Technical Design (TECD)

Program Description

The Technical Design (TECD) program prepares students for entry-level work as a technical designer/drafter and Computer-Aided Design (CAD) operator. Drafters prepare technical drawings and plans, which are used by production and construction workers to build everything from microchips to skyscrapers. Drafters' drawings provide visual guidelines, dimensions, materials and show how to construct a product or structure. Drafters fill in technical details using drawings, rough sketches, specifications, and calculations made by engineers, surveyors, architects, or scientists.

Mechanical ability and visual aptitude are important for drafters. Prospective drafters should be able to draw well and perform detailed work accurately. Artistic ability is helpful in some specialized fields, as is knowledge of manufacturing and construction methods. In addition, prospective drafters should have good interpersonal skills because they work closely with engineers, surveyors, architects, other professionals and, sometimes, with customers.

A wide variety of career opportunities exist for trained CAD Technicians, including CNC operators, CAD designers, drafters and prototype/development. Graduates may work in support of engineers using CAD software to prepare technical drawings and plans. Almost every company involved with design and/or manufacturing has one or more design/drafting positions, and the majority of those companies use CAD as their primary design and drafting tool. Students will be introduced to a variety of software design tools commonly used in industry, such as: AutoCAD, SolidWorks, Inventor, and 3D Studio Max.

Through the training and support of the Technical Design program at SVC, students will gain knowledge about workplace safety, work effectively in a manufacturing team environment, operate standard design tools and CAD equipment and create industrial blueprints for effective graphic communication. CAD technicians have a wide spectrum of opportunities available in career and wage progression as they demonstrate personal and professional competencies. Once established in a company, the technician's career will progress as the worker gains industry specific experience.

Entry into the Program

Please apply to the Admissions Office. Students may enter the program at the beginning of any quarter. Please be aware that some classes/sequences are not offered every quarter. It is recommended that students complete at least one year of high school algebra, or take WMATH 100 (Professional Technical Applied Math) before starting any of the certificate sequences. All courses in this program require extensive reading and use of computer technology. The ability to read English at the 8th grade level or above is highly recommended. Students should be skilled users of computer technology. For further information, contact the Department Chair or the Admissions Office.

Tech Prep

Skagit Valley College will grant credits toward a Professional/Technical degree based on competencies gained in high school. The competencies must be agreed upon by the appropriate teachers from the high school and the college. Credit will be transcripted after verification of successful completion of the agreed upon competencies. If you are interested in taking steps to begin work in the professional/technical workplace of the future, please contact your high school counselor.

Program Options

The Technical Design program offers several certificate options to meet the needs of students seeking entry-level CAD-related employment in a manufacturing workplace or other trades-related industry. Classes are offered both days and evenings. Students may choose to take individual skill enhancing classes, or select from several specialized certificate options.

Certificate Options

A Professional Technical Certificate prepares students for entry into a technical field of employment. Certificates include completion of the technical major required courses and any related instruction if required in communication, math, and human relation skills. Students must maintain a 2.0 GPA or above in all required course work.

TECHNICAL DESIGN - MANUFACTURING CERTIFICATE (54 CREDITS)

First Year

Fall	Cr	Winter	Cr	Spring	Cr
TECD 103	3	TECD 105	4	TECD 107	5
TECD 104	3	MANF 107	5	MANF 110	3
MANF 103	3	MANF 120	3	MANF 125	3
MANF 140	3	MANF 122	2	SOSC 113	1
†WMATH 100	5	†ENGL 170	3	SOSC 125	2
Total	**17**		**17**	**Total**	**14**

Summer	Cr
TECD 220	5
MANF 199	1
Total	6

† Students who do not receive an appropriate test score will require additional coursework to develop necessary skills for entry into class.

TECHNICAL DESIGN - AUTOMATED SYSTEMS CERTIFICATE (55 CREDITS)

First Year

Fall	Cr	Winter	Cr	Spring	Cr
TECD 103	3	TECD 105	4	TECD 107	5
TECD 104	3	MANF 107	5	MANF 156	5
MANF 103	3	MANF 150	5	SOSC 113	1
MANF 145	5	†WMATH 100	5	SOSC 125	2
†ENGL 170	3				
Total	**17**		**19**	**Total**	**13**

Summer	Cr
TECD 220	5
MANF 199	1
Total	6

† Students who do not receive an appropriate test score will require additional coursework to develop necessary skills for entry into class.

Technical Design Certificates

The Technical Design certificates will provide the basic skills needed for entry-level CAD-Technicians to perform in a manufacturing setting by introducing students to key product development concepts and a comprehensive sampling of essential software tools found in advanced manufacturing industries. This certificate option includes a CAD technical "core foundation," plus General Education requirements intended to help students foster the important communication skills required for successful work in a team-related design environment. In addition, the student will pick a trade-specialty focus to guide their path of study and complete an internship experience. Students must maintain a 2.0 GPA or above in all required course work.

TECHNICAL DESIGN - MANUFACTURING CERTIFICATE (54 CREDITS)

Required Courses: TECD 103, 104, 105, 107, 220, MANF 103, 110, 120, 122, 125, 140, 199, ENGL 170, WMATH 100, SOSC 113 and 125.)

TECHNICAL DESIGN - AUTOMATED SYSTEMS CERTIFICATE (55 CREDITS)

Required Courses: TECD 103, 104, 105, 107, 220, MANF 103, 107, 145, 150, 156, 199, ENGL 170, WMATH 100, SOSC 113 and 125

Manufacturing - Cad Technician Certificates

The Manufacturing CAD Technician certificates put conceptual computer modeling into the hands of the technician. With a solid basis in manufacturing fundamentals and a trade specialty, the manufacturing CAD operator will engage the latest tools to solve problems on the production floor and feed that information back up stream to influence the overall design process. Students will complete the CAD technical core courses, plus additional manufacturing fundamental courses focusing on trades specialties

such as composite technology, automated systems or welding.

MANUFACTURING CAD TECHNICIAN - AUTOMATED SYSTEMS CERTIFICATE (41 CREDITS)

Required Courses: MANF 103, 110, 122, 140, 145, 150, 156, TECD 103, 104, 105, and 107.

MANUFACTURING CAD TECHNICIAN - COMPOSITES CERTIFICATE (39 CREDITS)

Required Courses: CMPST 121, 123, 127, MANF 103, 110, 122, 140, TECD 103, 104, 105, and 107.

MANUFACTURING CAD TECHNICIAN - WELDING CERTIFICATE (44 CREDITS)

Required Courses: MANF 103, 110, 122, 140, TECD 103, 104, 105, 107, WT 111, 113, 112, and 114.

COMPUTER-AIDED TECHNICAL DESIGN CERTIFICATE (39+ CREDITS)

The Computer-Aided Technical Design certificate puts conceptual computer modeling into the hands of the technician. With a solid basis in manufacturing fundamentals and a trade specialty, the manufacturing CAD operator will engage the latest tools to solve problems on the production floor and feed that information back up stream to influence the overall design process. Students will complete the CAD technical core courses, plus additional manufacturing fundamental courses. In addition, the student will pick a trade-specialty focus to guide their path of study. CNC operation and CAM processes would be a natural progression for the student who focuses on Automated Systems Technology. The Composites Repair Technician uses design skills to enhance their work with a variety of composite materials. With a Quality Assurance emphasis, the student will influence process control as well as product quality. Students must maintain a 2.0 GPA or above in all required course work.

Required courses: MANF 110, 120, 122, 140; TECD 103, 104, 105, 107; plus complete ONE of the following trade specialty micro-certificate options:

- Automated Systems Technology (15 credits): Required courses: MANF 145, 150, 156
- Composite Repair Technician (13 credits): Required courses: CMPST 121, 123, and 127.
- Quality Assurance (13 credits): Required courses: MANF 103, 107, 120M 140 and WMATH 100.

Micro-Certificates

Micro-Certificates of Completion are designed for taking courses over a short period of time focusing on enhancement or development of a specific skill or set of skills. Micro-Certificate courses can help enhance employability skills or provide preparation for continuing education in the program area. Students must maintain a 2.0 GPA or above in all required course work.

TECHNICAL DRAWING MICRO-CERTIFICATE (15 CREDITS)

This micro-certificate program prepares students for entry-level work as a technical drafter and Computer-Aided Design (CAD) operator. The program is designed to provide training for individuals seeking entry-level employment as drafting technicians using the AutoDesk suite of products and SolidWorks computer-aided design software. Required courses: TECD 103, 104, 105, and 107

Course Descriptions

TECD 103 Introduction to Computer-Aided Design (3)

Introduction to computer-aided design (CAD) and graphics technology. Covers the basic techniques and standard practices of design. Introduces concepts of digital sketches, 3-D modeling and surface modeling. Covers the fundamental concepts of documentation and presentation for CAD. Prerequisite: Prior to entering this course, students should have mastered the following computer fundamentals: basic commands to operate software programs, directory structure, file management, and be able to use icons and keyboard commands.

TECD 104 Basic Computer-Aided Design (3)

Sequential study of computer-aided design (CAD) and graphics technology. Introductory study of 3-D modeling practices. Introduces drafting operations and the procedures used to create and edit CAD models. Covers the fundamental concepts of design and the product development process. Topics include sketching, basic commands, sketch relations, features, dimensioning, and basic part modeling. Prerequisite: TECD 103 or instructor permission.

TECD 105 Computer-Aided Design III (4)

Continuation of TECD 104 utilizing intermediate 3-D modeling tools in various software platforms. This study of 3-D modeling practices includes assemblies and Geometric Dimensioning and Tolerances. Topics include materials, derived parts, part patterning, constraints and reference geometry. Advanced topics in product development and manufacturing techniques are also explored. Prerequisite: TECD 104 or instructor permission.

TECD 107 Computer-Aided Design IV (5)

Intermediate study of 3-D modeling tools in various software platforms. In depth study of documentation practices for 3-D modeling. Apply techniques and standard practices of technical graphics to communicate design ideas. Topics include drafting, section views, exploded view, rendering and animation basics. Culminates with full presentation set for portfolio. Prerequisite: TECD 105 or instructor permission

TECD 220 Computer-Aided Design Studio (5)

Studio seminar utilizing skills gained in the TECD series. Apply CAD modeling and documentation skills to the design, development and presentation of products. Topics include functionality, material and manufacturing limitations, revisions and production concerns. Culminates with prototype product being developed for chosen trade specialty. Prerequisite: TECD 107 and instructor permission.