

## Overview

Visualizing spaces in three dimensions is critical to the success of the design of architectural spaces. The interplay of light, color, and space are critical concepts to master. Traditional methods for exploring these issues are very labor intensive. SketchUp Pro has enabled quicker and more accurate models to be generated. Learn how to explore SketchUp's power to reduce the amount of time you spend creating environments and models.

## Objectives

SketchUp Pro enables you to draw using a familiar pencil and paper paradigm in a software context. The following topics will provide you with a ground game for learning SketchUp. These topics are intended for individuals with little or no 3 dimensional drawing or SketchUp experience, but who want to start to create 3 dimensional models using SketchUp.

## Recommended Prior Skills

- Defining fundamental geometric terms including: polygon, parallel, perpendicular, axes, and arc.
- Defining 3 dimensional drawing terms including: rendering, field of view, and point of view.
- Demonstrate mouse skills including: double-click, single-click, drag, and right-click (context-click).
- \* You will need a basic 3-button scroll wheel mouse to use SketchUp efficiently.

## Upon completion of these topics, you should be able to:

- Create 2 dimensional geometry (in a 3D environment)
  - Create surfaces from lines
  - Create surfaces from circles
  - Generate surfaces from polygons
  - Generate surfaces from arcs
  - Create surfaces from freehand curves
- Demonstrate stickiness of geometry
- Create 3 dimensional geometry
- View a model in 3D
- Create surfaces from lines in 3D
- Demonstrate stickiness of geometry in 3D
- Create geometry with the push-pull tool
- Move entities to manipulate geometry
- Maintain coplanar geometry
  - Create a presentation with the LayOut tools
  - Create a presentation with the LayOut tools
- Maintain Coplanar geometry
  - Connect and generate forms
  - Lock an inference
  - Generate forms quickly
  - Restore a surface
  - Create a model, step-by-step
  - Mirror a model
  - Create an array
  - Apply Materials
  - Create 3D Text
  - Import models from the 3D Warehouse
  - Alter a model using built-in Styles
  - Position and export models to Google Earth

## Overview

Successful integration of modeling software within an architectural practice hinges on how well the computer information can be used, not only inside the computer (to other software packages), but also outside the computer to communicate to clients and review agencies. The output from your SketchUp computer models may be rendered in many different ways; from straight computer printouts, to raster images for retouching with photo editing software, to vector polygon graphics reworked with illustration software, to producing accurate perspective underlays for developing hand renderings.

## Objectives

SketchUp enables you to draw using a familiar pencil and paper paradigm in a software context. These additional fundamentals will provide you with skills to build up a 3 dimensional model from surfaces defined by the edges that are drawn. These topics are intended for individuals with basic experience in using SketchUp so you can create efficient 3 dimensional models.

## Recommended Prior Skills

- Define fundamental geometric terms including: polygon, parallel, perpendicular, axes, and arc.
  - Define 3-dimensional drawing terms including: rendering, field of view, and point of view.
  - Demonstrate mouse skills including: double-click, single-click, drag, and right-click (context-click).
  - Demonstrate proficient use of the line (pencil), move, erase, orbit, zoom, and select tools in SketchUp.
- \* You will need a basic 3-button scroll wheel mouse to use SketchUp efficiently.

## Upon completion of these topics, you should be able to:

- Demonstrate stickiness in the model
- Use Groups and Components to isolate geometry
- Know the difference between a group and a component
- Create a component
- Demonstrate component behavior
- Editing Components
- Create component nesting for efficient modeling
- Scaling similar components
- Understand the Component browser
- Download components for Google 3D Warehouse
- Combine components to create a model in Google Earth
- Locate a site in Google Earth
- Import the site to SketchUp
- Insert a component from a file
- Model from a Photograph
  - Photomatch
  - Texture Tweaker
- Understand the Materials browser
- Use the Follow-me tool
- Swap (reload) components in a model
- Work with SketchUp Styles
  - Apply
  - Edit/Create
  - Mix

## Overview

SketchUp is a powerful tool for communicating 3D design concepts in professional workflows. These advanced topics are designed for experienced SketchUp users who want to investigate advanced topic areas including working with CAD, creating curved surfaces and employing advanced presentation techniques for SketchUp models. Detailed instruction in the use of Google LayOut for print presentations is provided. SketchUp's strength is its ability to integrate with other systems. Participants will be given a thorough review of the entire design environment.

## Recommended Prior Skills

- To ability to Define and create basic geometric forms, including polygons, arcs and use more advanced features such as the 'Followme tool' and 'Texture Tweaker'
- Using Groups and Components to isolate geometry
- Using group components and the ability to edit them.
- Creating materials and using the materials browser and libraries.
- Knowledge of applying SketchUp Styles.
- Basic familiarity with use of LayOut for creating presentations.

We recommend that participants for this section of topics have already completed the 'Critical Essentials' and 'Additional Essentials' part of the course and have some modeling experiencing with SketchUp. We do not recommend moving forward until you are comfortable with the basic critical fundamentals of using SketchUp.

## Upon completion of this section, you should be able to:

- Import and Export CAD
- Entourage and Share models with 3D Warehouse
- Understand and employ existing Ruby Scripts
- Create and manipulate Curved Forms
- Photomatch from multiple images and integrate a model into a site photograph
- Leverage Advanced Presentation Techniques
- Show off a model in Google Earth
- Understand photorealistic rendering options
- Make compelling presentations with Google LayOut
- Understand the uses of the Section Tool
- Efficiently organize groups, components, and layers to increase model performance

## Overview

Landscape Design is a discipline that encompasses many workflows that result in designs ranging from human-scale site fixtures to regional masterplans. While many of these designs can be created from scratch, often AutoCAD files, surveyor data, hand renderings, and existing photography are all incorporated in the design process as well as the end result. Expressing all this information in three dimensions will greatly facilitate communication of the design to others.

## Recommended Prior Skills

To be successful with these topics, you should already be able to:

- Demonstrate proficiency with a standard three-button mouse in the Windows environment.
- Demonstrate proficiency navigating within a SketchUp environment.
- Understand “Click-Release-Click” and “Click and Drag” methods when using SketchUp tools.
- Be able to create linear and radial arrays within SketchUp using the Move/Copy tool.
- Have a basic understanding and ability to navigate in Google Earth.

## Upon completion of this section, you should be able to:

- Create custom face-me plant material from image files.
- Reload and Replace components.
- Import and Export your SketchUp model to and from Google Earth.
- Utilize various plug-ins and ruby scripts such as “drop.rb” and “SimplifyContours.rb”.
- Model terrain utilizing functions of the “Sandbox” tools.
- Use advanced techniques working with large files
- Using the “Hide Rest of Model” feature when editing components.
- Import file types from other software packages including AutoCAD, ArcGIS, and Adobe Photoshop.

## Overview

The Mastering 3D Using SketchUp: Geomodeling Training course provides students with a comprehensive overview of the process and benefits of exploring the interoperability of SketchUp and Google Earth, and a deeper look into the Google 3D Warehouse.

## Objectives

These topics will help you understand the fundamental principles of SketchUp as a 3D modeling software. You will learn how to create 3D objects quickly with basic and intermediate tools, as well as how to control model precision. You will learn to use image texturing to depict details of a model to reduce work and file size, as well as altering images in other applications for more efficient texture rendering. You will learn the process of tagging geo-referenced information to a 3D model using SketchUp. This will also provide you the techniques to improve 3D model quality and complexity for better final geomodeling results.

## Recommended Prior Skills

To be successful with these topics, you should already be able to:

- Define fundamental geometric terms including: polygon, parallel, perpendicular, axes, and arc.
- Define 3-dimensional drawing terms including: rendering, field of view, and point of view.
- Demonstrate mouse skills including: double-click, single-click, drag, and right-click (context-click).

## Upon completion of this section, you should be able to:

- Creating (2D) geometry in a (3D) environment
- Create and manipulating surfaces from lines, circles, polygons, arcs, etc.
- Create and manipulate surfaces in 3D
- View and navigate your model in 3D
- Understand and leverage stickiness in the model
- Maintain coplanar geometry and use/lock inferences
- Use the Push/Pull Tool, and Follow Me Tool
- Generate forms quickly and apply materials
- Create and use Groups and Components
- Understand the difference between a Group and a Component
- Edit Groups and Components
- Utilize photographs in your model
- Manipulate images/textures with Texture Tweaker
- Create materials and use the Materials Browser
- Align building to terrain data
- Upload your model to the Google 3D Warehouse
- Import site information (imagery and topography) from Google Earth
- Position and export models to Google Earth

## Overview

SketchUp Pro with Layout is a powerful tool for communicating 3D design concepts in professional workflows. These advanced topics are designed for experienced SketchUp users who want to investigate advanced topic areas including working with CAD, creating curved surfaces and employing advanced presentation techniques for SketchUp models. Detailed instruction in the use of LayOut for print presentations is provided. SketchUp's strength is its ability to integrate with other systems. Participants will be given a thorough review of the entire design environment.

## Recommended Prior Skills

- To ability to Define and create basic geometric forms, including polygons, arcs and use advanced features such as the 'Followme tool' and 'Texture Tweaker'
- Using Groups and Components to isolate geometry
- Using group components and the ability to edit them.
- Creating materials and using the materials browser and libraries.
- Knowledge of applying SketchUp Styles.
- Basic familiarity with use of LayOut for creating presentations.

We recommend that participants for this section of topics have already completed the 'Critical Essentials' and 'Additional Essentials' part of the course and have modeling experience. We do not recommend moving forward until you are comfortable with the critical fundamentals of using SketchUp Pro.

## Upon completion of this section, you should be able to:

- Make compelling presentations with LayOut
- ImportandExportCAD
- Leverage Advanced Presentation Techniques
- Efficiently organize groups, components, and layers to increase model performance
- Design Phases, Project Organization, Templates, Project Maps, Rendering, and how to Separate Detailed Models
- Use Layout Scenes and site plans to Configure Windows, Doors, Baseboards, Trim, Roof Details, Roof Intersections, Lights, and Site Grading
- Use Layout Text, Label Tool, Smart Grouping, and Scrapbooks
- Use Construction documents for Project data, Utilities, Grading, Landscape, Ceilings, Doors, Windows, building sections, exterior-interior elevations, and construction details.
- Configure MPE Plans (Mechanical, Plumbing, and Electrical)