

Texas Workforce Education Course Manual (WECM)

Technical Computer-Aided Courses (CAD) - Optional

Introduction to Technical Drafting

CIP	Rubric	Number	Course Title	Status	Semester Credit Hours	Min Cont Hours	Max Cont Hours
15.1301	DFTG	1005	Technical Drafting	Active	0	64	128
15.1301	DFTG	1305	Technical Drafting	Active	3	64	96
15.1301	DFTG	1405	Technical Drafting	Active	4	80	128
15.1301	DFTG	1205	Technical Drafting	Archived #	2	32	64

COURSE LEVEL Introductory

COURSE DESCRIPTION Introduction to the principles of drafting to include terminology and fundamentals, including size and shape descriptions, projection methods, geometric construction, sections, and auxiliary views.

END-OF-COURSE OUTCOMES Create technical sketches, geometric constructions, orthographic projections, pictorial/sectional views, dimension drawings, and apply lettering techniques.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1301 (Drafting and Design Technology/Technician, General)

EFFECTIVE DATE September 1, 2011

Basic Computer-Aided Drafting

CIP	Rubric	Number	Course Title	Status	Semester Credit Hours	Min Cont Hrs	Max Cont Hrs
15.1302	DFTG	1009	Basic Computer-Aided Drafting	Active	0	64	128
15.1302	DFTG	1309	Basic Computer-Aided Drafting	Active	3	64	112
15.1302	DFTG	1409	Basic Computer-Aided Drafting	Active	4	80	128
15.1302	DFTG	1209	Basic Computer-Aided Drafting	Archived #	2	32	64

COURSE LEVEL Introductory

COURSE DESCRIPTION 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.

END-OF-COURSE OUTCOMES Identify terminology and basic functions used with CAD software; use CAD hardware and software to create, organize, display, and plot/print working drawings; and use file management techniques.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1302 (CAD/CADD Drafting and/or Design Technology/Technician)

EFFECTIVE DATE September 1, 2011

Intermediate Computer-Aided Drafting

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1302	DFTG	2019	Intermediate Computer-Aided Drafting	Active	0	64	128
15.1302	DFTG	2319	Intermediate Computer-Aided Drafting	Active	3	64	128
15.1302	DFTG	2419	Intermediate Computer-Aided Drafting	Active	4	80	128
15.1302	DFTG	2219	Intermediate Computer-Aided Drafting	Archived #	2	32	64

COURSE LEVEL Intermediate

COURSE DESCRIPTION A continuation of practices and techniques used in basic computer-aided drafting including the development and use of prototype drawings, construction of pictorial drawings, extracting data, and basics of 3D.

END-OF-COURSE OUTCOMES Produce 2D and 3D drawings, pictorial drawings; use external referencing of multiple drawings to construct a composite drawing; and import and extract data utilizing attributes.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1302 (CAD/CADD Drafting and/or Design Technology/Technician)

EFFECTIVE DATE September 1, 2012

Advanced Computer-Aided Drafting

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1302	DFTG	2032	Advanced Computer-Aided Drafting	Active	0	64	128
15.1302	DFTG	2332	Advanced Computer-Aided Drafting	Active	3	64	96
15.1302	DFTG	2432	Advanced Computer-Aided Drafting	Active	4	80	128
15.1302	DFTG	2232	Advanced Computer-Aided Drafting	Archived #	2	64	128

SUGGESTED PREREQUISITE Intermediate Computer-Aided Drafting

COURSE LEVEL Advanced

COURSE DESCRIPTION Application of advanced CAD techniques.

END-OF-COURSE OUTCOMES Use a customized CAD system to create documents and/or solid models; and use OLE with external software.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1302 (CAD/CADD Drafting and/or Design Technology/Technician)

EFFECTIVE DATE September 1, 2011

Parametric Modeling and Design

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1306	DFTG	1045	Parametric Modeling and Design	Active	0	64	128
15.1306	DFTG	1345	Parametric Modeling and Design	Active	3	64	96
15.1306	DFTG	1445	Parametric Modeling and Design	Active	4	80	128

COURSE LEVEL Intermediate

COURSE DESCRIPTION Parametric-based design software for 3D design and drafting.

END-OF-COURSE OUTCOMES Use parametric modeling techniques to create rendered assemblies, orthographic drawings, auxiliary views, and details from 3-dimensional models.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1306 (Mechanical Drafting and Mechanical Drafting CAD/CADD)

EFFECTIVE DATE September 1, 2012

Mechanical Drafting

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1306	DFTG	1033	Mechanical Drafting	Active	0	64	128
15.1306	DFTG	1333	Mechanical Drafting	Active	3	64	96
15.1306	DFTG	1433	Mechanical Drafting	Active	4	80	128

COURSE LEVEL Introductory

COURSE DESCRIPTION Study of mechanical drawings using dimensioning and tolerances, sectioning techniques, orthographic projection, and pictorial drawings.

END-OF-COURSE OUTCOMES Develop a set of working drawings including assembly, detail, and pictorial.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1306 (Mechanical Drafting and Mechanical Drafting CAD/CADD)

EFFECTIVE DATE September 1, 2011

Architectural Drafting - Residential

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1303	DFTG	1017	Architectural Drafting - Residential	Active	0	64	128
15.1303	DFTG	1317	Architectural Drafting - Residential	Active	3	64	96
15.1303	DFTG	1417	Architectural Drafting - Residential	Active	4	80	128
15.1303	DFTG	1217	Architectural Drafting - Residential	Archived #	2	32	64

COURSE LEVEL Introductory

COURSE DESCRIPTION Architectural drafting procedures, practices, terms, and symbols. Preparation of detailed working drawings for residential structures. Emphasis on light frame construction methods.

END-OF-COURSE OUTCOMES Utilize architectural terms, symbols, residential construction materials, and processes to produce a set of residential construction drawings including site plan, floor plan, elevations, wall sections, schedules, details, and foundation plan using reference materials.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1303 (Architectural Drafting and Architectural CAD/CADD)

EFFECTIVE DATE September 1, 2012

Architectural Drafting - Commercial

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1303	DFTG	2028	Architectural Drafting - Commercial	Active	0	64	128
15.1303	DFTG	2328	Architectural Drafting - Commercial	Active	3	64	96
15.1303	DFTG	2428	Architectural Drafting - Commercial	Active	4	80	128
15.1303	DFTG	2228	Architectural Drafting - Commercial	Archived #	2	32	64

COURSE LEVEL Intermediate

COURSE DESCRIPTION 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.

END-OF-COURSE OUTCOMES Apply commercial construction materials and processes; produce a set of commercial construction drawings including a site plan, floor plans, reflected ceiling plan, sections, elevations, schedules, and details.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1303 (Architectural Drafting and Architectural CAD/CADD)

EFFECTIVE DATE September 1, 2012

Civil Drafting

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1304	DFTG	2030	Civil Drafting	Active	0	64	128
15.1304	DFTG	2330	Civil Drafting	Active	3	64	96
15.1304	DFTG	2430	Civil Drafting	Active	4	80	128

COURSE LEVEL Advanced

COURSE DESCRIPTION An in-depth study of drafting methods and principles used in civil engineering.

END-OF-COURSE OUTCOMES Interpret field notes; develop documents for a civil project; analyze and layout drainage and utilities infrastructure; and perform related calculations.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1304 (Civil Drafting and Civil Engineering CAD/CADD)

EFFECTIVE DATE September 1, 2011

Structural Drafting

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
04.0901	ARCE	1052	Structural Drafting	Active	0	64	128
04.0901	ARCE	1352	Structural Drafting	Active	3	64	128
04.0901	ARCE	1452	Structural Drafting	Active	4	80	128
04.0901	ARCE	1252	Structural Drafting	Archived #	2	48	64

COURSE LEVEL Intermediate

COURSE DESCRIPTION A study of structural systems including concrete foundations and frames, wood framing and trusses, and structural steel framing systems. Includes detailing of concrete, wood, and steel to meet industry standards including the American Institute of Steel Construction and The American Concrete Institute.

END-OF-COURSE OUTCOMES Identify components of structural systems; use reference materials; produce drawings for concrete, wood, and steel framing systems; draw design details and connections for framing components; and draw column and beam details for manufacture and assembly utilizing various fastening methods.

LAB RECOMMENDED

CIP CODE DESCRIPTION 04.0901 (Architectural Technology/Technician)

EFFECTIVE DATE September 1, 2011

Technical Illustration and Presentation

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1302	DFTG	2012	Technical Illustration and Presentation	Active	0	64	128
15.1302	DFTG	2312	Technical Illustration and Presentation	Active	3	64	96
15.1302	DFTG	2412	Technical Illustration and Presentation	Active	4	80	128

COURSE LEVEL Intermediate

COURSE DESCRIPTION Study of pictorial drawings including isometrics, obliques, perspectives, charts, and graphs. Emphasis on rendering and using different media.

END-OF-COURSE OUTCOMES Identify the processes used in technical illustration and produce pictorial drawings for use in technical presentation.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1302 (CAD/CADD Drafting and/or Design Technology/Technician)

EFFECTIVE DATE September 1, 2011

Introduction to Technical Animation and Rendering

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
10.0304	ARTV	1302	Introduction to Technical Animation and Rendering	Active	3	64	96
10.0304	ARTV	1402	Introduction to Technical Animation and Rendering	Active	4	80	128
10.0304	ARTV	1002	Introduction to Technical Animation and Rendering	Archived #	0	64	128

COURSE LEVEL Introductory

COURSE DESCRIPTION Basic study of technical computer models and animation.

END-OF-COURSE OUTCOMES Identify basic terminology and concepts associated with the development of technical computer models and animation, create a technical 3-D simulation using lighting, camera, materials, textures, views, and scenes, and demonstrate importing models from computer-aided design or solid modeling programs.

LAB RECOMMENDED

CIP CODE DESCRIPTION 10.0304 (Animation, Interactive Technology, Video Graphics and Special Effects)

EFFECTIVE DATE September 1, 2016

Advanced Technical Animation and Rendering

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1302	DFTG	2047	Advanced Technical Animation and Rendering	Active	0	64	128
15.1302	DFTG	2347	Advanced Technical Animation and Rendering	Active	3	64	96
15.1302	DFTG	2447	Advanced Technical Animation and Rendering	Active	4	80	128

COURSE LEVEL Advanced

COURSE DESCRIPTION Advanced 3D modeling, rendering and animation techniques using industry standard software. Emphasizes advanced use of camera settings, lighting, and surface to create detailed environments.

END-OF-COURSE OUTCOMES Build seamless models and set them up for animation; build realistic environments with detailed surfaces and lighting; add particle and volumetric effects and control them over time.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1302 (CAD/CADD Drafting and/or Design Technology/Technician)

EFFECTIVE DATE September 1, 2012

Advanced Technologies in Architectural Design and Drafting

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1303	DFTG	2031	Advanced Technologies in Architectural Design and Drafting	Active	0	64	128
15.1303	DFTG	2331	Advanced Technologies in Architectural Design and Drafting	Active	3	64	96
15.1303	DFTG	2431	Advanced Technologies in Architectural Design and Drafting	Active	4	80	128

SUGGESTED PREREQUISITE DFTG 1017/1317/1417 Architectural Drafting - Residential

COURSE LEVEL Advanced

COURSE DESCRIPTION Use of architectural specific software to execute the elements required in designing standard architectural exhibits utilizing custom features to create walls, windows and specific design requirements for construction in residential/commercial and industrial architecture.

END-OF-COURSE OUTCOMES Use architectural techniques to design, assemble, evaluate, and render architectural building components; develop plan and elevation drawings and details from three-dimensional architectural models.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1303 (Architectural Drafting and Architectural CAD/CADD)

EFFECTIVE DATE September 1, 2011

Final Project – Advanced Drafting

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1302	DFTG	2038	Final Project – Advanced Drafting	Active	0	64	144
15.1302	DFTG	2338	Final Project – Advanced Drafting	Active	3	64	144
15.1302	DFTG	2438	Final Project – Advanced Drafting	Active	4	80	144

COURSE LEVEL Advanced

COURSE DESCRIPTION A drafting course in which students participate in a comprehensive project from conception to conclusion.

END-OF-COURSE OUTCOMES Conceptualize, design and present a complete project in a prescribed discipline. Integrate problem solving and related technologies to identify solutions; use discipline specific industry standards, and produce documentation.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1302 (CAD/CADD Drafting and/or Design Technology/Technician)

EFFECTIVE DATE September 1, 2012

Texas Workforce Education Course Manual (WECM)

Technical Major Drawing/Drafting Courses - Optional

Architectural Illustration

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
04.0901	ARCE	1021	Architectural Illustration	Active	0	48	128
04.0901	ARCE	1321	Architectural Illustration	Active	3	48	96
04.0901	ARCE	1421	Architectural Illustration	Active	4	64	128

COURSE LEVEL Introductory

COURSE DESCRIPTION Architectural drawing and sketching. Emphasizes architectural structures in 3-D or pictorially either by hand or computer software.

END-OF-COURSE OUTCOMES Create three-dimensional representations of architectural structures; drawings; use various rendering techniques to establish shading and texture; produce presentation architectural renderings.

LAB RECOMMENDED

CIP CODE DESCRIPTION 04.0901 (Architectural Technology/Technician)

EFFECTIVE DATE September 1, 2012

Texas Workforce Education Course Manual (WECM)

Technical Major Elective Courses - Optional

Codes, Specifications, and Contract Documents

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
04.0901	ARCE	1342	Codes, Specifications, and Contract Documents	Active	3	48	80
04.0901	ARCE	1042	Codes, Specifications, and Contract Documents	Archived #	0	48	80
04.0901	ARCE	1242	Codes, Specifications, and Contract Documents	Archived #	2	32	32
04.0901	ARCE	1442	Codes, Specifications, and Contract Documents	Archived #	4	64	80

COURSE LEVEL Intermediate

COURSE DESCRIPTION Study of ordinances, codes, and legal documents as they relate to specifications and drawing. Discussion of owner-architect-contractor responsibilities, duties, and legal relationships.

END-OF-COURSE OUTCOMES Utilize codes, ordinances and legal documents; solve planning and construction problems with available resources; compose written construction specification documents; and analyze owner/architect/contractor relationship.

CIP CODE DESCRIPTION 04.0901 (Architectural Technology/Technician)

EFFECTIVE DATE September 1, 2012

Residential and Light Commercial Blueprint Reading

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1001	CNBT	1000	Residential and Light Commercial Blueprint Reading	Active	0	48	128
15.1001	CNBT	1300	Residential and Light Commercial Blueprint Reading	Active	3	48	96
15.1001	CNBT	1400	Residential and Light Commercial Blueprint Reading	Active	4	64	128

COURSE LEVEL Introductory

COURSE DESCRIPTION Introductory blueprint reading for residential and light commercial construction.

END-OF-COURSE OUTCOMES Scale prints with architectural and engineering scales; identify construction blueprint symbols and abbreviations; interpret a set of construction contract documents; and correlate elevations, sections, details, plan views, schedules, and general notes.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1001 (Construction Engineering Technology/Technician)

EFFECTIVE DATE September 1, 2012

Green Building

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
15.1001	CNBT	2017	Green Building	Active	0	64	128
15.1001	CNBT	2317	Green Building	Active	3	64	96
15.1001	CNBT	2417	Green Building	Active	4	64	128

COURSE LEVEL Intermediate

COURSE DESCRIPTION Methods and materials used for buildings that conserve energy, water, and human resources.

END-OF-COURSE OUTCOMES Explain the concept of green building; and identify materials to build exterior and interior systems that reflect sustainable building concepts. Explore smart energy technologies and their effects on energy usage.

LAB RECOMMENDED

CIP CODE DESCRIPTION 15.1001 (Construction Engineering Technology/Technician)

EFFECTIVE DATE September 1, 2012

Statics and Strength of Materials

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
04.0901	ARCE	2344	Statics and Strength of Materials	Active	3	48	96
04.0901	ARCE	2444	Statics and Strength of Materials	Active	4	64	96
04.0901	ARCE	2044	Statics and Strength of Materials	Archived #	0	48	96

SUGGESTED PREREQUISITE: DFTG 1005/1305/1405 Technical Drafting

COURSE LEVEL Advanced

COURSE DESCRIPTION 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.

END-OF-COURSE OUTCOMES Calculate load and the effect of forces on structures; prepare moment and shear diagrams; and analyze compression and tensile forces within structural elements

LAB RECOMMENDED

CIP CODE DESCRIPTION 04.0901 (Architectural Technology/Technician)

EFFECTIVE DATE September 1, 2011

Mechanical and Electrical Systems

CIP	Rubric	Number	Course Title	Status	Semester Credit Hrs	Min Cont Hrs	Max Cont Hrs
04.0901	ARCE	2052	Mechanical and Electrical Systems	Active	0	48	96
04.0901	ARCE	2352	Mechanical and Electrical Systems	Active	3	48	96
04.0901	ARCE	2452	Mechanical and Electrical Systems	Active	4	64	96

COURSE LEVEL Advanced

COURSE DESCRIPTION The properties of building materials (assemblies), specifications, codes, vendor references, and uses of mechanical, plumbing, conveying, and electrical systems as they relate to architecture for residential and commercial construction.

END-OF-COURSE OUTCOMES Perform mechanical/electrical/plumbing (MEP) calculations; select MEP components; interpret codes and specifications; and produce MEP drawings.

LAB RECOMMENDED

CIP CODE DESCRIPTION 04.0901 (Architectural Technology/Technician)

EFFECTIVE DATE September 1, 2011