



**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Syllabus for Diploma of Vocation (D.Voc.), 6<sup>th</sup> Semester**  
**Branch: Architectural Assistantship**  
**Subject Name: Software Application in Architecture**  
**Subject Code: 1260606**

**Type of course:** Core

**Prerequisite:** Basic understanding of computer skills, colour theory, composition and Knowledge of 2 D software (AutoCAD) with its commands and viewports.

**Rationale:** To enable the students to prepare the drawings of a given project through knowledge acquired in previous semester by preparing a set of drawings for any one project. To enable the student to create three dimensional objects in space with special elements on presentation and visualization of building using different rendering techniques using the latest program.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
0	0	2	2	0	0	30	20	50

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

**Content:**

Sr. No.	Content	Total Hrs.	Module % Weightage
1	<p><b>Project (Rendering of 2 D drawing) in AutoCAD / Photoshop</b></p> <p>Create realistic designs and Communicate ideas to clients and contractors through AutoCAD features include - Solid, surface and modeling tools, 3D viewing and navigation tools.</p> <p>For Visualizing and communicating complex designs with working in Layers and Colors, Drawing plans, Elevations, Sections. Enhancing drawings using hatch, patterns, strokes, color overlays, fill layers, inner and drop shadows, clipping groups, adjustment layers, material application, etc.</p> <p>Identify and resolve potential issues before construction begins by dimensioning drawings, connecting from one file format to another. Design documentation by having architectural renovations (Wall, door, and window design) through Drafting, drawing, and annotating floor plans.</p> <p>A hierarchical tree view and a filter feature to render the landscape of the design.</p> <p>The ability to display existing, demolished, and new construction in a single drawing.</p> <p>The design problem done in any previous semester shall be taken up to prepare a rendered drawing – plans, elevation (min 2) and section (min 1).</p>	8	30
2	<p><b>Making an existing 2 – D plan drawing compatible to 3-D drafting in Auto CAD / Sketchup</b></p>	4	10



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	<p>Commands and modifications to 2-D drawings -</p> <ul style="list-style-type: none"> <li>• B. Poly, rectangle, elevation, extrude – requirements and application.</li> <li>• 3-D exterior of blocks – preparation, modification of 2-D drawing.</li> <li>• To prepare a 2D floor plan to 3D model in AutoCAD, follow these steps: <ul style="list-style-type: none"> <li>• Remove all extra layers from the drawing.</li> <li>• Remove hatch, dimensions, texts, etc.</li> </ul> </li> <li>• To convert a 2D floor plan to a 3D model in SketchUp, follow these steps: <ul style="list-style-type: none"> <li>• Import and scale your 2D plan.</li> <li>• Draw the walls, Add the door openings, Add the window openings.</li> <li>• Group and tag your model.</li> <li>• You can import an image by: <ul style="list-style-type: none"> <li>• Clicking File &gt; Import, Selecting the image, you wish to use, making sure image is selected in the use image as options, Clicking imports,</li> <li>• scale an image by: Entering the imported component.</li> <li>• Selecting the Tape Measure Tool, Clicking the first line of the object you are going to scale and the last, Entering a distance (eg. 200m) and pressing enter.</li> </ul> </li> <li>• extrude walls by: Activating the push-pull tool by tapping the P key, clicking on the walls, Typing in height</li> </ul> </li> </ul>		
3	<p><b>Fundamentals of 3D drafting, and latest version Sketch up.</b></p> <p>SketchUp is 3D modeling software that can be used for a variety of drawing applications, including Interior design, Architectural drawing and modeling, Landscape architecture, walkthrough, Film 3D models.</p> <ul style="list-style-type: none"> <li>• SketchUp is designed to behave like a pencil, allowing users to draw whatever they can imagine. It offers high accuracy for creating 3D architecture modeling, including measurements, object positions, and object slopes.</li> <li>• SketchUp has several advantages for architects, including: <ul style="list-style-type: none"> <li>• Integrating the 3D design model with virtual placement into major platforms</li> <li>• Allowing clients to see their projects on the site before it's built.</li> <li>• Helping users analyze problems and get the project under construction.</li> <li>• learn how to use SketchUp for architecture through: <ul style="list-style-type: none"> <li>• Basic features, Coordinate system, 3-D entities and surfaces, Material Application, Component Placement, etc.</li> </ul> </li> </ul> </li> </ul> <p>Exercises – 1: converting simple geometric shapes into 3 – D objects.</p>	6	20



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4	<p><b>3-D Modeling (photoshop / Sketch up)</b></p> <p>Exercise 1 – make a cover page design.          some basic tools you can use to create new or on an existing image of a magazine cover in Photoshop.          Study the basics of Adobe Photoshop, Selection, Slice, Painting tools.          For existing image, scan an image into Photoshop CS3, then adjust the brightness, contrast and tonal range of the image, sharpen the overall focus of the image.          Working with layers will create a logo or collage for a PowerPoint presentation by using Text and Paints professionally.          Exercise on Basic and Advanced Retouching – color manipulations, levels, curves, patch tool, cropping, special color effects, black and white, sepia, grainy.          Transfer of CAD drawings into Photoshop while preserving graphic Scale.</p> <ul style="list-style-type: none"> <li>• Create a canvas: Set the dimensions to 8.5 inches wide and 11 inches tall.</li> <li>• Copy the cover layer: Drag the layer down to the new layer button in the layer’s palette.</li> <li>• Apply a color overlay: Use a color that is similar to the cover, but darker.</li> <li>• Erase big spots: Use the spot healing brush to remove the big spots.</li> <li>• Resize a portrait: Use command T to resize the portrait.</li> <li>• Change the text: Press T and select any of the text.</li> <li>• Change the color of the frame: Select the paint bucket tool and select the layer called base.</li> <li>• You can also look at existing magazine covers for inspiration.</li> <li>• Exercises – 2: Any previous semester design proposal to be converted in 3-D model.</li> <li>• Viewing 3 – D models</li> <li>• Rendering, shading, hide commands, lights and Camera.</li> <li>• Material representation</li> <li>• Importing, exporting library and printing 3 – D</li> </ul>	10	40
<b>Total</b>		28	100

**Reference Books:**

1. A Handbook on AutoCAD Tools practice, Azhar Wahab, SSR Krishna
2. Mastering AutoCAD 2019 and AutoCAD LT 2019, George Omura
3. Discovering AutoCAD 2020, Mark Dix
4. Architectural Design with SketchUp, Alexander C. Schreyer (second edition)
5. Google sketch up Cookbook, Practical recipes and essential techniques, Bonnie Roskes
6. SketchUp for Builders, A comprehensive Guide for creating 3D Building models using SketchUp, John Brock



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**Course Outcomes:**

<b>Sr. No.</b>	<b>CO Statement</b>	<b>Marks % Weightage</b>
CO-1	To develop the skills to prepare the rendered drawings using software.	30
CO-2	To develop skill of converting 2 – D drawing to 3 – D drawing using software.	20
CO-3	To understand the fundamentals of 3 D software applied in making drawings.	20
CO-4	To enable the students to create presentable 3 – D objects using rendering techniques.	20
CO-5	To prepare presentation for large gatherings, corporate clients-using CAD drawings, pictures, 3D images, text	10

**List of Open-Source Software/learning website:**

Students must refer to following sites to enhance their learning ability.

1. AutoCAD 2018 and higher version
2. Sketchup 2018 and higher version
3. Photoshop CS3