

**San José State University**  
**Aviation and Technology Department**  
**Tech 146 3D Printing and Applications, Fall 2018**

**Course and Contact Information**

<b>Instructor</b>	Ross Benz	Lecturer: Mark Tudman
<b>Office Location</b>	E 103	
<b>Contact</b>	ross.benz@sjsu.edu <u>or</u> 510-396-6303	
<b>Office Hours</b>	T 19:15 – 20:00	
<b>Class Days/Time</b>	T 16:30 – 19:15	
<b>Classroom</b>	E101 and E103	
<b>Prerequisites</b>	Tech 20A, Tech 25, Tech 140/5	

**Course Format**

The course relies on lecture materials presented in class and students are strongly encouraged to attend.

**Course Materials**

Copies of the course materials including the syllabus, lecture materials, and homework solutions will be available on CANVAS.

**Course Description**

Presentation of equipment, processes, and materials used in 3D printing. Applications for a variety of markets and industry in accelerating for product introduction, improving manufacturing operations and efficiency. Hands-on experience from CAD to realization of a product.

**Course Learning Outcomes**

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

1. Describe technologies used in development of 3D printing processes.
2. Identify typical equipment used in 3D printing
3. Select equipment and materials for processes
4. Describe the benefits of 3D printing and advantages/disadvantages vs. traditional manufacturing
5. Design and fabricate a 3D mechanical object using a 3D printer

**Recommended Text/Readings**

**Textbook**

The 3D Printing Handbook by Ben Redwood, Filemon Schoffer, Brian Garret  
ISBN: 978-90-827485-0-5

**Other**

Hopkinson, Hague, Dickens, Rapid Manufacturing: An Industrial Revolution for the Digital Age.  
Wiley, 2005.  
ISBN: 978-0470016138

## Course Requirements and Assignments

Homework will generally be assigned weekly and is due the following week.

## Final Examination or Evaluation

The final exam will be comprehensive, covering material presented in class and exercises in the lab.

## Grading Information

Course grade will be based on homework assignments, midterm, project, and final exam.

Homework	20%
Midterm	20%
Project	30%
Final	30%

## Determination of Grades

There will be no curving of grades. Final grades will be assigned as follows:

	A >94	A- 90-93
B+ 87-89	B 83-85	B- 80-82
C+ 77-79	C 73-75	C- 70-72
D+ 67-69	D 63-65	D- 60-62
F <60		

## Examinations

One 75-minute exam (midterm) and one 2-1/4 hour final examination.

## Class Protocol

Class participation and attendance are strongly encouraged. Use of cell-phones is discouraged. Computers and tablet are allowed for taking lecture notes or CAD use.

## 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/>

**Tech 146 3D Printing and Applications**  
**Fall 2018 Course Schedule/Outline**  
(Tentative Schedule: Subject to Change)

<b>Week#</b>	<b>Lecture Topic(s)</b>
1.	Lecture: Course administration and introduction to 3D printing/AM Lab: Introduction to FFF
2.	Lecture: Using FFF/FDM Lab: Nameplates (Intro to support/infill/bed adhesion)
3.	Lecture: History, Market, Technologies, Why Lab: Print-time management
4.	Lecture: 3D printing equipment and processes Lab: Material characterization and print optimization
5.	Tour: 3D printing equipment demo (SLA/MJF/FFF/FDM/MJ)
6.	Lecture: Typical materials in 3D printing/AM Lab: Alternate materials test prints
7.	Lecture: 3D print costing & comparison to traditional manufacturing Lab: Alternate materials cont.
8.	Midterm Review Lab: Open Lab
9.	Midterm
10.	Costing Presentations (Group)
11.	Tour: AM Production and Contract Manufacturing
12.	Project Assignment & Concept approval
13.	Open Lab/Tour
14.	Open Lab/Guest Lecture
15.	Project Presentations
16.	Project Presentations and Final Review
17.	Final Exam

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