

Documenting the Natural World through 3D Printing

Chincoteague Field Bay Station

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Workshop Description

This workshop will offer the opportunity for participants to preserve, in three-dimensional forms, the natural splendor of the plants and animals surrounding the Chincoteague Bay Field Station. Participants will use state of the art 3D software and scanners to design objects from the surrounding ecosystem and then will use a 3D printer to create the final object. Designs will be used as the basis for discussion about the use of 3D prints as a way to document local flora and fauna of an area.

Materials, software, and facilities will be provided. I will be bringing laptops, ipads, various scanners and 3D Printers (makerbot and possibly a formlab for stereolithography printing). You are welcome to bring your own laptops or ipads. Please feel free to download some free apps that I list below. There is also an optional trial version of Adobe CC 2015 that will allow you to do some cool things with your smart phones. If you are unable to set up a trial account of Adobe CC 2105 then no problem, I will show you through my own account on my laptop. Please contact me with any pre-workshop questions regarding the software or hardware.

Workshop Schedule

Friday:

Welcoming Introduction: 3D printing in General, 3D Printing used in the world of science and an also presentation of my own personal work

Saturday:

8:00 Class begins with an introduction to projects and the day's activities. If possible, the following iphone apps can be downloaded prior to the excursion: Adobe shape, Adobe color, Adobe brush and Adobe draw. We will use these apps to document various natural characteristics of natural forms. The only thing with these apps is that you will need to acquire an Adobe CC 2015 trial account. Also, they are only effective with internet (WiFi or Cellular) If you don't have an iphone or don't want to set up a trial account, then a basic camera can also be used to document forms. Just bring the camera's cords to upload images to computer back at the lab.

9:00 -11:30 Excursion to Wallops Island: Sampling and collecting color, shapes and textures of

the natural surroundings. Some objects can be brought back to the lab however, I will show you ways to document when species and forms cannot be removed from a location (I will reveal some of my top secret tricks).

1-5:00 Introduction to various software and scanning programs commonly used for 3D printing. Since, some natural forms are challenging to scan, I will show you different modeling programs that are used for complexed forms. We will then use our samplings from the morning excursion within different programs such as Adobe CC 2015. Some other free programs that I will go over are 123d Sculpt (app), 123d Catch (An app for scanning), 123d Creature (app), Tinkercad.com (cloud based program and students need to set up individual accounts), Meshmixer.com (free download). There will be a brief demonstration of an advanced design program called Rhino. There will also be demonstrations on 3D scanning objects (nextengine.com, 123d Catch and possibly a portable Artec Spider).

Sunday:

8:00-12:00 Creating 3D forms from observations under the microscope: We will have an opportunity to photograph microscopic forms that will then be used to model in 3D.

1:00-5:00 Sunday afternoon will be available for students to work on individual projects. I will help each student to work on different techniques or processes to achieve their own specific outcomes.

Monday:

8-12:00 The final day will be available for refinement on projects, processing projects for 3D printing and presentation of projects. Even though I will have 3D printers available, I will also discuss the use of companies that you can outsource your 3D designs such as Shapeways.com, Sculpteo.com and iMaterialize.com. These companies have a larger variety of printing options.

Software Programs

Free Apps (that can be downloaded on iphone or ipad)

123d Catch
123d Sculpt
123d Creature

Apps (Can be downloaded with trial version of Adobe CC 2015)

Adobe Brush
Adobe Draw
Adobe Color
Adobe Shape

Additional Materials to Bring:

A jump drive or a cloud based back up system for saving files.