

**TO:** The Faculty of the College of Engineering  
**FROM:** Vertically Integrated Projects (VIP) Program of the College of Engineering  
**RE:** New Undergraduate Course ENGR 47921

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

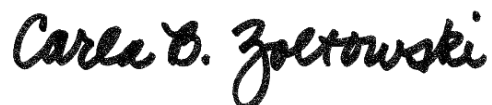
**ENGR 47921 – Senior Design Participation in Vertically Integrated Projects (VIP) I**  
Terms offered Fall, Spring, Lecture 1, Lab 1, cr. 2.

**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. Typically offered Fall Spring.

**Reason:** To broaden the participation of students, faculty, and teams from across engineering and across campus. Currently, the only permanent VIP course numbers are ECE course numbers (ECE 27900, ECE 37900, and ECE 47900). In addition, a unique course number is needed when VIP is being used to satisfy the first semester of the Senior Design/Capstone requirements.

Signature



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

**Required Text(s):** iClicker

**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<sup>1</sup> 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 have one common lecture hour each week which will address topics that include design, research, documentation and technical writing, communication, leadership and teamwork, ethics, project management, and intellectual property.

---

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

**Lab Outline:**

<b>Week</b>	<b>Major course milestones</b>
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