

ENGINEERING DESIGN TECHNOLOGY (ENGT)

ENGT 100 **3.0 UNITS**
Soft Skills for Manufacturing, Technology and Engineering Professionals
 Class Hours: 3.0 Lecture
 Total Contact Hours: 54 Lecture

This class introduces students to the major soft skills needed for job success in engineering, technology and manufacturing workplace. Here we provide information that will prepare students to find and more importantly to keep a job in today's fast changing engineering, technology and manufacturing fields. A variety of topics such as professionalism, ethics, self management, team followership and leadership skills, etiquette, attire, workplace communication skills, proper use of technology at workplace, safety at workplace, respect for diversity, self confidence and self presentation, job seeking and interviewing skills, resume building, negotiations techniques, proper and improper behaviors, use of the basic office resources, basic shop floor measurements, and similar topics, are reviewed and practiced through the course.
 Transfer Credit: CSU

ENGT 102 **2.0 UNITS**
Arduino for Internet of Things (IoT) and Embedded Systems Design
 Class Hours: 1.0 Lecture / 3.0 Laboratory
 Total Contact Hours: 18 Lecture / 54 Laboratory

This course provides introduction to embedded systems and internet of things (IoT) device design for the engineering design technologist. Students learn basics of design of embedded systems and IoT devices using the Arduino development platform.
 Transfer Credit: CSU

ENGT 103 **3.0 UNITS**
Introduction to Engineering Design Using Inventor
 Class Hours: 2.0 Lecture / 3.0 Laboratory
 Total Contact Hours: 36 Lecture / 54 Laboratory

This course introduces the student to the design process in engineering technology by the use of activities-based learning, project-based learning, and problem-based learning. The student will learn about the design process, geometric relationships, visualization, technical sketching, modeling, model documentation, and assemblies.
 Transfer Credit: CSU

ENGT 104 **4.0 UNITS**
Principles of Aerospace Design Technology
 Class Hours: 3.0 Lecture / 3.0 Laboratory
 Total Contact Hours: 54 Lecture / 54 Laboratory

In this class, students will explore the world of aeronautics, astronautics, flight and aerospace engineering design technology. The class explores the evolution of flight, flight fundamentals, navigation, control, aerospace materials, propulsion, space travel, orbital mechanics, ergonomics, remotely operated systems, and related subjects. Students will use 3D design software to help design related solutions of typical aerospace technology problems. Students will design models of aerospace components, systems, gliders, airplanes, rocket models, and autonomous flight vehicles.
 Transfer Credit: CSU

ENGT 105 **2.0 UNITS**
Product Design, Development, and Prototype Fabrication
 Class Hours: 1.0 Lecture / 4.0 Laboratory
 Total Contact Hours: 18 Lecture / 72 Laboratory

Prerequisite: ENGT 103 or ENGT 138 or ENGT 259 and ET 102 or NPD 104 or NPD 105 or equivalent with grades of "C" or higher or "Pass."
 This is a capstone course in the Engineering Design Technology program. In this course, students work in teams to design and develop an original solution to a valid open-ended technical problem by applying the engineering design process. Utilizing the activity-project-problem-based teaching and learning pedagogy, students will perform research to choose, validate, and justify a technical problem. After carefully defining the problem, students will design, build, and test their solution.
 Transfer Credit: CSU

ENGT 106 **4.0 UNITS**
Introduction to Drone Technology
 Class Hours: 3.0 Lecture / 3.0 Laboratory
 Total Contact Hours: 54 Lecture / 54 Laboratory

This course will provide the student with an introduction to drones or small unmanned aircraft systems (sUAS) engineering design and operations technology. The students will learn fundamentals of small unmanned aircraft systems design, fabrications and operations, and will be prepared to take written Federal Aviation Examination (FAA) exam for the privileges of exercising the Remote Pilot Certificate with a Small Unmanned Aircraft Systems (sUAS) rating.
 Transfer Credit: CSU

ENGT 111 **3.0 UNITS**
Plastics Technology
 Class Hours: 2.0 Lecture / 4.0 Laboratory
 Total Contact Hours: 36 Lecture / 72 Laboratory

This course provides knowledge of materials and processes used in the field of plastic manufacturing today. An overview of plastic technology and application of production processes, as well as fabrication methods are covered. This course includes molding, forming, reinforced materials, bonding, laminating, and finishing techniques, and plastic materials identification. This course is not open to students enrolled in or who have previously taken PMT 100. (Formerly PMT 100)
 Transfer Credit: CSU

ENGT 116 **4.0 UNITS**
Blueprint Reading and Production
 Class Hours: 3.0 Lecture / 3.0 Laboratory
 Total Contact Hours: 54 Lecture / 54 Laboratory

Recommendation: ENGT 131 or equivalent with a grade of "C" or higher or "Pass" This course is a study of working drawings and blueprints used in engineering and manufacturing. Emphasis is placed on the ability to visualize and interpret typical drawings. Research is required regarding standards, specifications, procedures, bulletins, and techniques, which are a parallel part of the shop drawing system. It is intended to prepare the student for accurate interpretation of drawings in order to carry out the applications required or use them as appropriate engineering and manufacturing references.
 Transfer Credit: CSU

<p>ENGT 117 4.0 UNITS Geometrical Dimensioning and Tolerancing and Model Based Definition Class Hours: 3.0 Lecture / 3.0 Laboratory Total Contact Hours: 54 Lecture / 54 Laboratory</p> <p>Corequisite: ENGT 116 or equivalent with a grade of "C" or higher or "Pass" or prior completion This is a basic course in datums, modifiers, form tolerancing, positional tolerance, and coordinate tolerance conversion. It will introduce students to the state of the art in dimensioning and tolerancing used in industry. Transfer Credit: CSU</p>	<p>ENGT 138 4.0 UNITS Introduction to Engineering Design Using Autocad Class Hours: 3.0 Lecture / 3.0 Laboratory Total Contact Hours: 54 Lecture / 54 Laboratory</p> <p>Recommendation: ENGT 116 and ENGT 131 or equivalent with a grade of "C" or higher, or "Pass," or appropriate work experience. This course focuses on the introduction to engineering design using the AutoCAD software. It includes drawing preparation based on 2D sketches and 3D models. It will prepare students to operate the systems and understand the applications of computer graphics utilizing industry standards. Students will learn to use an interactive computer graphics system to prepare drawings on personal computers. Transfer Credit: CSU; UC</p>
<p>ENGT 131 3.0 UNITS Design Fundamentals Including 3D Modeling Class Hours: 2.0 Lecture / 4.0 Laboratory Total Contact Hours: 36 Lecture / 72 Laboratory</p> <p>Recommendation: ENGT 116 or equivalent with a grade of "C" or higher, or "Pass." This course stresses basic design fundamentals using solid modeling software for students who have had no high school or no industry experience in CAD design or CAD drafting. Geometry construction, solid modeling, isometric rendering, orthographic projection, dimensioning, single auxiliary views, sectioning, and solid modeling practices will be introduced. Students will be able to 3D print their solid models and modify their designs based on the feedback they get from the instructor and their peers. Transfer Credit: CSU</p>	<p>ENGT 139 4.0 UNITS Cloud based 3D modeling with Onshape Class Hours: 3.0 Lecture / 3.0 Laboratory Total Contact Hours: 54 Lecture / 54 Laboratory</p> <p>This course will provide students with an introduction to 3D modelling on a cloud using the latest version of Onshape cloud-based online CAD system. The topics covered includes sculpting and parametric 3D parts modelling, bottom up and top down assemblies; rendering and visualization, preparation for 3D printing, and cloud-based CAD project management. Transfer Credit: CSU</p>
<p>ENGT 133 2.0 UNITS Solidworks for Sheet Metal Design Class Hours: 1.0 Lecture / 3.0 Laboratory Total Contact Hours: 18 Lecture / 54 Laboratory</p> <p>Prerequisite: ENGT 103 or ENGT 138 or ENGT 259 or ENGT 265 or equivalent with a grade of "C" or higher or "Pass." This course will familiarize students with sheet metal layout using SolidWorks tools to develop, bend allowances for pattern development, and manufacturing processes for sheet metal. It will also include applications to pipe layout and welding assemblies. Transfer Credit: CSU</p>	<p>ENGT 153 3.0 UNITS Machine Design Applications Using Solid Modeling Class Hours: 3.0 Lecture / 4.0 Laboratory Total Contact Hours: 54 Lecture / 72 Laboratory</p> <p>Prerequisite: ENGT 103, 138, 259 or 265 or equivalent with a grade of Pass or "C" or higher. This course covers auxiliary projections, sections, dimensions, and threads and fasteners. This course will also cover working drawings of machine parts, including details and assemblies, basic gear, cam layout, and simple mechanisms. Transfer Credit: CSU</p>
<p>ENGT 137 4.0 UNITS Industrial Design and 3D Modelling in Fusion360 Class Hours: 3.0 Lecture / 3.0 Laboratory Total Contact Hours: 54 Lecture / 54 Laboratory</p> <p>This course will provide students with an introduction to 3D modelling of ornamental objects, parts and simple assemblies on a cloud using the latest version of AutoDesk Fusion 360. The topics covered includes sculpting and parametric 3d parts modelling, bottom up and top down assemblies; rendering and visualization, preparation for 3D printing, and cloud-based CAD project management. The course also covers basic principles of industrial design and rapid manufacturing. Transfer Credit: CSU</p>	<p>ENGT 209 3.0 UNITS Plastics Injection Molding I Class Hours: 2.0 Lecture / 4.0 Laboratory Total Contact Hours: 36 Lecture / 72 Laboratory</p> <p>This course introduces the student to the fundamentals of set-up and operation of injection molding equipment as found in industry. Training on actual industrial equipment as well as safe material and equipment handling is stressed. (Formerly PMT 159) Transfer Credit: CSU</p>
	<p>ENGT 237 3.0 UNITS Statics and Strength of Materials Using Simulation Class Hours: 2.0 Lecture / 4.0 Laboratory Total Contact Hours: 36 Lecture / 72 Laboratory</p> <p>This is a course in the fundamental principles of statics and strength of materials and their applications to the solutions of typical force systems and equilibrium problems. Applications are made in the fields of welded, machined, extruded, and molded parts. Transfer Credit: CSU</p>

<p>ENGT 250 Fiberglass and Vacuum Infusion Process Technology Class Hours: 2.0 Lecture / 4.0 Laboratory Total Contact Hours: 36 Lecture / 72 Laboratory</p>	<p>3.0 UNITS</p>	<p>ENGT 259 Solidworks Introduction Class Hours: 3.0 Lecture / 3.0 Laboratory Total Contact Hours: 54 Lecture / 54 Laboratory</p>	<p>4.0 UNITS</p>
<p>This course is designed for individuals in the field of Fiberglass/ Composites, Production, and Tooling. This course includes lecture/ demonstration and lab projects so the student will understand and have the hands on ability to work with the material and equipment used in industry today. This class will cover the industrial use of fiberglass and other fabrics, and resins used in the manufacturing of composite parts. We also cover gel-coats, there application, including Gel-coat spray gun operation. We will introduce the students to the hand layup, Vacuum Infusion Process (VIP), and Resin Transfer Molding (RTM) production techniques. Emphasis on converting parts currently being made by the hand lay-up method to the closed mold VIP, and RTM process are covered. Topics include safe VIP and RTM equipment operation, mold design, fabrication, resin and catalyst selection, reinforcements, and core materials. Production methods leading to high output and troubleshooting techniques are discussed. This course is not open to students who have enrolled or completed PMT 172 and PMT 176. (Formerly PMT 176) Transfer Credit: CSU</p>		<p>This course assists students in creating three-dimensional (3-D) parametric part modeling, assembly modeling, surface modeling, and bills of materials. Students receive instruction utilizing the most recent release of SolidWorks software. Transfer Credit: CSU</p>	
<p>ENGT 251 Composites Fabrication and Tooling Class Hours: 2.0 Lecture / 8.0 Laboratory Total Contact Hours: 36 Lecture / 144 Laboratory</p>	<p>4.5 UNITS</p>	<p>ENGT 260 Advanced Modeling Using SolidWorks Class Hours: 3.0 Lecture / 3.0 Laboratory Total Contact Hours: 54 Lecture / 54 Laboratory</p>	<p>4.0 UNITS</p>
<p>This course will provide students with theory and hands-on exposure to fabrication methods with high-tech materials. Areas of concentration will include composite structures, material choices, design of composite structures, surface bonding, fastener installation, inspection processes and approved repair methods. Fabrication, safety procedures, and material handling are also covered. (Formerly PMT 151) Transfer Credit: CSU</p>		<p>Prerequisite: ENGT 259 or equivalent with a grade of Pass or "C" or higher, or appropriate work experience. This course advances the student's skill in creating three-dimensional (3-D) parametric part modeling, assembly modeling, and surface modeling. Students also learn how to create sheet metal assemblies, welding assemblies, formed tools, and molds. Transfer Credit: CSU</p>	
<p>ENGT 257 Advanced Modeling Using Inventor Class Hours: 3.0 Lecture / 3.0 Laboratory Total Contact Hours: 54 Lecture / 54 Laboratory</p>	<p>4.0 UNITS</p>	<p>ENGT 261 SolidWorks for Sustainable Design Class Hours: 3.0 Lecture / 3.0 Laboratory Total Contact Hours: 54 Lecture / 54 Laboratory</p>	<p>4.0 UNITS</p>
<p>Prerequisite: ENGT 103 or equivalent with a grade of Pass or "C" or higher. This course assists students in advanced applications of three-dimensional parametric part modeling, assembly modeling, surface modeling, and bills of materials. Students receive instruction utilizing the most recent release of Autodesk Inventor. Transfer Credit: CSU</p>		<p>Prerequisite: ENGT 259 or equivalent with a grade of "C" or higher or "Pass." In this class students will perform life cycle assessment (LCA) of the design of products and predict their environmental footprint. Students will learn to assess how businesses take inputs, process them by adding value, and generate outputs which are tangible and sustainable products. Students will estimate the sustainability of their designs by performing LCA assessments and modify their products to make them "greener." This will be achieved by evaluating different design and manufacturing and supply chain choices and by performing quantitative LCA analysis to justify their final decision. A major focus of this class will be for students to assess their design using the SolidWorks Environmental Management Systems (EMS). Finally, students will operationalize the tracking, documentation, and reporting of environmental impacts by businesses, according to the ISO standard 14001. Students will also be prepared for the Certified Sustainable Design Associate industry certification exam. Transfer Credit: CSU</p>	
<p>ENGT 258 Tools and Fixtures Applications Using Solid Modeling Class Hours: 3.0 Lecture / 3.0 Laboratory Total Contact Hours: 54 Lecture / 54 Laboratory</p>	<p>4.0 UNITS</p>	<p>ENGT 262 SolidWorks for Weldments Design Class Hours: 3.0 Lecture / 3.0 Laboratory Total Contact Hours: 54 Lecture / 54 Laboratory</p>	<p>4.0 UNITS</p>
<p>Prerequisite: ENGT 103, or ENGT 138, or ENGT 259, or ENGT 265 or equivalent with a grade of "C" or higher, or "Pass." This course is a study of modern techniques of design using solid modeling. Instruction includes the production, operations, and process materials selection for product design. Planning, scheduling, and cost performance are used to implement design solutions. Transfer Credit: CSU</p>		<p>In this class, students will learn how to effectively use SolidWorks to model parametric weldments and welded structures. Standard structural tubing, angle iron, flat plate, pipe, machined components, and custom profiles will be employed and combined in the design of the models. Students will produce weldment shop floor drawings to be used during fabrication. The ANSI and ISO welding symbols will be explored and implemented in both the modeling of weldments and the rendering of shop floor drawings. Students will also be prepared for the Certified SolidWorks Professional Advanced Weldments industry certification exam. Transfer Credit: CSU</p>	

ENGT 263**SolidWorks for Industrial Mold Tools Design**

Class Hours: 3.0 Lecture / 3.0 Laboratory

Total Contact Hours: 54 Lecture / 54 Laboratory

In this class students will design molded product features and mold tools. Molded parts design will cover design features such as draft, shell, ribs, vents, lips, mounting bosses, and snaps. Mold tools design will cover surfacing repairing, draft analysis, and parting surfacing creation. Design features such as tooling split for core and cavity creation, knitting the surfaces, sketching the mold block, extracting the core block, and separating the block from the part will be emphasized using specialized menus from SolidWorks. Students will also be prepared for the Certified SolidWorks Mold Tools Design industry certification exam.

Transfer Credit: CSU

4.0 UNITS**ENGT 299****Directed Studies**

A course to provide opportunity for individual research and field projects under the direction of a faculty member in a given department. With the guidance of the faculty member, students prepare and carry out a written learning agreement describing the purposes and outcomes of the project. Students should expect to meet with the supervising faculty member one to two hours each week for conferences. Credit is based upon the number of hours in the semester expected to complete the project (2 units for 108 hours). This course may be taken a maximum of 2 times. For selected disciplines, UC transfer credit may be possible after admission to a UC campus, pending review of appropriate course materials by UC staff. See a counselor for an explanation.

Transfer Credit: CSU

2.0 UNITS**ENGT 267****MoldFlow Simulations and Plastic Products Design**

Class Hours: 3.0 Lecture / 3.0 Laboratory

Total Contact Hours: 54 Lecture / 54 Laboratory

This course will provide students with an introduction to Plastic product design and Plastic Flow simulation with latest version of AutoDesk Inventor and MoldFlow. The plastic product design will include Inventor basic and advanced parametric 3d parts modelling, especially plastic part features like bosses, ribs, grilles, lips, rests, Snap fits and draft angles. and the Plastic flow simulation with MoldFlow will be used to check the manufacturability of the part, show how plastic flow into the part and help identify if and where potential quality problems will arise while providing suggestions for how to improve the design from form to manufacturability.

Transfer Credit: CSU

4.0 UNITS**ENGT 281****Sustainable Toy Design with Solidworks**

Class Hours: 2.0 Lecture / 4.0 Laboratory

Total Contact Hours: 36 Lecture / 72 Laboratory

Recommendation: ENGT111 or ENGT 116 or ENGT 209.

This course will provide students to learn the basic modeling skills and sustainable design process with Solidworks. The basic modeling will include parts design from extrusion/revolution/sweep/loft and bottom up assembly design plus the 2D drawing output. And the sustainable design will cover the definition, scope and metrics of sustainability, environmental assessment dashboard for 4 indicators like carbon footprint/energy consumption/air acidification/water eutrophication, and conceptual lifecycle thinking like raw material extraction/material processing/part manufacturing/assembly/product use/end of life/transportation. Case studies method will be used in this course and the cases come in with different toy design from simple to complex, and the toys can also be made in class with the laser cutters and 3D printers in the lab. (Formerly PMT 101)

Transfer Credit: CSU

3.0 UNITS