WASHINGTON STATE UNIVERSITY
School of
Electrical Engineering and Computer Science
VOILAND COLLEGE OF ENGINEERING AND ARCHITECTURE

DATE: July 8, 2026
TO: Prospective Senior Design Non-power Project Sponsors
FROM: Patrick Pedrow, Associate Professor (pedrow@wsu.edu)
REGARDING: Senior Design Projects for WSU School of EECS

With the 2026 fall semester approaching (starts Monday August 24, 2026) I am in need of senior design projects, and it is my hope you can provide one. This memo relates to **non-power projects** for computer engineering students **and** for electrical engineering students **not on the power track**. In a Q/A format, here are details:

1. **Q**: What is the macroscopic time frame for these projects? **A**: They start in August 2026 and end in May 2027.
2. **Q**: Is a budget required? **A**: In most cases, no formal budget or contract is required. The sponsoring company informally agrees to provide a practicing engineer or scientist as the team's mentor and provide supplies such as software licenses (if needed), microcontrollers, and printed circuit board (PCB) charges, when approved by the team's industry mentor.
3. **Q**: How much time is required from the mentoring engineer? **A**: Typically, the mentor videoconferences with the team for about an hour each week or every other week. Many team questions are answered via short emails.
4. **Q**: What are the key features of an engineering senior design project? **A**: The team is asked to **design** an engineering system that satisfies real-world engineering needs. These are not research projects, not testing projects, and not engineering studies; however, research, testing, and studies are integral activities in the iterative design algorithm. Ideally, the project is not over-specified by the sponsor so that the team is allowed to apply their iterative design skills to develop target technical specifications before they invoke concept generation, concept selection, prototype construction, validation, and testing.
5. **Q**: How can I submit a project? **A**: Write a one- or two-page abstract that describes the project – see the sample in the Appendix. Send the abstract to the instructor Patrick Pedrow (pedrow@wsu.edu). Sponsors are welcome to use their own template to describe their project; however, the phrase "the team will design a system" should dominate over phrases like "the team will conduct an engineering study" or "the team will evaluate field data already collected". If possible, the abstract will describe engineering tools that the team will learn and utilize if they join your design team. Here is a list of words and acronyms some students will recognize from EECS courses: FPGA, ASIC, VHDL, Python, Simulink, UAV, MATLAB, ADS, Cadence, OrCAD, LTspice, Arduino, printed circuit boards, RISC-V systems, Verilog, UART, GPIO, Memory Controllers, Ultrasound sensors and systems, etc.
6. **Q**: What is the deadline for submitting the abstract? **A**: Ideally, on or before July 27 a sponsor will ask the instructor to reserve a team for them and then the first version of the sponsor's abstract will be sent via email to the instructor on or before August 7; that gives the sponsor and instructor sufficient time to resolve residual questions regarding the project.
7. **Q**: How can I obtain answers to additional questions? **A**: Contact the instructor Patrick Pedrow (pedrow@wsu.edu).
8. **Q**: How many non-power teams are expected for this cycle of senior design? **A**: About seven non-power teams with about 4 students per team will be required to meet expected enrollment. This is a substantial increase over previous years.

Mentored senior design projects are synergistic activities for the sponsoring company to meet soon-to-graduate engineering students and for these students to learn about the sponsoring company and participate in modern engineering practices. Thanks for considering this opportunity.

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APPENDIX: Sample Abstract

Title:
Real-Time Meter Test System

Sponsor:
Schweitzer Engineering Laboratories; Pullman, WA

Problem Statement:
SEL meters accept high voltage signals. For functionally testing meters during development, a low voltage input is available on the mainboard. SEL uses an in-house device to generate these low voltage signals. However, for parallel testing of multiple meters simultaneously, a smaller and less inexpensive test generator is needed.

PROJECT DESCRIPTION

The team will develop a system that generates high-speed, real-time, low voltage test signals for SEL use to functionally test meter products. The system will consist of an Arduino-based Teensy 4.1 microprocessor board and a 16-bit 100Ksps multichannel analog to digital converter (ADC). The Teensy board will connect via 10/100 Ethernet to a main computer.

The test system consists of three subsystems:

1. Interface and driver between Teensy and ADC. This will be real-time code written in C++. This subsystem will need to be working early in the development process but then will likely need little further work.
2. Signal generator firmware on the Teensy. This will be real-time code written in C++.
3. Web browser on a desktop computer for configuration and monitoring. This will be front-end Javascript code.

The test system must be able to configure, generate, and monitor the following real-time streaming signals.

1. Pure sinusoidal wave at varying amplitude and frequency.
2. Signal consisting of multiple harmonics of configurable amplitude and phase relationships.
3. Impulse signals of configurable duration and amplitude.
4. Square waves of varying amplitude and frequency.
5. Arbitrary signal loaded from a .csv file through the browser and downloaded to the Teensy.

The system must be configurable to be able to run tests (generate signals) as follows:

1. Single, fixed duration.
2. Configurable multiple tests in configurable order.
3. Looping and repeating tests.

The team will test the system as follows:

1. With an oscilloscope.
2. The Teensy will stream the data it is sending to the ADC, using Ethernet, back to the web browser for cached display.

Equipment:

1. SEL will provide two Teensy 4.1 processors, two ADC daughter cards, two Teensy Ethernet kits, and breadboards (these devices are slightly static sensitive and SEL can provide advice on how to handle).
2. SEL will not be able to provide an oscilloscope.

Skills:

The team will learn about real-time embedded systems, web development, and low-level real-time hardware interfaces. These multi-discipline skills are very important in today's world of embedded devices that exist in everything from airplanes to automobiles, robotics, and real-time control systems.

SEL Contacts: Greg Zweigle (greg_zweigle@selinc.com), Arif Khan (arif_khan@selinc.com), and Drew Cannon (drew_cannon@selinc.com)