentor and/or decided by you and your project team. This expectation aligns with Purdue's academic regulations regarding attendance, which states that students are expected to be present for every meeting of the classes in which they are enrolled. When conflicts or absences can be anticipated, such as for many University-sponsored activities and religious observations, you should inform the team mentors (instructors) and teammates of the situation as far in advance as possible. Furthermore, you are responsible for knowing what occurred in that meeting (typically by discussing it with other team members) and how you can contribute to the project and team until the next meeting. An excused absence does not relieve you of that responsibility.

For unanticipated or emergency absences when advance notification to the team mentors (instructors) is not possible, you should contact the instructor as soon as possible by email or phone. If you feel ill, have any symptoms associated with COVID-19, or suspect you have been exposed to the virus.
You should stay home and contact the Protect Purdue Health Center (496-INFO) for guidance on appropriate action. Further guidance on class attendance related to COVID-19 are outlined in the Protect Purdue Pledge for Spring 2022 on the Protect Purdue website.

If you must miss class at any point in time during the semester, please reach out to your VIP team mentors via email so that they can communicate about how you can maintain your academic progress. If you find yourself too sick to progress in the course, notify your adviser and notify your VIP team mentors via email or Brightspace to make arrangements based on your particular situation. Please note that, according to Details for Students on Normal Operations for Fall 2021 announced on the Protect Purdue website, "individuals who test positive for COVID-19 are not guaranteed remote access to all course activities, materials, and assignments."

If you are unable to make direct contact with the instructor or to leave word with the instructor's department because of circumstances beyond the you, and in cases falling under excused absence regulations, you or the your representative should contact or go to the Office of the Dean of Students website to complete appropriate forms for instructor notification. Under academic regulations, excused absences may be granted for cases of grief/bereavement, military service, jury duty, and parenting leave. For details, see the Academic Regulations & Student Conduct section of the University Catalog website.

Grading

Your grade is based on three areas, along with seven requirements, and is assessed according to your course level and major. The grading guidelines are as follows; please note that "+" or "-" grades may be given if the assessment falls above or below, respectively, the stated guideline.

Grade	Description
A	Overall, the student's accomplishments and effort, documentation, and teamwork and interactions are excellent. All of the seven (7) requirements have been satisfied.
B	Overall, the student's accomplishments and effort, documentation, and teamwork and interactions are good. Six (6) of the seven (7) requirements have been satisfied.
C	Overall, the student's accomplishments and effort, documentation, and teamwork and interactions are adequate. Five (5) of the seven (7) requirements have been satisfied.
D	Overall, the student's accomplishments and effort, documentation, and teamwork and interactions are marginal. More than two of the seven (7) requirements are missing.
F	Overall, the student's accomplishments and effort, documentation, and teamwork and interactions are unacceptable. More than three of the seven (7) requirements are missing.

Accomplishments and effort:

__ Quantity of project accomplishments
__ Quality of project accomplishments
__ Initiative
__ Work ethic
__ Ability to overcome project setbacks
__ Learning needed for the project
__ Focuses effort on achieving goals
__ Manages time and tasks well
__ Overall

Documentation:

__ Individual documentation (quality/quantity)
__ Contributions to team documentation (quality/quantity)
__ Contributions to team poster/presentations
__ Use of appropriate tools (e.g., Git)
__ Overall

Teamwork and Interactions:

__ Participates fully in team (lab) meetings
__ Participates fully in sub-team meetings
__ Contributes fair share of team's work with acceptable quality
__ Keeps commitments and completes assignments on time
__ Listens to teammates and respects their contributions
__ Communicates clearly. Shares information with teammates
__ Respects and responds to feedback from teammates
__ As appropriate, involves and assists others in efforts
__ Demonstrates leadership and/or project management skills
__ Development and implementation of PD plan
__ Overall

Seven Requirements and Due Dates

As part of the assessment of the above, each student is required to:

1. Document individual contributions to the project and team in format as required by your project mentor(s).
2. Contribute as appropriate to project documentation, presentations, publications, and/or poster
3. Submit Professional Development plan by Friday, January 28th at 11:59 pm.
4. Complete mid-semester Individual Performance Evaluation (IPE) by Friday, February 25th at 11:59 pm in Brightspace.
5. Complete Final Individual Performance Evaluation (IPE) & PD Reflection (PDR) by Friday, April 29th at 11:59 pm in Brightspace.
6. Complete mid-semester and final peer evaluation of team members in CATME (mid-semester due Friday, February 25th at 11:59 pm and final peer evaluations due Friday, April 29th at 11:59 pm.
7. Complete final Purdue course evaluation and submit screen shot of completion to Brightspace (due Friday, April 29th at 11:59 pm).

Performance assessment will be done once at mid-semester and again at the completion of the semester using the criteria that follows. The mid-semester assessment is advisory (formative).

Professional Development (PD) Plan

To support your success on your project and your team, and overall, in your career and your life, you will create an individualized Professional Development Plan. For all students *except for those enrolled in VIP 17911 or 17912*, the plan is expected to incorporate ten (10) Professional Development (PD) activities that can be completed throughout the semester and include the three required activities: the Welcome to VIP "lecture" and the two Communication activities (the abstract submission and participation in the research conference). *For students enrolled in VIP 17911 and 17912, the PD Plan only needs to include the three required activities.* Typically, VIP students participate in the Purdue Undergraduate Research Conference through the Office of Undergraduate Research to complete the abstract and presentation requirements. *A team's advisor may opt for them to participate in a different conference or venue to satisfy the requirement. Please see your VIP Team Expectations at the end of the document for more information.*

Track/Topic*	Activity	Organizing unit	Date (of activity or expected participation)
1. PD (Required)	Welcome to VIP	VIP	Complete by Monday, January 28th.
2. Communication (Required)	Research Conference – Application submission	OUR	See Purdue Undergraduate Research Conference Website
3. Communication (Required)	Research Conference – Poster/Oral Presentation	OUR	Poster/oral presentations due by: See Purdue Undergraduate Research Conference Website

The remaining seven activities are to be chosen by the student, depending on their interest and what would be most beneficial for their work on a specific team. Please see the Team Expectations Section below for specific suggestions for this team.

VIP is working with other programs to compile an expansive library of Professional Development videos along with access to interactive workshops, live presentations, etc. Students should browse the materials and talk with their mentors during the first week of the semester to create their individual Professional Development (PD) Plan. The PD plan should be submitted on Brightspace by Friday, January 28th. Students may update their plans as needed during the semester without resubmitting to Brightspace.

Students will be expected to document their participation in each of the activities via the assignments posted in their team Brightspace, as well as in the Midsemester Individual Performance Evaluation (IPE) and the Final IPE & PD Reflection assignments.

ECE Senior Design Students

In addition to the above requirements and expectations, senior design students must complete the following documents (templates are posted on the VIP website and in Brightspace):

- VIP Senior Design Project Proposal: Must be completed by individually by each senior design student during the first semester of Senior Design to ensure he/she has an appropriate project and role. This is to be submitted at the mid-semester and final evaluations during the first senior design semester instead of the Individual Performance Evaluation rubrics.
- VIP Senior Design Project Description: Must be completed during the second semester of Senior Design by each project team. This is to be submitted at the mid-semester and final evaluations during the second senior design semester instead of the Individual Performance Evaluation rubrics.
- VIP Senior Design Reflection, Outcomes Matrix, and Rubric document: An index of how the course outcomes have been met over the two semesters and where evidence for this mastery can be found (notebook, project documentation, etc.). This is to be submitted at the mid-semester and final evaluations both senior design semesters instead of the Individual Performance Evaluation rubrics.
- Both the Senior Design Project Proposal/Description and the Senior Design Reflection, Outcomes Matrix and Rubric document will used by the advisor(s) and VIP admin to approve the satisfaction of the course outcomes and in determining the course grade.

Grading for Senior Design Students

(Each outcome will be rated on a scale from 1 to 4, where 4 is “Excellent”, 3 is “Good”, 2 is “Adequate/Acceptable”, and 1 is “Inadequate/Unacceptable”	**Weight**
i. An ability to apply engineering design to create a product that meets the specified needs of this engineering design experience with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	30%

ii.	An ability to develop and conduct experimentation, analyze and interpret data, and use engineering judgment to draw conclusions related to the development of the product of this engineering design experience.	15%
iii.	An ability to identify, formulate, and solve complex engineering problems arising from this engineering design experience by applying principles of engineering, science, and mathematics.	15%
iv.	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives associated with this design experience.	10%
v.	An ability to communicate effectively with a range of audiences appropriate to this design experience in both a written report and oral presentation.	10%
vi.	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies to complete the engineering design experience associated with this course.	10%
vii.	An ability to recognize ethical and professional responsibilities associated with this engineering design experience and make informed judgments which must consider the impact of the product of this engineering design experience in global, economic, environmental, and societal contexts.	10%

Classroom Guidance Regarding Protect Purdue

Any student who has substantial reason to believe that another person is threatening the safety of others by not complying with Protect Purdue protocols is encouraged to report the behavior to and discuss the next steps with their instructor. Students also have the option of reporting the behavior to the Office of the Student Rights and Responsibilities. See also Purdue University Bill of Student Rights and the Violent Behavior Policy under University Resources in Brightspace.

Academic Integrity and Professional Responsibility

Academic integrity is one of the highest values that Purdue University holds. The VIP Program expects every member of the Purdue community to adhere to the Purdue Honor Pledge ("As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue.") and practice honorable, ethical, and professional behavior both inside and outside the classroom. In VIP, students are encouraged to work together and share information. When indicated, students and teams are allowed to modify previous versions of documents to be submitted for the current assignment. However, it is unacceptable for students to claim individual work that is not their own or to use sources without appropriate citation. It is also unacceptable for students to misrepresent information to their instructional staff, their team, and/or their client. In addition, misuse of VIP resources is considered dishonest. At the instructor's discretion, instances of academic dishonesty will result in a reduced score, a zero score, or a failing grade for the course. All occurrences of academic dishonesty will be reported to the Office of Students Rights and Responsibilities (OSSR) and the students' respective schools. If there is any question as to whether a given action might be construed as academic dishonesty, please see the instructor or the teaching assistant before you engage in any such action.

Nondiscrimination Statement

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that

diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. A hyperlink to Purdue's full Nondiscrimination Policy Statement is included in our course Brightspace under University Policies.

Accessibility

VIP, and Purdue University, strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let us know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247.

Mental Health/Wellness Statement

- **If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try WellTrack, https://purdue.welltrack.com/.** Sign in and find information and tools at your fingertips, available to you at any time.
- **If you need support and information about options and resources**, please see the Office of the Dean of Students, http://www.purdue.edu/odos, for drop-in hours (M-F, 8 am- 5 pm). Phone: 765-494-1747.
- **If you find yourself struggling to find a healthy balance between academics, social life, stress**, etc. sign up for free one-on-one virtual or in-person sessions with a Purdue Wellness Coach at RecWell. Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is completely free and can be done on BoilerConnect. If you have any questions, please contact Purdue Wellness at evans240@purdue.edu.
- **If you're struggling and need mental health services**: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office on the second floor of the Purdue University Student Health Center (PUSH) during business hours. CAPS also offers resources specific to COVID-19 on its website. Topics range from "Adjusting to the New Normal" to "How to Talk with Professors about Personal Matters."
- **TaskHuman: On-demand access to wellness providers with 1000s of topics, day or night**
    - Purdue users eligible for unlimited FREE coaching: https://taskhuman.com/referral/purdue
    - Good intro video: https://www.youtube.com/watch?v=eTeq8hApTNg
- **Basic Needs Security:**
    - Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday. Considering the significant disruptions caused by the current global crisis as it related to COVID-19, students may submit requests for emergency assistance from the Critical Needs Fund.

Emergency Preparation

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

VIP Team Expectations: How to Succeed on Team

- How many hours/week should each student devote to VIP? (Note: it would be expected that students spend approximately 3 – 5 hours/week for each credit hour they are enrolled.)
- How is the student expected to document his or her individual and project work throughout the semester?
- Expectations for weekly meetings?
- Any specific assignments (especially if assessed individually)?
- Is there a final presentation and/or report? If so, what is the expected content and format?
- What are expectations for the completion of the required Professional Development (PD) plan?
- Will the team participate in the Purdue Undergraduate Research Conference or another conference or venue?
- Any other expectations?

VIP Team Facilities Standard Operation Procedures (SOP) and Expectations

The VIP Suite is available for schedule team (lab) meetings, and for other VIP related meetings (see "Reserving VIP Lab Rooms on the Resources page (https://engineering.purdue.edu/VIP/resources). Teams may also be meeting in research lab, classrooms, and conferences room as indicated by your team mentors. All VIP students are expected to comply with the Protect Purdue Plan.

If your VIP team uses your advisors' research lab facilities, information regarding SOP and Expectations will be provided here.