

# ENGINEERING TECHNOLOGY (ENG)

## ENG 118 Introduction to Engineering Technology and Lab

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

This course is an introduction to engineering technology that gives an overview of the profession and explores typical duties and workplace environments for technicians, technologists, and engineers today and in the future. Students use mathematics and critical thinking skills related to various fields of engineering. The Microsoft Office Suite of products is used for generating reports and presentations.

## ENG 210 Introduction to Programmable Automation Controllers & Lab

3 Class Hours, 4 Lab Hours, 5 Quarter Credit Hours

Prerequisites: (ELY 212 and ELY 213) or ERD 242

This course is an introduction to the programmable automation controller (PAC) and automation systems. Using the Allen-Bradley CompactLogix PAC and Studio 5000 software, students learn the tag-based structure common in today's PACs, ladder logic fundamentals and programming techniques using series and parallel elements. Relay instructions, timers, counters, comparisons, and subroutines are introduced. Students will create and download their programs into the CompactLogix training unit, debug the programs, and verify the correct operation. Students will also practice the practical wiring of input and output devices and general installation of PLCs

## ENG 259 Commercial Drone / UAV Certification

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

This course covers the commercial use of and the training required to become a commercial drone pilot. The course will also include the following: completion of flying a mission on a simulator; completion of flying a mission on a real drone; and assessing, compiling and presenting the data obtained from the real drone mission. Upon completion of this course, students who meet FAA standards, are eligible to sit for the Federal Aviation Administration (FAA) Section 107 Commercial Small Unmanned Aerial System (sUAS) exam for pilot certification at an approved FAA testing facility.

## ENG 263 Commercial Utilization of Drones / UAVs

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

This course covers the commercial use of drones to collect information for commercial applications. Students will team up to create small companies (3 or 4) and utilizing photogrammetry and cloud-based post processing solutions, that will create the required deliverables to a mock client. The use of insurance, mission creation, flight clearance apps will be learned as well as contracts, weather limitations, and various measurement tools.

## ENG 281 Engineering Internship

20 Lab Hours, 4 Quarter Credit Hours

Students will have the opportunity to integrate career-related experience into the undergraduate A.S. program by participating in planned, supervised employment in a related field. This will contribute to the student's personal and professional growth in an Electrical/Mechanical/Welding Engineering Technology field and provide invaluable career awareness for students. The internship will also complement what has been learned in the classroom. The internship will include a reflection or evaluation by students at the completion of the internship. This internship requires a minimum of 20 hours per week.

## ENG 283 Capstone Project

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Students will utilize all their previous electronic knowledge to develop, test, document and present an electronic project. The process will mimic the procedure of a technician working as part of a team in a company's Research and Design department. Based around the learning of the concepts of Printed Circuit Board (PCB) layout, students will select or be given an electronic project. They will then layout the PCB, have it created by a PCB maker, create the necessary project documentation, cost analysis, Gantt Chart scheduling and finally the fabricating and testing of the electronic PCB project. The course will culminate in a PowerPoint presentation of the work to the NEIT Faculty, their family and/or friends.

## ENG 289 Drone/UAV Engineering

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: ERD 111 and MA 210

Corequisites: ENG 263

This course covers the engineering that goes into a drone/UAV/rover. The students will select a path to design and build a commercial use (Videography, Autonomous or Data Acquisition) Remotely Operated Vehicle/ROV. Topics will include drone aerodynamics, brushless motors, electronic speed controllers, transmitters, telemetry, gimbals, flight controllers, RF downlinks, FPV, ground stations and GPS. The final exam for the course will consist of a successful team build and operation of an autonomous drone and rover combined mission to solve a realworld problem.

## ENG 400 Microsoft Applications for Engineers

3 Class Hours, 3 Quarter Credit Hours

Corequisites: ENG 489

Engineers must be fluent in computer applications used to plan and analyze engineering projects. In this course, students will learn the necessary skills to use spreadsheets, project management applications and databases in their engineering projects, starting with their Senior Capstone projects. Students will use spreadsheets for common engineering calculations and graphical data representation. In the project management application, students will create schedules (Gantt charts) and budgets and plan their Senior Capstone project. Students will also be exposed to databases and how they can be used for sharing of data between applications, and for analysis and report.

## ENG 481 Senior Engineering Internship

20 Lab Hours, 4 Quarter Credit Hours

Students will have the opportunity to integrate career-related experience into the undergraduate program by participating in planned, supervised employment in a related field. This will contribute to the student's personal and professional growth in an Electrical/Mechanical Engineering Technology field and provide invaluable career awareness for students. The internship will also complement what has been learned in the classroom. The internship will include a reflection or evaluation by students at the completion of the internship. This internship requires a minimum of 20 hours per week.

## ENG 489 Introduction to Senior Capstone

2 Class Hours, 2 Quarter Credit Hours

Prerequisites: (ELT 463 or MCT 424)

This course results in the definition of the Senior Project. The senior project proposal is written and presented at this time. The proposal completely describes the technical content of the senior project, including theory of operation, what is being delivered, a schedule, specification, parts list, system block diagram, schematics, graphs and flow charts.

**ENG 499 Senior Capstone**

4 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: ENG 489

This course gives each student the opportunity to design, fabricate, test troubleshoot, and document a project of their choice. This is primarily a lab course where students are expected to use all their skills to demonstrate their technical abilities learned in the bachelor's program. Students will have the opportunity to communicate progress on the senior project in both oral and written reports. This experience simulates the work environment by requiring students to follow a plan, meet the technical specification for their deliverable, and produce a working system on time. In a final session, all projects are presented and demonstrated to the class and faculty.