

## Villanova University Blender Workshop

Instructor: Danielle Martinez  
Spring 2019  
Office: CLAS IT Office, SAC 085  
Office Hours: By appointment  
Classroom: Mendel G86  
Email: [danielle.martinez@villanova.edu](mailto:danielle.martinez@villanova.edu)

**Please monitor your Villanova email account on a regular basis to ensure that you receive class messages from the instructor.**

### Workshop Description

Say you are in a class where it would be beneficial to show a 3D model of a specimen that is traditionally only viewable through an electron microscope. The cost of the kind of instrumentation that does is astronomical and not without limits. The instrument creates a model that is only viewable through a two dimensional monitor, and does not allow exportation to a VR headset for life-like viewing. Unreal Engine provides the canvas and tools. However, by itself cannot create the model for you, but does allow for custom models to be imported into the Unreal. For this, I would like to introduce Blender. Blender is a free and open source 3D creation suite used for modeling, motion tracking, animation, and more. As stated on their site, whatever you create is yours.

During this workshop we are going to explore the possibilities of using Blender 2.7. While doing so, we will be examining our project through the lens of Imitationalism, an aesthetic art theory.

Workshop Materials: Blender 2.8. There will also be short tutorial videos that I will assign.

### Learning Objectives

- To familiarize yourself with the Blender's interface.
- To gain a foundation for creating a basic 3D meshes.
- To acquire a strong background in preparation to learn more complex methods of creating your own experience.

### General Information

Blender can serve many purposes. It has been used to recreate the layout of an archeological site. A team of Italian researchers are using Blender and a recently discovered self-portrait of Leonardo DaVinci to put a face on the original Renaissance Man. Sculpt custom objects to bring a famous literary work to life like the app created by Boston College called "Joycestick", based on James Joyce's *Ulysses*. These are just a few examples of how Blender can be used.

### Method of Instruction

This workshop is project driven. Every week we will progress further with our meshes. The beginning of each class will be spent on a brief review of the previous class. After that we will move on to the next phase of our project. There will be demonstrations and it will be hands-on. Toward the end of each class there will be time for questions.

## Unreal Terms and Definitions

Axis – reference used to determine the position, rotation, and scale of a given object. In Blender there are 3: X,Y, and Z.

Edge – line segment on a boundary of a given shape.

Mesh – grouping of vertices, edges, and faces along the X,Y, and Z axes to form a 3 dimensional object.

Vertex – the point on a shape where 2 of more lines meet.

Face – the individual flat surfaces that make up an object.

Form – In the art world, a 3 dimensional shape.

Geometry – the most basic form of our object, without any modifiers.

Lighting – the arrangement of our light sources, which can affect the feel and tone of our spaces.

Line – an edge joining to vertices. In art, a moving dot.

Materials – In a word, textures. These make our actors look like that are made of some real life such as wood, chrome, or brick.

Origin – the starting point on a graph and 0 exist on all axes.

Orthographic view – a 2 dimensional drawing of a 3 dimensional object.

Isometric view – a method of drawing to represent a 3 dimensional object using 2 dimensions. The object is measurable from all axes and appears equally foreshortened. Angles between all the axes are the same at 120°.

Unit – How blender measures, which can be modified into metric or imperial measurements.

## **Blender (open source)**

Continue your education in Blender:

- <https://www.blender.org/support/tutorials/>

## **Free Assets**

Further customize your virtual world with free high quality assets.

- <https://www.unrealengine.com/marketplace/free>
- <https://stevelois.com/ue4/ue4-resources/>
- <https://www.turbosquid.com/Search/3D-Models/free>

## **Grant Info**

Interested in becoming an entrepreneur with the knowledge you gained from this workshop? Below are examples of NSF grants for you to do so:

- EA2. Global, Distance, and Higher Education  
- <https://seedfund.nsf.gov/topics/educational/>
- IT11. Human-Computer Interaction; Virtual Reality; Augmented Reality  
- <https://seedfund.nsf.gov/topics/information-technologies/>

## **Villanova VR Competition**

Want to put your skills to the test? Enter the Villanova VR Competition:

- <https://www1.villanova.edu/villanova/artsci/ceet/news/villanova-university-virtual-reality-competition.html>