Syllabus

ESC 240 Engineering Design

General Information

Date

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Author

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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