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## Software Education Modules

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These modules assumes the user has little to no knowledge of each program. You can use any of these programs to create files for use on our machines. *You may skip modules as needed to meet your educational needs.*

The \*REQUIRED tutorials are listed below, all others are optional.

- Illustrator CC (lasers/CNCs)
  - NetFabb (3D printers)
  - PreForm (resin printer)
  - Epilog Dashboard (Epilog lasers)
  - LaserWorks/RuiDas Works (BOSS laser)
  - PartWorks (Shopbots)
  - Torchmate CAD (plasma cutter CNC)
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### **\*Illustrator CC**

This tutorial introduces the most-used program here at the FabLab. It starts with the essentials and covers only what is necessary to know in order to create files specifically for our machines. You can use this program to create files for use on both of our Epilog and BOSS lasers, our ShopBot CNCs, and our Torchmate Plasma CNC.

Note: Another option is to use CorelDRAW software to create your vector files. CorelDRAW is another common program very similar to Illustrator. Many of the lesson included in the Illustrator tutorials can be applied to the CorelDRAW program.

Video link:

<https://www.lynda.com/Illustrator-tutorials/Illustrator-CC-Essential-Training-2015/370378-2.html>

#### Module 1 - Getting Started

1. What is Adobe Illustrator?
2. Touring the Illustrator Interface
3. Exploring the Illustrator's Tools Panel
4. Creating new documents
5. Modifying and saving your documents

#### Module 2 - Navigating Your Documents/Working with Artboards

1. Working with Illustrator's panels
2. Creating and using custom guides
3. Locking and hiding artwork
4. Manipulating artboards with the Artboard tool

#### Module 3 - Layers

1. Exploring the Layers panel
2. Creating and editing layers
3. Hiding, locking, and deleting layers
4. Tips for organizing your artwork using layers (OPTIONAL)

#### Module 4 - Creating and Editing Objects

1. Understanding vector paths
2. Drawing basic lines and curves
3. Drawing rectangles and ellipses
4. Drawing polygons and stars
5. Modifying existing shapes and paths
6. Using the Direct Selection tool
7. Moving and duplicating objects
8. Scaling objects
9. Rotating objects
10. Adding strokes to your objects

#### Module 5 - Working with Type Tools

1. Creating point and area type objects
2. Making basic edits with the Control panel
3. Exploring the type panels
4. Converting text into paths

#### Module 6 - Using Raster Graphics

1. Using the Image Trace panel
2. Converting pixels into paths

#### **\*Epilog Dashboard**

This short tutorial covers how to print your file from your vector software and set the preferences for the print job. It covers both Basic and Advanced options for use with our Epilog lasers.

#### Video Links:

Module 1 - <https://www.youtube.com/watch?v=zKCsCDTzn6I>

Module 2 - <https://www.youtube.com/watch?v=xvnEA-Sfo1U>

#### Module 1 - Epilog Dashboard Overview:

1. Laser Cutter Tutorial - FabLab@School - Part 2 of 3: Epilog Printing Preferences

#### Module 2 - Color Mapping

1. Epilog Laser - Understand Color Mapping

#### **\*LaserWorks/RuiDas Works**

This short tutorial goes over the basics of the proprietary software used with the BOSS laser.

#### Video Link:

<https://www.youtube.com/watch?v=aozB0qJJO2A>

#### Module 1 - LaserWorks Overview

1. LaserWork Software Tutorial

### **\*PartWorks (V-Carve)**

These tutorials go over the basics of the software used with our ShopBot CNC and ShopBot Desktop CNC.

Video Link:

[https://www.youtube.com/playlist?list=PLLApxzPYu5T6d2vqgLxO7Tt\\_6X7\\_7PjI0](https://www.youtube.com/playlist?list=PLLApxzPYu5T6d2vqgLxO7Tt_6X7_7PjI0)

Module 1 - PartWorks Overview

1. Getting started with PartWorks
2. Importing an image and tracing in V-Carve
3. Types of toolpaths that can be prepared using PartWorks

### **\*Torchmate CAD**

These tutorials go over the basics of the Torchmate CAD software for use on our Torchmate Plasma CNC.

Video Link:

<https://www.youtube.com/playlist?list=PLtmThMSi-HaciwDEBtYnNjBnthHchtKeE>

Module 1 - Introduction to Torchmate CAD

1. Introduction To Torchmate CAD/CAM

Module 2 - Paths and Text Tools

1. How To Make and Break a Path
2. Text Tool Overview
3. How To Create A Tool Path
4. Name Plate Tutorial

Module 3 - Tools and Export

1. Welding Tools Overview
2. DXF Import Options and Settings

Module 4 - Advanced Applications

1. Scan and Trace Wizard Tutorial
2. How To Make Precision Parts
3. Nesting Tutorial
4. Node Editing
5. Applying Kerf Width
6. Programming Multiple Tools (Multi-tool)
7. Sequencing Tool Paths
8. How To Use The Custom Parts Library
9. Ginsu Knife Tool

## **\*TinkerCAD**

This tutorial goes over the essentials of the web-based CAD platform, TinkerCAD. This program is best suited for users with little to no 3D CAD design experience. You can use this for use in 3D printers and some advanced CNC applications.

### Video Link:

<https://www.lynda.com/Tinkercad-tutorials/Welcome/371319/420570-4.html>

### Module 1 - Introduction to TinkerCAD

1. Introducing TinkerCAD
2. Learning the interface
3. Navigating in TinkerCAD
4. Setting up the grid

### Module 2 - Designing in 3D

1. Adding and moving 3D shapes
2. Scaling and changing dimensions
3. Rotating 3D shapes
4. Using the workplane
5. Grouping and ungrouping
6. Using hole objects
7. Aligning shapes

### Module 3 - Duplicating and Creating Patterns

1. Options for copying
2. Creating linear patterns
3. Creating circular patterns

### Module 4 - Working with Shape Generators

1. Introducing Shape Generators
2. The polygon generator
3. The text generator
4. The image generator

### Module 5 - Importing Assets

1. Importing 2D SVGs
2. Importing 3D STLs

### Module 6 - Finishing a Design

1. Downloading a design
2. Naming and sharing

## **\*AutoCAD**

This tutorial goes over the essentials of the industry-standard CAD program, AutoCAD. This is an advanced program best suited for use in drafting precision parts and prototypes, as well as architectural design. You can use this for use in 3D printers and CNC applications.

### Video Link:

<https://www.lynda.com/AutoCAD-LT-tutorials/AutoCAD-2015-Essential-Training/162105-2.html>

### Module 1 - Introduction

1. Exploring the user interface
2. Using the ribbon
3. Changing workspaces
4. Accessing help

### Module 2 - Navigating Drawings

1. Selecting drawing units
2. Converting drawing to new units
3. Using commands and panning a drawing
4. Using the Zoom command to navigate

### Module 3 - Drawing Objects

1. Lines
2. Circles
3. Arcs
4. Ellipses
5. Splines
6. Polylines
7. Rectangles and polygons
8. Points and donuts

### Module 4 - Modifying Objects

1. Selecting objects
2. Moving and copying
3. Rotating and scaling
4. Breaking and joining
5. Editing with grips

### Module 5 - Dimensioning

1. Measuring distances and areas
2. Making dimension objects
3. Editing existing dimensions

### Module 6 - Output

1. Plotting from a layout and from model space
2. Outputting DWFx files for sharing online
3. Publishing multiple sheets

### **\*Fusion 360**

This tutorial goes over the essentials of the Autodesk program, Fusion 360. This is a program best suited for use in drafting precision parts and prototypes. You can use this for use in 3D printers and CNC applications.

Video Link:

<http://www.autodesk.com/products/fusion-360/learn-training-tutorials>

Module 1 - Introduction

1. Sketch
2. Import
3. Model
4. Assemble

Module 2 - Next Steps

1. Manage
2. Drawings
3. Simulate

Module 3 - Intro to CAM and Sculpting

1. CAM
2. Sculpt
3. Patch

### **\*Blender**

This tutorial goes over the essentials of the 3D modeling program, Blender. This program is both beginning and advanced user friendly. You can use this for use in 3D printers.

Video Link:

<http://www.lynda.com/Blender-tutorials/Blender-Essential-Training/87088-2.html>

Module 1 - User Interface

1. Overview of the Blender Interface
2. Understanding 3D view windows
3. Navigating in 3Dspace

Module 2 - Selecting and Translating Objects

1. Selecting objects
2. Moving objects
3. Rotating objects
4. Scaling objects
5. Changing an object's origin
6. Selecting pivot points
7. Using Snap to move objects precisely

Module 3 - Essentials of Modeling

1. Creating mesh primitives
2. Selecting vertices, edges, and faces

3. Editing mesh objects
4. Proportional editing
5. Sculpt mode (Updated version)
6. Working with edges and edge loops
7. Extrusions

#### Module 4 - Advanced Modeling

1. Joining mesh objects
2. Stitching vertices
3. Creating text
4. Boolean tools
5. Vertex groups

#### **\*NetFabb**

This tutorial goes over the essentials of the 3D mesh repair program, NetFabb. This program is easy to use and is a critical step in the finalizing stage of your model prior to printing. You can use this for use with any 3D design and exports to almost any program.

#### Video Link:

<http://www.lynda.com/3D-Printing-tutorials/Up-Running-3D-Printing/151814-2.html>

#### Module 1 - Introduction

1. Introducing NetFabb Studio

#### Module 2 - Repairing an Object

1. Performing an automatic repair in Netfabb Studio
2. Performing a manual repair in Netfabb Studio

#### Module 3 - Editing and Exporting

1. Slicing a flat bottom
2. Creating a hollow model
3. Wrapping a model
4. Measuring your 3D model
5. Exporting your file

#### **\*PreForm**

This tutorial goes over the all parts of the program used to print with our FormLabs Resin Printer. This program is easy to use and is required to print on the machine.

#### Video Link:

<https://www.youtube.com/watch?v=SSYAE8bTISo>

#### Module 1 - Introduction

1. Performing with Preform Webinar - 03/31/14