DRAFTING & DESIGN

- Drafting and Design Technology AAS Degree (coursecatalog.tvcc.edu/pathways/science-engineering-math/drafting-design/drafting-design-technology-aas/)
- Advanced Drafting Certificate (coursecatalog.tvcc.edu/pathways/science-engineering-math/drafting-design/advanced-drafting-certificate/)
- Basic Drafting Certificate (coursecatalog.tvcc.edu/pathways/science-engineering-math/drafting-design/basic-drafting-certificate/)
- Computer Aided Drafting OSA (coursecatalog.tvcc.edu/pathways/science-engineering-math/drafting-design/computer-aided-drafting-osa/)

ARCE-2344. Statics and Strength of Materials. (3 Credits)
(3-3-0) This course is taken for academic credit. (Prerequisite: DFTG 1305) Students will earn an A, B, C, D, F, or W. Internal effects of forces acting upon elastic bodies and the resulting changes in form and dimensions. Includes stress, shear, bending moments, and simple beam design. Lab fee.

ARCE-1315. Structural Steel Detailing. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. This course covers the preparation of structural steel drawings and bills of material for the purpose of fabrication and erection. Emphasis will be placed upon using structural design framing plans to develop detailed steel members, connections, and assemblies. Lab fee.

DFTG-1240. Introduction to Computer Aided Drafting. (2 Credits)
This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Topics include CAD equipment, software selection and interface; setting up a CAD workstation; upgrading a computer to run advanced CAD software; storage devices; storing, retrieving, back-up and sharing databases; file servers and local area networks (LANs); and transferring drawing files over the Internet.

DFTG-1305. Technical Drafting. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. An introduction to reading, interpreting, and developing technical drawings, including the principles of drafting and computer-aided design. Lab fee.

DFTG-1309. Basic Computer Aided Drafting. (3 Credits)
This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. An introduction to computer-aided drafting. Emphasis is placed on setup; creating and modifying geometry; storing and retrieving predefined shapes; placing, rotating, and scaling objects, adding text and dimensions, using layers, coordinate systems, and plot/print to scale.

DFTG-1310. Specialized Basic Computer Aided Drafting (cad). (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A supplemental course to Basic Computer Aided Drafting using an alternative computer-aided drafting (CAD) software to create detail and working drawings.

DFTG-1317. Architectural Drafting, Residential. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Preparation of architectural drawings for residential structures with emphasis on light frame construction methods, including architectural drafting procedures, practices, terms, and symbols. Lab fee.

DFTG-1333. Mechanical Drafting. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Study of mechanical drawings using dimensioning and tolerances, sectioning techniques, orthographic projection and pictorial drawings. Lab fee.

DFTG-1345. Parametric Modeling and Design. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Parametric-based design software for 3-D design and drafting. Lab fee.

DFTG-1357. Specialized Intermediate Computer Aided Drafting. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A continuation of practices and techniques used in Specialized Basic Computer-Aided Drafting. Emphasizes advanced dimensioning techniques, the development and use of prototype drawings, construction of pictorial drawings, interfacing 2-D and/or 3-D environments and extracting data. Lab fee.

DFTG-1358. Electrical/Electronics Drafting. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Electrical and electronic drawings stressing modern representation used for block diagrams, schmatic diagrams, logic diagrams, wiring/assembly drawings, printed circuit boards layouts, motor control diagrams, power distribution diagrams, and electrical one-line diagrams. Lab fee.

DFTG-1409. Basic Computer Aided Drafting. (4 Credits)
(4-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. An introduction to computer-aided drafting. Emphasis is placed on setup; creating and modifying geometry; storing and retrieving predefined shapes; placing, rotating, and scaling objects, adding text and dimensions, using layers, coordinate systems, and plot/print to scale. Lab fee.

DFTG-1417. Architectural Drafting, Residential. (4 Credits)
This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Architectural drafting procedures, practices, terms, and symbols. Preparation of detailed working drawings for residential structure. Emphasis on light frame construction methods. Lab fee.

DFTG-1457. Specialized Intermediate Computer Aided Draft. (4 Credits)
This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A continuation of practices and techniques used in Specialized Basic Computer-Aided Drafting. Emphasizes advanced dimensioning techniques, the development and use of prototype drawings, construction of pictorial drawings, interfacing two-dimensional (2D) and/or three-dimensional (3D) environments and extracting data.

DFTG-2280. Coop Education, Drafting and Design Technology/Technician, General. (2 Credits)
(2-1-10) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Career related activities encountered in the student's area of specialization are offered through a cooperative agreement between the College, employer and student. Under supervision of the College and the employer, the student combines classroom learning with work experience. Includes a lecture component. Lab fee.

DFTG-2321. Topographical Drafting. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Plotting of surveryor's field notes. Includes drawing elevations, contour lines, plan and profiles, and laying out traverses. Lab fee.

DFTG-2323. Pipe Drafting. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A study of pipe fittings, symbols, specifications and their applications to a piping process system. Creation of symbols and their usage in flow diagrams, plans, elevations, and isometrics. Lab fee.

DFTG-2328. Architectural Drafting, Commercial. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Architectural drafting procedures, practices, governing codes, terms and symbols, including the preparation of detailed working drawings for a commercial building, with emphasis on commercial construction methods. Lab fee.

DFTG-2332. Advanced Computer Aided Drafting. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Application of advanced CAD techniques. Lab fee.

DFTG-2340. Solid Modeling/Design. (3 Credits)
(3-2-4) This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A computer-aided modeling course. Development of three-dimensional drawings and models from engineering sketches and orthographic drawings and utilization of three-dimensional models in design work. Lab fee.

DFTG-2438. Final Project, Advanced Drafting. (4 Credits)
This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A drafting course in which students participate in a comprehensive project from conception to conclusion.

DFTG-2440. Solid Modeling/Design. (4 Credits)
This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A computer-aided modeling course. Development of three-dimensional drawings and models from engineering sketches and orthographic drawings and utilization of three-dimensional models in design work.

What Drafters Do (https://www.bls.gov/ooh/architecture-and-engineering/drafters.htm#tab-2)

Drafters use software to convert the designs of architects and engineers into technical drawings. Most workers specialize in architectural, civil, electrical, or mechanical drafting and use technical drawings to help design everything from microchips to skyscrapers.

Duties

Drafters typically do the following:

- Design plans using computer-aided design (CAD) software
- Work from rough sketches and specifications created by engineers and architects
- Design products with engineering and manufacturing techniques
- Add details to architectural plans from their knowledge of building techniques
- Specify dimensions, materials, and procedures for new products
- Work under the supervision of engineers or architects

Some drafters are referred to as *CAD operators*. Using CAD systems, drafters create and store technical drawings digitally. These drawings contain information on how to build a structure or machine, the dimensions of the project, and what materials are needed to complete the project.

Drafters work with CAD to create schematics that can be viewed, printed, or programmed directly into building information modeling (BIM) systems. These systems allow drafters, architects, construction managers, and engineers to create and collaborate on digital models of physical buildings and machines. Through three-dimensional rendering, BIM software allows designers and engineers to see how different elements in their projects work together.

The following are examples of types of drafters:

Architectural drafters draw structural features and details for buildings and other construction projects. These workers may specialize in a type of building, such as residential or commercial. They may also specialize by the materials used, such as steel, wood, or reinforced concrete.

Civil drafters prepare topographical maps used in construction and civil engineering projects, such as highways, bridges, and dams.

Electrical drafters prepare wiring diagrams that construction workers use to install and repair electrical equipment and wiring in power plants, electrical distribution systems, and residential and commercial buildings.

Electronics drafters produce wiring diagrams, assembly diagrams for circuit boards, and layout drawings used in manufacturing and in installing and repairing electronic devices and components.

Mechanical drafters prepare layouts that show the details for a variety of machinery and mechanical tools and devices, such as medical equipment. These layouts indicate dimensions, fastening methods, and other requirements for assembly. Mechanical drafters sometimes create production molds.

SUMMARY (https://www.bls.gov/ooh/architecture-and-engineering/drafters.htm)

- Drafters
- 2018 Median Pay: $55,550 per year, $26.71 per hour
- Typical Entry-Level Education: Associate's degree
- Work Experience in a Related Occupation: None
- On-the-job Training: None
- Number of Jobs, 2018: 199,900
- Job Outlook, 2018-28: 0% (Little or no change)
- Employment Change, 2018-28: -700

Work Environment (https://www.bls.gov/ooh/architecture-and-engineering/drafters.htm#tab-3)

Although drafters spend much of their time working on computers in an office, some may visit jobsites in order to collaborate with architects and engineers. Most drafters work full time.

How to Become a Drafter (https://www.bls.gov/ooh/architecture-and-engineering/drafters.htm#tab-4)

Drafters typically complete education after high school, often through a program at a community college or technical school. Some programs lead to an associate of applied science in drafting or a related degree. Others result in a certificate or diploma.

Pay (https://www.bls.gov/ooh/architecture-and-engineering/drafters.htm#tab-5)

The median annual wage for drafters was $55,550 in May 2018.

Job Outlook (https://www.bls.gov/ooh/architecture-and-engineering/drafters.htm#tab-6)

Employment of drafters is projected to show little or no change from 2018 to 2028. Increased construction activity is projected to drive demand for drafters, but this is expected to be tempered as engineers and architects increasingly perform some tasks previously done by drafters.

State & Area Data (https://www.bls.gov/ooh/architecture-and-engineering/drafters.htm#tab-7)

Explore resources for employment and wages by state and area for drafters.

Similar Occupations (https://www.bls.gov/ooh/architecture-and-engineering/drafters.htm#tab-8)

Compare the job duties, education, job growth, and pay of drafters with similar occupations.

More Information, Including Links to O*NET (https://www.bls.gov/ooh/architecture-and-engineering/drafters.htm#tab-9)

Learn more about drafters by visiting additional resources, including O*NET, a source on key characteristics of workers and occupations.

SUGGESTED CITATION:

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Drafters,
on the Internet at https://www.bls.gov/ooh/architecture-and-engineering/drafters.htm (visited *February 29, 2020*).

TVCC has partnered with Career Coach (https://tvcc.emsicc.com/?radius=&region=10%20Mile%20Radius%20from%20Athens%2C%20TX) for students to discover majors and in-demand careers and education based on your interests!

- Career Assessment Profiler
- Interactive Career Catalog
- Browse TVCC's Pathways

Some careers in this field will require a bachelor's degree.

- TVCC's AA degrees are fully transferable to public universities in Texas. See an academic advisor or TVCC's university transfer webpage (https://www.tvcc.edu/Advisement/Category.aspx?z=72) for more information on this transfer opportunity.
- Many of TVCC's AAS degrees lead to an online Bachelor of Applied Arts and Sciences (BAAS) degree with participating universities. See an academic advisor or the BAAS transfer website (https://www.ntxccc.org/pathways/) for more information on this transfer opportunity.