Syllabus

ESC 240 Engineering Design

General Information

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Department
Science and Technology

Course Prefix
ESC

Course Number
240

Course Title
Engineering Design

Course Information

Credit Hours
3

Lecture Contact Hours
2

Lab Contact Hours
3

Catalog Description
An introductory course in engineering design where student teams are guided through a comprehensive engineering design-build project. In this course, students will learn about programming microcontrollers, using machine tools, fabricating mechanisms, designing circuit boards, and selecting engineering materials. Teamwork, problem solving, prototype testing, and troubleshooting are skills that are emphasized throughout the course.

Key Assessment
This course contains a Key Assessment for the AS Engineering Science program

Prerequisites
MAT 272
Co-requisites
None

Grading Scheme
Letter

First Year Experience/Capstone Designation

This course is designated as satisfying the outcomes applicable for status as a Capstone Course

SUNY General Education

This course is designated as satisfying a requirement in the following SUNY Gen Ed category
None

FLCC Values

Institutional Learning Outcomes Addressed by the Course

Vitality
Inquiry
Perseverance
Interconnectedness

Course Learning Outcomes

Course Learning Outcomes

1. Design and construct a prototype within given parameters.

2. Test and troubleshoot the operation of the prototype and make improvements.

3. Communicate a completed design project to peers.

4. Reflect and evaluate their individual design process, including cost and environmental impact.

Outline of Topics Covered

I. Fundamentals of engineering design

II. Use of machine tools

III. Material identification
IV. Troubleshooting
V. Position sensors
VI. Sensor housing
VII. Sensor circuit
VIII. Circuit board design
IX. Microcontroller
X. Microcontroller circuit
XI. Microcontroller programming
XII. Control programs
XIII. Linkage and chassis design
XIV. Servo motors
XV. Servo motor control
XVI. Drive system design
XVII. DC Motors
XVIII. Motor mounts, adapters
XIX. DC Motor control
XX. Assembly, battery mounts, switches