

1. Definition and How CPCA can be involved

A capstone project takes place in the final year in a college program and is a course where students apply the skills and knowledge they have acquired during their previous courses through a project. A capstone project usually includes designing and building a small prototype, system or unit. It is called a capstone because it represents a crowning achievement as a capstone does in architecture. Due to significant emphasis on applied training by the government, all colleges are looking at adding capstone course to their programs.

A capstone course is supposed to strengthen two types of skills

- a) Technical Skills
- b) Soft Skills: This includes creative thinking, team work, communication and problem solving.
- c) Project Based Skills: This includes the following items:
 - Proposal Preparation
 - Ethics
 - Project Management
 - Financial Management
 - Contracts and Reporting
 - Intellectual Property
 - Report Preparation and Presentation

In order to provide real-life experiences for students, all Colleges, including Lambton, are very interested in partnering with CPCA members who have projects within their organizations that can be used for capstones. These projects should be simple, provide low risk for the company and can be complete out over a semester. A few examples:

- Demo units for exhibitions
- Test platforms for evaluating new instrumentation and control devices
- A small control system unit for a bigger project

The benefits of participating in capstone projects for industry include:

1. Access to personnel to carry out projects they are not able to dedicate resources towards to complete
2. Work with students one on one providing an opportunity to vet potential hires
3. Try new ideas and concepts in a low risk environment
4. An opportunity to choose a scholarship recipient based on project results

Companies interested in collaborating on a capstone project need to submit a short description of a project to CPCA.

2. Project Examples from Lambton College's Instrumentation and Control Engineering Program

These projects were executed last year. Please note that all projects were designed by the faculty and no industry was involved. The hope is to bring more industrial projects to the College.

Project 1: Smart Residential Duct Inspection Robot

Features

- Smart - smart phone controlled; safe self-driving
- Residential Duct Inspection - wide angle High Quality Visual images
- Low-Cost

Deliverables

Smart Car

- Self-Driving
- Automatic Picture Shooting
- Smart Communication (HTTP interface and picture transfer through SFTP Server)

Project 2: Installation and Commissioning of Wireless HART Transmitter and Receiver

Objective

This project is to change a traditional field device communication method to wireless by adding a wireless THUM adaptor. A temperature and pressure transmitter will be included in this configuration. We will see the live status data of the transmitter wirelessly from a computer.

Deliverables

- Wiring diagram of the device connection
- Wireless gateway setting and network configuration
- Project power point for the presentation
- This project can potentially be used in a distillation lab to monitor the steam pressure and temperature (needs to be approved by supervisor)
- Wireless HART knowledge to the reader and audience