

Jennifer Prince

Fusion 360 Training

WEEK 1 – MAKING PARTS

Day 1 - Getting Started

- I. Introduce CAD and Fusion 360
 - A. What CAD is and why we CAD
 - B. Sample CADs
 - C. Quickly make a box with hole
 1. Toolbar
 2. Marking menu
 3. Toolbox
 4. Point out timeline, make edit
- II. Go through [Learning Fusion 360](#)
- III. Do [Lesson 2: User Interface](#)

Day 2 - Sketch

- I. Introduce Sketches
 - A. Can be done on a plane or face
 - B. Pulled outward/along a path to create a 3D shape
 - C. Center on the origin
 - D. Define sketches as completely as possible using relationships
 - E. Can be changed even after extruding
 - F. Types of Sketches
 1. Lines
 2. Rectangles
 3. Circles
 4. Arcs
 5. Polygons
 - ~~6. Ellipses~~
 - ~~7. Splines~~

- 8. Fillets
- 9. Offset
- G. Reiterate that everything should be fully defined
- II. Do [Hands-on Exercises](#)
 - A. Creating a Sketch for Beginners
 - B. Construction Geometry and Constraints for Beginners
 - C. Sketching Basics
 - D. Extra - Intermediate Sketching to Fully-defining a Sketch
- III. At home: watch videos and do more exercises under Sketch

Day 3 - Model

- I. Introduce Modeling
 - A. Design history (Parametric vs. Direct)
 - B. Sketch-based features
 - 1. Revolve
 - 2. ~~Sweep~~
 - 3. ~~Loft~~
 - 4. ~~Rib~~
 - C. Threads
 - D. Construction Planes
 - E. Mirror
 - F. Fillets and Chamfers?
 - G. Section Analysis
 - H. Material and Color
- II. Do [Hands-on Exercises](#)
 - A. Modeling
 - B. Creating Features from Sketches
 - C. Working with Draft, Chamfer, Combine, and Scale
 - D. Working with Holes, Threads, and the Shell Command
- III. Over the weekend: Go through exercises and videos under Model

WEEK 2 – MAKING ASSEMBLIES

Day 1 - Assemble

- I. Bodies vs. Components
 - A. Components are the “parts” that make up a structure
 - B. Components work together to make an assembly
- II. [Joints vs. As-built joints](#)
- III. [Watch](#) videos on Assemblies and Joints
- IV. Do [Hands-on Exercises](#)
 - A. Assemble
 - B. Creating New Bodies and Components
 - C. Inserting Components used for Distributed Design
 - D. Manually Adding Joints

Day 2 - Assemble

- I. Continuation of Day 1 [Hands-on Exercises](#)
 - A. Working with Subassemblies and As-built Joints
 - B. Enabling Motion using Joints and Contact Sets
 - C. Updating Designs using Distributed Components

Day 3 - Making your own assembly

- I. [Broach Press](#)
 - A. Download the drawings
 - B. Make a project called Broach Press
 - C. CAD each part based on drawings
 - D. Assemble everything together
- II. 2016 FRIP iPad stand
 - A. Measure actual stand
 - B. CAD based on measurements
- III. Over the weekend: Go through Assembly in Learning, be comfortable with it. Finish Broach Press/FRIP and share the project with me sometime.

WEEK 3 – GEARBOX CAD / GROUP PROJECTS

Day 1

- I. How to upload a CAD file to Fusion 360
 - A. New Design from File
 - B. Upload in Data Panel
- II. Make 1-stage Gearbox Assembly (use ½ inch shafts)
 - A. Show them how to get CAD file from VEXpro (and McMaster-Carr in Fusion)
 - B. Crash course on gears
 - C. Make the gearbox

Day 2 - Distributed Design

- I. Finish up Gearboxes
- II. Split into two groups
- III. Group project
 - A. Simple ball shooter
 - B. Tiny chassis
 - C. Own proposal

Day 3

- I. Continue working on Group project
- II. Share group project with me

WEEK 4 – INDIVIDUAL PROJECTS

Day 1

- I. Put all the skills you have learned to the test with your own designs!
- II. 3D Print Ideas
 - A. A fidget toy
 - B. Custom legos
 - C. Tiny Tiko-like Robot
 - D. Senior Gift

Day 2

- I. Continue personal design

II. Try to finalize CAD today

Day 3

I. 3D print projects

Break week(s) - Explore Fusion on your own. Render and Simulate your CADs. There's a wealth of information available at [Learning Fusion 360](#)