

# RESEARCH EXPERIENCES FOR TEACHERS – SUMMER 2022

Enhancing Teacher Knowledge & Skills in Modern Manufacturing

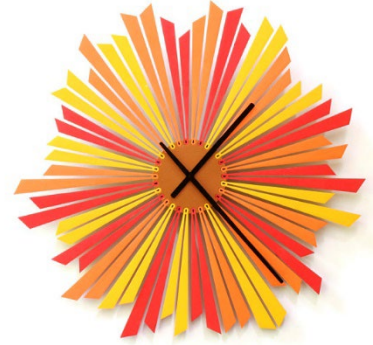
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## **Project #2: Laser Processing**

**Faculty Instructor:** Dr. Mathew Kuttolamadom (mathew@tamu.edu)

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- 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



Laser-cut clock made from birch and hand painted

Date	Topics	Location
Day 1	<ul style="list-style-type: none"><li>• Lab and laser-related safety</li><li>• Introduction to CO<sub>2</sub> lasers, Part modeling</li><li>• Operation of laser cutter/engraver</li></ul>	Product Innovation Cellar (PIC)
Day 2	<ul style="list-style-type: none"><li>• Hands-on modeling for materials/geometries</li><li>• Computer-aided manufacturing, File Submit</li><li>• Setup, Laser Processing, Post-Processing</li></ul>	Product Innovation Cellar (PIC)
Day 3	<ul style="list-style-type: none"><li>• Individual Projects</li><li>• Curriculum proposals, Challenges</li><li>• Brainstorming, Group discussion, Resources</li></ul>	Product Innovation Cellar (PIC)