

ENGT 009: INTRODUCTION TO ROBOTICS

Originator

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Justification / Rationale

Labor market indicators show that there are jobs available and an advisory committee recommended the course.

Effective Term

Fall 2019

Credit Status

Credit - Degree Applicable

Subject

ENGT - Engineering Technology

Course Number

009

Full Course Title

Introduction to Robotics

Short Title

INTRO TO ROBOTICS

Discipline**Disciplines List**

Engineering Technology

Modality

Face-to-Face

Catalog Description

This course is an introduction to robotics. The history of robots along with the components that constitute a robot will be covered. Students will learn to manipulate the basic building blocks of a robot by programming a microcontroller and interfacing with basic circuits, sensors and motors.

Schedule Description

This course is an introduction to robotics.

Lecture Units

1

Lecture Semester Hours

18

Lab Units

1

Lab Semester Hours

54

In-class Hours

72

Out-of-class Hours

36

Total Course Units

2

Total Semester Hours

108

Required Text and Other Instructional Materials**Resource Type**

Web/Other

Description

Tutorials from arduino.cc, adafruit.com and other websites will be used.

Class Size Maximum

30

Course Content

1. History of robotics
2. Robots and their use
 - a. Manufacturing
 - b. Safety
 - c. Military
 - d. Medicine
 - e. Hobby
3. How robots speak
 - a. Bits to Bytes, Words
 - b. Decimal to binary
4. Programming, types of microcontrollers
 - a. Arduino, Raspberry Pi, Beagle Board, Basic Stamp
5. Making Robots Move
 - a. Motors
 - b. Actuators
 - c. Servos
6. Sensors
 - a. Temperature
 - b. Light
 - c. Sound
 - d. Humidity
 - e. Pressure

Lab Content

1. Introduction
 - a. Serial communication printout of "Hello World"
2. Working with LEDs
 - a. Display various blinking lights patterns
3. Working with motors
 - a. How to power motors with motor drivers
 - b. Spin motors, spin motors in different directions and at various speeds
4. Read from a sensor input
 - a. Digital
 - b. Analog
5. Move a motor depending on sensor input

Course Objectives

	Objectives
Objective 1	Describe the history of robotics.
Objective 2	Describe at least three uses of robots.

Objective 3 Use a microcontroller to detect sensor changes from environmental changes, such as temperature, humidity, light intensity.

Objective 4 Make a motor spin using a microcontroller.

Student Learning Outcomes

Upon satisfactory completion of this course, students will be able to:

Outcome 1 Write programs for a microcontroller.

Outcome 2 Interface a microcontroller to electronic sensors.

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.
Laboratory	Laboratory will be used to gain a hands-on understanding of the material presented in lecture.
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
Group activity participation/observation	During lab students will work in teams to perform and solve the lab report.	In Class Only
Laboratory projects	During Lab students will be expected to discuss with their classmates the purpose of the lab and their findings. Laboratory projects and findings will be evaluated to gain a better understanding for the students' comprehension of the material.	In and Out of Class
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 written answer.	Out of Class Only

Assignments

Other In-class Assignments

1. Take notes
2. Quizzes
3. Exams
4. Lab Work

Other Out-of-class Assignments

1. Reading Assignments
2. Written/Online homework
3. Lab writeups

Grade Methods

Letter Grade Only

MIS Course Data

CIP Code

15.0000 - Engineering Technology, General.

TOP Code

092400 - Engineering Technology, General

SAM Code

C - Clearly 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

Not transferable

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

ENGT 009 Approval Letter.pdf

Approvals

Curriculum Committee Approval Date

10/18/2018

Academic Senate Approval Date

10/25/2018

Board of Trustees Approval Date

11/14/2018

Chancellor's Office Approval Date

11/22/2018

Course Control Number

CCC000598706

Programs referencing this courseEngineering Technology AS Degree (<http://catalog.collegeofthedesert.eduundefined?key=209>)Electronics Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=210>)Robotics Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=211>)Industrial Automation Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=212>)