MECH 5354: Design Studio I

Wintermester 2024
Time: M-F 9:00-1:00 PM
Location: W.M. Keck Center – Cotton Facility (410 S. Cotton Street)

INSTRUCTOR: Francisco Medina, PhD.
Associate Professor, Department of Aerospace and Mechanical Engineering
Director of Technology and Engagement, W.M. Keck Center for 3D Innovation
e-mail: frmedina@utep.edu
office: Engineering Room A103
Cell: 915-373-5047

Juan Pablo Garcia Chavira, M.S.
Ph D Assistant Instructor, Department of Aerospace and Mechanical Engineering
e-mail: jgarciacha@miners.utep.edu

OFFICE HRS: By appointment

COURSE DESCRIPTION AND GOALS:
The MECH 5354 course is the first design studio (Design Studio 1) in the Graduate Certificate in 3D Engineering and Additive Manufacturing (AM). The course is targeted to students registered in the certificate program. This project-based course is designed to provide students training and activities targeting the use of desktop material extrusion 3D printers while considering the limitations of this particular AM technology. Other topics of interest to material extrusion 3D printing will also be covered in this class.

Upon completion of this course, each student should be able to:

- Describe the major components of a desktop material extrusion printer
- Operate and maintain a desktop material extrusion printer (MakerBot Method X).
- Use CAD software to design parts
- Prepare printer instructions using slicing software
- Criticize part designs being considered for desktop 3D printing
- Predict stress concentrations in parts when considering end-use conditions
- Modify 3D part designs based on experimental data and failure behavior
- Explain the impact of print parameters and effectively troubleshoot failed prints
- Determine the best print orientation provided loading conditions and application

TEXTS:

No text requirements for this course.

ASSIGNMENT DEADLINES:
All assignments must be submitted on time. **No late assignments will be accepted and a grade of zero (0) will be assigned for any work not delivered on time**

METHOD OF EVALUATION

Your **grade for this course will be assessed based on attendance to the class, and on your participation and performance in multiple projects**. A minimum of two projects will be assigned through the semester. The specifics of each project will be discussed as the semester unfolds. No late work will be accepted for project's work and deliverables. Each project will be given 45% weight towards the final grade. Also, given the length of the class (2 weeks), your attendance is mandatory and it will count 10% towards your final grade.

GRADING

Your final grade will be calculated based on the points you have accumulated as follows:

A	≥90
B	≥80 but <90
C	≥70 but <80
D	≥60 but <70
F	<60

The instructor reserves the right to revise this grading plan. However, students will be informed of any changes during the semester.

*** For further class policies, please refer to the MECH 5354-Class Addendum**