

## Syllabus

### **MECH 5353: Advanced 3D Engineering and Additive Manufacturing Fall 2020**

**INSTRUCTOR:** David Espalin (Assistant Professor, e-mail: [despalin@utep.edu](mailto:despalin@utep.edu))

**OFFICE HRS:** T W 10:00 – 11:00 AM Mountain Time (MT) or by appointment (MS Teams)

**CLASS MEETING FORMAT:** M W 1:30 - 2:50 PM MT (Blackboard Collaborate)

Lectures will be delivered during the listed days and times using Blackboard Collaborate. While attendance is not mandatory, students are highly encouraged to attend class to enhance their understanding of course content via real-time interactions. All lectures will be recorded and made available in Blackboard Collaborate.

#### **COURSE DESCRIPTION AND GOALS**

The MECH 5353 course is the final instruction-based class towards the Graduate Certificate in 3D Engineering and Additive Manufacturing (AM). The course is targeted to students registered in the certificate program and who have taken or are taking the progression of classes consisting of MECH 5351, MECH 5352, MECH 5354, and MECH 5355, or to those who have demonstrated knowledge equivalent to the topics covered in those classes. This class will focus on advanced and recent topics of interest in AM and related technologies, specifically focusing on Material Extrusion of thermoplastics and Laser Powder Bed Fusion of metals. Topics of interest that will be discussed include but are not limited to:

- Relationships between Material Properties and Processing
- Recent Advancements in Manufacturing related to AM
- Advanced Concepts in Polymers and Metals AM
- Monitoring, Qualification and Certification Efforts

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

- Discuss the recent advances in AM, either in research or commercially available machines
- Describe the material properties that impact processing conditions
- Discuss the material extrusion and laser powder bed fusion processing conditions that have a profound impact on fabrication output

#### **METHOD OF EVALUATION**

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. Your grade for this course will be assessed based on your assignments, projects, and exams.** The specifics of each assignment and project will be discussed as the semester unfolds. At least two non-cumulative exams will be given. No late work will be accepted. The weight percentages given to each item are:

- Exams 50%
- Projects 40%
- Assignments 10%

#### **GRADING**

Your final grade will be calculated based on the points you have accumulated relative to the maximum available points; the percentage of which will be assigned to a letter grade as follows:

A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	59% or less

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

### **COVID-19 PRECAUTIONS**

You must STAY AT HOME and REPORT if you (1) have been diagnosed with COVID-19, (2) are experiencing COVID-19 symptoms, or (3) have had recent contact with a person who has received a positive coronavirus test. Reports should be made at [screening.utep.edu](https://screening.utep.edu). If you know anyone who should report any of these three criteria, encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to [COVIDaction@utep.edu](mailto:COVIDaction@utep.edu).

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website ([screening.utep.edu](https://screening.utep.edu)) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to class when feeling ill or exhibiting any of the known COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. Students are advised to minimize the number of encounters with others to avoid infection.

Wear face coverings when in common areas of campus or when others are present. You must wear a face covering over your nose and mouth at all times in this class. If you choose not to wear a face covering, you may not enter the classroom. If you remove your face covering, you will be asked to put it on or leave the classroom. Students who refuse to wear a face covering and follow preventive COVID-19 guidelines will be dismissed from the class and will be subject to disciplinary action according to Section 1.2.3 *Health and Safety* and Section 1.2.2.5 *Disruptions* in the UTEP Handbook of Operating Procedures.

### **COVID-19 ACCOMODATIONS**

Students are not permitted on campus when they have a positive COVID-19 test, exposure or symptoms. If you feel your performance in this class is being negatively affected by exposure, symptoms, or testing positive for COVID-19, you should contact me as soon as possible so we can arrange necessary and appropriate accommodations.

**\* For further class policies, please refer to the MECH 5353-Class Addendum**