DRAFTING AND DESIGN TECHNOLOGIES

Associate of Applied Science Degrees

- Architectural Technology
- Civil/Survey Technology
- Mechanical Drafting and Solid Modeling
- Pre-Architecture
- Surveying Technology

Certificates of Completion

- Architectural Technology
- Civil/Survey Technology
- Drafting and Graphics
- Geographical Information Systems
- Mechanical Drafting and Solid Modeling
- Pre-Architecture

The Drafting and Design Technologies Program provides students with a strong foundation in Computer-Aided Drafting (CAD), Architecture/Design, and relevant theory and concepts necessary to become successful in various related fields. These fields include

- Architecture,
- Architectural Technology,
- Civil/Survey Technology,
- Mechanical Drafting and Solid Modeling, and
- Surveying/Geomatics

Excellent job and salary opportunities are available nationwide for Drafters/CAD specialists, technicians, architects, and engineers. With its rapid growth, Southern New Mexico has strong employment possibilities for graduates of the Drafting and Design Technologies Program. Students with previous related training and/or formal education may qualify for more advanced positions, such as construction inspector or supervisor, contractor, or senior drafter.

Within the Drafting and Design Technologies Program are five courses of study leading to associate of applied science degrees. These allow students to tailor their studies to their own interests and career aspirations.

- ***Architectural Technology:*** Architectural 2D and 3D drafting, residential design, construction estimating, construction technology, architectural rendering and animation, green building (LEED), and Building Information Modeling (BIM)
- ***Civil/Survey Technology:*** Civil engineering drafting, surveying fundamentals, roadway construction drafting, land development drafting, and GIS training
- ***Mechanical Drafting and Solid Modeling:*** Mechanical drafting, machine/manufacturing fundamentals, basic mechanical design, parametric solid modeling, and animation
- ***Pre-Architecture:*** Architectural theory and drawing; design studio/culture; architectural history; computer applications; introduction to construction principles and construction documents; and presentation techniques.
- ***Surveying Technology:*** Survey engineering drafting, surveying fundamentals, geographical information systems, digital mapping, and programming.

While pursuing this program, whether taking classes or working in a co-op position, students will be required to perform the same job duties and be able to meet the same physical requirements that they will as a graduate in the field including working at a computer for an extended period of time and the ability to lift 25 to 50 pounds. Courses, as well as careers, in Drafting and Design Technologies will require a person to be able to work at computers, communicate verbally and in writing, and participate in an online environment.

Students in all Drafting and Design Technologies options are required to own or purchase a **windows-based computer or laptop** with a webcam and microphone, at an approximate cost of $1,400, that is capable of running the software packages utilized in the program. For minimum computer or laptop technical specifications and requirements, students should contact the department. Drafting and Design Technologies students are also required to have and maintain reliable broad-band internet access. In addition to required textbooks, Drafting and Design Technologies students should also expect to purchase drawing/sketching tools and supplies, architect's and engineer's scales, external hard-drives (or other similar file backup devices), website and/or software subscriptions and other related supplies at an approximate cost of $100 per semester on average.

Future students who are still in high school are encouraged to take courses in mathematics, science, English, and drafting/CAD. Furthermore, dual credit opportunities are available for high school students who wish to earn college credit while still in high school. These credits may apply to their high school credit requirements as well as DACC Drafting and Design Technologies requirements. (For more information, refer to the section titled, "Dual Credit Program (https://catalogs.nmsu.edu/dona-ana/general-information/dual-credit-program/)," within this catalog.)

Pre-Architecture Program Overview

Students planning to pursue a professional career in architecture may find it more convenient and economically advantageous to begin their studies closer to home. The DACC Pre-Architecture program, which culminates in an associate of applied science degree, consists roughly of the first two years of a standard, bachelor's degree curriculum in architecture. Currently, the most popular transfer universities for DACC Pre-Architecture students are the University of New Mexico and Texas Tech University. Both offer in-state tuition rates and have signed articulation agreements with DACC providing for the smooth and efficient transfer of credits.

However, acceptance into a transfer university's architecture program is not automatic nor is it guaranteed. Students must follow the regular application procedures of the chosen university.

In addition, DACC cannot guarantee placement into a transfer university's architecture program at any particular level, as such matters are totally dependent on how the university in question may evaluate transcripts, portfolios and other required materials against its own acceptance criteria. For example, in order to be accepted at UNM, a final grade of *B-* or better is required in ARCH 1120 Introduction to Architecture and ARCH 1110 Architectural Drawing, and a final grade of *C-* or better is required in all other courses in the DACC Pre-Architecture curriculum.

Potential architecture students should contact a Pre-Architecture advisor at DACC for assistance with course scheduling and transfer procedures (575) 527-7592.

Students in the Pre-Architecture Program are required to purchase a **windows-based computer or laptop** with a webcam and microphone, at an approximate cost of $1,400, that is capable of running the software packages utilized in the program. For minimum computer or laptop technical specifications and requirements, students should contact the department. Drafting and Design Technologies students are also required to have and maintain reliable broad-band internet access. In addition to required textbooks, Pre-Architecture students should also expect to purchase drawings tools, model-making materials, and other art-related supplies at an approximate cost of $200 per semester on average.

Credit Transfer to Bachelor's Degrees in Engineering Technology or Geomatics at NMSU

The Architectural Technology, Civil/Survey Technology, Mechanical Drafting and Solid Modeling, and Surveying Technology associate degree programs include courses that allow students to earn credits that may be transferable into one of the engineering technology or geomatics programs offered by NMSU. These courses allow students to maximize the number of credits applicable to an NMSU Engineering Technology or geomatics program, while also making it possible to earn an associate degree for immediate employment in a drafting related field. Students should contact a Drafting and Design Technologies program advisor for the most current information and requirements related to these credit transfer opportunities (575) 527-7592.

Additional Program Information

Students in the Drafting and Design Technologies options or Pre-Architecture program receive training from highly qualified faculty through online instruction and/or in modern classrooms and laboratories equipped with the latest in computers, peripheral equipment, and professional software. The Drafting and Design Technologies program is housed at the DACC East Mesa Campus.

Classes are scheduled during the day and evening hours, as well as during the summer, to serve both full- and part-time students, including local high school students who are participating in the dual credit enrollment program. Courses are available at the various DACC locations, as well as selected high schools in the area. In the case of the Drafting and Design Technologies options, the majority of classes are delivered online, allowing the students to pursue a certificate of completion or degree through distance education. For information about availability and delivery format of specific classes or degree options students should contact the department.

Students also have the opportunity to gain professional development and leadership skills through student organizations. These student organizations are affiliated with at least one of the following:

- American Design Drafting Association (ADDA),
- SkillsUSA,
- National Association of Home Builders (NAHB), and
- American Institute of Architecture Students (AIAS).

Students actively participate in numerous events and activities. Members also take part in activities sponsored by other professional associations, recruiting at high schools, and participating in community service projects. Students can compete in statewide and nationwide drafting contests sponsored by SkillsUSA and other organizations.

Additional Graduation Requirements

A final grade of *C-* or better is required in all DRFT courses. A final grade of *C-* or better is required in ENGL 1110G Composition I. A final grade of *B-* or better is required in ARCH 1120 Introduction to Architecture and ARCH 1110 Architectural Drawing; in all other ARCT courses, a minimum final grade of *C-* is required.

Architectural Technology - Associate of Applied Science (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/architectural-technology-associate-applied-science/)

Civil/Survey Technology - Associate of Applied Science (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/civil-survey-technology-associate-applied-science/)

Mechanical Drafting and Solid Modeling - Associate of Applied Science (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/mechanical-drafting-solid-modeling-associate-applied-science/)

Pre-Architecture - Associate of Applied Science (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/pre-architecture-associate-degree/)

Surveying Technology - Associate of Applied Science (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/surveying-technology-associate-applied-science/)

Architectural Technology - Certificate of Completion (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/architectural-technology-certificate-completion/)

Civil/Survey Technology - Certificate of Completion (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/civil-survey-technology-certificate-completion/)

Drafting and Graphics Technology - Certificate of Completion (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/general-drafting-graphics-certificate-completion/)

Geographical Information Systems - Certificate of Completion (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/geographical-information-systems-certificate-completion/)

Mechanical Drafting and Solid Modeling - Certificate of Completion (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/mechanical-drafting-solid-modeling-certificate-completion/)

Pre-Architecture - Certificate of Completion (https://catalogs.nmsu.edu/dona-ana/academic-career-programs/drafting-design-technologies/pre-architecture-certificate-completion/)

DRFT 100. Introduction to Architecture, Engineering, & Construction
3 Credits (3)
Introduction to and exploration of careers in the fields of architecture, engineering, and construction. Specific fields to include: architecture, civil engineering, mechanical engineering, structural engineering, engineering technology, residential construction, commercial construction,

geographical information systems (GIS), surveying, sustainable design, and green building

Learning Outcomes

1. Prepare accurate written technical documents,
2. Produce drawing documents that are technically sound,
3. Develop and practice productive work skills, and
4. Upgrade technical knowledge and skills to keep pace with real-world changes
5. Describe different career options in architecture, engineering, and construction,
6. Define the roles of different design professionals and support staff,
7. Explain related educational and professional licensing requirements,
8. Articulate employer expectations,
9. Explore related courses and programs of study at DACC and NMSU, and 1
10. Develop good workplace skills and professional, productive work habits.

DRFT 105. Technical Drawing for Industry
3 Credits (2+2P)

Technical sketching, basic CAD, and interpretation of drawings with visualization, speed and accuracy highly emphasized. Areas of focus include various trades such as machine parts, welding, heating and cooling, and general building sketches/plan interpretation.

DRFT 108. Drafting Concepts/Descriptive Geometry
2 Credits (1+2P)

Basic manual drafting skills, sketching, terminology and visualization. Graphical solutions utilizing applied concepts of space, planar, linear and point analyses. Metric and S.I. units introduced. May be repeated up to 2 credits.

Learning Outcomes

1. Analyze the parallels and distinctions between drafting and design within the Engineering and Architectural domains.
2. Outline the attributes of linear, two-dimensional, and three-dimensional graphic portrayal.
3. Sketch fundamental geometric shapes in linear, two-dimensional, and three-dimensional formats.
4. Explain the characteristics of an Architectural and Engineering Scale.
5. Apply appropriate Architectural or Engineering Scale to dimension drawings accurately.
6. Identify and expound upon the following concepts: a) Plan view, b) Elevation view, c) Section view.
7. Generate precise, readable, and meticulous drawings in Plan, Elevation, and Section views.

DRFT 109. Computer Drafting Fundamentals
3 Credits (2+2P)

Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: E T 109 and C E 109. May be repeated up to 3 credits.

Learning Outcomes

1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units. 1
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes. 1
11. Utilize the two Drawing Environments: Paper Space and Model Space. 1
12. Manage AutoCAD drawing files.

DRFT 112. Drafting Concepts/Computer Drafting Fundamentals I
4 Credits (2+4P)

Basic drafting skills, terminology, and visualization. Introduction to principles and fundamentals of computer-aided drafting. Same as E T 106.

Prerequisites: OECS 207, OECS 125 or consent of instructor.

DRFT 113. Drafting Concepts/Computer Drafting Fundamentals II
4 Credits (2+4P)

Drafting for mechanical/industrial applications; machine part detailing, assemblies in orthographic, isometric, auxiliary, oblique, and sectional views. Two-dimensional AutoCAD with introduction to 3-D AutoCAD. Same as E T 216. Restricted to: Community Colleges only.

Prerequisite: DRFT 112.

DRFT 114. Introduction to Solid Modeling
3 Credits (2+2P)

Introduction to 3D mechanical parametric solid modeling and basic assembly creation utilizing Autodesk Inventor as well as other applicable solid modeling software packages. Creation of 2D working drawings from 3D solid models and 3D models for machining/manufacturing purposes will be emphasized. Application of Geometric Dimensioning and Tolerancing (GD&T), material properties, and industry standard fastening and manufacturing practices methods will be introduced. Restricted to Community Colleges campuses only.

Prerequisite: A C- or better in DRFT 109.

Learning Outcomes

1. Create 3D solid models.
2. Read and interpret 2D technical drawings.
3. Read and interpret 3D technical drawings.
4. Define and sketch the standard, sectional, and auxiliary views of a given object.
5. Annotate working mechanical drawings following industry standards.
6. Dimension working mechanical drawings following industry standards.
7. Identify standard threads callouts.
8. Identify standard fasteners callouts.
9. Identify standard metal shapes and sizes. 1
10. Produce sheet and assembly drawings. 1
11. Manage Electronic files.

DRFT 115. General Construction Safety
3 Credits (3)

Overview of general construction safety related to building, highway and road construction, and surveying field work for entry-level individuals. Students will also have the opportunity to earn a 10-hour construction industry OSHA card.

Learning Outcomes

1. Discuss the general history of OSHA.
2. Discuss the general history of the U.S. safety movement.
3. Utilize the OSHA web site as a basic safety resource.
4. Utilize the Call Before You Dig website as a basic safety resource.
5. Recognize construction site hazards.
6. Identify construction site hazards.
7. Avoid construction site hazards.
8. Follow proper basic first aid procedures in an emergency.
9. Avoid exposure to blood-borne pathogens in an emergency situation. 1
10. Interpret hazard communication. 1
11. Recognize proper lifting techniques. 1
12. Recognize personal protective equipment.

DRFT 124. Introduction to Geometric Dimensioning and Tolerancing
3 Credits (2+2P)

Introduction to geometric dimensioning and tolerancing (GD&T) for the mechanical CAD drafting, solid modeling, mechanical engineering technology, mechanical engineering, and manufacturing industries. Related industry standard finishes and fasteners will also be introduced and explored. Restricted to Community Colleges campuses only.
Prerequisite/Corequisite: DRFT 114.

Learning Outcomes

1. Analyze and interpret mechanical engineering drawings and associated information accurately.
2. Apply and utilize terminology related to Geometric Dimensioning and Tolerancing (GDT) effectively.
3. Interpret and explain dimensioning symbols used in engineering drawings, ensuring clear understanding of their representation and significance.
4. Interpret and explain GDT modifiers and symbols, comprehending their purpose and impact on the design and manufacturing process.
5. Apply GDT rules and concepts to engineering drawings, ensuring adherence to industry standards and specifications.
6. Apply datum system concepts appropriately, understanding their role in establishing reference points for dimensional control.
7. Explain the characteristics and key features of different types of tolerances, such as bilateral, unilateral, and geometric tolerances, comprehending their implications on part functionality and manufacturing processes.

DRFT 130. General Building Codes
3 Credits (2+2P)

Interpretation of the Building Code, local zoning codes, A.D.A. Standards and the Model Energy Code to study construction and design requirements and perform basic plan checking. Restricted to: Community Colleges only.

Learning Outcomes

1. Navigate, interpret, and apply Codes as necessary to meet different agency or governmental entities' requirements for their approval.
2. Develop critical thinking strategies to develop a preliminary design and plan to check for code compliance.
3. Classify occupancy classification of buildings and structures.
4. Determine "Location on Property" requirements of buildings and structures.
5. Classify occupant loads of buildings and structures.
6. Calculate exit requirements of buildings and structures.
7. Determine fire rating of building elements.
8. Define specific construction requirements based on types of construction and materials.
9. Determine the number of plumbing fixture counts based on occupancy group and occupant load. 1
10. Determine accessibility requirements of buildings and structures.

DRFT 135. Electronics Drafting I
3 Credits (2+2P)

Drafting as it relates to device symbols; wiring, cabling, harness diagrams and assembly drawings; integrated circuits and printed circuit boards; schematic, flow and logic diagrams; industrial controls and electric power fields. Drawings produced using various CAD software packages.
Prerequisites: DRFT 108 and DRFT 109.

DRFT 143. Civil Drafting Fundamentals
3 Credits (2+2P)

Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic, contour drawings, plan and profiles, and street/highway layout. Restricted to Community Colleges only. Taught with E T 143 and SUR 143.
Prerequisite: DRFT 109.

Learning Outcomes

1. Use appropriate drafting/technical terminology.
2. Identify of the different types of Civil Engineering work drawing plan sets.
3. Understanding and the use of the terminologies used in the industry.
4. Use AutoCAD Civil 3D.
5. Enter appropriate data into AutoCAD software in order to retrieve necessary outcomes.
6. Plot/Print different types of civil engineering working plans.
7. Read, interpret and understand engineering drawings.
8. Define and understand the different types of engineering drawings.

DRFT 151. Construction Principles and Print Reading
3 Credits (2+2P)

Introduction to construction materials, methods, and basic cost estimating and print reading applicable in today's residential, commercial, and public works industry. Instruction by print reading and interpretation, field trips, and actual job-site visits and progress evaluation.

Learning Outcomes

1. Read, Interpret, and Reference Construction Working Drawings and Construction Specifications.
2. Perform basic sketches related to construction details, plans, etc.
3. Apply standard working drawing/drafting practices including appropriate scale, units, linetypes, text, dimensions, etc.
4. Differentiate among the various construction/design disciplines including Civil/Survey, Structural, Architectural, Mechanical, Plumbing, Electrical, etc.
5. Know the basic principles related to the following processes: Construction Document Development, Bidding, Permitting, and Construction.
6. Identify common construction materials and quality control practices associated with the various construction disciplines listed above.
7. Know basic construction methods associated with the various construction disciplines listed above.
8. Conduct safe construction observations for the sole purpose of documenting construction materials, methods, and progress.
9. Utilize proper, technical construction terminology. 1

10. Conduct material research, and utilize the organization standards of the Construction Specifications Institute. 1
11. Document construction phases by visiting construction sites and developing a digital, construction project portfolio.

DRFT 153. Survey Drafting Applications
3 Credits (2+2P)
Introduction to drafting in the field of survey engineering. Drawings, projects and terminologies related to Point Data, topography, land/boundary surveys, legal descriptions and plat surveys. Using the current Autodesk software. Taught with SUR 143. Restricted to: Community Colleges only.
Prerequisite: DRFT 109.
Learning Outcomes
1. Use appropriate drafting/technical terminology.
2. Identify different types of survey work drawings.
3. Understand and use terminologies used in the industry.
4. Use AutoCAD Civil 3D.
5. Enter appropriate data into AutoCAD software in order to retrieve necessary outcomes.
6. Plot/Print different types of civil engineering working plans
7. Read, interpret and understand surveying drawings.

DRFT 163. Civil Infrastructure Detailing
3 Credits (2+2P)
Infrastructure detailing related to civil engineering projects including: ponding, roadway, sewer, and storm-water structures; concrete foundations; and related utility details. Restricted to Community Colleges campuses
Prerequisite(s): DRFT 109.
Learning Outcomes
1. l. Prepare accurate written technical documents,
2. Produce drawing documents that are technically sound,
3. Develop and practice productive work skills, and
4. Upgrade technical knowledge and skills to keep pace with real-world changes DRFT 163 Course Competencies l. Create applicable details utilizing AutoCAD and other software packages,
5. Interpret local design standards, applicable codes, and industry practices,
6. Apply local design standards,
7. Apply applicable codes,
8. Follow standards industry practices,
9. Design applicable details within given parameters, and
10. Develop good workplace skills and professional, productive work habits.

DRFT 164. Intermediate Mechanical Drafting/Solid Modeling
3 Credits (2+2P)
Intermediate 3D mechanical parametric solid modeling and assembly creation utilizing Solidworks as well as other applicable parametric modeling software packages. Creation of 2D working drawings from 3D solid models, 3D models for machining/manufacturing, and assemblies will be emphasized. Geometric Dimensioning and Tolerancing (GD&T), material properties, and industry standard fastening and manufacturing practices and methods will be further explored. Restricted to Community Colleges campuses only.
Prerequisite/Corequisite: DRFT 114.
Learning Outcomes
1. Recognize standard views of a given object.
2. Recognize auxiliary views of a given object.
3. Dimension working mechanical drawings following appropriate industry standards.
4. Produce sectional views of a given object.
5. Apply Geometric Dimensioning and Tolerancing (GDT) practices and standards to working drawings.
6. Identify standard thread and fastener callouts.
7. Apply standard thread and fastener specifications.
8. Create 3D solid models.
9. Produce sheet and assembly drawings. 1
10. Manage Electronic files.

DRFT 165. Introduction to Building Information Modeling
3 Credits (2+2P)
Introduction to Building Information Modeling (BIM) in the development of virtual 3D building models, construction documents, renderings and basic animations related to architectural, structural, and mechanical/electrical/plumbing building components. Utilizes the latest BIM technologies in the integration one, parametric BIM. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Demonstrate proficiency in creating comprehensive 3D architectural project models using Revit Architecture, through guided tutorials and independent work.
2. Transform architectural project models into functional working drawings, ensuring accurate representation of design elements and documentation standards.
3. Develop a solid understanding of the essential tools and features commonly used in Revit Architecture, enabling efficient and effective modeling and documentation.
4. Cultivate project file management skills, including organizing, naming, and version control, to maintain a structured and easily navigable digital workspace.

DRFT 180. Residential Drafting
3 Credits (2+2P)
Basic residential drafting including, floor plans, foundation plans, sections, roof plans, exterior and interior elevations, and site plans. Applicable residential building and zoning codes, construction methods and materials, adaptable residential design, and drawing and sheet layout for architectural drafting will be introduced. Restricted to Community Colleges campuses only.
Prerequisite: A C- or better in DRFT 109.
Learning Outcomes
1. Establish AutoCAD drawings for Architectural projects, ensuring appropriate settings, units, and templates are utilized.
2. Apply relevant building codes to residential drafting projects, ensuring compliance with safety and regulatory requirements.
3. Apply design standards specific to residential drafting projects, incorporating principles of functionality, aesthetics, and spatial planning.
4. Generate a comprehensive residential floor plan working drawing, accurately representing the layout and dimensions of interior spaces.
5. Produce residential foundation plan working drawings, depicting the structural elements and dimensions of the foundation system for a residential project.

6. Create a detailed residential wall section working drawing, illustrating the construction and composition of walls in a residential structure.
7. Develop residential exterior elevation working drawings, showcasing the external appearance, materials, and architectural features of a residential building.
8. Generate a residential interior elevation working drawing, highlighting the vertical surfaces, materials, and design elements within the interior spaces of a residential project.
9. Produce a residential site plan working drawing, depicting the placement of buildings, landscape features, and utilities within the property boundaries. 1
10. Coordinate details and references consistently throughout a set of residential working drawings, ensuring accuracy and clarity in the documentation. 1
11. Set drawings to scale, including the layout of multiple scaled drawings on one sheet, allowing for efficient presentation and communication of design information.

DRFT 181. Commercial Drafting
3 Credits (2+2P)
Drafting principles, plan coordination, and code analysis applicable in the development of working drawings for commercial, public, and industrial building projects. Students will utilize National Cad Standards, ADA Standards, and will be introduced to modern office practice. Restricted to Community Colleges campuses.
Prerequisite: DRFT 109.
Learning Outcomes
1. Setup AutoCAD drawings for architectural projects.
2. Apply building code to residential drafting projects.
3. Apply design standards to residential drafting projects.
4. Produce a residential floor plan working drawing.
5. Produce residential foundation plan working drawings.
6. Produce a residential wall section working drawing.
7. Produce residential exterior elevation working drawings.
8. Produce a residential interior elevation working drawing.
9. Produce a residential site plan working drawing. 1
10. Coordinate details and referencing throughout a set of residential working drawings. 1
11. Set drawings to scale, including multiple scaled drawing on one sheet layout.

DRFT 190. Finding and Maintaining Employment
2 Credits (2)
Techniques in self-evaluations, resume writing, application completion, job interviewing, and job retention. Exposure to work ethics, employee attitudes, and employer expectations. May be repeated up to 2 credits.
Learning Outcomes
1. Develop an understanding of utilizing online tools for effective self-promotion in professional contexts.
2. Gather relevant documents to enhance employability, including resumes, cover letters, and supporting materials.
3. Create a comprehensive portfolio that encompasses a print-ready resume, video resume, and well-crafted cover letter.
4. Demonstrate the ability to set realistic and meaningful professional and personal goals, aligning them with career aspirations.
5. Exhibit positive interview techniques, showcasing effective communication skills, professionalism, and confidence.
6. Display a thorough comprehension of workplace ethics, including principles of integrity, accountability, and respect.
7. Evaluate personal performance as an employee, analyzing strengths, areas for improvement, and opportunities for growth.

DRFT 204. Geographic Information Systems Technology
3 Credits (2+2P)
The use of digital information for which various digitized data creation methods are captured. Users will capture, store, analyze and manage spatially referenced data in a modeled mapping procedure.
Learning Outcomes
1. Present projects and critiques using visual, oral, and written communication skills.
2. Prepare written technical documents use appropriate drafting/technical terminology.
3. Produce documents that are technically sound.
4. Analyze information to develop solutions to technical aspects of a problem/situation.
5. Upgrade knowledge and skills to keep pace with real-world changes.
6. Produce projects that respect the intellectual property of others.
7. Participate in activities of professional organization and community service.
8. Demonstrate professionalism with regard to attendance, punctuality and contribution to course.
9. Demonstrate professional demeanor. 1
10. Practice productive work skills. 1
11. Create an employment portfolio.

DRFT 214. Advanced Solid Modeling
3 Credits (2+2P)
Advanced 3D mechanical parametric solid modeling and assembly creation utilizing Inventor, Solidworks, and/or other applicable solid modeling and parametric modeling software packages. Creation of complete working drawing sets and/or sheet sets, PDF documents, and assembly drawings will be emphasized. Developing and designing parts and assemblies to meet client needs will be introduced and explored. Restricted to Community Colleges campuses only.
Prerequisite/Corequisite: DRFT 114.
Learning Outcomes
1. Recognize standard views of a given object.
2. Recognize auxiliary views of a given object.
3. Evaluate shop drawings and hand drawings.
4. Create PDFs and Three-Dimensional PDFs from Three-Dimensional models and assemblies.
5. Dimension working mechanical drawings following appropriate industry standards.
6. Produce sectional views of a given object.
7. Apply Geometric Dimensioning and Tolerancing (GDT) practices and standards to working drawings.
8. Identify standard thread and fastener callouts.
9. Apply standard thread and fastener specifications. 1
10. Produce assembly drawings. 1
11. Produce working drawing sets and/or sheet sets. 1
12. Interpret client needs/instructions.

DRFT 222. Introduction to Geomatics
3 Credits (2+3P)

Theory and practice of geomatics as applied to plane surveying in the areas of linear measurements, angle measurements, area determination, differential and trigonometric leveling, and topographic mapping. Crosslisted with: SUR 222.
Prerequisite: MATH 1250G or MATH 1430G.

Learning Outcomes

1. Various

DRFT 230. Building Systems Drafting
3 Credits (2+2P)

Development of working drawings for electrical, plumbing, and HVAC systems, for residential and commercial building through the applications of both 2D Drafting and 3D Building Information Modeling (BIM) techniques. Basics of project setup, National CAD Standards, ADA Standards, modern office practice, code analysis, as well as Sustainability and LEED for new construction. Restricted to: Community Colleges only.
Prerequisite: DRFT 180 or DRFT 181.

Learning Outcomes

1. Differentiate between three phases of electrical installation: temporary, rough-in, and finish.
2. Define basic electrical terms.
3. Cite basic rules of electrical circuit design.
4. Specify methods of wiring a home with energy conservation techniques.
5. Draft basic electrical symbols, including switches, duplex receptacle outlets, ceiling and wall-mounted lights, and circuit lines.
6. Identify basic service specification requirements, including service capacity, service entrance, meter base, and distribution panel locations.
7. Create and utilize symbols legends and schedules used in preparing electrical plans.
8. Identify plumbing fixtures and materials typically included in residential and commercial plans.
9. Cite sizing standards of plumbing piping. 1
10. Specify methods to conserve energy in the plumbing installation. 1
11. Draft plumbing lines and symbols with proper line weights and abbreviations. 1
12. Describe drainage and vent systems. 1
13. Differentiate between public and private sewage disposal systems, and identify basic component of each system. 1
14. Create and utilize symbols legends and schedules used in preparing plumbing plans. 1
15. Identify code requirements related to heating and cooling equipment and duct systems. 1
16. Explain how differing heating and cooling systems work. 1
17. Contrast zonal and central heating systems and list the advantages and disadvantages of each. 1
18. List the code requirements for HVAC systems. 1
19. Define basic HVAC terminology and identify basic HVAC symbols. 2
20. Describe how schedules are used in HVAC drawings, and cite the kind of information included in schedules. 2
21. Create and utilize symbols legends and schedules used in preparing HVAC plans.

DRFT 240. Structural Systems Drafting
3 Credits (2+2P)

Study of foundations, wall systems, floor systems and roof systems in residential, commercial and industrial design/construction. Produce structural drawings including foundation plans, wall and building sections, floor and roof framing plans, shop drawings and details; schedules, materials lists and specifications. Use of various software.
Prerequisite/Corequisite: DRFT 180 or DRFT 181. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Have a basic understanding of Structural Systems.
2. Have a knowledge of the different types of materials used in Structural Design.
3. Understand the complete lifecycle of a project as it pertains the Structural Systems.
4. Be able to take basic hand sketches and turn them into usable construction documents.
5. Project File management skills.

DRFT 242. Roadway Development Drafting
3 Credits (2+2P)

Advanced civil/survey technology and drafting related to roadway development. Emphasis is on relevant terminology, codes/standards, and the production of complex working drawings such as topographical/ grading, drainage, master utilities, roadway P P/details/etc., according to agency standards. Restricted to Community Colleges campuses only.
Prerequisite: DRFT 143.

Learning Outcomes

1. Become familiar with industry terminology.
2. Utilize file management.
3. Configure AutoCAD for the civil drafting environment.
4. Recognize and utilize line types associated with Civil Drafting.
5. Create a standardized layering system for duplication of drawings.
6. Understand industry standards and conventions for roadway development.
7. Utilize design standards in the creation of roadway development drawings.
8. Generate roadway alignments.
9. Generate existing ground profiles. 1
10. Generate proposed finish ground roadway profiles while adhering to design standards. 1
11. Create utility plans that incorporate main lines, service lines, and all associated fittings. 1
12. Understand utility terminology and standards. 1
13. Determine flow line, BOC elevations, etc. 1
14. Understand the concepts of super elevated roadways roadway transitions. 1
15. Generate finish grade surfaces.

DRFT 243. Land Development Drafting
3 Credits (2+2P)

Advanced civil/survey technology and drafting related to land development. Emphasis is on relevant terminology codes/standards, and the production of complex working drawings such as subdivision plats, local utility and drainage plans, construction details roadway P P, etc., according to local development/ agency standards.
Prerequisite: DRFT 143 and DRFT 153.

Learning Outcomes

1. Use appropriate drafting/technical terminology.
2. Produce documents that are technically sound.
3. Analyze information to develop solutions to technical aspects of a problem/situation.

4. Upgrade knowledge and skills to keep pace with real-world changes.
5. Demonstrate professionalism.
6. Practice productive work skills.
7. Read engineering drawings.
8. Produce complex engineering drawings.
9. Read and interpret design standards related to land development and subdivision design. 1
10. Plot or print to industry size sheets of paper.

DRFT 250. Principles of Detailing and Design
3 Credits (2+2P)
Advanced practice in construction documentation in the development and coordination of working drawings & specifications. In particular, will utilize Architectural Graphic Standards, National CAD Standards, and ADA standards to develop detail drawings related to Architectural, Civil, Structural and Building Mechanical systems. Will also be introduced to basic principles, factors, and process of building design such as space planning, site analysis, and basic architectural programming.
Prerequisite/Corequisite: DRFT 180 or DRFT 181. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Experience producing the various types of detailed working drawings and related information for Civil, Residential Commercial Projects.
2. Industry Standards: Architectural Graphic Standards, National CAD Standards, Building, and Land Development Codes, etc.
3. Internet Research methods for construction materials/methods, construction documents, CAD details, etc.
4. Architectural design process, including programming, schematic design documents, design development documents, and construction documents.
5. Sustainability and LEED in architecture.
6. AutoCAD software for 2-D Drafting.
7. Revit software for Building Information Modeling (BIM).
8. Accuracy, legibility, neatness, and professional appearance of drawings.
9. Drafting skills and speed. 1
10. Work ethics, professionalism, and productive work habits. 1
11. Teamwork and presentations.

DRFT 254. Spatial Data Processing
3 Credits (2+2P)
Utilizes the tools and technologies of GIS, processing volumes of geodata identifying a numerical, coded or listed map. Involves the analysis of spatial data from various diverse applications and place in a descriptive mapping process. Restricted to Community Colleges campuses only.
Prerequisite: DRFT 204.
Learning Outcomes
1. Present projects and critiques using visual, oral, and written communication skills.
2. Prepare written technical documents use appropriate drafting/technical terminology.
3. Produce documents that are technically sound.
4. Analyze information to develop solutions to technical aspects of a problem/situation.
5. Upgrade knowledge and skills to keep pace with real-world changes.
6. Produce projects that respect the intellectual property of others.
7. Participate in activities of professional organization and community service.
8. Demonstrate professionalism with regard to attendance, punctuality and contribution to course.
9. Demonstrate professional demeanor. 1
10. Practice productive work skills. 1
11. Create an employment portfolio.

DRFT 255. Independent Study
1-3 Credits (1-3)
Instructor-approved projects in drafting or related topics specific to the student's individual areas of interest and relevant to the drafting and graphics technology curriculum. Consent of instructor required. May be repeated for a maximum of 6 credits.

DRFT 258. Introduction to Infraworks
3 Credits (2+2P)
Introduction to the utilization of Infraworks software for the conceptualization, optimization, and visualization of infrastructure projects in the context of the built and natural environment. Restricted to Community Colleges campuses
Prerequisite(s): DRFT 143.
Learning Outcomes
1. Prepare accurate written technical documents,
2. Produce drawing documents that are technically sound,
3. Develop and practice productive work skills, and
4. Upgrade technical knowledge and skills to keep pace with real-world changes DRFT 253 Course Competencies I. Navigate within a 3D drawing/modeling space,
5. Connect drawings to data sources,
6. Stylize data sources,
7. Create models elements,
8. Analyze models,
9. Collaborate on a project with others,
10. Communicate design, and
11. Develop good workplace skills and professional, productive work habits.

DRFT 265. Advanced Building Information Modeling Applications
3 Credits (2+2P)
Advanced applications of Building Information Modeling (BIM) including the creation of, and practice in collaborative work sets, data and design analyses, energy modeling and analysis, preliminary LEED analysis, construction take-offs & estimation, and construction animation, through use of various BIM and related software. Restricted to: Community Colleges only.
Prerequisite: DRFT 165.
Learning Outcomes
1. Create full 3D Structural project model by “converting” Revit Architectural model.
2. Perform advanced Revit tasks including Family Editing Creation, Phasing, and Work-sharing.
3. Have a working knowledge of the tools that the majority of users will use to work with Revit and Navisworks.
4. Perform basic Navisworks tasks including Clash Detection and Timeliner.
5. Improve Project File management skills in particular.
6. Improve efficiency in use of Revit.

DRFT 274. GIS Theory and Analysis
3 Credits (2+2P)

Analyzes the hypothesis in which location and spatial data sufficiently quantifies the appropriate statistical methodology. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): DRFT 254.

DRFT 276. Computer Rendering and Animation I
3 Credits (2+2P)
Introduction to technical applications of computer generated renderings and animations for the architecture and engineering fields. 3D models, photo-realistic renderings, and basic animation movie files will be produced utilizing industry standard modeling and animation software.

DRFT 288. Portfolio Development
3 Credits (2+2P)
Production of a portfolio consisting of previously produced student work related to the student's individualized degree option. Process shall include the compilation and organization of working and presentation drawings, construction documents, BIM Models, and renderings/ animations. Students will learn the basics of design layout and online portfolio documentation. Job search and resume preparation activities will also be required. Production of new material and content may also be required. This course is designed as a last semester course in the Drafting & Design curricula. Consent of Instructor. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Produce a professional quality portfolio.
2. Produce working drawings (if required).
3. Prepare a professional resume.
4. Prepare for a job interview.
5. Conduct a job search.
6. Work independently.
7. Practice professional networking skills.

DRFT 290. Special Topics
1-4 Credits (1-4)
Topics subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

DRFT 291. Cooperative Experience
1-6 Credits (1-6)
Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student meets with advisor weekly. Graded S/U.
Prerequisite: consent of instructor.

DRFT 295. Professional Development and Leadership DAGA
1 Credit (1)
Students gain experience in leadership, team building, performing community service, and membership and/or leadership in a student organization. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Name: Adrian Manriquez, Instructor

Office Location: DADM 200G

Phone: (575) 527-7747

Website: https://dacc.nmsu.edu/academics/programs/drafting-and-design-technology/index.html (https://dacc.nmsu.edu/academics/programs/drafting-and-design-technology/)