



# 3D PRINTING TRAINING

COURSE OUTLINE

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## MARKFORGED (INSTALLATION) – 1 DAY

### 1. Preparation

- Unboxing
- Verifying Boxes Content
- Printer Installation
- Plugging the Printer on the Network

### 2. Introduction

- SolidXperts Introduction
- Good Use of 3D Printing
- Comparison Against ABS
- Useful Web Pages
- Eiger Account Creation
- Introduction to STL files

### 3. Maintenance and Calibration

- 3D Printer Components
- The Use of USB Key
- Leveling Technic
- Fiber Nozzle Adjustment
- Test Prints
- Nozzle Cleaning
- Plastic and Fiber Nozzle Replacement
- Wet Plastic Purge
- XY Adjustment
- Strap Tensioning

### 4. Informations

- Part Glue
- Print Information
- Mechanical Properties

### 5. Advanced Operations

- Menu Options
- Fiber/Sandwich Technic
- Type of Fiber Filling
- Part View and Internal View
- Visibility Options
- Completely Filling a Part of Fiber
- Completely Filling a Part of Plastic
- Helping the Fiber Pathing by Changing the Geometry
- Helping the Fiber Pathing by Changing the orientation of the Part
- Brim
- Opening a Request to MarkForged
- Saving the Logs

### 6. Questions

- Questions
- Starting a Print with a Custom Part

**Course Objectives :** At the end of each course, students will know the capabilities of the software and will be able to use the learned features.

**Training Course :** Training is given in class at SolidXperts or online where each student has access to a workstation or online product version.

**Methodology :** Training is based on case studies demonstrated by the instructor. At the end of each lesson, time will be given for exercises.

**Competences Evaluation :** During the classwork, the instructor will correct the exercises on-demand and explain the solutions to the entire class if needed.

**Instructor :** SolidXperts trainers are Certified SolidWorks Instructors (CSWI) and authorized by Emploi-Québec.

**Course Materials :** One or more training manuals are included with the training course.

**Attestation :** A certificate will be given to each student at the end of the course to attest to the successful completion of the requirements for the course.

## DESIGN FOR ADDITIVE MANUFACTURING (DFAM) – 1 DAY

### 1. What is Additive Manufacturing?

- Brief history of additive manufacturing
- Examples of uses

### 2. Basic Principle of Technology

- Mechanical operation
- Special features of the FFF process
- Strengths and weaknesses of the technology

### 3. Presentation of Printing Materials

- ABS and PLA
- Onyx
- Continuous fiber

### 4. Overview of Printing Software

- Creation of an STL file
- Example of printing software

### 5. Producing Efficiently

- Choose the right orientation
- Limit the use of support material
- Limit weaknesses (sense of impression)
- Limit printing time
- Support behavior

### 6. Questions to Ask Yourself Before Producing a Part

- Purpose of manufacture
- Usage environment
- Duration of use
- Number of parts to manufacture
- Technologie available

### 7. Adaptation of the design according to the type of manufacture and use

- Machining mode of thinking vs. Additive manufacturing

### 8. Design Optimization for FFF Additive Manufacturing

- Precision and tolerances
- Wall thicknesses
- Minimum dimensions
- Reduce stress
- Chamfer vs. Rounding
- Limit fragility
- Surface quality
- Cost and manufacturing time

### 9. Tips for Greater Durability

- Wear parts and technology integration
- Use of purchased parts
- Thread
- Pause while printing

### 10. Scenarios

- Prototyping
- Tools

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