

# Eng Graphics/Design Tech (EGDT)

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## **EGDT 1000. Introduction to Engineering Drawing and Technical Design. (2 Credits)**

Covers basic sketching, instruments and their use, lettering, geometric construction, dimensioning, multi-view drawings, and section views, using CAD (computer-aided drafting) and traditional hand tools. Teaches introductory skills required in several first-year drafting technology courses.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

## **EGDT 1010. Electrical Drafting and Design. (3 Credits)**

Prerequisite(s): EGDT 1040 with a grade of C- or higher

Introduces several types of electrical drawings such as Block, Connection, Logic, Schematic, Wiring, and Panel Diagrams. Covers basic DC theory, electricity and electrical terms. Includes the principles of Ohm's law, Watt's law, Logic Truth Tables, Series and Parallel Circuits, and Printed Circuit Board Design.

Lab access fee of \$45 for computers applies. Course fee of \$27 applies for supplies.

## **EGDT 1020. 3D Architectural Modeling. (3 Credits)**

Utilizes a Building Information Modeling system (BIM) to design 3D architectural models. Covers 3D modeling design theory, parametric modeling methods, generation of residential and commercial construction plans and details, building components and systems, and manipulation of model information. May be delivered hybrid and/or online.

Lab access fee of \$45 for computers applies.

## **EGDT 1040. Fundamentals of Technical Engineering Drawing. (3 Credits)**

Introduces fundamental technical engineering drawings, practices, and standards used by various engineering disciplines. Provides basic sketching, computer-aided drafting (CAD) tools, geometric construction, drawing layout, standard dimensioning, multi-view drawings, sectioning, plotting, checking, correcting, and other CAD and drafting skills.

Lab access fee of \$45 for computers applies.

## **EGDT 1050. Intro to 3D Printing and Fabrication PP. (3 Credits)**

Introduces the history of design and fabrication. Explores how design and fabrication applies to, affects, and connects various fields, environments, cultures, and workplaces. Teaches basic design and fabrication competencies through analyzing and solving real-world problems using current technology. Encourages an appreciation for the evolution of design and fabrication and its application in diverse fields of academia and industry.

Investigates the possibilities of new emerging technologies in these fields. Course fee of \$42 applies for supplies.

## **EGDT 1060. MicroStation Infrastructure Design. (3 Credits)**

Teaches the MicroStation Open Roads drafting software system used to draw and plot various types of infrastructure projects. Demonstrates civil design skills needed in an infrastructure design workflow for a typical UDOT or civil engineering transportation project. Includes Digital Terrain Models (DTM's), horizontal and vertical alignments, plan and profiles, grading design, and utilities/piping design and drafting. Focuses on the development of a civil engineering infrastructure plan set for a typical state highway or freeway.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

## **EGDT 1070. 3 Dimensional Modeling Inventor. (3 Credits)**

Teaches basic 3D computer modeling course which emphasizes the development of 3D machine parts, assemblies, and drawings in a constraint-based modeling environment using AutoDesk Inventor. Emphasizes the feature based design process, which simulates actual manufacturing processes with 2D sketching tools and with 3D modeling tools including extrusions, revolutions, sweeps, lofts, coils, shells, placed features, patterns, and many others. Also teaches creation of basic multi-part assemblies, constraint-driven assembly animation, and generation of detailed production drawings.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

## **EGDT 1071. 3 Dimensional Modeling--Solidworks. (3 Credits)**

Teaches basic 3D computer modeling, which emphasizes the development of 3D machine parts, assemblies, and drawings in a constraint-based modeling environment using Solidworks. Emphasizes the feature based design process, which simulates actual manufacturing processes with 2D sketching tools and with 3D modeling tools including extrusions, revolutions, sweeps, lofts, coils, shells, placed features, patterns, and many others. Also teaches creation of basic multi-part assemblies, constraint-driven assembly animation, and generation of detailed production drawings.

Software fee of \$35 applies.

Lab access fee of \$45 for computers applies.

## **EGDT 1090. Introduction to Architectural Drafting and Design. (2 Credits)**

Covers basic procedures used in the development of residential plans. Includes architectural drafting standards, symbols, and techniques. Uses lectures and text reading assignments related to the drawings and worksheets. Introduces students to the architectural profession and related fields.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 1100. Architectural Drafting and Design. (3 Credits)**

Prerequisite(s): EGDT 1020 with a grade of B- or higher

Covers procedures used in developing a complete set of architectural residential plans. Includes architectural drafting standards and code requirements. Reinforces math skills using dimensioning and estimating exercises. Utilizes lectures and text reading assignments with related worksheets and drawings.

Lab access fee of \$45 for computers applies.

**EGDT 1200. Mechanical Drafting and Design. (3 Credits)**

Prerequisite(s): EGDT 1070 or EGDT 1071 or EGDT 1040, with a grade of C- or higher

Requires previous knowledge of CAD software including geometric construction, linework, and dimensioning. Focuses on the design and documentation of mechanical components with proper tolerancing using design layouts, the Machinery's Handbook, and manufacturer's reference materials including retaining rings, bearings, oils seals, and other hardware. Details the form, fit, and function of mechanical components using the ASME Y14.5 Standard. Introduces geometric dimensioning and tolerancing in detailing the components. Includes precision dimensioning, gear design, shaft design, surface finish, materials, threaded holes, threaded fasteners, manufacturing methods, and machining processes and applications.

Course fee of \$50 applies.

Software fee of \$35 applies.

Lab access fee of \$45 applies.

**EGDT 1300. Structural Drafting and Design. (3 Credits)**

Prerequisite(s): EGDT 1040 with a grade of C- or higher

Covers fundamentals of structural design. Studies structural steel detailing of beams, columns, braces, templates, marking and numbering systems, bill of materials, welding symbols, and erection drawings to AISC standards.

Software fee of \$20 applies.

Lab access fee of \$45 for computers applies. Course fee of \$19 applies for supplies.

**EGDT 1400. Surveying Applications and Field Techniques I. (3 Credits)**

For people seeking a surveyor's license, civil engineering majors, Engineering Graphics and Design Technology majors, Construction Management majors, and anyone else wishing to learn fundamentals of surveying. Covers history of surveying, mathematics, field notes, measurement and computations, basic surveying instruments and equipment, leveling procedures, bearing computations, topography, mathematical traverse closures, area computations, and basic property surveying. Completers should be able to work in the job-entry phase of the surveying field.

Course fee of \$47 for materials applies.

Lab access fee of \$45 computers applies.

**EGDT 1600. Technical Math Algebra. (3 Credits)**

Prerequisite(s): MAT 0920 or equivalent with "C-" grade or better or appropriate test scores

Covers the basic principles of algebra, geometry, and trigonometry as they relate to problem solving on the job. Includes solving equations, percent, proportion, variation, calculator operations, measurements, formula rearrangement, functions and graphs, and solving right and oblique triangles.

**EGDT 1610. Technical Math Geometry Trig. (3 Credits)**

Prerequisite(s): EGDT 1600 or equivalent course with a grade of C- or higher

Covers more advanced principles of algebra, geometry, and trigonometry as they relate to problem solving on the job. Includes systems of equations, powers and roots, trigonometry functions, vectors, polynomials, quadratic equations, exponents and radicals, and circle concepts.

**EGDT 1720. Architectural Rendering FF. (3 Credits)**

Discusses how Architectural Rendering plays an important role in the way we view and present the world around us. Includes: elements in the physical and natural world, as well as the influences human cultures have on our society through the construction of buildings, structures, and other works of man. Introduces the necessary skills and practices required in architectural rendering theory and presentation. Develops skills in perspective, layout, shading, color theory and presentations of interior and exterior architectural rendering projects. Software fee of \$45 applies. Lab access fee of \$45 applies.

**EGDT 2010. Advanced Electrical CAD. (2 Credits)**

Prerequisite(s): EGDT 1010 and EGDT 1040, with "C-" grade or higher

For second year Drafting Technology majors. Concentrates on the completion of electrical-electronic diagrams using CAD procedures. Those layout procedures studied will include logic and schematic diagrams. Printed wiring board and AC motor control wiring diagram layout from reference schematics will also be covered. Includes a basic introduction to AC electrical theory including inductance and capacitance and their relationship to AC motors and motor controls. Completers should have entry-level skills for an electrical-electronic drafting position.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 2020. Descriptive Geometry. (3 Credits)**

Prerequisite(s): EGDT 1040 with a grade of C- or higher

Covers advanced orthographic projection principles used to render views of objects from any conceivable direction. Explains the creation of views needed to solve problems graphically rather than mathematically. Includes true length and angle, true size and shape, clearance, bearing, slope and grade, intersections, shortest distance, dihedral angle, and revolution. Reinforces the use and application of accurate scaling techniques.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies. Course fee of \$19 for materials applies.

**EGDT 2040. Piping Drafting. (2 Credits)**

Prerequisite(s): EGDT 1040 with a grade of C- or higher

Includes single-line and double-line pipe symbols. Covers both isometric and orthographic projection. Studies piping connections such as welded, screwed, soldered, flanged, and bell and spigot. Uses manufacturer's and reference materials specifications. Includes information on copper tubing and brass fittings. Uses hydraulic theory and formulas. Also uses computer (CAD) to develop drawings.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 2050. Plate Layout. (2 Credits)**

Prerequisite(s): EGDT 2020 with a grade of C- or higher

A continuation of Descriptive Geometry (EGDT 2020). Patterns are made of rolled or folded surfaces such as bins, hoppers, duct work, vent pipes, tanks, storage containers, etc. Patterns are also made for pipe end cuts, pipe intersections, transition pieces and twist angles. Emphasizes three types of pattern development: (1) parallel line, (2) radial line, (3) triangulation. Includes practical problems in finding the line of intersection between surfaces and drawing patterns.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 2100. Architecture Materials and Methods. (3 Credits)**

Prerequisite(s): EGDT 1020 with a grade of C- or higher

Introduces traditional architectural materials and methods of design and construction. Covers wood, masonry, and concrete construction as well as finish materials. Builds skills related to organizing, detailing, dimensioning, and scheduling construction documents for a commercial type building.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 2200. Advanced Mechanical. (3 Credits)**

Prerequisite(s): EGDT 1200 and (EGDT 1070 or EGDT 1071) all with a grade of C- or higher

Employs 3D modeling software to enhance design processes, including sketching, parametric modeling, 3D assemblies, and producing 2D working drawings. Included are sheet metal, structural parts, mass property, and stress analysis.

Software fee of \$35 applies.

Lab access fee of \$45 computers applies.

**EGDT 2300. Advanced Structural CAD. (3 Credits)**

Prerequisite(s): EGDT 1300 and (MATH 1060 or EGDT 1610) both with a grade of C- or higher

A second year class for students who have completed first year structural drafting and want to enhance their knowledge of structural steel detailing. Includes the proper views and dimensioning practices for columns, stairways, handrails, cross-bracing, anchor bolt layout, erection drawing, and field bolt lists. Completers should be ready for entry-level employment as a structural steel detailer for small detailing companies or large construction companies.

Software fee of \$18 applies.

Lab access fee of \$45 computers applies.

**EGDT 2310. Structural Steel Modeling. (3 Credits)**

Prerequisite(s): EGDT 1040 and EGDT 1300 both with a grade of C- or higher

Teaches Tekla Structures modeling software. Includes modeling of structural steel buildings, hoppers, stairs, piping, and miscellaneous steel projects. Prepares students for detail and erection drawings which are produced for fabrication and erection of structural steel projects.

Software fee of \$18 applies.

Lab access fee of \$45 computers applies.

**EGDT 2400. Surveying Applications and Field Techniques II. (3 Credits)**

Prerequisite(s): EGDT 1040 or equivalent, EGDT 1400 and (EGDT 1600 or MATH 1060) both with a grade of C- or higher

Covers advanced concepts in the U.S. Public Land and State Plane Coordinate systems. Utilizes advanced surveying instruments such as total station, automatic level, GPS equipment, and data collectors. Covers advanced leveling procedures, volume computations, monumentation, mapping, boundary surveys, and route surveys. Features the writing of legal property descriptions. Builds upon knowledge of safe surveying procedures. Includes use of surveying calculation softwares. Covers horizontal curve calculations and highway staking. Completers should be able to work as an instrument person on survey crews and also prepare the drawings related to the surveys.

Lab access fee of \$45 for computers applies

Software fee of \$18 applies.

Course fee of \$52 for materials applies

**EGDT 2500. 3 Dimensional Modeling--Civil 3D. (3 Credits)**

Prerequisite(s): EGDT 1040, EGDT 1400

Describes design workflows of typical civil engineering firms. Employs functions of Autodesk Civil 3D application software for civil design and modeling. Includes Digital Terrain Models (DTM's), street alignments, plan and profiles, grading, and utilities/piping design and drafting. Develops a full set of civil engineering improvement plans for a residential subdivision.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies. Course fee of \$19 for materials applies.

**EGDT 2600. Applied Structures I - Statics. (3 Credits)**

Prerequisite(s): MATH 1050 or MATH 1055 or (EGDT 1600 and 1610)

Covers architectural structures for low-rise and light construction projects. Applies trigonometry and technical math. Covers lateral, wind, seismic, and snow loads. Introduces the basic principles of statics including: force systems, moments, resultants of force systems, analysis of structures, centroids and centers of gravity, and moments of inertia.

**EGDT 2610. Applied Structures II - Strength of Materials. (3 Credits)**

Prerequisite(s): EGDT 2600 with a grade of B- or higher

Examines architectural long-span and high-rise structures with an emphasis on steel and concrete construction. Covers stresses, strains, properties of materials, Poisson's ratio, thermal effects, shear force, bending moments, lateral loads, deflection, connections, beam design and column design.

**EGDT 2710. Special Problems Mechanical. (2 Credits)**

Prerequisite(s): EGDT 2200 with a grade of C- or higher

An advanced course in mechanical layout and design using solid modeling techniques. Students, with approval, may design and layout projects of their choice. Final details are fabricated in the machine shop.

Lab access fee of \$45 for computers applies.

**EGDT 2720. Special Problems Surveying. (2 Credits)**

Prerequisite(s): EGDT 2400 and (MATH 1060 or EGDT 1610) both with a grade of C- or higher

For people seeking a surveyor's license, civil engineering, drafting and construction management majors. Covers instrument maintenance and calibration, basic photogrammetry and surveying for photogrammetry, mine surveying, construction surveying, resection, and legal aspects of land surveying. Completers should have job skills for surveying and civil technology.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 2730. Special Problems Civil Drafting. (2 Credits)**

Prerequisite(s): EGDT 1400 with a grade of C- or higher

For people seeking a surveyor's license or intended Civil Engineering and Engineering Graphics and Design majors desiring a civil drafting emphasis. Covers preparation of drawings associated with surveying and civil engineering and design. Projects include: property surveys and subdivision design, geotechnical investigations, wastewater treatment, storm drains, highway design, topographic mapping, earthen and concrete dams, and NICET certifications.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 2740. Special Problems Architectural. (2 Credits)**

Prerequisite(s): EGDT 1100 with a grade of C- or higher

A special problems course in architectural drafting. Teaches how to layout and detail a floor plan using a 3D modeling package.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 2750. Special Problems Architectural Rendering. (2 Credits)**

For students who wish to develop additional architectural rendering skills to enhance their job performance. Covers theory of perspective, laying out a building perspective from blueprints, inking techniques to develop a finished rendering, and quick coloring methods for ink renderings.

Course fee of \$10 for materials applies.

**EGDT 2760. Special Problems Structural. (2 Credits)**

Prerequisite(s): EGDT 1300 with a grade of C- or higher

Provides opportunities for in-depth study in structural steel drafting. Teaches beam sizing and selection for design drawing. Requires a special class project with complete objectives and goals outlined and presented to the instructor for approval. Emphasizes project documentation. Computer graphics are an important part of this course.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 2780. Special Problems Electrical. (2 Credits)**

Prerequisite(s): EGDT 1010 with a grade of C- or higher

For students who wish to advance beyond EGDT 2010 through the development of an outside project which incorporates advanced theory and drawing procedures. The instructor will review project outline to ensure that it meets course objectives and will monitor student progress, establishing progressive goals.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 281R. Internship. (1-3 Credits)**

Prerequisite(s): Department approval and completion of: EGDT 1010, EGDT 1040, EGDT 1070 or EGDT 1071, EGDT 1020, EGDT 1100, EGDT 1200, EGDT 1300, and EGDT 1400, all with a C- or higher

Provides on-the-job work experience in the student's major. Includes student, employer, and coordinator evaluations, on-site work visits, written assignments, and presentations. Provides experience in writing and completing individualized work objectives that improve present work performance.

May be repeated for a maximum of 3 credits toward graduation. May be graded Credit/No Credit.

**EGDT 285R. AEC Design Lecture Series. (0.5 Credits)**

Provides student opportunities to network and collaborate with industry professionals. Provides exposure to career options within the architecture and other related design industries. Emphasizes the importance of professional ethics and communicating with others. May be Graded Credit/No Credit. May be repeated for a maximum of 3 credits toward graduation.

**EGDT 2860. Cooperative Correlated Instruction Skills USA. (0.5 Credits)**

SkillsUSA is a first year class for Engineering Graphics and Design Technology majors. Includes leadership training, parliamentary procedure, job interview skills, prepared speaking, extemporaneous speaking, and organizational skills. Upon completion, the student should understand the SkillsUSA organization and how it helps to build leadership skills.

**EGDT 2870. Portfolio and Career Preparation. (1 Credit)**

Required for Engineering Graphics and Design Technology majors. Teaches necessary job acquisition skills. Instructs students in the job search process, including production of typical types of correspondence, job interview techniques, and creation of presentation-quality portfolios. Correspondence includes letters of application, resumes, follow-up letters, letters of acceptance and rejection, and references. Interview techniques include interview preparation, appearance, and question/answer techniques. Final project is portfolio of samples of work in all areas of Engineering Graphics & Design Technology learned for the degree.

Software fee of \$18 applies.

Lab access fee of \$45 for computers applies.

**EGDT 3450. Civil Design Systems. (3 Credits)**

Prerequisite(s): EGDT 2500, EGDT 3500, and University Advanced Standing

Teaches theories, principles, and practices of traffic systems design, gravity and pressure piping systems design, surface grading systems, and hydrology. Explores various computational and design software used to develop finished construction drawings for public and private infrastructure projects.

**EGDT 3500. Advanced Civil Drafting and Design. (3 Credits)**

Prerequisite(s): [(EGDT 1040 or EGDT 1060) and EGDT 1400 each with a grade of C- or higher] and University Advanced Standing

Covers the analysis, design and preparation of drawings associated with the surveying and civil engineering fields. Exposes the student to the NICET certification process. Focuses on GPS and GIS technologies to acquire design data. Develops a working knowledge of the Utah Department of Transportation Standard Plans and Specifications. Projects include: property surveys, topographic mapping, subdivision design, geotechnical investigations, Water and Wastewater Treatment Plants, storm drainage, highway design, traffic flow diagrams, and earthen and concrete dams.

Lab access fee of \$45 for computers applies. Course fee of \$19 for materials applies.