

Minnesota State College Southeast

ELEC 1330: Introduction to Instrumentation & Control

A. COURSE DESCRIPTION

Credits: 2

Lecture Hours/Week: 1

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course is an introduction to sensing, instrumentation and control using National Instruments hardware and software (such as MultiSim, LabView, and the MyDAQ). Pre-built applets will be used to input and output data from digital and analog interfaces, make logical decisions based upon input, and data processing. Devices interfacing with this tool may include, but are not limited to photo-electric sensors, servos, and LEDs. Upon completion, students should have a cursory understanding of how National Instruments hardware and software tools can be used for data acquisition, control, and instrumentation environments. (Prerequisite: none) (2 credits: 1 lecture/1 lab)

B. COURSE EFFECTIVE DATES: 12/15/2015 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Introduction to National Instruments LabView
2. Data acquisition, logic processing, and configuration of National Instruments hardware & software
3. Analog and digital interfacing
4. Loading, configuration, and operation of LabView virtual interfaces
5. Utilize 3rd party applications, such as Excel, to create, format and edit cells for data acquisition
6. Import data from National Instrument hardware & software into spreadsheets and display in graphical form
7. Format acquired data using 3rd party application, such as Excel, for organizational and cataloging purposes (including margins, headers, etc.)
8. Gain an understanding of National Instrumentals and computer data acquisition vocabulary

D. LEARNING OUTCOMES (General)

1. Describe National Instruments LabView & MultiSim
2. Introduction to visual programming language and properties
3. Review of output devices
4. Review of input devices
5. Introduction to National Instruments hardware
6. Implementation of physical instrumentation tools
7. Implementation of virtual instrumentation tools
8. How to read data with LabView
9. How to output signals with LabView
10. Editing simple input reading programs in LabView
11. Editing simple output programs in LabView
12. Perform signal monitoring in LabView and output a response during a specific condition
13. Explain and execute closed loop control using National Instruments tools

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

This course was previously called Computers for Technicians.