

NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY INS 233 – PROCESS CONTROL INTEGRATION (4 CR.)

Course Description

Presents computer automation including PLCs, SCADA, and PC-based systems to control processes. Topics such as PLC control and computer data acquisition are introduced where students will use existing systems or build systems and control these systems with PLCs and computer data acquisition systems. Assesses students through test and project evaluations and the course will be assessed by graduate feedback. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

General Course Purpose

The goal in this course is to provide students with practical experience in building small systems. Students will build HMIs using RSVIEW and apply control systems in flow, pressure, and other relevant systems.

Course Prerequisites/Corequisites

Prerequisites: INS 230 and ELE 233.

Course Objectives

Upon completing the course, the student will be able to:

- a) Use appropriate verbal and non-verbal responses in interpersonal relations, discussion, and group projects.
- b) Use listening skills for interpretation of tasks given.
- c) Determine the nature and extent of the information needed so that control can be accomplished through the HMI.
- d) Weigh evidence and determine if generalizations or conclusions based on given data are warranted or if more research is needed.
- e) Use problem solving skills to advance a project from the drawing board to a working system.
- f) Recognize the interdependence of distinctive world-wide social, economic, geo-political, and cultural systems related to energy subjects.
- g) Determine the nature and extent of information needed and to build a system to control a process.
- h) Access needed information effectively to accomplish a project.
- i) Evaluate and use information effectively, individually or as a group, to construct a project.
- j) Use logical and mathematical reasoning within the context of various disciplines to control the level in a tank.
- k) Interpret and use mathematical formulas to calculate the tank level and other critical calculations.
- l) Use graphical, symbolic, and numerical methods to analyze, organize, and interpret data, such as P & IDs.
- m) Distinguish between causal and correlational relationships between processes.
- n) Recognize methods of inquiry that lead to scientific knowledge for completion of projects.
- o) Build PLC Systems with HMIs including flow control, temperature control, pressure control, and level control.
- p) Integrate controls using SCADA, Fieldbus and HART.

Major Topics to be Included

- a) PLC Systems
- b) Building HMIs
- c) Building SCADA Systems
- d) Fieldbus and HART Networks
- e) Integration of Systems