ME 5351: Introduction to 3D Printing and Additive Manufacturing
Fall 2017
Time: S 9:00-11:50 PM
Room: CCSB 1.0202

INSTRUCTOR: Cesar Terrazas (Research Assistant Professor, Keck Center, e-mail: caterrazas2@utep.edu; office: Keck Center, Engineering Room 108)
Mireya Perez (Research Administrator, Keck Center, e-mail: maperez4@utep.edu; office: Keck Center, Engineering Room 108)

OFFICE HRS: By appointment

Course Description and Goals:
The MECH 5351 course is the first class towards the Graduate Certificate in 3D Engineering and Additive Manufacturing (AM). The instruction is targeted towards practicing engineers or soon to graduate engineering students seeking exposure to the various Additive Manufacturing technologies for a career in this growing field. This introductory course is intended as an overview of the various aspects of additive manufacturing but it also draws comparisons with traditional subtractive, formative, and joining manufacturing processes. Current emphasis is the use of AM techniques for fabrication of functional components. This course will teach the basics of each AM technology including design considerations, processes strengths and limitations.

Upon completion of this course, each student should be able to:
• Provide a comprehensive overview of AM technologies including descriptions of related technologies, design and AM-specific software and post-processing/part finishing approaches.
• Discuss the wide variety of new and emerging applications like micro-scale 3DP, medical applications, direct printing of electronics and directly manufacturing end-use components.
• Explain the capabilities, limitations, and basic principles of the various AM technologies.
• Evaluate and select appropriate AM technologies for specific applications.
• By the completion of various hands-on activities and projects throughout the semester, students will apply AM techniques (including CAD) in the design and prototyping of components using AM technologies.

TEXTS:

SOME ADDITIONAL REFERENCES:

In addition to the listed references, students are encouraged to search current literature on the topic of additive manufacturing since they provide the most current advances and developments in AM and these could be helpful for a broader understanding of the subject. Also, discussion activities will be performed based on assigned readings for journal articles from these sources. Two repositories recommended, which are accessible through the UTEP’s network, are:

1. [www.sciencedirect.com](http://www.sciencedirect.com)
2. [www.springerlink.com](http://www.springerlink.com)

**ASSIGNMENT DEADLINES:**
All assignments must be submitted on time at the beginning of class the day the assignment is due. **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 your performance in weekly quizzes, homework, and in-class activities that will count a total of 10%, two exams at 15%, and a final exam at 20%. Finally, projects will count 40% of your grade. Starting on week 2, one weekly quiz will be given towards the beginning or end of the class (10-15min) that will cover material from the previous week or the current lecture. Some quizzes might be team quizzes. There will be no make-up quizzes. Two exams will be given during the semester and a final comprehensive exam. Make-up exams will be given only for extremely credible reasons. There will be two to three projects throughout the semester. No late work will be accepted for project’s work and deliverables.

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

- A \( \geq 90 \)
- B \( \geq 80 \) but \(< 90 \)
- C \( \geq 70 \) but \(< 80 \)
- D \( \geq 60 \) 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 5351-Class Addendum.*