

## Drafting and Design Technology (DDT)

Availability of courses in this program is dependent upon student enrollment. See master schedule of classes or advisor for further information.

### **DDT 103 Introduction to Computer Aided Drafting** 2-3-3

This course provides an introduction to basic Computer-Aided Design and Drafting (CAD) functions and techniques, using “hands-on” applications. Topics include terminology, hardware, basic DOS and Windows functions, file manipulation, and basic CAD software applications in producing softcopy and hardcopy. Upon completion, students should be able to identify and select CAD hardware, employ basic DOS and Windows functions, handle basic text and drawing files, and produce acceptable hardcopy on a CAD system.

### **DDT 111 Fundamentals of Drafting and Design Technology** 2-3-3

This course serves as an introduction to the field of drafting and design and provides a foundation for the entire curriculum. Topics include safety, lettering, tools and equipment, geometric constructions, and orthographic sketching. Upon completion, students should develop and use safe work habits, identify and properly use common drafting tools and equipment, construct geometric figures, and sketch basic orthographic views of objects.

### **DDT 112 Introductory Technical Drawing** 2-3-3

This course covers drawing reproduction and orthographic projection and sectioning. Emphasis will be placed on the theory as well as the mechanics of orthographic projection and shape description, the relationship of orthographic planes and views, the views and their space dimensions, the application of the various types of sections, and drawing reproduction. Upon completion, students should have an understanding of orthographic projection and be able to identify orthographic planes, produce orthographic views of objects, apply the various sectioning techniques and methods, and reproduce drawings.

### **DDT 115 Blueprint Reading for Machinists** 3-0-3

This course provides the students with terms and definitions, theory of orthographic projection, and other information required to interpret drawings used in the machine trades. Topics include multiview projection, pictorial drawings, dimensions and notes, lines and symbols, and sketching. Upon completion, students should be able to interpret blueprint drawings used in the machine trades.

### **DDT 116 Blueprint Reading for Construction** 3-0-3

This course provides the students with terms and definitions, theory of orthographic projection, and other information required to interpret drawings used in the construction trades. Topics include multiview projection, dimensions and notes, lines and symbols, sketching, foundations plans, site plans, floor plans, elevations, sections, details, schedules, electrical plans and specifications. Upon completion, students should be able to interpret blueprint drawings used in the machine trades.

### **DDT 117 Manufacturing Processes** 2-3-3

This course in materials and processes includes the principles and methodology of material selection, application, and manufacturing processes. Emphasis is directed to solids to include material characteristics, castings, forging, and die assemblies. Upon completion, students should be able to discuss and understand the significance of materials’ properties, structure, basic manufacturing processes, and express and interpret material specifications.

### **DDT 118 Basic Electrical Drafting** 2-3-3

PREREQUISITE: DDT 111, DDT 112, DDT 113, or permission of the instructor.

This course covers the universal language of electrical drafting, including electrical lines, symbols, abbreviations, and notation. Emphasis is placed on typical components such as generators, controls, transmission networks, and lighting, heating, and cooling devices. Upon completion, students should be able to draw basic diagrams of electrical and electronic circuits using universally accepted lines and symbols.

### **DDT 119 Advanced Electronic Drafting** 2-3-3

PREREQUISITE: DDT 111, DDT 112, DDT 113 or permission of the instructor.

This course introduces drafting and design techniques dealing with production of electronic equipment for consumer, commercial, and military applications. Emphasis is placed on schematic drawings, connection or wiring diagrams, industrial electronic diagrams, ladder schematics, flow block diagrams, and documentation types and techniques related to the power delivery industry. Upon completion, students should be able to prepare documentation specified to ANSI standards and be familiar with the techniques of composition and the unique symbols and practices of industry.

### **DDT 121 Intermediate Technical Drawing** 2-3-3

PREREQUISITE: DDT 111, DDT 112, DDT 113 or permission of the instructor.

This course is designed to develop a strong foundation in common drafting and design practices and procedures. Topics include auxiliary views, basic space geometry, pictorial drawings, and basic charts and graphs. Upon completion, students should be able to project and develop auxiliary views, locate and specify points, lines, and planes in space, develop axonometric, oblique, and perspective drawings and draw basic charts and graphs.

**DDT 122 Advanced Technical Drawing** 2-3-3

PREREQUISITE: DDT 111, DDT 112, DDT 113 or permission of the instructor.

This course covers the methods of providing size description and manufacturing information for production drawings. Emphasis will be placed on accepted dimensioning and tolerancing practices including Geometric Dimensioning and Tolerancing for both the Customary English System and the ISO System. Upon completion, students should be able to apply dimensions, tolerances, and notes to drawings to acceptable standards, including Geometric Dimensioning and Tolerancing, and produce drawings using and specifying common threads and various fasteners, including welding methods.

**DDT 123 Intermediate CAD** 2-3-3

PREREQUISITE: DDT 113 or permission of the instructor.

This course covers intermediate-level concepts and applications of CAD design and drafting. Emphasis will be placed on intermediate-level features, commands, and applications of CAD software. Upon completion, students should be able to develop and use external references and paper space, apply higher-level block creation techniques and usage, including attributes, and apply basic-level customization techniques to CAD software.

**DDT 125 Surface Development** 2-3-3

PREREQUISITE: DDT 111, DDT 112 or permission of the instructor.

This course covers surface intersections and developments. Emphasis is placed on the basic types of intersections using simple geometric forms. Upon completion, students should be able to draw common types of surface intersection and handle them simply as applications of the concepts learned in this class.

**DDT 131 Machine Drafting Basics** 2-3-3

PREREQUISITE: DDT 111, DDT 112, DDT 113 or permission of the instructor.

This course in machine drafting and design provides instruction in the largest speciality area of drafting in the United States, in terms of scope and job opportunities. Emphasis will be placed on the applications of multi-view drawings, including drawing organization and content, title blocks and parts lists, assembly drawings, detail drawings, dimensioning and application of engineering controls in producing industrial-type working drawings. Upon completion, students should be able to organize, layout, and produce industrial-type working drawings, including the application of title blocks, parts lists, assemblies, details, dimensions, and engineering controls.

**DDT 132 Architectural Drafting** 2-3-3

PREREQUISITE: DDT 111, DDT 112, DDT 113 or permission of the instructor.

This course in architectural design and drafting introduces basic terminology, concepts and principles of architectural design and drawing. Topics include design considerations, lettering, terminology; site plans, and construction drawings. Upon completion, students should be able to draw, dimension, and specify basic residential architectural construction drawings.

**DDT 133 Basic Surveying** 2-3-3

This course covers the use of surveying instruments, mathematical calculations and the theory of land surveying. Topics include USGS benchmarks, measuring horizontal and vertical angles and distances, terms, and recording and interpreting field notes. Upon completion, students should be able to recognize benchmarks and measure, specify, and record field notes.

**DDT 134 Descriptive Geometry** 2-3-3

This course is designed to teach the fundamental concepts of descriptive geometry through an emphasis on logical reasoning, visualization, and practical applications. Topics include orthographic projection, points and lines in space, auxiliary views, plane representation, intersecting and non-intersecting lines, piercing and intersecting planes, plane development, and calculations. Upon completion, students should be able to project and intersect points, lines, and planes, with their relationships in space, as well as develop surfaces of an object for fabrication purposes.

**DDT 181 Special Topics in Drafting and Design Technology** 3-0-3

These courses provide specialized instruction in various areas related to the drafting industrial. Emphasis is placed on meeting students' needs.

**DDT 182 Special Topics in Drafting and Design Technology** 1-0-1

These courses provide specialized instruction in various areas related to the drafting industrial. Emphasis is placed on meeting students' needs.

- DDT 191 Drafting Internship** 0-5-1  
PREREQUISITE: Permission of the instructor.  
This course is designed for those who are involved in a structured employment situation that is directly related to the field of drafting and design and is coordinated with the drafting instructor. The student must spend at least 5 hours per week in an activity planned and coordinated jointly by the instructor and the employer. Upon completion, students should have gained valuable work experience in a well-planned, coordinated training/work situation.
- DDT 192 Drafting Internship** 0-10-2  
PREREQUISITE: Permission of the instructor.  
This course is limited to those who are involved in a structured employment situation that is directly related to the field of drafting and design and is coordinated with the drafting instructor. The student must spend at least 10 hours per week in an activity planned and coordinated jointly by the instructor and the employer. Upon completion, students should have gained valuable work experience in a well-planned, coordinated training/work situation.
- DDT 193 Drafting Internship** 0-15-3  
PREREQUISITE: Permission of the instructor.  
This course is limited to those who are involved in a structured employment situation that is directly related to the field of drafting and design and is coordinated with the drafting instructor. The student must spend at least 15 hours per week in an activity planned and coordinated jointly by the instructor and the employer. Upon completion, students should have gained valuable work experience in a well-planned, coordinated training/work situation.
- DDT 211 Intermediate Machine Drafting** 2-3-3  
PREREQUISITE: DDT 131 or permission of the instructor.  
This second course in machine drafting and design provides more advanced instruction in the largest speciality area of drafting. Topics include applications of previously developed skills in the organization and development of more complex working drawings, use of vendor catalogs and the Machinery's Handbook for developing specifications, and use of standardized abbreviations in working drawings.
- DDT 212 Intermediate Architectural Drafting** 2-3-3  
PREREQUISITE: DDT 132 or permission of the instructor.  
This second course in architectural design and drafting continues with more advanced and detailed architectural plans. Topics include floor construction and detailing, foundation, wall, and roof construction and detailing; use of standards manuals; perspective drawings; electrical plans; plumbing plans; and building materials, with emphasis on residential and some light commercial applications. Upon completion, students should be able to draw and specify advanced-level plans including various architectural details.
- DDT 213 Civil Drafting, Plat Maps** 2-3-3  
PREREQUISITE: DDT 111, DDT 112, DDT 113 or permission of the instructor.  
This course introduces the drafting practices, symbols, conventions, and standards utilized in civil engineering contract documents. Topics include site planning, land surveying, topographic surveys, along with civil terminology. Upon completion, students should be able to draw accurate plat maps giving legal descriptions of land parcels, draw simple site plans, and identify and use proper symbols and conventions on civil engineering drawings.
- DDT 214 Pipe Drafting** 2-6-4  
PREREQUISITE: DDT 111, DDT 112, DDT 113 or permission of the instructor.  
This course covers the theory and practical application needed to understand piping fundamentals as used in refineries and petrochemical plants. Topics include process and mechanical flow diagrams, plant equipment, isometric drawings, instrumentation symbols, pipe symbols, flanges, fittings, and applications of basic math and trigonometry. Upon completion, students should be able to demonstrate pipe drafting techniques and fundamentals in order to prepare working drawings used in refineries and the petrochemical industrial environment.
- DDT 215 Geometric Dimensioning and Tolerancing** 2-3-3  
PREREQUISITE: DDT 111, DDT 112, DDT 113 or permission of the instructor.  
This course is designed to teach fundamental concepts of size description by geometric methods including appropriate engineering controls. Emphasis is placed on the drawing and application of common geometric dimensioning and tolerancing symbols to engineering drawings as designated by the latest ANSI/ASME Standards. Upon completion, students should be able to use geometric dimensioning and tolerancing symbols in applying size information and manufacturing controls to working drawings.
- DDT 217 Building Codes, Ordinances, Zoning Restrictions and the A.D.A.** 3-0-3  
PREREQUISITE: Permission of the instructor.

This course provides an in-depth study of building codes, municipal ordinances, zoning restrictions, and compliance with the Americans With Disability Act as related to commercial drafting and design. Emphasis is placed upon working understanding of these topics.

**DDT 221 Advanced Machine Drafting** 2-3-3

PREREQUISITE: DDT 131 or permission of the instructor.

This third course in machine drafting and design covers the development of complex, advanced working drawings by applying previously developed skills. Topics include application of previously developed skills in the organization and development of complex, advanced-level working drawings, including sub-assemblies and a basic design problem. Upon completion, students should be able to organize, layout, and produce complex, advanced-level working drawings, including sub-assemblies and a basic design problem.

**DDT 222 Advanced Architectural Drafting** 2-3-3

PREREQUISITE: DDT 132 or permission of the instructor.

This third course in architectural design and drafting continues with advanced architectural plans, including a slant toward light commercial construction. Topics include climate control plans, application of building codes, building materials and finish specifications, cost estimating, and bid specifications. Upon completion, students should be able to apply current techniques in producing advanced-level architectural plans, including residential and light commercial applications.

**DDT 223 Advanced Civil Drafting** 2-3-3

PREREQUISITE: DDT 213 or permission of the instructor.

This course is designed to build on the concepts learned in Civil Drafting I and introduces the student to more complex projects and problems. Topics include but are not limited to profiles, staking plans, grading plans, utility plans, and civil detailing. Upon completion, students should be able to accurately draft the documents described previously.

**DDT 224 Structural Concrete Drafting** 2-3-3

PREREQUISITE: DDT 111, DDT 112, DDT 113, or permission of the instructor.

This course is designed to develop the knowledge and skills necessary to understand the basic components and terminology of pre-cast and poured-in-place concrete structures. Emphasis is placed on pre-cast concrete framing plans, sections, fabrication and connection details, poured-in-place concrete foundations, floor systems, and bills of material. Upon completion, students should be able to construction engineering and shop drawings of concrete beams, column, floor, rood, and wall framing plans using the A.I.S.C. Manual and incorporating safety practices.

**DDT 225 Structural Steel Drafting** 2-3-3

PREREQUISITE: DDT 111, DDT 112, DDT 113 or permission of the instructor.

This course covers the theory and practical applications necessary to understand the basic design and terminology of structural steel components used in light commercial buildings. Emphasis is placed on structural steel drafting techniques, bolted and welded connections, framing plans, sections, fabrication and connection details, and bills of material. Upon completion, students should be able to produce engineering and shop drawings incorporating standard shapes, sizes, and details using the A.I.S.C. Manual and incorporating safety practices.

**DDT 226 Technical Illustration** 2-3-3

PREREQUISITE: DDT 121 or permission of the instructor.

This course provides the student with various methods of illustrating structures and machine parts. Topics include axonometric drawings; exploded assembly drawings; one point, two point, and three point perspectives, surface textures, and renderings. Upon completion, students should be able to produce drawings and illustrations using the previously described methods.

**DDT 228 Geographic Information Systems** 2-3-3

PREREQUISITE: DDT 223 or permission of the instructor.

This course is designed as an introduction to the world of G.I.S. and what it's about and builds on the skills attained in Civil Drafting I and II. Emphasis will be placed on utilizing G.I.S. software in conjunction with a CAD program to produce "intelligent" maps tied to a database in solving complex projects and problems. Upon completion, students should be able to manipulate attributed objects drawn on CAD/GIS software and accurately produce basic G.I.S. drawings.

**DDT 231 Advanced CAD** 2-3-3

PREREQUISITE: DDT 111, DDT 112, DDT 113 or permission of the instructor.

This course covers the advanced applications of CAD software to engineering projects in various applications, including architectural, civil, mechanical, and environmental engineering, with consideration for advanced physical and psychological principle of CAD. These principles will be applied toward CAD customization and programming principles, for the expressed purpose of increasing productivity and improving the performance of the CAD operator, thereby, making CAD much more productive in an engineering environment. Emphasis will be place on using intelligent CAD techniques to increase the quality of output. And, 3D modeling and rendering will be introduced.

Upon completion, students should be able to apply advanced CAD techniques in solving complex problems related to all engineering applications.

**DDT 232 CAD Customization** 3-3-4

PREREQUISITE: DDT 123 or permission of the instructor.

This course introduces the various methods of customizing CAD software to meet individual or company needs. Topics include menu customizing, programing, custom command macros, script files, slides, and slide libraries. Upon completion, students should be able to customize and write menus, write programming routines, and write script files for the purpose of increasing the proficiency of the CAD operator.

**DDT 233 Solids Modeling** 3-3-4

PREREQUISITE: DDT 123 or permission of the instructor.

This course provides instruction in 3D Design Modeling utilizing the 3D capabilities of CAD software. Emphasis is placed on 3D wire-frame, surface and solids modeling along with the development of 2D detail drawings from 3D models. Upon completion, students should be able to generate 3D surface and solid models and 2D orthographic production drawings from created solid models.

**DDT 234 3D Graphics and Animation** 3-3-4

PREREQUISITE: DDT 123 or permission of the instructor.

This course is design to challenge the imagination of the student in a 3-dimensional problem solving environment. The student will be given a basic introduction to the concepts of 3D design and animation then apply those concepts to a design project. Upon completion, students should be able to create and animate objects in a 3dimensional environment.

**DDT 235 Specialized CAD** 3-3-4

PREREQUISITE: DDT 113 or permission of the instructor.

This course introduces alternative CAD application software and alternative platforms, and can serve as a means of introducing third party programs that work in conjunction with a specific CAD application. Topics include various Graphical User Interfaces (GUI's) and how to navigate them, as well as how to use a third party application to make working in a specific CAD package easier and more productive. Upon completion, students should be able to use more than one CAD software package to produce hardcopy and use third party software to make certain tasks easier with a specific CAD program.

**DDT 236 Design Project** 2-3-3

PREREQUISITE: Permission of the instructor.

This course is designed for advanced students who aspire to more advanced and specialized skills in one certain drafting area. Emphasis will be place on the student's ability to apply the principles learned in previous drafting classes in one special area, as approved by the instructor. The required project must be agreed upon by the instructor and the student, as well as how the work is to be accomplished. Upon completion, students should further reinforce previously learned concepts by applying engineering principles and controls to a personal design project.

**DDT 237 Current Topics in CAD** 2-3-3

PREREQUISITE: DDT 113 or permission of the instructor.

This course serves to introduce changing technology and current CAD subjects and software and the computing hardware needed to utilize new products. Topics include currents trends in how industries use CAD applications, new developments, improvements and progressions within specific CAD applications as well as the necessary hardware. Upon completion, students should be able to use more updated software in a specific CAD application and be more aware of improvements in CAD software and how to apply advancing technology in improving their CAD proficiency.

**DDT 238 Special Topics in CAD** 3-0-3

PREREQUISITE: DDT 113 or permission of the instructor.

This course in special CAD and multimedia topics covers special capabilities possible with CAD software, especially in conjunction with other graphical software, such as virtual "walk-throughs" or multimedia presentations. Topics include but are not limited to combining CAD software, image editing software, authoring software, and 3D software into one harmonious relationship to produce multimedia presentations. Upon completion, students should be aware of and understand how to utilize several software packages to produce multimedia presentations.

**DDT 239 Independent Studies** 0/2-8/1-4

PREREQUISITE: DDT 122 or permission of the instructor.

This course provides practical application of prior attained skills and experiences as selected by the instructor for the individual student. Emphasis is placed on applying knowledge from prior courses toward the solution of individual drafting and design problems. Upon completion, students should demonstrate the application of previously attained skills and knowledge in the solution of typical drafting applications and problems.

**DDT 240 Public Utility Drafting** 2-3-3

PREREQUISITE: DDT 223 or permission of the instructor.

This course is designed to develop the knowledge and skills necessary to understand the control and direction of public utility drafting. Emphasis is placed on drafting techniques, sections, fabrication and connection details, and bills of materials for fresh water, storm water, and waste water. Upon completion, students should be able to produce engineering and shop drawings, incorporating details using the A.I.S.C. manual and incorporating safety practices.

**DDT 261 Statics, Strengths, and Testing of Materials** 3-3-4

PREREQUISITE: PHY 115 or permission of the instructor.

This is an advanced course that provides the student with information on the theory and general principles of engineering design. The course is a study of forces, vectors, equilibrium, rigid body, structural analysis, friction, centroids, mechanical properties of material, stress, strain, moments, bending, shear, and deflection. The destructive and non-destructive testing of various materials is also introduced in this course.

**DDT 267 Co-op Elective** 0-5-1

PREREQUISITE: Permission of the instructor.

This course allows the student to work parallel in a job closely related to the student's major while attending college. The grade is based on the employer's evaluation of the student's productivity, an evaluation work report submitted by the student, and the student's learning contract.

**DDT 268 Co-op Elective** 0-10-2

PREREQUISITE: Permission of the instructor.

This course allows the student to alternate semesters of full-time work in a job closely related to the student's major with semesters of full-time school. The grade is based on the employer's evaluation of the student's productivity, an evaluation work report submitted by the student, and the student's learning contract.

**DDT 284 Computer Aided Modeling I** 2-3-3

PREREQUISITE: DDT 282 or equivalent experience.

This course is an introduction to computer-aided modeling (CAM). Topics include three-dimensional drawing, filters, three-dimensional coordinates, view ports, meshes, surfaces, projections, model space, and model ports. Upon completion, students should be able to draw and dimension the wire-frame model of an object using three-dimensional microcomputer techniques.

**DDT 285 Computer Aided Modeling II** 2-3-3

PREREQUISITE: DDT 284 or equivalent experience.

This course is a continuation of DDT 284. Topics include projecting, model space, paper space, model views, external references, and solid modeling. Upon completion, students should be able to draw and dimension the diagrams necessary to clearly and completely describe an electronic network.

**DDT 286 Electronics CAD** 2-3-3

PREREQUISITE: DDT 282 or equivalent experience.

This course is an introduction to computer-aided drafting for electronics. Topics include block diagrams, electronics symbols, schematic diagrams, logic diagrams, wiring diagrams, and printed circuits. Upon completion, students should be able to draw and dimension the diagrams necessary to clearly and completely describe an electronic network.

**DDT 289 Process CAD** 2-3-3

PREREQUISITE: DDT 285 or equivalent experience.

This course is an introduction to computer-aided drafting for process control. Topics include process symbols, multiview process projections, P & I diagrams, and isometric process projections. Upon completion, students should be able to draw and dimension the plans necessary to clearly and completely describe a process-control network.

**DDT 290 Survey of Aerospace Technology** 3-0-3

This course provides a survey of Aerospace technology including the history of spaceflight, propulsion, orbital mechanics, and the space environment. A discussion of unmanned spacecraft, and the manned space program is also included, as well as, debate about the future, with solid facts and some speculation about humankind's ventures in the final frontier.