

San José State University
Department of Mechanical Engineering
ME 268 3D Printing and Additive Manufacturing, Spring 2019

Course and Contact Information

Class Days/Time:	Tuesdays and Thursdays 7:30 PM to 8:45 PM
Classroom:	Dudley Moorhead Hall Rm 164
Registration Code:	30634
Prerequisites:	BSME or instructor consent
Instructor:	P. Woytowitz
Office Location:	Dudley Moorhead Hall Rm 164 (after class)
Telephone:	408-316-6821
Email:	peter.woytowitz@sjsu.edu
Office Hours:	T-Th 8:45-9:30 pm

Course Format

This class ordinarily meets in person according to the scheduled dates and times. Course materials will be made available from the instructor using Google Drive. Calculations may require the use of engineering software such as MATLAB or free alternatives such as GNU Octave that students can run using their own computers.

Course Description

Application of fundamental technologies in 3D printing and additive processes for polymers, metals, composites, and biomaterials. Equipment, process, and materials selection for design applications such as electronics, medical devices, aerospace, vehicles, and consumer products. Hands-on experience to design or perform a 3D scanning and converting digital data into physical objects.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

1. describe various methods of 3D printing processes
2. describe the 3d printing and additive manufacturing workflow
3. select materials and process for specific application
4. model 3D printing and additive manufacturing processes
5. understanding of manufacturing principles for additive manufacturing (AM)
6. apply design principles for 3D printing and additive manufacturing
7. implement 3D printing and additive manufacturing for prototyping and product realization

Required Textbook

1. *Additive Manufacturing Technologies*, Gibson, Rosen and Stucker, Springer 2nd Ed, 2015

Course Requirements and Assignments

According to the Office of Graduate and Undergraduate Programs <http://www.sjsu.edu/gup/syllabusinfo/>, "Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or

preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.”

Grading Information

The course grade will be weighted as follows:

20% for Homework

20% for Midterm Exam

30% for Project

30% for Final Exam

Late homework will not be accepted.

The overall course grade is calculated from a weighted sum of all graded components. Graded percentage points correspond to letter grade as follows:

93.0-100 A | 90.0-92.9 A- | 87.0-89.9 B+ | 83.0-86.9 B | 80.0-82.9 B-

77.0-79.9 C+ | 73.0-76.9 C | 70.0-72.9 C- | 67.0-69.9 D+ | 63.0-66.9 D | 60.0-62.9 D- | 0-59.9 F

Exceptions: Any grading appeals or late petitions must be petitioned promptly in writing (or email). Exceptions will normally be evaluated at the very end of the semester in context with semester track record and all other exceptions class-wide. Special consideration for truly unavoidable and extenuating circumstances will depend on timing and strength of supporting documentation (e.g., doctor's note, jury summons, military orders).

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs Syllabus Information web page at <http://www.sjsu.edu/gup/syllabusinfo/>.

Course Schedule

This schedule is subject to change with fair notice via announcement in class or notification via Canvas. Specific reading assignments and deadlines will be communicated in Canvas.

Week	Dates	Topics, Readings, Assignments, Deadlines
1	1/24	Course overview; Introduction and overview of AM technologies (Ch 1)
2	1/29	Development of AM technology (Ch 2)
3	2/5	AM process chain (Ch 3)
4	2/12	Vat Polymerization (VP) processes (Ch 4)
5	2/19	Power Bed Fusion (PBF) processes (Ch 5)
6	2/26	Extrusion based systems (Ch 6)
7	3/5	AM lab access and training
8	3/12	Material and binder jetting (Ch 7-8)
9	3/19	Midterm; Directed Energy Deposition (DED) processes (Ch 10)
10	3/26	AM systems and process selection considerations (Ch 12-13)
11	4/2	Spring recess
12	4/9	Software for AM and DDM (Ch 15-16)
13	4/16	Design for additive manufacturing (Ch 17)
14	4/23	Post processing operations (Ch 14)
15	4/30	Final Project Collaborations
16	5/7	Project Presentations (20 min each team)

Last day of class is 5/9. Final Exam will be held on **Tuesday May 21 from 1945-2200** in the regular classroom.