ENGT 061: INDUSTRIAL SENSORS AND ADVANCED APPLICATIONS

Originator
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Justification / Rationale
Labor market indicators show that there are jobs available and an advisory committee recommends the course

Effective Term
Fall 2019

Credit Status
Credit - Degree Applicable

Subject
ENGT - Engineering Technology

Course Number
061

Full Course Title
Industrial Sensors and Advanced Applications

Short Title
INDUSTR SENSORS ADV APPL

Discipline

Disciplines List
Engineering Technology

Modality
Face-to-Face

Catalog Description
Course includes topics related to basic process instrumentation and control. A brief review of industrial electronics is expanded upon to develop more advanced process instrumentation and control concepts. Topics include advanced applications of components used in both DC and AC motor control, recorders, control valves and actuators, temperature sensors, pressure sensors, level sensors, flow sensors and instrumentation maintenance techniques.

Schedule Description
Course includes topics related to basic process instrumentation and control. A brief review of industrial electronics is expanded upon to develop more advanced process instrumentation and control concepts.
Prerequisite: ENGT 060

Lecture Units
2

Lecture Semester Hours
36

Lab Units
0

In-class Hours
36

Out-of-class Hours
72

Total Course Units
2
Total Semester Hours
108

Prerequisite Course(s)
ENGT 060

Required Text and Other Instructional Materials

Resource Type
Web/Other

Description
Various web based resources will be used

Class Size Maximum
30

Entrance Skills
Troubleshoot devices

Prerequisite Course Objectives
ENGT 060-Troubleshoot industrial control devices

Entrance Skills
Basic functions of digital devices

Prerequisite Course Objectives
ENGT 060-Understand the basic function of FETs
ENGT 060-Understand the basic functions of an operational amplifier
ENGT 060-Understand the basic function of Silicon Controlled Rectifiers

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Course Content

1. Direct Current (DC) review
2. Alternating Current (AC) review
3. Electronic circuits in instrumentation
4. Electronic test equipment
5. Basic digital logic
6. Process-control principles
7. Servomechanisms
8. Control stability
9. Steady-state regulation
10. Transient regulation
11. Signal-level and bias changes
12. Impedance matching
13. Operational amplifiers in instrumentation systems
14. Digital-to-analog converters
15. Analog-to-digital converters
16. Data-acquisition
17. Resistance-temperature detectors
18. Thermistor characteristics
19. Thermocouple sensors
20. Strain sensors
21. Motion sensors

22. Pressure sensors
23. Flow sensors
24. Actuators
25. Mechanical and electrical control elements
26. Control system parameters
27. Discontinuous controller modes (TPM, MM, FCM)
28. Continuous controller modes (PCM, ICM, DCM)
29. Composite control modes (PI, PD, PID)
30. Control-loop characteristics (Obj)

Course Objectives

	Objectives
Objective 1	Describe a variety of electronic sensors and their applications.
Objective 2	Discuss analog-to-digital and digital-to-analog conversion.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Compare and Contrast sensors.
Outcome 2	Explain and utilize analog-to-digital and digital-to-analog converters.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Discussion	Students will discuss the material during lecture and lab.
Lecture	Lecture will provide a theoretical introduction and explanation of the material being covered.
Participation	Students will be asked questions during lecture and lab.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Mid-term and final evaluations	Students will be tested through Canvas to determine their understanding of the material.	In Class Only
Student participation/contribution	Students will be evaluated by their participation in both lecture and lab.	In Class Only
Tests/Quizzes/Examinations	Quizzes and Exams will include multiple choice questions.	In Class Only
Written homework	Homework will be assigned via Canvas and some questions will require a short answer written response.	Out of Class Only

Assignments

Other In-class Assignments

1. Take notes
2. Quizzes
3. Exams
4. Discussion

Other Out-of-class Assignments

1. Reading assignments
2. Writing assignments

Grade Methods

Letter Grade Only

MIS Course Data

CIP Code
15.0000 - Engineering Technology, General.

TOP Code
092400 - Engineering Technology, General

SAM Code
B - Advanced Occupational

Basic Skills Status
Not Basic Skills

Prior College Level
Not applicable

Cooperative Work Experience
Not a Coop Course

Course Classification Status
Credit Course

Approved Special Class
Not special class

Noncredit Category
Not Applicable, Credit Course

Funding Agency Category
Not Applicable

Program Status
Not program-applicable

Transfer Status
Transferable to CSU only

Allow Audit
No

Repeatability
No

Materials Fee
No

Additional Fees?
No

Files Uploaded

Attach relevant documents (example: Advisory Committee or Department Minutes)
EngrTech Advisory 02-27-18 Minutes and Handouts.pdf

Approvals

Curriculum Committee Approval Date
11/09/2018

Academic Senate Approval Date
11/29/2018

Board of Trustees Approval Date
12/14/2018

Chancellor's Office Approval Date
3/20/2019

Course Control Number
CCC000603623

Programs referencing this course
Engineering Technology AS Degree (http://catalog.collegeofthedesert.eduundefined?key=209)