

# TDD - DRAFTING/DESIGN TECH

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## TDD 128 Detailing-Assembly-Fixture Design

Concentrating on the appropriate documentation of the engineering design intent, this course introduces the technician to the concepts, skills and tools for developing formal, precisely constructed detail, assembly, fixture and tooling drawings. Knowledge and application of graphical principles for the creation of mechanical drawings is demonstrated through freehand sketching as well as the use of a computer-aided drafting/design system. The importance of standards, documentation and the appropriate use of technical graphics to compliment the communication process will be stressed.

*Upon successful completion of this course, students should be able to:*

*Perform mathematical calculations associated with cost estimation, justification, design, build/purchase of parts, fixtures and tooling.*

*Contrast various aspects of special, multipurpose and modular fixture/tooling system design.*

*Discuss factors related to the determination of material usage, methods of construction and manufacture of work holding devices, fixtures and tools.*

*Utilize software library reference materials and data management techniques to assist in the design/drafting of parts, assemblies, fixtures and tools.*

*Detail working drawings via standard practices associated with geometric dimensioning and tolerancing.*

*Develop assembly drawings with associated bill of materials.*

Prerequisite: MAT 128 and TCC 122\* (\*Course may be taken concurrently.)

**3 Credits2 Weekly Lecture Hours**

**3 Weekly Lab Hours**

## TDD 190 CADD Internship (1 credit)

College-Sponsored Experiential Learning (CSEL) is designed to integrate on-the-job learning experiences with classroom studies. These experiences are structured either to explore career options or to prepare for a specific occupation. Students participating in the Cooperative Education and Internship Program gain college credit and are graded for their learning/work experience by the appropriate faculty. Students participating in this 60 hour internship will earn 1 college credit for this experience. Upon successful completion of this hands-on work experience, the student should be able to satisfy instructionally selected competencies from those below according to the number of credits to be awarded. NOTE To be eligible for an internship, students must: Have completed a minimum of 18 or more credits within the last 5 years. Have begun course work in their major (at least 9 credits). Have an overall grade point average (GPA) of 2.5. Obtain a written recommendation by a DCCC faculty within the discipline of the internship. Submit a current resume to the Office of Student Employment Services.

*Upon successful completion of this course, students should be able to:*  
*Explain three program-related concepts that have been applied during the work experience.*

*Describe the ways that technology is utilized in the work experience.*

*Analyze the culture of the host organization.*

*Analyze an operational process within the work experience.*

*Demonstrate how assigned tasks depend on successful communication.*

*Describe how time and activity are managed to meet work-imposed deadlines.*

*Describe an instance where problem-solving skills were needed to analyze a situation in the work experience.*

*Demonstrate specifically how job-related competence has improved.*

*Formulate a self-assessment for career growth and personal satisfaction.*

*Satisfy the competencies of the chosen CSEL placement (to be developed in consultation with the CSEL instructor).*

*Work closely with a faculty mentor in the student's program/major to complete a project which articulates how the experience helps the student achieve program outcomes.*

**1 Credit**

**TDD 194 CADD Internship (2 credits)**

College-Sponsored Experiential Learning (CSEL) is designed to integrate on-the-job learning experiences with classroom studies. These experiences are structured either to explore career options or to prepare for a specific occupation. Students participating in the Cooperative Education and Internship Program gain college credit and are graded for their learning/work experience by the appropriate faculty. Students participating in this 120 hour internship will earn 2 college credits for this experience. Upon successful completion of this hands-on work experience, the student should be able to satisfy instructionally selected competencies from those below according to the number of credits to be awarded. NOTE To be eligible for an internship, students must: Have completed a minimum of 18 or more credits within the last 5 years. Have begun course work in their major (at least 9 credits). Have an overall grade point average (GPA) of 2.5. Obtain a written recommendation by a DCCC faculty within the discipline of the internship. Submit a current resume to the Office of Student Employment Services.

*Upon successful completion of this course, students should be able to:*  
*Explain three program-related concepts that have been applied during the work experience.*

*Describe the ways that technology is utilized in the work experience.*

*Analyze the culture of the host organization.*

*Analyze an operational process within the work experience.*

*Demonstrate how assigned tasks depend on successful communication.*

*Describe how time and activity are managed to meet work-imposed deadlines.*

*Describe an instance where problem-solving skills were needed to analyze a situation in the work experience.*

*Demonstrate specifically how job-related competence has improved.*

*Formulate a self-assessment for career growth and personal satisfaction.*

*Satisfy the competencies of the chosen CSEL placement (to be developed in consultation with the CSEL instructor).*

*Work closely with a faculty mentor in the student's program/major to complete a project which articulates how the experience helps the student achieve program outcomes.*

**2 Credits****TDD 199 CADD Internship (3 credits)**

College-Sponsored Experiential Learning (CSEL) is designed to integrate on-the-job learning experiences with classroom studies. These experiences are structured either to explore career options or to prepare for a specific occupation. Students participating in the Cooperative Education and Internship Program gain college credit and are graded for their learning/work experience by the appropriate faculty. Students participating in this 180 hour internship will earn 3 college credits for this experience. Upon successful completion of this hands-on work experience, the student should be able to satisfy instructionally selected competencies from those below according to the number of credits to be awarded. NOTE To be eligible for an internship, students must: Have completed a minimum of 18 or more credits within the last 5 years. Have begun course work in their major (at least 9 credits). Have an overall grade point average (GPA) of 2.5. Obtain a written recommendation by a DCCC faculty within the discipline of the internship. Submit a current resume to the Office of Student Employment Services.

*Upon successful completion of this course, students should be able to:*  
*Explain three program-related concepts that have been applied during the work experience.*

*Describe the ways that technology is utilized in the work experience.*

*Analyze the culture of the host organization.*

*Analyze an operational process within the work experience.*

*Demonstrate how assigned tasks depend on successful communication.*

*Describe how time and activity are managed to meet work-imposed deadlines.*

*Describe an instance where problem-solving skills were needed to analyze a situation in the work experience.*

*Formulate a self-assessment for career growth and personal satisfaction.*

*Satisfy the competencies of the chosen CSEL placement (to be developed in consultation with the CSEL instructor).*

*Work closely with a faculty mentor in the student's program/major to complete a project which articulates how the experience helps the student achieve program outcomes.*

**3 Credits3 Weekly Lecture Hours****TDD 203 Kinematics**

This course provides an introduction to mechanisms used for transmitting forces, controlling position, determining spatial interference and providing feedback information.

*Upon successful completion of this course, students should be able to:*  
*Set up and solve basic problems in spatial motion analysis, using both graphical and analytical methods.*

*Design simple mechanisms.*

*Draw simple mechanisms.*

*Set up and solve kinematic problems involving straight-line motion, rotary motion, and combined motion.*

*Solve problems involving cams, gears and gear trains.*

Prerequisite: MAT 128 and TCC 112 and TCC 231 and PHY 107.

**3 Credits2 Weekly Lecture Hours****3 Weekly Lab Hours**

**TDD 216 Three Dimensional CADD**

This course provides instruction in advanced computer-aided design and drafting (CADD) techniques in addition to creation of three-dimensional drawings. Students progress from two-dimensional projection to wireframe, surface modeling, solids modeling and rendering techniques. Emphasis will be placed on maximizing a personal computer-based CADD system to develop a series of increasingly difficult drafting assignments and ending with a presentation quality final project and portfolio of completed drawings.

*Upon successful completion of this course, students should be able to:*  
*Describe user coordinate systems, workplanes and coordinate data, using absolute, relative, polar and spherical coordinates, as well as coordinate filters, to create planar, prismatic and three-dimensional curved features on drawings.*

*Create semi and logarithmic scales and charts, as well as three-dimensional pictorial line and pie charts, bar graphs, scatter plots and surface plots. Construct three-dimensional drawings consisting of wireframe, primitives and solids; and utilize software features to determine the mass properties of a three-dimensional solid models.*

*Utilize descriptive geometry techniques to draft three-dimensional intersections and developments.*

*Compose axonometric, oblique and perspective view drawings.*

*Construct orthographic, isometric and auxiliary view drawings utilizing parametric modeling software.*

*Develop three-dimensional drawings to include assembly drawings using parametric constraint/ modeling techniques.*

*Make sections, profiles and cut away views of three-dimensional objects, including constrained drawings.*

*Apply intermediate to advanced rendering, shading and animation techniques to optimize technical design presentations.*

*Use various display, drawing and plotter parameters and commands to satisfy the specific requirements of a 3D design/drafting assignment.*

Prerequisite: TCC 122.

**3 Credits2 Weekly Lecture Hours**

**2 Weekly Lab Hours**

**TDD 225 Computer Aided Drafting**

An introduction to computer-aided drafting through familiarization with computers and software used, and investigation of the knowledge and skills required of an operator of computer-aided drafting systems. Emphasis is on the IBM microcomputer-based systems, which will be learned through accomplishment of a series of increasingly complex drafting assignments. NOTE: Prerequisites: TDD 124, or architectural drafting course, or drafting experience.

*Upon successful completion of this course, students should be able to:*  
*Identify the components of a typical computer-aided drafting system. Boot up (start) the system in preparation for beginning a new drawing or editing an existing drawing.*

*Identify a drawing, establish drawing parameters and use menus or commands appropriately to begin work on the drawing.*

*Enter pertinent data for the drafting assignment, using absolute and relative coordinates, last coordinates, keyboard and digitizing or pointing devices. Operate the display controls including WINDOW, PAN and other drawing and screen control commands to satisfy the specific requirements of the drafting assignment.*

*Modify and correct drawings using the edit commands.*

*Provide dimensions, notes, bills of materials and other text on drawings as necessary to satisfy the information requirements of manufacturing or construction.*

*Use drawing libraries composed of standard shapes and components, or previously prepared drawings to insert desired information and entities in current drawings.*

*Plan, lay out and complete the necessary drawings to describe a design, manufacturing or construction project selected by the student as an individual or as a member of a planning group.*

*Save (on disk) and plot drawings produced with the microcomputer-based systems.*

Prerequisite: TDD 124.

**3 Credits2 Weekly Lecture Hours**

**2 Weekly Lab Hours**

**TDD 227 Advanced CADD**

This course provides students with computer-aided drafting design (CADD) software customization techniques. Emphasis includes improvement of software function via menu customization, proper installation of the software, macro programming and management of electronic files. Additionally, activities associated with the evaluation of newly evolving CADD related systems provide skills appropriate for identifying specialized design and drafting career opportunities.

*Upon successful completion of this course, students should be able to:*

*Use a text editor to create and modify computer software files.*

*Write macros to simplify CADD system operations and maximize speed and accuracy.*

*Structure and edit menus to enhance CADD software module access and performance capabilities.*

*Customize CADD support files such as prototype drawings, line types, hatches, text fonts, and styles and slide libraries.*

*Create customized CADD Help files, icon and menus.*

*Assemble a career growth portfolio to represent expertise in CADD customization.*

*Develop a methodology for evaluating new computer software and related technologies for computer-aided drafting and design.*

*Utilize object linking and extracting technology to create integrated graphics/ textual databases for productivity optimization.*

Prerequisite: TCC 122.

**3 Credits2 Weekly Lecture Hours**

**2 Weekly Lab Hours**