

# Additive Manufacturing Technology

**CHAIR:** Cameron Collins

**CO-CHAIR:** Rod Murphy

**CONTEST DATE:** April 26, 2018

**CONTEST LOCATION:** Hutchinson Fairgrounds, Pride of Kansas Building

**CONTEST TIME:** 8:00 am

**PURPOSE:** To evaluate each team's preparation for employment and to recognize outstanding students for excellence and professionalism in the field of Digital and Additive Manufacturing. Additive Manufacturing embraces a wide range of materials and derivative processes building parts suitable for end-use service. The virtually unlimited design freedom enabled by additive manufacturing allows the creation of shapes and the integration of feature and function that previously required subassemblies.

Employment opportunities for creative individuals are growing while industry adopts AM methods. Ready access to workstations and service providers make the Internet a growing marketplace for public AM gadgets.

**ELIGIBILITY:** Team of two. Open to a team of two active SkillsUSA members enrolled in programs using 3-D imaging and animation as an occupational objective.

**CLOTHING REQUIREMENT:** Unless the contest chair says otherwise, students are required to wear the Official SkillsUSA Kansas T-shirt and blue jeans (no tears, holes, or bagginess) clean and neat with appropriate shoes for contest or Official SkillsUSA white polo shirt with black dress slacks, black socks and black leather shoes.

Official SkillsUSA white polo attire



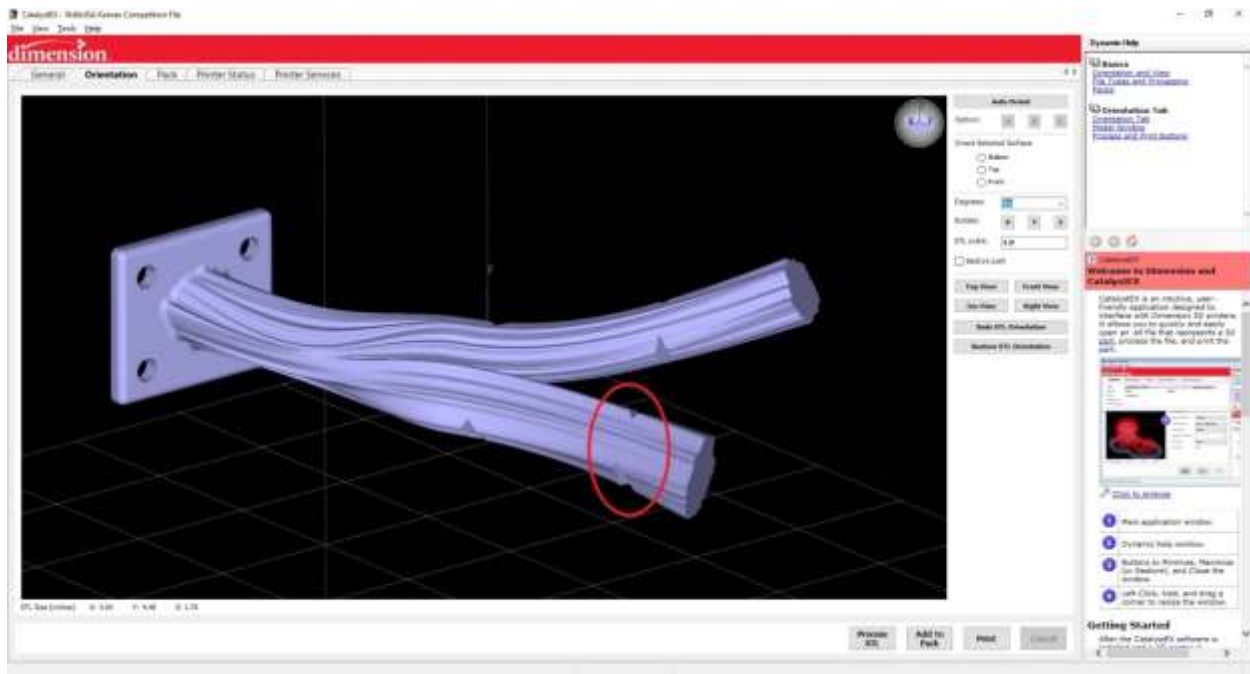
## 2018 Additive Manufacturing Technology

### Tire Swing Challenge:

Students must design a fixture that connects a tire swing to a tree branch in the highlighted red location. The tree will be oriented in the position shown below and mounted 12" off the ground. The tire swing fixture must stay connected to the tree branch when force is applied. Force is defined as a person moving the tire swing fixture with a light amount of pressure. The tire swing fixture must include a moving assembly and hold an Everbilt 1/8 in. x 1-1/4 in. Zinc-Plated Rope S-Hook with 10lbs of weight. Students must create a design that prints in no more than 2 hours with a build volume of no more than 2X2X2 cubic inches. Students must submit CMB and STL files to be printed via Catalyst no later than 3:00 pm on April 13<sup>th</sup> 2018. CMB and STL files can be sent to [ccollins@depcollc.com](mailto:ccollins@depcollc.com). Once files are submitted they will be printed on a 3D printer that uses ABS model material and Soluble support material. Final prints will be delivered day of contest.

On contest day, students must submit:

1. Engineering Notebook
2. 3D printed design - provided by contest chair day of contest
3. 10 Minute presentation of design



Tree File and Catalyst program can be downloaded from -

<https://drive.google.com/drive/folders/1-94OvFKMMItKK9J26EYCCkfj2rVJtdPB?usp=sharing>

**Knowledge Performance**

## 2018 KANSAS STATE CHAMPIONSHIPS (KSC) CONTEST UPDATE



This contest will include a written knowledge exam assessing general knowledge related to direct digital manufacturing technology in such areas as: additive manufacturing technologies, basic design technologies, additive manufacturing materials.

### Some Recommended Resources:

Hopkinson, N Rapid Manufacturing: An Industrial Revolution for the Digital Age.  
Chichester, England: John Wiley, 2006, Print.

Joacob, Paul F., and David T. Reid. Rapid Prototyping & Manufacturing: Fundamentals of Stereolithography. Dearborn, MI: Society of Manufacturing Engineers in Cooperation with the Computer and Automated Systems Association of SME, 1992. Print.

“Inside ExOne.” ExOne Home. Web.24 Apr. 2015. <http://www.prometal-rct.com/eng/process.html>.

ASTM Standard: Standard Terminology for Additive Manufacturing Technologies

**Notes: Contestants will have time during the contest to prep their model. Fixtures will be tested during the contest.**