MFG 5390: Special Topics-Additive Manufacturing
Course Syllabus

Instructor: Amit J Lopes, Ph.D.
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Office Hours: TR 8:30 – 9:30 am
Time/Place: Online

Text:
Additive Manufacturing Technologies : Rapid Prototyping to Direct Digital Manufacturing by Ian Gibson, David W. Rosen, Brent Stucker, Springer, 2010, ISBN: 978-1-4419-1119-3

Alternate Texts:
1. Wohlers, T., "Wohlers Report 2012: State of the Industry," Wohlers Associates, Annual Worldwide Progress Report, 2012.
2. Noorani, R.I., Rapid Prototyping: Principles and Applications, John Wiley & Sons, 2005.
3. Proceedings of the Solid Freeform Fabrication Symposium, The University of Texas at Austin, Austin, Texas. (1990 – present), see http://utwired.engr.utexas.edu/lff/symposium/ for searchable papers from 1990.

Prerequisite: Permission of Department Chair

Objective:

This course covers relevant aspects of additive manufacturing processes to form three-dimensional artifacts with applications ranging from prototyping to production. Additive manufacturing (AM) technologies use a layer-based manufacturing process to fabricate three-dimensional (3D) parts directly from computer-aided-design (CAD) models. The goal of this course is to educate students on a variety of AM and other manufacturing technologies, their advantages and disadvantages for producing both prototypes and functional production quality parts, and discuss the important research challenges associated with using these technologies. This will be an applied research oriented course where you experience conducting literature reviews, designing AM specific products, and proposing methodologies to improving product design and ensuring part quality.

Upon completion of this course, each student will have knowledge about:

- The capabilities, limitations, and basic principles of AM technologies and related technologies including CAD and AM-specific software and post-processing/part finishing approaches
- Evaluation and selection of appropriate AM technologies for specific applications like micro-scale AM, medical applications, electronics application, and directly manufacturing end-use components
- Awareness of important research challenges in AM and application of this knowledge for developing a challenging rapid manufacturing application

Course Grading Scheme: >90 – A; >80 and <90 – B; >70 and <80 – C; >60 and <70 – D; <60 - F

Conference Paper - Project Grading Scheme:
5% importance of project proposal
20% proficiency of project presentation
60% technical merit of project paper
15% participation effort in project activities