GOVERNMENT OF TAMILNADU
DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI-25
STATE PROJECT COORDINATION UNIT
(Established under Canada India Institutional Cooperation Project)

CURRICULUM

Course Name	**SKETCHUP**
Course Code	**AA/2020/003**
Course Duration	40 Hours
Minimum Eligibility Criteria and Pre-requisites (if any)	10TH STD & Above
Course Objectives	• Gain and understanding of Google SketchUp and introduce modeling terminology and concepts. • Learn how to begin a new project in Google SketchUp and introduce you to tools and concepts necessary to design and draw. • Grasp and appreciation for viewing and presenting models in 3D to clients and design team members. • Gain knowledge of the benefits and uses of 3D modeling and how they are applicable to your design business.
Course Outcomes	At the end of training, the participants will be able to • use SketchUp to model basic architectural projects • create architectural shapes and objects using the three-dimensional tools provided by the program • select and produce various viewing styles and understand how they affect the communication between client and designer • utilize preferences, layers, components, materials and other tools to organize data within each project • print out drawings using various output options provided by the program • demonstrate an understanding of how SketchUp can import and export files to and from other applications, such as Google Earth and AutoCAD
Expected Job Roles	Drafting & Design Assistant in various Architecture Firms.

TEACHING AND SCHEME OF EXAMINATION						
Course Code	**Course Name**	**Hours**		**Assessment Marks**		**Duration of Examination**
				Min	**Max**	
AA/2020/003	**SKETCHUP**	Theory	16	10	20	3 Hours
		Practical	24	40	80	
		Total	40	50	100	

AA/2020/003 SKETCHUP

DETAILED SYLLABUS

Unit No	Modules	No of Hours	
		Theory	Practical
I	**Introduction**	**7 Hours**	
1.1	Introduction – Getting Started with SketchUp, Understanding the Templates– GUI: Understanding SketchUp Interface	3	4
1.2	Understanding Various Menus, Understanding the Status Bar, Understanding the Default Tray, Understanding the Toolbars customization and managing Trays		
1.3	Mouse Control &SketchUp Preferences–Creating, Saving and Opening a Model– Importing Different Types of Files into SketchUp		
1.4	Axes – Understanding the Axes in SketchUp& Reorienting the Axes– Inference – Concept of Inference, Understanding the various inference types and locking the inference.		
	Lab Exercise: Reorienting the axes and draw and modify a construction plan		
II	**Tools**	**8 Hours**	
2.1	Drawing Tools – Understanding the line tool–constructing a surface–dividing a face and joining faces and understanding the various input methods	3	5
2.2	Understanding the rectangle tool and various dimensions inputs–drawing a Rotated rectangle Entity–Understanding the creation of circle entity and its various parameters		
2.3	drawing an ellipse from circle–Understanding the creation of polygon entity and its various parameters–drawing an Arc using various Arc tools: Arc, 2point Arc, 3-point Arc, Pie Tool		
2.4	Drawing a Free handshapes- Editing- Grouping object,		
2.5	Draw commands, Line, Arc, polygon, Edit drop down menu.		
	Lab Exercise: Create an interior bedroom with proper dimensions		
III	**Tools and functions**	**14 Hours**	
3.1	Modify Tools – Understanding the Dividing–Splitting and Exploding Entities–Understanding the Flipping–Mirroring and Rotating	5	9
3.2	Scaling a model using Scale tool–Tape Measure tool and Stretching a Model using Scale tool–Understanding the Follow me tool–Automatic and Manual Extrusion with Follow Me Tool and modeling Revolved shape		
3.3	Soften/Smooth Edges of Geometry & Hiding Geometry– Tape Measure Tool & Protractor Tool–Measuring Distance/ Create guides, Measuring an Angle- Editing Guidelines– Annotating Model: Understanding the Annotation Tools, Adding Text, Text as a Model Entity, Dimension– attaching a photo to a Model: MatchPhoto'sColor-codedtools		

3.4	Creatinga3DModelfromaPhoto–Deleting a Matched Photo- Texture mapping, using the paint tool to apply textures to your models		
3.5	Creating and using new texture maps- Create new scenes- Create new style-Saving scenes and styles.		
	<u>Lab Exercise:</u> Create a section view of kitchen cabinetry with wood materials		
IV	**Creation of model**	**11 Hours**	
4.1	Getting Started with Component–Understanding the components–Creating a Component, editing a Component–Editing all instances of a Component–Making Dynamic Component	5	6
4.2	Adding Attributes–Defining Attribute Values and testing– Inserting–Replacing and Interacting with dynamic Component–Searching for Component, adjusting a component's insertion point–Editing Component		
4.3	Viewing a Model: Camera–Changing the view or focal length–Sections: To place a Section Plane–Filling Voids in section cuts–Creating new geometry from a section–showing / hiding section planes–Exporting Section cut effects– Styles: Choosing a Style– Editing styles–Style Editing options– Managing in-model styles and collections–Sharing styles–adding fog effect to model		
4.4	ApplyingMaterials&Textures–AddingColorsandTextureswithmaterials–ApplyingMaterials– Replacing one material with another–Editing Materials–Editing Options–calculating Material Area–Managing and organizing materials–creating new material, Applying Textures		
4.5	Adding Geographic location from Google Map–Applying Real-time Shadows- Lights and settings- Light with shades- Direction lights-Ambient lights- General lights- Accent lights.		
	<u>Lab Exercise:</u> Create a plan with text and 3D elevation, export it as a PDF and take a print of that documents		
	Total Theory and Practical Hours	**16**	**24**
	Total hours	**40**	

HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS /EQUIPMENTS
1	Computer/Laptop for each student
2	LCD Projector

SOFTWARE REQUIREMENT

GOOGLE SKETCHUP (3D Design Software)

REFERENCES

S.NO	Particulars	Author	Publisher/Website
1	Modeling with SketchUp for Interior Design Conceptualize, Create, Communicate:	Bonnie Roskes and Annie Elliott	3DVinci
2	Introduction to SketchUp	-	3DVinci
3	Sketchup tutorial	-	BGSU University Libraries
4	THEA for SketchUp user manual	-	Solid Iris Technologies
5	Learning SketchUp: A 3D Modelling Guide for Beginners	Allan Hanson	Kindle Edition
6	Google SketchUp Pro 8 step by step	João Gaspar	Kindle Edition
7	SketchUp for Interior Design: 3D Visualizing, Designing, and Space Planning	Lydia Cline	Kindle Edition
8	SketchUp 7.1 for Architectural Visualization: Beginner's Guide	Robin de Jongh	Kindle Edition
9	SketchUp Tutorial - 1 - Beginner SketchUp Tutorial (You Tube)	-	Jake Day Williams
10	SketchUp Floor Plan Tutorial for Beginners (You Tube)	-	CAD CAM Tutorials
11	Sketchup Building Design Tutorial | Sketchup Building Home Design Plan | modern homes (You Tube)	-	Tamil tutorial
12	Sketchup Building Design Tutorial (You Tube)	-	Tamil tutorial

ASSESSMENT AND CERTIFICATION

S.No	Criteria for Assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% ofmarks in theory and practical examination.
6.	On successful completion of training, certificate will be issued by Directorate of Technical Education through the project polytechnic.

END EXAMINATION

ALLOCATION OF MARKS

S.No	Description	Max. Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Aim and Procedure	20
	b)Demonstration / Execution	25
	c)Result & Viva Voce	15
	d) Record	20
	Total Marks	**100**

THEORY MODEL QUESTION PAPER

AA/2020/003- SKETCHUP

(Maximum Marks: 20)

(N.B: Answer any **Twenty** questions) **20x1= 20 Marks**

1.How do you use zoom extension tool?

2.How do you use follow me tool?

3.How do you draw a rectangle in sketch up?

4.What does the symbol for extruding a surface look like?

5.With in the paint bucket window what is the eye dropper used for?

6.When should sections planes be used?

7.Which one best describes the purpose of the push/pull tool?

8.Which tool do you change the material of your model?

9.How can you edit your material?

10.How is the 3d warehouse accessed?

11.What tool is ideal for making spheres and curved surfaces?

12.How is 3d text created in sketch up?

13.How do you set the units in sketch up?

14.How can you select multiple entities in sketch up?

15.What is the purposeof layout?

16.What is the purpose of measurement tool box?

17.Why should a model be purged?

18.What is the use of instructor beneficial?

19.What kind of files can be imported into SU?

20. What kind of files can be exported from SU?

21.What are the advantages of using outliner?

22.Name a way to view shadows in a model.

23.Which best describes the purpose of the pan tool?

24.What happen if you press CTRL when using the move tool?

25.What are the steps to performing a subtraction?