RESEARCH EXPERIENCES FOR TEACHERS – SUMMER 2019

Enhancing Teacher Knowledge & Skills in Modern Manufacturing

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Project #2: Laser Processing

Faculty Instructor: Dr. Mathew Kuttolamadom (mathew@tamu.edu)
Teaching Assistant: Mike Liu (mliu011@tamu.edu)

Laser-cut clock made from birch and hand painted

1) Focus: 3-day education/research experience on fundamentals of laser cutting/engraving, and on-site training on programming for laser processing, its operation, and post-fabrication finishing.
2) Lab Training and Integrated Project: This exercise will afford teachers the ability to fabricate 2-D geometries through laser processing (cutting/engraving) on a variety of materials by creating models, selecting the proper process parameters, operating the laser, and post-processing.
3) Authentic Research Experience: Participants will gain a deep understanding of laser operational parameter effects and tolerances on different types of materials, as well as effective programming and operation of the laser cutter/engraver; such knowledge/skills will be employed to fabricate a component of the Stirling Engine.
4) Equipment: Laser cutter/engraver, Laser processing software, Finishing tools
5) Expected Outcomes:
   - Be able to create 2-D models for processing by the laser cutter software
   - Be able to select appropriate process parameters for the laser cutter based on the material type/thickness
   - Be able to effectively and safely operate the laser cutter/engraver
   - Ability to communicate technical course knowledge/concepts to a wide audience
   - Create a first draft curriculum module that utilizes laser cutting/engraving

Date	Topics	Location
Day 1	• Lab and laser-related safety • Introduction to CO_2 lasers, Part modeling • Operation of laser cutter/engraver	Product Innovation Cellar (PIC)
Day 2	• Hands-on modeling for materials/geometries • Computer-aided manufacturing, File Submit • Setup, Laser Processing, Post-Processing	Product Innovation Cellar (PIC)
Day 3	• Individual Projects • Curriculum proposals, Challenges • Brainstorming, Group discussion, Resources	Product Innovation Cellar (PIC)