ENGINEERING TECHNOLOGY (ENGTE)

Courses

ENGTE-105 DRAFTING PRINCIPLES 9 Credits
Includes line work, lettering, applied geometry, dimensioning, orthographic projection, and the use of drafting tools. Emphasis on various methods of drafting views of objects including auxiliary views, revolutions, intersections, developments, technical illustration, precision dimensioning, working drawings and reproductions of drawings. Traditional and CAD drafting tools used.

ENGTE-130 COMPUTER AIDED MACHINE DRAFTING 9 Credits
Application of computer aided drafting skills using AutoCAD software on increasingly complex drawings. Emphasis is on drafting technician’s position as a designer and detailer for support of engineered and manufactured products. Techniques of dimensioning and tolerancing detail drawings for manufacturing covered. Current manufacturing techniques and engineering product design processes also covered. Pre-requisite: ENGTE-105.

ENGTE-135 APPLIED PHYSICS 3 Credits
Combines lectures, classroom discussion and problem solving to teach fundamentals of physics. Topics include uniform linear and circular motion, uniform acceleration, projectiles, Newton’s First, Second, and Third Laws of Motion, curvilinear motion, forces in rotation, elasticity, friction, work, momentum, rotational motion, mechanical properties of materials, vibrations and waves, sound and fluid mechanics, energy, and properties of materials. Pre-requisite: MTHPT-137.

ENGTE-154 INTRODUCTION TO COMPUTER DRAFTING 4 Credits
Teaches basic computer skills using various CAD software. Learning centers around these components and how they send and receive information. Basic understanding of computer hardware, software, and disk operating systems. Uses basic drafting skills learned from traditional drafting courses to create simple dimensioned drawings.

ENGTE-190 DIRECTED STUDY IN ENGINEERING TECHNOLOGY 10 Credits
Opportunity to learn advanced skills in areas agreed upon by student and instructor. Objectives developed to complete a specialized project or course of study and a plan to achieve these objectives.

ENGTE-204 CIVIL TECHNOLOGY 9 Credits
Combines lectures, assignments and lab work to give the student a basic understanding of civil technology including civil drafting, basic surveying, and mapping procedures. The student will develop skills in the use of AutoCAD Civil 3D for civil design and drafting applications as well as the use and maintenance of survey equipment. Covers basics of mapping including contours, symbols, topography, curve geometry, and curve data. Methods of calculating angles, bearings, distances, areas, quantities, and slope. Practical problems given in cross-sections and profiles, cuts and fills, grades, earthwork, and horizontal alignment layout and simple curve layout. Concepts of survey, leveling procedures, traverse closures and areas, triangulation, construction surveys, and computations by various methods. Mastery of correct methods of note-taking and electronic data collection. Pre-requisites: ENGTE-105, ENGTE-154, and MTHPT-137.

ENGTE-205 ADVANCED CIVIL DRAFTING AND DESIGN 5 Credits
The student will be prepared to perform basic civil engineering functions, such as surface and contour creation, grading and drainage plans, alignment layout, profiles, pipe networks, detail drawings and survey data management. Upon completion of this course, the student will prepare a complete set of civil engineering drawings. Pre-requisite: ENGTE-105, ENGTE-130, ENGTE-145, and ENGTE-204.

ENGTE-208 ARCHITECTURAL AND STRUCTURAL DRAFTING 9 Credits
Fundamental architectural drafting methods taught. Site plans, foundation plans, floor plans, elevations, construction details, lighting and wiring, stair details, floor and roof framing plans, interior elevations drafted, and window and door schedules developed. Prepares students to draft structural steel, precast and poured-in-place concrete, and structural wood projects. Includes engineering drawings and shop drawings. Pre-requisite: ENGTE-154 or instructor’s permission.

ENGTE-209 SURVEYING 5 Credits
This course is the second of a two-part introductory sequence in plane surveying, including the measurement of distances, elevations, angles and directions. Principles and field use of traditional and modern surveying instruments are covered in lecture and practiced in lab. The student will learn and use fundamental surveying concepts and practices utilizing electronic, land-base, surveying equipment to solve real world surveying problems. Students will also learn about topographic surveying and mapping, boundary surveys, construction surveying, route surveying, earthwork and volumes, and global positioning systems. Pre-requisite: ENGTE-204.

ENGTE-225 3-D CAD MODELING 5 Credits
This is a study in advanced CAD concepts and procedures to develop three-dimensional wireframe models. Emphasis will be on the creation and use of 3-D primitives, surface modeling, basic solids modeling, shading techniques, and the use of rendering and animation software. Pre-requisite: ENGTE-154 or instructor’s permission.

ENGTE-227 CAD/CAM PROJECT 5 Credits
This course will be a "senior" project class where the students will work in teams to design and build a project. The projects will be based on "real world" problems from local area businesses that require assistance in implementing solutions to their production problems due to a lack of time/ability. Typically, 1/2 of the semester focuses on the CAD design of the project with the last 1/2 of the semester focusing on the CAM fabrication of that project.
ENGT-237 APPLIED PHYSICS II 3 Credits
Covers basic engineering principles necessary for a drafts person to communicate on a technical level with designers. Covers temperature and heat, thermal properties of materials, fundamentals of thermodynamics, electrostatics, capacitance and dielectrics, current resistance, power, basic DC circuits, magnetism, electromagnetic induction, basic AC circuits, electrons and solid state physics, light and illumination, mirrors and lenses, and vision and optical instruments. Pre-requisite: ENGT-135 or GENTC-133.

ENGT-241 INTRODUCTION TO MACHINING 4 Credits
Introduction to the machine shop environment to include but not limited to safety in work place and use of tools safely. Introduction to history, theory and uses of simple cutting tools, hand tools, hand held power tools, machine tools with focus on lathes, milling machines and grinders. Measuring and layout of parts using precision scales, squares, calipers and micrometers. Material knowledge of metals and synthetics to relate to the machining process. Machine cutting tools and their designed use including speeds and feeds. Knowledge of work holding as it relates to machine shop equipment which include jigs, fixturing, and correct machining order. Pre-requisite: ENGT-154.

ENGT-243 ADVANCED MACHINING 4 Credits
This course provides the engineering students with the knowledge for lab operation of machining, special attachments, bench work, layout, heat treating, hardness testing, layout inspection, jig and fixture setup, tool design. This course is designed to provide the students with the development of manufacturing plans for the efficient manufacturing of moderately complex products. Individualized laboratory practice will integrate the textbook, reference manuals and technical tools placing emphasis on the production of moderately complex products using production machines, setups, and fixtures. Introduction to numerical controls for x, y, and z-axis application, tool controls for hole and milling operations, blueprint reading for NC and CNC programming, and Geometric Dimensioning and Tolerancing for NC programming. Pre-requisite: ENGT-241.

ENGT-246 CONSTRUCTION AND MANUFACTURING TECHNOLOGY 2 Credits
Gives students an understanding of legal aspects and practical applications of surveying techniques. Civil engineering terminology, engineering methods in the construction of roads, bridges, and other structures, practical understanding of methods industry uses to work metals, basic metallurgy and effects of heat treatment, methods of forging and casting, followed by overview of general metal working and inspection techniques.

ENGT-290 DIRECTED STUDY IN ENGINEERING TECHNOLOGY 1-10 Credits
Opportunity to learn advanced skills in areas agreed upon by student and instructor. Objectives developed to complete a specialized project or course of study and a plan to achieve these objectives.

ENGT-292 SPECIAL TOPICS IN ENGINEERING TECHNOLOGY 1-10 Credits
Offers opportunity to learn advanced skills for students who are progressing at faster than normal pace.

ENGT-294 IN:ENGINEERING TECHNOLOGY 10 Credits
Work experience in business related to the student’s career goal. Student is a paid, part-time employee working under supervision of employer and program coordinator. Registration only with the approval of program coordinator.

ENGT-305 ADVANCED SURVEYING DRAFTING & DESIGN 5 Credits
Consists of lecture and lab work pertaining to typical highway, bridge, storm drainage, sewer, and land development design. Lab work performed by CAD, field trips made to observe on-going projects. Pre-requisite: ENGT-204.

ENGT-306 STRENGTH/MATERIAL/MECH 4 Credits

ENGT-310 SURVEYING LAW AND BOUNDARY DESCRIPTIONS 3 Credits
This course was designed to give the student a basic understanding of the different types of boundary descriptions in common use and the correct way to prepare a boundary description. They will acquire basic knowledge in many of the problems they will encounter in description. The student will gain a basic knowledge in Survey Law and how to apply it to their job. Pre-requisites: ENGT-204, ENGT-205, and ENGT-209.

ENGT-312 PUBLIC LAND SURVEYING 3 Credits
This course was designed to give the student a basic understanding of the different types of surveys done in the United States. They will cover metes and bounds surveys done by the English, French, and Spanish along with the current Public Land Survey Systems (PLSS); be able to explain each type of survey and understand where to look for information on the different types of surveys. Pre-reqs: ENGT-204, ENGT-205, and ENGT-209.

ENGT-313 SURVEYING AND SOFTWARE APPLICATIONS 3 Credits
This course was designed to give the student a basic understanding of different survey programs and how to use each one. The student will use these programs to develop surveying projects and preparing final drawings. Pre-requisites: ENGT-204, ENGT-205, and ENGT-209.

ENGT-314 SURVEYING RESEARCH AND EVIDENCE 3 Credits
This course was designed to give the student a basic understanding of survey research and evidence. Students will become familiar with places to research, where to start, what to collect, how to evaluate what is found, and how to evaluate evidence. Pre-requisites: ENGT-204, ENGT-205, and ENGT-209.

ENGT-315 SURVEY ADJUSTMENTS 3 Credits
Studies matrix inverse; solution of linear equation by matrices, theory, and computation of least squares adjustments, coordinate transformation, error ellipses, and statistical testing. Pre-requisite: AAS degree.

ENGT-317 SUBDIVISION PLANNING & PLATTING 3 Credits
This course deals with land use planning; governmental regulations and permits as applied to subdivisions; subdivision planning, computations and preparation of subdivision plats. Pre-requisites: AAS degree.
ENGTE-390 DIRECTED STUDY IN ENGINEERING TECHNOLOGY 1-5 Credits
Opportunity to learn advanced skills in areas agreed upon by student and instructor. Objectives developed to complete a specialized project or course of study and a plan to achieve these objectives.

ENGTE-394 IN:ENGINEERING TECHNOLOGY 12 Credits
Work experience in business related to the student's career goal. Student is a paid, part-time employee working under supervision of employer and program coordinator. Registration only with the approval of program coordinator.

ENGTE-409 ADVANCED SURVEYING 5 Credits
Expands on topics taught in the basic survey course. Consists of lectures, lab and field trips. Topics presented on plane surveying, topographics, public land, construction staking, geodetic, hydrographic and land development. Discussion presented on geographics information and global position systems. Pre-requisite: ENGTE-204.

ENGTE-410 PROJECT MANAGEMENT 4 Credits
Lecture and field trips to construction projects. Estimating, contracts, contract administration, construction materials, and equipment management and productions covered.

ENGTE-411 GEODESY 3 Credits
The objective of this course is to give the student an introduction to the principles of geodesy, particularly geometric geodesy, astronomic geodesy, and principles of map projections. Pre-requisites: ENGTE-204, ENGTE-205, and ENGTE-209.

ENGTE-415 SURVEY OFFICE PRACTICE 3 Credits
The student will have a basic understanding of how the business operates and many of the considerations that a business manager must deal with. They will get an appreciation of the problems encountered by the managers and will be able to understand their problems and help make work a better place. Pre-requisites: ENGTE-204, ENGTE-205, and ENGTE-209.

ENGTE-490 DIRECTED STUDY IN ENGINEERING TECHNOLOGY 1-12 Credits
Opportunity to learn advanced skills in area agreed upon by student and instructor. Objectives developed to complete a specialized project or course of study and a plan to achieve these objectives.

ENGTE-492 SPECIAL TOPICS IN ENGINEERING TECHNOLOGY 1-5 Credits

ENGTE-494 IN:ENGINEERING TECHNOLOGY 12 Credits
Work experience in business related to the student's career goal. Student is a paid, part-time employee working under supervision of employer and program coordinator. Registration only with the approval of program coordinator.