



Montgomery County  
**CONSTRUCTION TRADES FOUNDATION**

### **Principles of Architecture and CAD Technology**

The Montgomery County Students Construction Trades Foundation, Inc. has developed a design pathway program, Principles of Architecture and CAD Technology. The designing and engineering of physical structures from original concept to complete architectural and engineering plans that includes using AutoCAD software are major elements of the program. Students master a variety of design skills that includes the participation in a “student design-built” house project. Upon graduation, students will be capable of furthering their education in a number of careers in the construction industry that are related to developing, designing, constructing, and maintaining the built environment.

The Principles of Architecture and CAD Technology program provides students an opportunity to learn about design through 4 sequential semester classes, Architectural Drafting Techniques, Computer-Assisted Drafting (CAD) Technology: Architectural Applications, Residential Design Studio, and Advanced AutoCAD Applications. For students who earn a B grade or better and pass a departmental assessment exam from the Department of Applied Technologies, up to seven credits may be transferred to Montgomery College’s Architectural and Construction Technology. A.A.S., CAD for the Building Professional Certificate, and Management of Construction Certificate.

The following describes the scope and sequence for the four classes in the Principles of Architecture and CAD Technology Program.

<b>Design Modules-Semester 1</b>	<b>Architectural Drafting Techniques</b>
<b>Module 5103-01-06</b>	Introduction to Drafting
<b>Module 5103-02-06</b>	General Drafting Techniques
<b>Module 5103-03-06</b>	Introduction to Architecture
<b>Module 5103-04-06</b>	Residential Architecture
<b>Module 5103-05-06</b>	Manual and Computer Prepared Drawings
<b>Module 5103-06-06</b>	Sketching and Free-hand Drawing
<b>Module 5103-07-06</b>	View development
<b>Module 5103-08-06</b>	Development of Professional Drafting Standards
<b>Module 5103-09-06</b>	Basic Dimensioning and Scales
<b>Module 5103-10-06</b>	Basic Geometric Construction

<b>Module 5103-11-06</b>	Pictorial Drawing
<b>Module 5103-12-06</b>	Light Construction Principles & Structural Support
<b>Module 5103-13-06</b>	Floor Plan Layout and Development
<b>Module 5103-14-06</b>	Elevation Layout and Development
<b>Module 5103-15-06</b>	Foundation layout and Development
<b>Module 5103-16-06</b>	Perspective Projection

<b>Design Modules-Semester 2</b>	<b>Computer-Assisted Drafting (CAD) Technology: Architectural Applications</b>
<b>Module 5104-01-06</b>	Introduction to AutoCAD
<b>Module 5104-02-06</b>	Starting and Setting Up Drawings
<b>Module 5104-03-06</b>	Introduction to Drawings and Saving Drawings
<b>Module 5104-04-06</b>	Drawing Lines, Erasing Objects, Using Layers and Making Prints
<b>Module 5104-05-06</b>	Drawing Basic Shapes
<b>Module 5104-06-06</b>	Object Snap, Geometric Constructions and Multiview Drawings
<b>Module 5104-07-06</b>	Using Geometry Calculator and Filters
<b>Module 5104-08-06</b>	Placing Text on Drawings
<b>Module 5104-09-06</b>	Drawing Display Options
<b>Module 5104-10-06</b>	Layouts, Plotting and Printing
<b>Module 5104-11-06</b>	Basic Editing Commands
<b>Module 5104-12-06</b>	Automatic Editing
<b>Module 5104-13-06</b>	Creating Multiple Objects with Array
<b>Module 5104-14-06</b>	Working with AutoCAD Files
<b>Module 5104-15-06</b>	Introduction to Polylines and Multilines
<b>Module 5104-16-06</b>	Drawing and Editing Polylines and Splines
<b>Module 5104-17-06</b>	Obtaining Information about the Drawing
<b>Module 5104-18-06</b>	Basic Dimensioning Practices
<b>Module 5104-19-06</b>	Editing Dimensions
<b>Module 5104-20-06</b>	Drawings Section Views and Graphic Patterns
<b>Module 5104-21-06</b>	Creating Symbols for Multiple Use

<b>AutoCAD Modules-Semester 3</b>	<b>Residential Design Studio</b>
<b>Module 5106-01-06</b>	Introduction to the Young American House Design Project
<b>Module 5106-02-06</b>	Overview of Local and National Building Code Requirements
<b>Module 5106-03-06</b>	Residential Design Principles, Drawing Standards, and Criteria
<b>Module 5106-04-06</b>	Site Work and Plot Plan Development Plans Reviews
<b>Module 5106-05-06</b>	Sectional and Details
<b>Module 5106-06-06</b>	Basic Structural Materials and Systems
<b>Module 5106-07-06</b>	Schedule Development and Preparation
<b>Module 5106-08-06</b>	Framing Plans-Layout and Preparation

<b>Module 5106-09-06</b>	Fireplace Plans and Sections
<b>Module 5106-10-06</b>	Reflective Ceiling Plans
<b>Module 5106-11-06</b>	Residential Mechanical and Electrical Plans
<b>Module 5106-12-06</b>	Basic Estimating
<b>Module 5106-13-06</b>	Working Drawing Preparation and Development
<b>Module 5106-14-06</b>	Portfolio Development

<b>AutoCAD Modules-Semester 4</b>	<b>Advanced AutoCAD Applications</b>
<b>Module 5107-01-06</b>	Review of Basic AutoCAD Features
<b>Module 5107-02-06</b>	Introduction to 3D Display Commands
<b>Module 5107-03-06</b>	Basic 3D Drawing and Advanced Applications
<b>Module 5107-04-06</b>	Introduction to Architectural Desktop
<b>Module 5107-05-06</b>	Missing Elements and Groups
<b>Module 5107-06-06</b>	Space and Boundary Objects
<b>Module 5107-07-06</b>	Walls
<b>Module 5107-08-06</b>	Windows
<b>Module 5107-09-06</b>	Doors
<b>Module 5107-10-06</b>	Door and Window Assemblies
<b>Module 5107-11-06</b>	Stairs
<b>Module 5107-12-06</b>	Roofs
<b>Module 5107-13-06</b>	Structural Members, Column Grids
<b>Module 5107-14-06</b>	AEC Dimensions
<b>Module 5107-15-06</b>	Elevations
<b>Module 5107-16-06</b>	Sections
<b>Module 5107-17-06</b>	Drawing Management
<b>Module 5107-18-06</b>	Callouts
<b>Module 5107-19-06</b>	Detail Components and the Detail Component Manager
<b>Module 5107-20-06</b>	Schedules and Schedule Tags
<b>Module 5107-21-06</b>	Sheets Sets
<b>Module 5107-22-06</b>	The Design Center
<b>Module 5107-23-06</b>	VIZ Rendering
<b>Module 5107-24-06</b>	Assigning Attributes and Generating a Bill of Material
<b>Module 5107-25-06</b>	External References

## **ARCHITECTURAL DRAFTING TECHNIQUES**

### **DESIGN MODULE 5103-01-06**

### **INTRODUCTION TO DRAFTING**

1. Discuss the history of technical drawing.
2. Explain the need for a graphic language.
3. Explain why technical drawing is a universal language.
4. Demonstrate the use of basic drafting instruments.

### **DESIGN MODULE 5103-02-06**

### **GENERAL DRAFTING TECHNIQUES**

1. Explain the “Alphabet of Lines”.
2. Explain the various line types and styles.
3. Explain the use of line weights.
4. Identify the main styles of lettering.
5. Demonstrate architectural freehand lettering.
6. Draft and letter a standard title block.

### **DESIGN MODULE 5103-03-06**

### **INTRODUCTION TO ARCHITECTURE**

1. Identify the various career options in architecture and construction.
2. Identify the duties and educational requirements that are required in architecture and construction.
3. Describe the working conditions that should be considered in the various architectural and construction positions.

### **DESIGN MODULE 5103-04-06**

### **RESIDENTIAL ARCHITECTURE**

1. Identify the main traditional residential styles that have evolved in the United States during the past two hundred years.
2. Describe the characteristics of contemporary residential architecture.
3. Describe the current trends in both design and construction of houses.

### **DESIGN MODULE 5103-05-06**

### **MANUAL AND COMPUTER PREPARED DRAWINGS**

1. Identify the relative strengths both manual and computer drafting.

### **DESIGN MODULE 5103-06-06**

### **SKETCHING AND FREE-HAND DRAWING**

1. Identify the basic tools that are needed for freehand sketching.
2. Demonstrate how the pencil should be held in the process of drawing lines.
3. Demonstrate how lines are divided and angles sketched.

### **DESIGN MODULE 5103-07-06**

### **VIEW DEVELOPMENT**

1. Describe how three-dimensional objects are described on a two-dimensional surface.

2. Identify the total number of views that are used in the orthographic Projection system.
3. Identify the three basic dimensions needed to describe an object.
4. Identify and name the views found in the projection box.
5. Demonstrate the orthographic views of a variety of objects.

#### **DESIGN MODULE 5103-08-06**

#### **DEVELOPMENT OF PROFESSIONAL DRAFTING STANDARDS**

1. Identify the common terms found on typical mechanical drawings.
2. Identify the common terms found on typical architectural drawings.
3. Identify the common architectural graphic symbols found in drawings.
4. Identify the common material symbols used in architectural drawings.
5. Describe the importance of abbreviations used in architectural drawings.
6. Describe the importance of drafting expression in standardized drafting.
7. Demonstrate the drafting expression process in architectural views.

#### **DESIGN MODULE 5103-09-06**

#### **BASIC DIMENSIONING AND SCALES**

1. Describe the importance for careful measuring with a scale.
2. Identify the most common architectural scales.
3. Describe the difference between a civil engineers scale an architectural scale.
4. Describe why the metric scale is becoming more necessary to learn to use.
5. Demonstrate the correct placement of dimensions.
6. Demonstrate the calculation of dimension in both feet/inches and decimal.

#### **DESIGN MODULE 5103-10-06**

#### **BASIC GEOMETRIC CONSTRUCTION**

1. Demonstrate the construction of common geometric shapes.

#### **DESIGN MODULE 5103-11-06**

#### **PICTORIAL DRAWING**

1. Demonstrate the construction of isometric views.
2. Demonstrate the construction of oblique views.
3. Describe the differences between an oblique cavalier view and an oblique cabinet view.
4. Demonstrate the construction of circles in an isometric view.

#### **DESIGN MODULE 5103-12-06**

#### **LIGHT CONSTRUCTION PRINCIPLES & STRUCTURAL SUPPORT**

1. Describe the type of loads that are found in typical residential construction.
2. Describe the differences between forces and loads.
3. Identify the horizontal members found in a residential structure.
4. Identify the vertical members found in a residential structure.

#### **DESIGN MODULE 5103-13-06**

#### **FLOOR PLAN LAYOUT AND DEVELOPMENT**

1. Identify the information required to be shown on a residential floor plan?

2. Identify the symbols and floor plan elements required on floor plans?
3. Describe how dimensions for exterior and interior walls, windows, doors are to be shown.
4. Describe the importance of room orientation in developing a well designed floor plan.

#### **DESIGN MODULE 5103-14-06**

#### **ELEVATION LAYOUT AND DEVELOPMENT**

1. Describe the important external features of the house that are to be included on each elevation view.
2. Describe the vertical dimensions that are required on each elevation view.
3. Identify the materials that are shown on elevation views.
4. Describe the window elevation that should be shown on the elevations.
5. Identify the window styles that can be chosen for a residential.
6. Describe how roof angles are indicated.
7. Describe how grade lines are shown on elevations.
8. Identify how below grade line elements such as foundations and footings are shown.

#### **DESIGN MODULE 5103-15-06**

#### **FOUNDATION LAYOUT AND DEVELOPMENT**

1. Identify the information that is required on a foundation plan.
2. Identify the symbols that are used to show materials and basement equipment.
3. Describe how technique for the overall dimensions, sub-dimensions, and dimensions of beams, girders, columns, and footings are accomplished.

#### **DESIGN MODULE 51030-16-06**

#### **PERSPECTIVE PROJECTIONS**

1. Describe the visual ray projection process.
2. Demonstrate the procedure for a one-point perspective.
3. Demonstrate the procedure for a two-point perspective.
4. Identify and demonstrate the different rendering and illustration techniques.
5. Demonstrate shades and shadow projections.

## **COMPUTER-ASSISTED DRAFTING (CAD) TECHNOLOGY: ARCHITECTURAL APPLICATIONS**

### **AutoCAD MODULE 5104-01-06**

### **INTRODUCTION TO AutoCAD**

1. Describe terms commonly used in AutoCAD.
2. Discuss the difference between 2D & 3D drawings.
3. Explain the XYZ Coordinate System used in AutoCAD.
4. Explain Dialog Boxes.
5. Discuss the Graphics Window.
6. Describe the Standard Toolbar and it's Components.
7. Describe Object Properties toolbar and it's Components.
8. Describe Pull Down menus, Shortcut menus, Tablet menus and Image tile menus.
9. Explain how you access the Help command.
10. Explain how you use the Esc, function, control, Alt and shortcut keys.

### **AutoCAD MODULE 5104-02-06**

### **STARTING AND SETTING UP DRAWINGS**

1. Discuss what size paper sheet will the drawing be plotted.
2. Explain which units of measure will be used.
3. Describe what precision is required for the drawing.
4. Explain what will be the name of the drawing.
5. Explain how you use MDE.

### **AutoCAD MODULE 5104-03-06**

### **INTRODUCTION TO DRAWINGS AND SAVING DRAWINGS**

1. Discuss what values will be used for Grid & Snap settings.
2. Describe the many ways can the Line command be accessed.
3. Explain how you Cancel a command.
4. Explain how you create and use a drawing Template.
5. Explain how you use QSAVE, SAVEAS, & SAVE commands.
6. Discuss the FILEDIA System variable.
7. Explain how you save a drawing for Older AutoCAD releases or in the DXF Format.
8. Explain how you Open an Existing drawing.
9. Explain how you Open a Windows Explorer or DXF file.
10. Explain how you Search for AutoCAD Files.
11. Explain how you Open Part of a drawing.
12. Explain how you Close a drawing.
13. Explain how you determine the Drawing Status.

### **AutoCAD MODULE 5104-04-06**

### **DRAWING LINES, ERASING OBJECTS, USING LAYERS AND MAKING PRINTS**

1. Discuss ANSI and its Line Conventions.
2. Discuss the different Linetypes.
3. Explain how you access the line command.
4. Discuss the Point Entry Method.
5. Discuss the Absolute, Relative & Polar Coordinate System.
6. Explain how you pick points using the Screen Cursor.



7. Explain how you draw Multiple Lines.
8. Explain how you use the Coordinate Display.
9. Explain how you use Ortho mode, Direct Distance Entry & Polar Tracking.
10. Explain how you use the Close Line & Line Continue option.
11. Explain how you use the Undo or U option.
12. Explain how you Erase an entity.
13. Discuss the difference between Window, Crossing, WPolygon, CPolygon and Fence options.
14. Explain how you Add to or Remove from the Selection Set.
15. Explain how you select Stacked objects.
16. Explain how you use, create, filter & manage Layers.
17. Explain how you set different Colors, Linetypes & Lineweights.
18. Explain how you change object Properties.
19. Explain how you use the AutoCAD Design Center.
20. Explain how you Print or Plot a drawing.

#### **AutoCAD MODULE 5104-05-06**

#### **DRAWING BASIC SHAPES**

1. Explain how you use Dragmode.
2. Discuss the different ways to draw a Circle & Arc.
3. Explain how you use the @ symbol with Coordinates.
4. Explain how you draw Ellipses.
5. Explain how you draw Polygons.
6. Explain how you draw Rectangles.
7. Explain how you draw Donuts.
8. Explain how you use the Chamfer command.
9. Explain how you use the Fillet command.
10. Explain how you use Extend Arcs.
11. Explain how you change Line Width.

#### **AutoCAD MODULE 5104-06-06**

#### **OBJECT SNAP, GEOMETRIC CONSTRUCTIONS AND MULTIVIEW DRAWINGS**

1. Explain how you Snap to specific features.
2. Discuss Object Snap Modes.
3. Explain how you set the Running Object Snaps.
4. Discuss Autosnap settings.
5. Explain how you change Aperture Size.
6. Explain how you use Temporary Tracking to locate points.
7. Explain how you use AutoTracking to locate points.
8. Explain how you draw Parallel Lines & Curves.
9. Explain how you Divide an object at a specified distance.
10. Explain how you draw Points.
11. Explain how you create Orthographic Projection Multiview drawings.
12. Explain how you create Auxiliary View drawings
13. Explain how you draw & edit Construction Lines.

#### **AutoCAD MODULE 5104-07-06**

#### **USING GEOMETRY CALCULATOR AND FILTERS**



1. Explain how you access the Geometry Calculator.
2. Explain how you use Basic Math Functions.
3. Explain how you make Unit Conversions.
4. Explain how you make a Point Entry.
5. Explain how you use the Calculator Command Transparently.
6. Explain how you use the Object Snap Modes.
7. Explain how you Calculate Distances.
8. Explain how you Find Intersection Points.
9. Explain how you Find a Point on a Line.
10. Explain how you Find an Angle.
11. Explain how you Find a Radius.
12. Discuss the Calculator Shortcut Functions.
13. Explain how you use Advanced Math & Trigonometric Functions.
14. Explain how you Set & use Variables with the Geometry Calculator.
15. Explain how you use AutoCAD's System Variables in the Geometry Calculator.
16. Explain how you draw using Point Filters.
17. Explain how you use X & Y Filters to Project Views.
18. Explain how you Create Selection Sets.

#### **AutoCAD MODULE 5104-08-06**

#### **PLACING TEXT ON DRAWINGS**

1. Discuss Text Standards.
2. Explain how you use DTEXT, TEXT & QTEXT commands.
3. Explain how you make Multiple Lines of Text using the MTEXT command.
4. Explain how you use AutoCAD Text Fonts & Text Styles.
5. Explain how you use AutoCAD Design Center to manage Text Styles.
6. Explain how you draw Special Symbols.
7. Explain how you draw Underscore & Overscore Text.
8. Explain how you Edit Existing Text.
9. Explain how do you Check Spelling.
10. Explain how you Search for & Replace Material Automatically.

#### **AutoCAD MODULE 5104-09-06**

#### **DRAWING DISPLAY OPTIONS**

1. Discuss Zoom.
2. Explain how you Redraw & Regenerate the screen.
3. Explain how you get Close to your Work.
4. Explain how you Move Around the Display Screen.
5. Explain how you set View Resolution for Quick Displays.
6. Explain how you create your own Working Views.
7. Explain how you use Transparent Display commands.
8. Discuss an Aerial View.
9. Explain how you use the Aerial View.
10. Discuss Model Space.
11. Discuss Paper Space.
12. Discuss Viewports.
13. Explain how you use Tiled Viewports.
14. Explain how you use Floating Viewports.
15. Discuss the 3D Display commands.
16. Explain how you Redraw & Regenerate Viewports.

17. Explain how you control the Order of Display.

**AutoCAD MODULE 5104-10-06**

**LAYOUTS, PLOTTING AND PRINTING**

1. Discuss the Plotting Procedure.
2. Discuss Layout & Plotting Terms.
3. Discuss Layout Settings.
4. Explain how you Select & Manage Plot Devices.
5. Explain how you use Plot Styles, Plot Style Tables & Plot Style Modes.
6. Explain how you Attach Plot Style Tables to drawings and layouts.
7. Explain how you Assign Plot Styles to drawings, layers & objects.
8. Explain how you Specify Plot Settings.
9. Explain how you determine drawing Scale Factors.
10. Explain how you Plot to a File or create a Plot File.
11. Explain how you use the Batch Plot Utility.
12. Discuss the keys to Efficient Plotting.

**AutoCAD MODULE 5104-11-06**

**BASIC EDITING COMMANDS**

1. Explain how you draw using the Chamfer command.
2. Explain how you draw using the Fillet command.
3. Explain how you draw using the Break command.
4. Explain how you draw using the Trim or Extend commands.
5. Explain how you use the Move command.
6. Explain how you use the Copy command.
7. Explain how you draw a mirror image using the Mirror command.
8. Explain how you Rotate an object.
9. Explain how you use the Align command.
10. Explain how you use the Scale command.
11. Explain how you modify the length & height of an object using the Stretch & Lengthen commands.
12. Explain how you select objects for Future Editing.
13. Explain how you create Object Groups.

**AutoCAD MODULE 5104-12-06**

**AUTOMATIC EDITING**

1. Discuss Grips.
2. Explain how you use and Control Grips.
3. Explain how you automatically edit with Grips.
4. Explain how you use Grips to do Automatic Editing with the Stretch, Copy, Move, Rotate, Scale, and Mirror commands.
5. Discuss the Differences between Basic Editing & Automatic Editing.
6. Explain how you set Object Sorting Methods.
7. Discuss the Properties Window.
8. Explain how you Modify an object using the Properties Window.
9. Explain how you Edit between Multiple Drawings.
10. Discuss the Property Painter.
11. Explain how you use Match Properties or Painter.

**AutoCAD MODULE 5104-13-06**

**CREATING MULTIPLE OBJECTS WITH  
ARRAY**

1. Discuss Array.
2. Discuss the difference between a Rectangular and Circular Array.
3. Explain how you arrange objects in a Rectangular Pattern.
4. Explain how you arrange objects in a Circular Pattern.

#### **AutoCAD MODULE 5104-14-06**

#### **WORKING WITH AUTOCAD FILES**

1. Discuss the types of File Names.
2. Discuss the types of File Extensions.
3. Discuss Windows Explorer.
4. Explain how you use Windows Explorer.
5. Discuss the Basic Windows Explorer Functions.
6. Explain how you Manage Files using Windows Explorer.
7. Discuss Diskette operations that can be performed using Windows Explorer.
8. Explain how you perform Drag-and-Drop operations using Windows Explorer.
9. Explain how you Recover a Damaged drawing.
10. Explain how you use the Audit command.
11. Explain how you Export Files.
12. Explain how you Import Files.

#### **AutoCAD MODULE 5104-15-06**

#### **INTRODUCTION TO POLYLINES AND MULTILINES**

1. Discuss Polylines.
2. Discuss Multilines.
3. Explain how you draw using Polylines.
4. Discuss Undo.
5. Discuss Redo.
6. Explain how you use Undo & Redo commands.
7. Explain how you Fill Polylines & Traces.
8. Explain how you draw Multilines.
9. Explain how you use the Element Properties Dialog Box.
10. Explain how you edit Multilines.
11. Explain how you Sketch with AutoCAD.

#### **AutoCAD MODULE 5104-16-06**

#### **DRAWING AND EDITING POLYLINES AND SPLINES**

1. Discuss Polylines.
2. Discuss Polyarcs.
3. Explain how you draw using Polyline Arcs.
4. Explain how you edit Polylines using the Pedit command.
5. Explain how you edit a Polyline as one unit.
6. Explain how you convert a Polyline into individual line & arc segments.
7. Discuss the additional methods for smoothing Polylines.
8. Explain how you draw curves using the Spline command.
9. Explain how you edit Splines.
10. Explain how you create a Polyline Boundary.

**AutoCAD MODULE 5104-17-06****OBTAINING INFORMATION ABOUT THE DRAWING**

1. Explain how you find the Area of shapes & objects.
2. Explain how you List Drawing Data.
3. Explain how you find the Distance between 2 points.
4. Explain how you identify Point Locations.
5. Explain how you check for the time spent on a drawing.

**AutoCAD MODULE 5104-18-06****BASIC DIMENSIONING PRACTICES**

1. Discuss a Dimension.
2. Discuss the Types of Dimensioning.
3. Discuss the 2 most accepted Arrangements of Text.
4. Explain how you draw Dimensions with AutoCAD.
5. Explain how you draw Linear Dimensions.
6. Explain how you Dimension Angled Surfaces & Auxiliary Views.
7. Explain how you Dimension Angles.
8. Discuss Dimension Practices.
9. Explain how you Locate Dimensions.
10. Discuss Datum & Chain Dimensions.
11. Explain how you create Datum & Chain Dimensions.
12. Explain how you use QDIM to Dimension.
13. Explain how you include Symbols with Dimension Text.
14. Explain how you draw Center Dashes or Centerlines in a circle or arc.
15. Explain how you Dimension Circles.
16. Explain how you Dimension Arcs.
17. Explain how you draw Leader Lines.
18. Discuss Alternate Dimensioning Practices.
19. Explain how you draw Thread drawings & Notes.
20. Explain how you Layout Dimensioning.
21. Discuss Dimension Styles.
22. Explain how you create Dimension Styles.
23. Explain how you create your own Dimension Styles.
24. Explain how you Override existing Dimension Variables.
25. Explain how you use the Dimensioning Modes.

**AutoCAD MODULE 5104-19-06****EDITING DIMENSIONS**

1. Explain how you select Dimensions for Editing.
2. Explain how you edit Dimension Text Values.
3. Explain how you edit Dimensions with the QDIM command.
4. Explain how you edit Dimension Text Placement.
5. Explain how you use the DIMEDIT command.
6. Discuss Shortcut menu options.
7. Explain how you copy Dimension Styles between drawings.
8. Explain how you use the Properties Window to edit Dimensions.
9. Explain how you use the MATCHPROP command.
10. Explain how you edit Associative Dimensioned objects.
11. Explain how you make changes to Dimension Elements.
12. Discuss Dimension Definition Points

**AutoCAD MODULE 5104-20-06****DRAWING SECTION VIEWS AND GRAPHIC PATTERNS**

1. Discuss the different Types of Sections.
2. Discuss the different Section Line Symbols.
3. Explain how you draw Section Lines & Hatch Patterns.
4. Explain how you Hatch from the command prompt.
5. Explain how you Edit Hatch Patterns.
6. Explain how you draw objects with Solid Fills.

**AutoCAD MODULE 5104-21-06****CREATING SYMBOLS FOR MULTIPLE USE**

1. Discuss a Block.
2. Discuss a WBlock.
3. Explain how you create symbols as Blocks or WBlock.
4. Explain how you use a Block or WBlock in a drawing.
5. Explain how you Edit Blocks or WBlocks.
6. Explain how you create a Block from a Drawing File.
7. Explain how you create a permanent Global Block.
8. Discuss a Symbol Library.
9. Explain how you create a Symbol Library.
10. Explain how you Rename Blocks.
11. Explain how you Delete a Named Object.

## **RESIDENTIAL DESIGN STUDIO**

### **DESIGN MODULE 5106-01-06**

### **INTRODUCTION TO THE YOUNG AMERICAN HOUSE DESIGN PROJECT**

1. Discuss design specifications.
2. Discuss the Young American House Design specifications.
3. Discuss the requirements needed to develop the residential working drawings.
4. Discuss the comparative value of house of equal size.
5. Discuss the areas of a house that influence its sale.
6. Explain how you start the process of designing a house.
7. Discuss our client and perspective client.

### **DESIGN MODULE 5106-02-06**

### **OVERVIEW OF LOCAL AND NATIONAL BUILDING CODE REQUIREMENTS**

1. Discuss a planning checklist.
2. Discuss the restrictions and legal aspects of the lot.
3. Explain how you plan the house to fit the site.

### **DESIGN MODULE 5106-03-06**

### **RESIDENTIAL DESIGN PRINCIPLES, DRAWING STANDARDS AND CRITERIA**

1. Explain how you orient the house to the sun.
2. Explain how you provide a sense of privacy in your design.
3. Discuss solar planning.
4. Explain how you choose the appropriate basic structure.
5. Explain how you use a matrix to analyze space relationships.
6. Discuss a bubble diagram.
7. Explain how you use bubble diagrams.
8. Discuss good bathroom designs.
9. Discuss good kitchen design using a work triangle.
10. Discuss an elevation.
11. Discuss the different roof types.
12. Explain how you select and coordinate window and door sizes and types.
13. Discuss an easement.
14. Discuss contour lines.
15. Discuss traffic flow
16. Discuss fenestration
17. Discuss bearings.
18. Discuss topographical features.

### **DESIGN MODULE 5106-04-06**

### **SITE WORK AND PLOT PLAN DEVELOPMENT-PLANS REVIEWS**

### **DESIGN MODULE 5106-05-06**

### **SECTIONS AND DETAILS**

**DESIGN MODULE 5106-06-06**

**BASIC STRUCTURAL MATERIALS AND SYSTEMS**

**DESIGN MODULE 5106-07-06**

**FRAMING PLANS-LAYOUT AND PREPARATION**

**DESIGN MODULE 5106-08-06**

**FIREPLACE PLANS AND SECTIONS**

**DESIGN MODULE 5106-09-06**

**REFLECTIVE CEILING PLANS**

**DESIGN MODULE 5106-10-06**

**RESIDENTIAL MECHANICAL AND ELECTRICAL PLANS**

**DESIGN MODULE 5106-11-06**

**BASIC ESTIMATING**

**DESIGN MODULE 5106-12-06**

**WORKING DRAWING PREPARATION AND DEVELOPMENT**

**DESIGN MODULE 5106-13-06**

**PORTFOLIO DEVELOPMENT**



## **ADVANCED AutoCAD APPLICATIONS**

### **AutoCAD MODULE 5107-01-06**

### **REVIEW OF BASIC AUTOCAD FEATURES**

1. Identify the basic commands of Autocad.
2. Identify the basic editing processes.
3. Identify the layering process.
4. Demonstrate printing and plotting process.

### **AutoCAD MODULE 5107-02-06**

### **INTRODUCTION TO 3D DISPLAY COMMANDS**

1. Demonstrate the process of redrawing and regenerating viewports.
2. Demonstrate the order of display.
3. Demonstrate the process of screen clearing.

### **AutoCAD MODULE 5107-03-06**

### **BASIC 3D DRAWING AND ADVANCED APPLICATIONS**

1. Identify 3D coordinates.
2. Describe the right and rule.
3. Demonstrate the process of displaying 3D views.
4. Demonstrate 3D construction techniques.
5. Demonstrate the hiding and shading process.

### **AutoCAD MODULE 5107-04-06**

### **INTRODUCTION TO ARCHITECTURAL DESKTOP**

1. Define the basic definitions found in Desktop.
2. Define the concepts of Desktop.
3. Describe the abbreviations used in Desktop
4. Demonstrate the use of tool palettes in Desktop.
5. Identify the properties of the palette in Desktop.
6. Describe the content browser in Desktop.
7. Demonstrate the process of opening of the drawing menu in Desktop.

### **AutoCAD MODULE 5107-05-06**

### **MASING ELEMENTS AND GROUPS**

1. Demonstrate the process of massing/mass of elements and groups.
2. Demonstrate modeling.
3. Demonstrate the process of hiding the slice markers.
4. Demonstrate the use of the drape tool to create contour massing models.

### **AutoCAD MODULE 5107-06-06**

### **SPACE AND BOUNDARY OBJECTS**

1. Demonstrate how to create a space tool palette.
2. Demonstrate how to create a space object.
3. Demonstrate how to create space plan with space objects.
4. Demonstrate how to apply space boundaries.
5. Demonstrate how to use **Space Auto Generate** tool.

6. Demonstrate how to use the **AEC Modify Trim** option.
7. Demonstrate how to use the **AEC Modify Divide** option.
8. Demonstrate how to use **AEC Modify Merge** option.
9. Demonstrate how to use **AEC Modify Crop** option.
10. Demonstrate how to use 2005 space object grip features

#### **AutoCAD MODULE 5107-07-06            WALLS**

1. Demonstrate how to place a wall object.
2. Demonstrate how to change walls by dynamically pulling grips.
3. Demonstrate how to create wall sweeps.
4. Demonstrate how to create wall encaps using to calculate automatically.
5. Demonstrate how to use plan modifiers.
6. Demonstrate how to use the **Roof/floor** line option.
7. Demonstrate how to use the interference conditions.
8. Demonstrate how to use **Cleannups – Applying ‘T’ Cleanup and Wall Merge**.
9. Demonstrate how to edit wall styles.

#### **AutoCAD MODULE 5107-08-06            WINDOWS**

1. Demonstrate how to place a window object using Reference.
2. Demonstrate how to place a window object using Offset/Center.
3. Demonstrate how to Change Window Sizes with Grips.
4. Demonstrate how to Add Profile.
5. Demonstrate how to Move the window vertically, within the wall, and along the wall.
6. Demonstrate how to edit Window Styles.

#### **AutoCAD MODULE 5107-09-06            DOORS**

1. Demonstrate how to place a door object using **Reference**.
2. Demonstrate how to place a door object using **Offset/Center**.
3. Demonstrate how to change door size and swing locations with **Grips**.
4. Demonstrate how to control the door swing angle.
5. Demonstrate how to add a profile.
6. Demonstrate how to add a door knob.
7. Demonstrate how to move the door within the wall, and along the wall.
8. Demonstrate how to edit door styles.
9. Demonstrate how to use the **Materials** tab.

#### **AutoCAD MODULE 5107-10-06            DOOR AND WINDOW ASSEMBLIES**

1. Demonstrate how to create a **Primary Grid** for a Door/Window assembly.
2. Demonstrate how to create a door style for double doors.
3. Demonstrate how to assign doors to a Door/Window assembly.
4. Demonstrate how to test the partially complete Door/Window Assembly.
5. Demonstrate how to add sidelites.
6. Demonstrate how to size the frame of a Door/Window Assembly.
7. Demonstrate how to remove the sill of a Door/Window Assembly.
8. Demonstrate how to use a Door/Window Assembly.

## **AutoCAD MODULE 5107-11-06**

## **STAIRS**

1. Demonstrate how to set **AEC Object Settings**.
2. Demonstrate how to make a **Stairs** tool palette.
3. Demonstrate how to place a stair object.
4. Demonstrate how to modify a stair with stair grips.
5. Demonstrate how to change an AEC stair object style.
6. Demonstrate how to add a stair rail object.
7. Demonstrate how to edit a stair style.
8. Demonstrate how to place a multi-landing stair.
9. Identify the process of determining interference conditions for stairs.
10. Demonstrate how to anchor a second stair to an existing landing.
11. Demonstrate how to project a stair edge to a polyline.
12. Demonstrate how to project a stair edge to a wall or AEC object.
13. Demonstrate how to generate a polyline from a stair object.
14. Demonstrate how to create a stair tower.

## **AutoCAD MODULE 5107-12-06**

## **ROOFS**

1. Demonstrate how to make a **Roof** and **Roof Slabs** tool palette.
2. Demonstrate how to place a roof object.
3. Demonstrate how to modify a roof object.
4. Demonstrate how to edit a roof edge.
5. Demonstrate how to convert to roof and surfu.
6. Demonstrate how to use the **Convert to Roof Slabs** command.
7. Demonstrate how to use the **roofslabmodifyedges** command.
8. Demonstrate how to use **Apply Tool Properties**.
9. Demonstrate how to cut a hole in a roof slab.
10. Demonstrate how to add edge profiles in place.
11. Demonstrate how to create a roof dormer.

## **AutoCAD MODULE 5107-13-06**

## **STRUCTURAL MEMBERS, COLUMN GRIDS**

1. Demonstrate how to make a **Structure** palette.
2. Demonstrate how to place a column and column grid line.

## **AutoCAD MODULE 5107-14-06**

## **AEC DIMENSIONS**

1. Demonstrate how to set the text style.
2. Demonstrate how to create a dimension style.
3. Demonstrate how to create AEC dimension style.
4. Demonstrate how to use and modify an AEC dimension style.
5. Demonstrate how to dimension doors & windows with AEC dimension styles.
6. Demonstrate how to add a manual AEC dimension.
7. Demonstrate how to detach objects from AEC dimensions.
8. Describe AEC dimension chains.
9. Describe the Dimension Wizard.

## **AutoCAD MODULE 5107-15-06**

## **ELEVATIONS**

1. Demonstrate how to make a new **Elevations** tool palette.
2. Demonstrate how to create a simple building.
3. Demonstrate how to make an elevation.
4. Demonstrate how to modify and update a 2D elevation.
5. Describe how elevation subdivisions work.
6. Demonstrate how to work with material boundaries.

## **AutoCAD MODULE 5107-16-06**

## **SECTIONS**

1. Demonstrate how to make a new **Section** too palette.
2. Demonstrate how to create a simple building.
3. Demonstrate how to place a section object.
4. Demonstrate how to generate a section.
5. Demonstrate how to change the section arrow appearance.
6. Describe live section definitions.
7. Demonstrate how to create a live section.
8. Demonstrate how to modify a live section.

## **AutoCAD MODULE 5107-17-06**

## **DRAWING MANAGEMENT**

1. Describe the Drawing Management concept.
2. Describe how to use the **Project Browser**.
3. Demonstrate how to create constructs and elements in the **Project Navigator**.
4. Demonstrate how to work with constructs and elements in the **Project Navigator**.
5. Describe how to assign constructs and elements in the **Project Navigator**.
6. Demonstrate how to create views in the **Project Navigator**.
7. Demonstrate how to create plotting sheets in the **Project Navigator**.

## **AutoCAD MODULE 5107-18-06**

## **CALLOUTS**

1. Demonstrate how to create plotting sheets in the **Project Navigator**.
2. Demonstrate how to create a new project with the **Project Browser**.
3. Demonstrate to creating a new construct in the **Project Navigator**.
4. Demonstrate how to create elevations with the **MARK A3 Elevation** callout.
5. Demonstrate how to create details with the **Detail Boundary** callout.
6. Demonstrate how to place elevations in an **ELEVATION SHEET**.
7. Demonstrate how to place details into a **DETAIL SHEET**.
8. Demonstrate how to place floor plans in a **PLAN SHEET**.

## **AutoCAD MODULE 5107-19-06**

## **DETAIL COMPONENTS AND THE DETAIL COMPONENT MANAGER**

1. Describe the component concept.
2. Demonstrate how to create a wall detail using detail components.
3. Demonstrate how to place detail components.
4. Demonstrate how to use the **Detail Component Manager**.

## **AutoCAD MODULE 5107-20-06**

## **SCHEDULES AND SCHEDULE TAGS**

1. Demonstrate how to create schedule tags and **Schedules** tool palette.
2. Demonstrate how to create schedule.
3. Demonstrate how to test schedule.
4. Demonstrate how to modify a schedule.
5. Demonstrate how to schedule across drawings.
6. Demonstrate how to place door and window tags.
7. Demonstrate how to place schedules.
8. Demonstrate how to use schedules to locate objects.
9. Demonstrate how to create and use custom schedules.

## **AutoCAD MODULE 5107-21-06**

## **SHEET SETS**

1. Demonstrate how to create a sheet set.
2. Demonstrate how to modify a sheet set.
3. Demonstrate how to test a new sheet set.

## **AutoCAD MODULE 5107-22-06**

## **THE DESIGN CENTER**

1. Demonstrate how to use the **Design Center** to create a kitchen.
2. Demonstrate how to add appliances.
3. Demonstrate how to create the counter.
4. Demonstrate how to place the sink.
5. Demonstrate how to generate kitchen sections/elevations.

## **AutoCAD MODULE 5107-23-06**

## **VIZ RENDERING**

1. Describe how best to learn to operate VIZ Render.
2. Demonstrate how to make a simple scene.
3. Demonstrate how to use VIZ Render.
4. Demonstrate how separate surfaces.
5. Demonstrate how to apply materials.
6. Demonstrate how to create and modify materials.
7. Demonstrate how to add people and trees.

## **AutoCAD MODULE 5107-24-06**

## **ASSIGNING ATTRIBUTES AND GENERATING A BILL OF MATERIALS**

1. Demonstrate the process of assigning attributes to blocks
2. Describe the process of editing attribute definitions.
3. Demonstrate the process of inserting blocks with attributes.
4. Demonstrate the process of changing attribute values.
5. Demonstrate the process of changing attribute definitions.
6. Describe the use of attributes to automate drafting documentation.
7. Explain how to collect attribute information.

## **AutoCAD MODULE 5107-25-06**

## **EXTERNAL REFERENCES**

1. Explain the use of reference drawings.

2. Describe how to bind dependent objects to a drawing.
3. Demonstrate how to edit reference drawings.
4. Demonstrate how to use Xrefs in multiview layouts.