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<b>Course Prefix/No.:</b>	<b>EEM 271</b>
<b>Course Title:</b>	<b>Sensors and System Interfacing</b>
<b>Lecture Hours/Week:</b>	<b>1.0</b>
<b>Lab Hours/Week:</b>	<b>3.0</b>
<b>Credit Hours/Semester:</b>	<b>2.0</b>

[Distance Learning Attendance/VA Statement](#)  
[Textbook Information](#)

### **COURSE DESCRIPTION**

This course includes an introduction to various types of sensors and how they interface with computers and programmable logic controllers. Emphasis is placed in interfacing the computer or controller with machines to accomplish a task.

### **COURSE COMPETENCIES**

Upon successful completion of this course, the student should be able to:

#### **Module 1 – Investigate Sensor Devices**

- Examine the following sensors:
  - Temperature sensors
  - Pressure sensors
  - Flow sensors
  - Level Sensors
  - Limit switch
  - Inductive proximity switch
  - Capacitive proximity switch
  - Photo-electric switch
  - Fiber optic Photo-electric sensors

#### **Module 2 – Wiring Sensors**

- Correctly wire and verify the following sensors:
  - Temperature sensors
  - Pressure sensors
  - Flow sensors
  - Level Sensors
  - Limit switch
  - Inductive proximity switch
  - Capacitive proximity switch
  - Photo-electric switch
  - Fiber optic Photo-electric sensors

#### **Module 3 – Interfacing Sensors with a Programmable Logic Controller**

- Correctly wire 120 VAC digital sensors as isolated digital inputs
- Correctly wire low-voltage digital sensors as sinking or sourcing inputs
- Correctly wire analog sensors to analog input modules on the programmable logic controller.
- Program a programmable logic controller to include the use of the following sensors:
  - Temperature sensors
  - Pressure sensors
  - Flow sensors
  - Level Sensors
  - Limit switch
  - Inductive proximity switch
  - Capacitive proximity switch
  - Photo-electric switch
  - Fiber optic Photo-electric sensors

## Module 4 – Interfacing sensors with a Robotic Controller/Computer

- Correctly wire 120 VAC digital sensors as isolated digital inputs
- Correctly wire low-voltage digital sensors as sinking or sourcing inputs
- Correctly wire analog sensors to analog inputs on robotic controller (where applicable).
- Program a robotic controller/computer to include the use of the following sensors:
  - Temperature sensors
  - Pressure sensors
  - Flow sensors
  - Level Sensors
  - Limit switch
  - Inductive proximity switch
  - Capacitive proximity switch
  - Photo-electric switch
  - Fiber optic Photo-electric sensors

### MINIMAL STANDARDS

Assignments and attendance must be completed as designated in “Evaluation Strategies/Grading.” Criteria for minimal acceptable performance will be provided by the instructor.

### REQUIREMENTS

#### Attendance Policy

The college attendance policy, stated in the college handbook, will be honored. The instructor will provide specific requirements for the course.

#### Academic Honesty

Students are expected to adhere to the college policy regarding student conduct as stated in the college handbook.

#### Assignments

Students are expected to complete all assignments and any supplementary exercises designated by the instructor.

### EVALUATION STRATEGIES/GRADING

Successful completion of the course requires the completion of each module with an average of 70 points. Grades will be calculated from work attitude, all tests/projects, homework assignments, and laboratory assignments.

#### Grading Scale

A = 90.0 – 100  
B = 80.0 – 89.9  
C = 70.0 – 79.9  
D = 60.0 – 69.9  
F = 00.0 – 59.9

#### Evaluation Method

Tests/Projects (minimum of four total)	50% of each module
Lab Work	25% of each Module
Work Attitude	25% of each Module

Work Attitude is defined as:

- Participation
- Cooperation
- Appearance
- Effort
- Safety
- Responsibility
- Professionalism
- Attendance
- Self Motivation
- Works Independently

### **ENTRY LEVEL SKILLS**

The student must be able to demonstrate a basic understanding of electricity and AC and DC motors and generators.

**PREREQUISITE:** EEM 117

**CO-REQUISITES:** None

**Disabilities Statement:** Any student who feels s/he may need an accommodation based on the impact of a disability should contact the Special Resources Offices (SR) at 803-327-8007 in the 300 area of Student Services. The SRO coordinates reasonable accommodations for students with documented disabilities.

Effective: 2009FA