# Architecture CADD

## Course Syllabus

<table>
<thead>
<tr>
<th>Course Number:</th>
<th>TTC-0880</th>
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<tbody>
<tr>
<td>OCAS Code:</td>
<td>8903</td>
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<tr>
<td>Course Length:</td>
<td>120 Hours</td>
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<tr>
<td>Career Cluster:</td>
<td>Manufacturing</td>
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<tr>
<td>Career Pathway:</td>
<td>Manufacturing Production Process Development</td>
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<tr>
<td>Career Major(s):</td>
<td>Advanced CAD Drafter-Architectural Emphasis</td>
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### Pre-requisite(s):

This course is a basic Architectural Drafting course utilizing Computer-Aided Drafting and Design (CADD) software that develops computer skills and electronic skills and applications within the field of architectural drafting. Topics covered are advanced computer operations, introduction to residential architecture drafting, CADD application software, site conditions/plot plans, lettering and tools, residential design/room layout, structural systems and building materials, working drawings/floor plans and details, dimensioning, foundations, electrical/mechanical/plumbing, presentation drawings, interior and exterior elevations, roof plans, commercial architectural drafting, structural steel framing plans, pre-cast concrete, framing plans, foundations and walls and structural wood.

### Textbooks:


### Course Objectives:

#### A. Discuss Introduction to Architecture

1. Differentiate the job requirements and qualifications for an architectural drafter, an architectural designer, and an architect.
2. Identify six distinct styles of residential architecture.
3. Discuss factors which contribute to the development of modern or futuristic homes.
4. Explain architectural design as it relates to form and function.
5. Identify four factors that appear to be giving new trends in architectural design.

#### B. Demonstrate Knowledge of Basic Construction Details

1. Discuss nominal and actual lumber sizes, past and present.
2. Discuss types of brick; nominal and actual brick sizes.
3. Discuss types and sizes of concrete blocks.
4. Identify reinforcing bar (rebar) and reinforcing wire mess; classify by size.
5. Draw a typical footing and foundation detail.
6. Draw a typical wall section with concrete slab floor and truss roof.
7. Draw a typical wall section with wood floor and framed roof.
8. Differentiate platform framing and balloon framing.
9. Identify three ways in which corner posts may be framed.
10. Identify two ways in which the intersection of partitions and exterior walls may be framed.
11. Discuss special framing considerations for window and door openings.
12. Illustrate special framing details for built-up floor and ceiling beams.
13. Illustrate special framing details for bathtub.
15. Identify twelve types of roof designs.
16. Detail five types of cornices.

C. Use Reference Material
1. Discuss the contents and use of American Institute of Architects’ (AIA) Graphics Standards.
2. Discuss the procurement and use of Federal Housing Authority (FHA) Specifications.
3. Discuss the contents and use of the annual commercial and residential architectural volumes of SWEET’S Catalog.

D. Draw Dimension and Label Residential Plans
1. Draw, dimension, and label a Floor Plan from a given simple floor plan of an approximate 1,500 sq. ft. residence to a 1/4”=1'-0” scale.
2. Draw, dimension, and label a Foundation Plan with necessary footing details for the given 1,500 sq. ft. residence to a 1/4”=1'-0” scale.
3. Draw, dimension, and label a Typical Wall Section for the given 1,500 sq. ft. residence to a 1” = 1'-0” scale.
4. Draw, dimension, and label Front, Rear, Right, and Left Elevations for the given 1,500 sq. ft. residence to a 1/4”=1'-0” scale.
5. Draw, dimension, and label a Plot Plan for the given 1,500 sq. ft. residence on lot of given size and bearing to an appropriate scale.
6. Draw and label a complete Electrical Plan for the given 1,500 sq. ft. residence to a 1/4”=1'-0” scale.
7. Draw, dimension, and label Kitchen and Bathroom Cabinet Details for the given 1,500 sq. ft. residence to an appropriate scale.

E. Introduction to Architectural Drafting
1. Terms associated with architectural drafting.
2. Typical levels of architectural job titles and their associated responsibilities and qualifications.
3. Architectural work phases and descriptions of work completed at each phase.
5. Characteristics of architectural lettering styles.
6. Descriptions of standard references and resource materials used in the design and construction industry.
7. Standard architectural abbreviations.
8. Use an architectural scale.
9. Practice lettering using triangle, extended, and variation styles.
10. Use standard references and resource materials.

F. Architectural Building Materials
1. Terms associated with architectural building materials.
2. Common types of architectural building materials.
3. Characteristics of lumber used in construction.
4. Types of wood products commonly used in construction and their definitions.
5. Types of steel products commonly used in construction and their descriptions.
6. Definitions of the terms cement and concrete.
7. Types of masonry products commonly used in construction and their definitions.
8. Types of fasteners commonly used in construction and their description.
9. Types of glazing products commonly used in construction and their descriptions.
10. Types of thermal-insulation materials commonly used in construction and their descriptions.
11. Thermal-insulation applications and their descriptions.
12. Types of damp-proofing and drainage materials commonly used in construction and their descriptions.
13. Common construction-material symbols.
15. Practice drawing common building-material symbols.

G. Site Conditions
1. Terms associated with site conditions.
2. General questions considered in conducting a site analysis.
3. Descriptions of climate-orientation factors considered in conducting a site analysis.
4. Physical characteristics of a site considered in conducting a site analysis and their definitions.
5. Site-clearing and removal practices considered when conducting a site analysis and their definitions.
6. Definitions of types of drawings commonly completed as part of a site analysis.
7. Components of a property survey.
8. Components of a plot plan.
9. Symbols commonly used on a plot plan.
10. Components of a grading plan and their definitions.
11. Analyze a potential construction site.
12. Draw a property survey.
13. Draw a plot plan.

H. Introduction to Working Drawings
1. Terms associated with working drawings.
2. Descriptions of types of drawings usually included in a set of working drawings.
3. Identify types of drawings in a set of working drawings and descriptions of the information found in each type.
5. Description of the drawing-identification system used in a set of working drawings.
7. Standard architectural-line work techniques.
8. Plan symbols used on floor plans.
9. Plan symbols used on elevation drawings.
10. Symbols and methods used in cross-referencing drawings.
12. Prepare a title block.
13. Determine appropriate drawing scales.
14. Develop a floor plan.
15. Develop elevation drawings.

I. Section and Detail Drawings
1. Terms associated with section and detail drawings.
2. Architectural methods used in drawing cutting-plane lines.
3. Definitions of the terms detail drawing and section drawing.
4. Types of architectural section drawings and their descriptions.
5. Symbols used on section drawings.
6. Types of architectural detail drawings and their descriptions.
7. Stairway features described on stairway details.
8. Reference methods used for sections and details.
9. Symbols used in referencing sections and details.
10. Develop a footing detail.
11. Develop a sill detail.
12. Develop a cornice detail.
13. Select necessary section views from a floor plan.
14. Develop a longitudinal section.
15. Develop a wall-section drawing.

J. Structural Systems
1. Terms associated with structural systems.
2. Definition of the term structural system.
3. Types of materials used in structural systems.
4. Descriptions of the types of forces exerted on a structural system.
5. Definitions of the major components of a structural system.
6. Purposes of the basic components of a substructure.
7. Types of footings.
8. Types of information shown on a foundation plan.
9. Basic types of superstructures and their descriptions.
10. Factors considered in commercial roof design.
11. Types of roofs.
12. Types of materials used as roof framing members.
13. Types of materials used as roof coverings and their descriptions.
14. Descriptions of other components to be considered in commercial roof design.
15. Types of information shown on a roof framing plan.
16. Analyze the effects of structural forces on building design.
17. Develop a foundation plan.
18. Develop required foundation sections.
19. Develop a roof framing plan.

K. Architectural Dimensioning
1. Terms associated with dimensioning.
2. Statements concerning standard architectural-drafting dimensioning techniques.
3. Statements concerning metric-system dimensioning techniques.
4. Statements concerning modular-drafting drawing and dimensioning techniques.
5. Practice using standard architectural-drafting dimensioning techniques.
6. Dimension a floor plan.
7. Dimension a foundation plan.
8. Dimension an elevation drawing.
9. Dimension a plot plan.
10. Dimension section drawings.

L. Plumbing Systems
1. Terms associated with plumbing systems.
2. Major types of plumbing systems and their descriptions.
3. Descriptions of the major subsystems of a plumbing system.
4. Components of a water-distribution system and their definitions.
5. Characteristics of a well-designed water-distribution system for a commercial structure.
7. Characteristics of a well-designed waste-disposal system for a commercial structure.
8. Piping symbols and abbreviations.
10. Definitions of types of plans drawn for commercial plumbing systems.
11. Descriptions of drawing methods used in completing plumbing and piping plans.
12. Descriptions of the types of drawings done for piping and plumbing plans.
13. Factors to consider when deciding which type of drawing to use to illustrate piping and plumbing plans.
14. Calculate total fixture units per structure and determine required diameter of building sewer line for a commercial structure.
15. Use the Uniform Plumbing Code to answer questions about commercial plumbing systems.
16. Develop a plan drawing of a commercial plumbing system.
17. Develop an isometric drawing of a commercial plumbing system.

M. HVAC Systems
1. Terms associated with HVAC systems.
2. Definitions of abbreviations commonly used in HVAC design.
3. Definition of the term air-conditioning.
4. Major subsystems of an HVAC system.
5. Major types of commercial heating systems and their descriptions.
6. Definitions of classifications of cooling systems.
7. Descriptions of the major types of central cooling systems.
8. Basic components of a ventilation system.
9. Types of ventilation systems.
10. Climatic zones in the 48 adjacent states of the United States and their correct descriptions.
11. Factors used in determining HVAC-system size requirements.
12. Standard HVAC system-design handbooks and specification manuals and descriptions of the type of information contained in each book.
13. HVAC-system drafting symbols.
15. Use standard HVAC system-design handbooks to answer questions concerning HVAC systems.
16. Develop an HVAC plan.
17. Develop equipment schedules.

N. Electrical Systems
1. Terms associated with electrical systems.
2. Units of measure associated with electrical systems and their correct definitions.
3. Major subsystems of a commercial structure’s electrical system.
4. Equipment and materials used in power-distribution systems and their definitions.
5. Materials used in installing electrical power-distribution systems and their definitions.
6. Descriptions of the major types of lighting sources.
7. Common types of equipment requiring an electrical service load within commercial structures.
8. Symbols used on electrical plans.
9. Purposes of types of drawings commonly completed for a structure’s electrical system.
10. Components of an electrical power distribution plan.
11. Components of an electrical lighting plan.
12. Purposes of types of electrical schedules.
13. Use the National Electrical Code to answer questions concerning standards for electrical systems.
15. Develop an electrical power-distribution plan.
16. Develop an electrical lighting plan.
O. Presentation Techniques
1. Terms associated with presentation techniques.
2. Definition of the term presentation drawing.
3. Types of presentation drawings and their definitions.
4. Components of a perspective drawing and their descriptions.
5. Common uses for types of rendering media.
6. Uses for materials commonly used to construct architectural models.
7. Draw a two-point exterior perspective.
8. Render drawings.
9. Construct an architectural model.

Teacher developed objectives

Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures: 1. Students are graded on theory and shop practice and performance.
2. Each course must be passed with seventy (70%) percent or better.
3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

The student must maintain a grade point average of 2.0 or better.