

# 3D Literacy<sup>®</sup> Workshop

## Level II – 3D CAD Design for 3D Printing

### 2-Day Workshop

The Level II 3D Literacy workshop is designed to help strengthen the instructor's knowledge and confidence with using a 3D printer in the classroom. Routine operation and maintenance procedures for the 3D printer will be covered to assist with keeping the 3D printers running at optimum performance during high demand times of the school year. We will also cover open source software and free community websites that will further expand the instructor's ability to create unique and challenging learning opportunities for their students. The second day will focus primarily on utilization of Autodesk Inventor for teaching 3D CAD design to the students. This will cover basic software functions, part development and design strategies for 3D printing, and suggestive methods for teachers to measure the students' progress with learning how to solve technical problems using 3D CAD design software.

#### Day 1 – 3D Printer Refresher Course

- 3D Printer Operation/Maintenance Skills:
  - Calibrating the 3D printer's X, Y, and Z axis
  - Utilizing functions on the LCD Smart Controller
  - Replacing the Hot End (included in cost)
  - Setting the Adjustable Z Limit Switch
  - Bed leveling activities
- 3D Printer Communities – Networking
  - Thingiverse
  - 123D App communities
  - FB/Pinterest
  - Collaboration among teachers
- Slic3r – G Code Generator
  - Basic operating procedures
  - Printing settings to change
  - Creating Multiple Config Files
  - Optimizing workflow in the classroom
- NetFABB –
  - Fixing Corrupt STL Files
  - Changing part resolutions
  - Re-orientation of parts

#### Day 2 – Autodesk Inventor Introductory Course

- Introduction to 3D CAD Design
- Basic design skills for 3D printing
  - Creating a 2D Sketch
  - XYZ Coordinate System
  - Create 3D Features
    - Extrude, Revolve, Loft
  - Part Modifiers
    - Holes, fillets, chamfers, shells
  - File exportation process for 3D Printing
- Intermediate skills
  - Creating work features
  - Utilizing patterns
    - Both 2D Sketches and part features
- Creating a drafting print for grading
- Limitations of 3D Printers
  - Design features to optimize strengths and minimize weaknesses
- Review of materials presented
  - Question and answer session