

Delta-Montrose Technical College

TECHNICAL DRAFTING

THE PROGRAM

The Technical Drafting Core Program is designed to qualify students for entry-level employment. Students will learn all basic drafting and AutoCAD skills applicable to general drafting positions. Because all technical fields use computer aided design software, there also is a strong emphasis on in-depth knowledge of various software programs. Students who complete the two-semester core program may choose to do a third semester of specialization in civil, architectural, or mechanical drafting.

CAREER OPPORTUNITIES

The entry-level drafter works with designers and engineers to create detail drawings from concept sketches and design layouts for fabrication and presentation. The design/drafter produces layouts, assemblies, designs, and production drawings according to specifications and design criteria of the industry. Technical drafting is a profession that encompasses a variety of disciplines that are always in high demand. Designer/drafters are needed in mechanical, structural, industrial, electronics, civil, manufacturing, architectural, and aerospace fields. The design/drafter is an integral part of any design team, developing drawings and designs for production. Qualified graduates can expect to earn between \$18,000 and \$24,000 per year to start.

PREREQUISITES

Students must have general mathematics skills and basic computer skills including MS Windows operation. Students must also meet the required minimum TABES levels. Prerequisites must be satisfied before the designated class may be taken and may require extra time to complete the program.

CONTINUING EDUCATION

The Community Education Department routinely offers basic AutoCAD training in an evening course. Additional courses offering a specialization in architectural, civil, or mechanical drafting are also available in an evening format. Other classes are sometimes offered on topics such as blueprint reading. Call 874-7671 for more information or current class schedule.

COOPERATIVE EDUCATION

DMTC may award credit for work experience related to the different disciplines of drafting/design. The student will work through the department to determine eligibility.

COURSE AVAILABILITY

The Technical Drafting Core Program is a two-semester (1 year required) course which is followed by any optional third semester specialization which consists of architectural, civil, or mechanical drafting fields. Students may start the program at the beginning of the fall or winter semesters.

Program information, courses, and credit hours are subject to change.

Class Schedule

10:00 a.m. – 12:30 p.m.

1:00 p.m. – 3:45 p.m.

TECHNICAL DRAFTING & CAD

CREDITS

BUS105 Business Orientation.....0.5
CAD100 Blueprint Reading for Computer
 Aided Drafting3
CAD101 Computer Aided Drafting I.....3
CAD102 Computer Aided Drafting II.....3
CAD119 Intermediate CAD Applications3
CAD202 Computer Aided Drafting/3D3

CAD201 Computer Aided Drafting/Custom.... 3
CAD249 AutoLISP Programming 3
CAD256 SolidWorks Basics..... 6
CAD257 SolidWorks Intermediate 6
CAD260 C.A.D. Project 2
CAD275 Special Topics 6
CAD285 Independent Study 2

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CAR105 Job Site Layout and Blueprint Reading	1
DRT101 Technical Drafting I.....	3
DRT102 Technical Drafting II.....	3
DRT103 Technical Drafting III.....	3
DRT106 Intro to Axonometric Views.....	3
DRT107 Intro to Sections and Auxiliary Views.....	3
DRT160 Intro to Industrial Drafting & Design.....	3
Total Credits	62.5

ARCHITECTURAL DRAFTING CREDITS

AEC102 Residential Construction Drawing	5
AEC121 Construction Materials and Systems	4
ARC216 Estimating I.....	3
ARC205 Commercial Drawing Practice I	4
CAD121 Intermediate CAD/Architectural Applications	3
CAD225 Architectural Desktop/Autodesk	3
CAD227 Architectural Design/Drafting I.....	6
CAD275 Special Project.....	3
Total Credits	31

CIVIL DRAFTING CREDITS

ARC108 Blueprint Reading II (Civil).....	3
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CAD285 Independent Study	5
EGT220 Introduction to Civil Graphics Technology	3
EGT221 Land Surveying Concepts.....	3
EGT222 Topographic Map Concepts Earthwork.....	3
EGT223 Municipal Mapping.....	3
EGT224 Transportation Mapping.....	3
ENT255 Civil Drafting.....	5
ENT243 Advanced Survey Drafting	3
Total Credits	31

MECHANICAL DRAFTING CREDITS

CAD152 Intermediate CAD-Mechanical.....	3
CAD157 Three-Dimensional CADD-Mechanical.....	3
CAD251 Assembly and Detail GD&T	3
CAD253 Mechanical Design/Drafting I.....	6
CAD258 SolidWorks Advanced	6
CAD285 Independent Study	4
EGT263 Welding Fabrication Drawings	3
MTE120 Manufacturing Processes	3
Total Credits	31

COURSE DESCRIPTIONS

AEC102 Residential Construction Drawing **5 Credits**
 Covers an investigation of light frame construction techniques and the production of residential construction drawings. The course covers residential construction materials, components, and systems related to wood frame structures. Students produce a professional set of construction drawings of a residential structure.

AEC121 Construction Materials and Systems **4 Credits**
 Examines building materials and construction techniques. Topics include a study of soils, concrete, brick, masonry, steel, timber, and plastics, and a study of types of building structural systems and components. Principles of interpreting light commercial construction drawings (blueprints) for structural and trade information are also introduced.

ARC108 Blueprint Reading II (Civil) **3 Credits**
 Covers the interpretation and reading of civil blueprints. The civil branch of engineering deals with the design and construction of highways, bridges, tunnels, and waterworks.

ARC205 Commercial Drawing Practice I **4 Credits**
 Studies small commercial and multiple family dwellings. Construction techniques are discussed. Working drawings are prepared through extensive use of references and manufacturing catalogs.

ARC216 Estimating I **3 Credits**
 Covers basic construction estimating. The student will develop skills in estimating the amount and cost of various constructions. He/She will demonstrate these skills by making estimates of material and labor quantities and cost for representative types of construction.

BUS105 Orientation **0.5 Credit**
 Places emphasis on getting acquainted with the college and each other, advising and career exploration, study skills strategies, presentation skills, and team building exercises. This is an introductory course required for all freshmen business majors.

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- CAD100 Blueprint Reading for Computer Aided Drafting** **3 Credits**
Covers linetype identification, identification of symbols, linear dimensions, angular dimensions, arrowless dimensions, machine process callouts, drawing notes, ANSI/ASME/ISO dimensioning standards, tolerances, freehand sketching, and reading working drawings.
- CAD101 Computer Aided Drafting I** **3 Credits**
Focuses on basic computer aided drafting skills using the latest release of CAD software. Includes file management, Cartesian coordinate system, drawing set-ups, drawing aids, layer usage, drawing geometric shapes, editing objects, array, text applications, basic dimensioning, and Help access.
- CAD102 Computer Aided Drafting II** **3 Credits**
Focuses on advanced computer aided drafting skills using the latest release of CAD software. Includes blocks and wblocks, polylines, multilines, polyline editing, advanced editing, editing with grips, hatching, isometric drawings, dimensions and dimension variables, paper space and viewports, templates, external references, and printing/plotting.
- CAD119 Intermediate CAD Applications** **3 Credits**
Serves all areas of technical graphics. Includes producing two-dimensional working drawings using applications of geometric construction, intersection and development methods, and animation techniques. Databases and file management systems are incorporated into the learning experience to improve and increase production time of technical drawings.
- CAD121 Intermediate CAD/Architectural Applications** **3 Credits**
Focuses on 2D residential concept drawings that are created from given design parameters and appropriate specifications. Requires 2D floor plans, cross sections, and elevations.
- CAD152 Intermediate CAD-Mechanical** **3 Credits**
Requires a set of documentation production drawings. Drawings are created per ASME/ANSI Y14.5M spec. Application of 2D, limits and fits, geometric dimensioning and tolerancing, dimensions, and annotations are required.
- CAD157 Three-Dimensional CADD-Mechanical** **3 Credits**
Focuses on the creation of 3D concept design models using as-built assemblies, layouts, sketches, and existing concept designs. Requires 2D extractions from the 3D models, dimensioning, and annotations.
- CAD201 Computer Aided Drafting/Custom** **3 Credits**
Focuses on program customization using the latest release of CAD software. Includes customizing menus, customizing toolbars, attribute extraction, basic CAD programming, advanced dimensioning, path options, script files, and slide shows.
- CAD202 Computer Aided Drafting/3D** **3 Credits**
Focuses on construction of three-dimensional objects using the latest release of CAD software. Includes wireframe construction, surface modeling, solid modeling, extrusions, Boolean operations, 3D editing, 3D views, rendering, and 3D to 2D construction.
- CAD225 Architectural Desktop/Autodesk** **3 Credits**
Provides students with the software application training in Architectural desktop necessary to produce 3D Architectural drawings utilizing 2D drafting skills.
- CAD227 Architectural Design/Drafting I** **6 Credits**
Develops a fundamental understanding of building design, concepts, and construction methods by preparing working drawings with necessary details for framing, brick, and steel construction. Four basic designs are used as models including one story or ranch, one and one-half story, two-story, and split-level. The student chooses one design and produces a full set of detail drawings.
- CAD249 AutoLISP Programming** **3 Credits**
Introduces the student to the development of AutoLISP programming language. Covers techniques and concepts needed to design the AutoCAD environment to suit the drafter's specific needs.

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CAD251 Assembly and Detail GD&T	3 Credits
Focuses on 3D assembly drawings created from individual data bases. Assemblies are built using WBLOCK and XREF applications. Production drawing is created using the 2D extractions from the 3D model. Presentation methods are also demonstrated.	
CAD253 Mechanical Design/Drafting I	6 Credits
Introduces the concept of multiple part mechanical assembly and detail drawings. Includes cast, machined, welded, and purchased parts and operating mechanisms. Covers part call-outs, material lists, drawing organization, and appropriate dimension systems such as precision and/or metric applications.	
CAD256 SolidWorks Basics	6 Credits
Examines the basics of SolidWorks software to produce parametric models.	
CAD257 SolidWorks Intermediate	6 Credits
Teaches the student to apply intermediate SolidWorks applications to produce parametric models of parts and assemblies.	
CAD258 SolidWorks Advanced	6 Credits
Demonstrates the advanced applications of SolidWorks software to CAD 234.	
CAD260 C.A.D. Project	2 Credits
Focuses on a final computer aided drafting project in the student's area of special interest.	
CAD275 Special Project	Credits Vary
Provides students with a vehicle to pursue in depth exploration of special topics of interest.	
CAD285 Independent Study	Credits Vary
Meets the individual needs of students. Students engage in intensive study or research under the direction of a qualified instructor.	
CAR105 Job Site Layout and Blueprint Reading	1 Credit
Introduces blue-print reading and how they apply to the construction site. Includes in-depth introduction to site layout (materials and methods).	
DRT101 Technical Drafting I	3 Credits
Introduces the student to basic engineering graphics technology principles through development of basic entry-level drafting skills. Enables the student to develop skills in sketching, reading drafting scales, interpreting line types, lettering techniques, geometric construction, orthographic projection, and drawing reproduction.	
DRT102 Technical Drafting II	3 Credits
Introduces students to auxiliary views, pictorials, sections, threads and fasteners, springs, and intersections and developments.	
DRT103 Technical Drafting III	3 Credits
Introduces the student to industrial dimensioning practices. Enables the student to develop skills in dimensioning techniques and learn to apply the ASME Y14.5M-1994 dimensioning standard.	
DRT106 Intro to Axonometric Views	3 Credits
Introduces the principles of pictorial practices. Covers axonometric projection (isometric, oblique/cabinet, and cavalier) and perspective drawing (one and two point perspectives).	
DRT107 Intro to Sections and Auxiliary Views	3 Credits
Introduces the principles of how parts are represented in 2D space by using sectional views of parts to clarify internal detail, and projection of inclined planes that need to be shown in their true shape and size.	
DRT160 Intro to Industrial Drafting & Design	3 Credits
Introduces the drafting principles that are expected to be understood by drafters in both the mechanical and architectural disciplines.	
EGT220 Introduction to Civil Graphics Technology	3 Credits
Introduces the fundamental concepts and drafting principles required of a civil engineering technician. Covers roles, required skills and responsibilities of a civil engineering technician, terminology, types of	

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civil drafting and employment opportunities, classes of maps and map projections, typical drawing formats, current drafting and CAD practices, and mapping resources.

EGT221 Land Surveying Concepts

3 Credits

Enables the student to apply map symbols, calculate and measure map scales, describe land parcels, write and lay out legal descriptions, describe land using the Public Land Survey System. Teaches student to interpret and reduce field notes, lay out horizontal and vertical angles, bearings, azimuths, coordinates and traverses, mathematically close a boundary survey, interpret G.P.S. data, and create a computer database. Includes lecture, computer drawing, and small project work.

EGT222 Topographic Map Concepts Earthwork

3 Credits

Enables the student to identify and interpret topographic symbols, interpret different types of survey data, construct topographic map models, interpolate contours, set up grading plans, grade calculations, research resources for topographic maps, and identify map scales.

EGT223 Municipal Mapping

3 Credits

Enables student to identify the elements of plats and municipal maps, apply appropriate symbology, and interpret legal descriptions and survey data. Covers different types of municipal maps, symbology, GIS (Graphic Information Systems) applications, implications of local codes, and utility requirements.

EGT224 Transportation Mapping

3 Credits

Covers different types of drawing formats, interpretation of survey data, calculation of curves, slopes, earthwork, highway codes, and development of plan and profile sheets and cross sections.

EGT263 Welding Fabrication Drawings

3 Credits

Examines welding technologies and symbology from the perspective of the drafter/designer. Enables the student to interpret weld symbols and draw weldments and details as part of assigned project work and drawings.

ENT243 Advanced Survey Drafting

3 Credits

Focuses on traverses, legal descriptions, horizontal and vertical curves, land sections, and coordinates. Emphasizes field note interpretation. Graphics for this course are produced on CAD workstations.

ENT255 Civil Drafting

5 Credits

Focuses on advanced techniques and drafting practices in the civil engineering field including structural steel and reinforced concrete drawing.

MTE120 Manufacturing Processes

3 Credits

Focuses on contemporary manufacturing organization, methods, and processes involved in converting raw materials into finished products.