Springfield Technical Community College

ACADEMIC AFFAIRS

Course Number: ESET-371   Department: ESET.AS

Course Title: Sensors & Data Acquisition   Semester: Fall   Year: 2008

Objectives/Competencies

Course Objective	Competencies
1. Understand the basic principles of modern sensors used to measure fundamental physical parameters.	a. Be able to work with various transducers (electrical, optical, mechanical, etc.) typically used in data acquisition applications. b. Understand transducer, driver and interface circuits used in data acquisition systems.
2. Understand data acquisition, components and associated circuitry including Op-Amp "building-block" type sub-systems.	a. Understand the practical limitations of measurement circuits. b. Understand common analog to digital conversion techniques (ADC). c. Understand common digital to analog conversion techniques (DAC). d. Understand relationships between sample rate, sample size and bit rate. e. Understand Nyquist Criteria sampling theorem. f. Use simulation software (Electronic WorkBench or MultiSim) to design and test prototypical interface circuits.

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	g. Be knowledgeable about the basic Op-Amp based building block circuits: adders, gain blocks, filters, etc.
2. Develop proficiency with modern automated test equipment and PC interfacing in data acquisition and instrumentation control applications.	a. Select appropriate equipment for a particular task. b. Configure and install data acquisition hardware and software c. Install correct drivers for proper operation of hardware, operating system and application software. d. Understand calibration techniques and reference measurements. e. Import/Export data to mainstream PC applications. f. Display and graph collected data using MS Excel.
3. Familiarity with PIC micro-controller and smart sensor technology.	a. Understand micro-controller applications to remote testing and smart sensors. b. Use PIC micro-controller for digital and analog data acquisition applications. c. Design interface circuitry for PIC micro-processor input/output.
4. Develop proficiency with LabView Software	a. Demonstrate the ability to develop and run basic LabView Virtual Instruments