# SYLLABUS

Course Number and Name:	ME557 – Additive Manufacturing
Term:	Fall 2021
Lecture:	Tuesday/Thursday, PHO 205, 6:30-8:15pm
Lab:	TBD, EPC B05, TBD
Credits:	4. Engineering topic.
Number of Contact Hours:	LAB – 1, LECTURE – 3
Instructor or Coordinator:	Stephen Chomyszak
Office Hours:	By Appointment

Textbook(s) and/or Other Required Material:

Misc. articles and chapters from a variety of sources

**Course Description:** This course will teach the fundamentals of Additive Manufacturing (AM) theory and how AM is being used in industry to accelerate product development and its implications on traditional low-volume and high-volume manufacturing processes. Topics will include:

- 1. Hands on use of FDM (Fused Deposition Modeling), SLA (Sterolithography) and DMLS (Direct Metal Laster Sintering) equipment,
- 2. Methods for designing for additive manufacturing (DFAM), and
- 3. Implications of additive manufacturing in the complete product lifecycle.

We will use the equipment in EPIC to demonstrate and practice the design and production of additive parts.

Prerequisites by topic: None

Co-requisites by topic: None

Status in the Curriculum: Elective

#### **Course Learning Outcomes:**

- i. Understand and be able to apply fundamentals of additive processes including FDM, SLA, DMLS
- ii. Understand theory and be able to use methods for design for additive
- iii. Understand the applications for additive and how they are changing as the technology changes
- iv. Learn associated methods for additive including reverse engineering and post processing

- v. Understand the additive eco-system and how it is changing
- vi. Run experiments to optimize additive processes
- vii. Create additive designs and evaluate the design and print quality

# Semester Schedule:

Week	Tuesday		Thursday	
	Lecture	Lab	Lecture	Lab
1			1 - Introduction	
2	2 - Digital Workflow	1	3 - DFAM	1
3	4 - FDM	2	5 – Topology Optimization	2
4	Formlabs		Inspire	
5	6 - Lattices	3	7 - SLA	3
6	nTopology	4	Aon3D	4
7	Review for midterm		MIDTERM	
8	8 - Powder Bed Fusion	5	8 - Powder Bed Fusion	
9	9 - Other	6	10 - Equipment	6
10	11 – Reverse Engineering	7	MarkForged	7
11	12 – Post Processing	8	13 - PRP	8
12	14 – Medical Applications	9	15 – Tooling Applications	9
13	Desktop Metal		Thanksgiving – No Class	
14	16 - Startups	10	17 – Mass Production	10
15	18 – Supply Chain		19 – Wrap Up	

## Assignments and Grading Criteria

This course will be comprised of individual and team-based work. Evaluation of team-based work will be comprised of a final team grade given by the instructor for the overall quality of the work produced by the entire team AND will be prorated based upon a peer evaluation of each member's contribution to the team by all other members on the team. The peer evaluation will be agreed to and signed by all members on the team and will be used in the determination of an individual's team-based evaluation.

The breakdown for the grade weighting is:

Attendance	10%
Assignments	15%
Midterm Exam	25%
Team Project	50%

Due to the importance of the team project, failure to participate in the project will result in a failing grade for the course.

### **Attendance Policy:**

All students are expected to attend all lecture, labs, and events scheduled by their respective team. I will be taking attendance at lectures and labs and I encourage team leaders to take attendance at their team meetings as well to provide meaningful data during the team's peer assessment.

Tracking of attendance will take the following format on a spreadsheet:

1 = Student is present and accounted for during scheduled class/lab time

0.5 = Student is not present but was proactive in communicating their absence to me via email

0 = Student not present and no prior notification given

A series of three 0's in a row will constitute a contact to the Department Chair to investigate the circumstances behind extended absences and to determine any administrative actions that should be taken as a result of the findings.

You can ask to see your attendance record for the class at any time.

#### Academic Conduct:

All students will be expected to follow Boston University's code for academic conduct found here: <u>https://www.bu.edu/academics/policies/academic-conduct-code/</u>