

ENTP 190 "3D Printing and Rapid Prototyping"
Spring, 2016
Stetson University

Instructors

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Time & Locations

MWF 1:30-2:20pm. Locations, as specified in the schedule: Sage 239 (classroom),
Library East Room (computer room), Library Innovation Lab (lab room).

Since this is a heavily lab-based course, most "office hour" needs will be addressed
during class meeting times. Other consultation with the instructors will be
scheduled as needed.

Books (required)

Bryden, Douglas. 2014. "CAD & Rapid Prototyping for Product Design." Hachette
Book Group. (ISBN: 9781780673424)

Hallgrimsson. Bjarki. 2012. "Prototyping & Modelmaking For Product Design."
Hachette Book Group. (ISBN: 9781856698764)

Supplies (recommended)

A 6-Inch digital vernier caliper. These cost about \$10 to \$15.

Although a reasonable amount filament will be supplied for 3D printing, students
should budget up to \$50 for the purchase of other supplies they will need for their
projects.

Students will find a laptop most useful for this course.

Grade Weights

% of final grade	Item
50.00	Assignments/Quizzes (8)
10.00	Attendance
10.00	Project proposal
10.00	Presentations (2)
20.00	Final paper
100.00	Total

Assignments

Graded components of the course are introduced here. They will be presented in full detail during the course of the semester. The graded components of the course combine demonstrating proficiency on basic skills and the development and completion of a semester project.

There will be a total of six short assignments and two quizzes as listed in the schedule. It is expected that some of the work for each assignment will be completed during class time and that remainder will be done as homework. Some assignments will be evaluated in class by student demonstration while others will be turned in for grading.

Students will give two presentations of about eight minutes each during the semester. The first will be a defense of the project proposal, and the second will be a presentation of the completed project.

The project proposal will be a minimum of 1000 words, plus references and illustrations. The cumulative element for the semester will be a paper on the project. The paper will be a minimum of 3000 words plus extensive appendices documenting the project.

Because of the highly interactive nature of the course, attendance is a graded component.

Semester project

The project you will develop and complete for this course will be a major undertaking. You will make two presentations on it, write a short assignment, a proposal, and a final paper on it, and spend several weeks of class time working on it (an addition to many hours outside of class time). Altogether the project will be at the core of more than 40% of your semester grade.

We want you to think early and often about your project. We will give you some presentations and structured activities to support that in the early weeks. We want you to undertake something that is ambitious and pushes you to learn new skills but is possible to accomplish within the semester and the tools and supplies available (you will likely need to spend some of your own money on supplies for the project).

The project itself must include the following, at minimum:

1. 3D design done in Fusion.
2. 3D printed elements.
3. One other fabrication technique available through Innovation Lab (may petition for exemption if your 3D work is sufficiently complex).

4. Multiple versions showing evolution based on prototyping and testing.

We will ask you to turn in artifacts or documentation of the artifacts for each of these elements as part of your final paper grade.

Class Policies

All work submitted for a grade in this class must be the student's own work and must be done exclusively for this class.

Assignments are due at the beginning of class on the due dates listed below. Late work will lose 10 percent of its grade for every day that it is late, up to a maximum of 50 points. The only exceptions will be for extreme, documented cases in which the student has made a serious attempt to contact me beforehand.

Computer/printer failure is not a valid excuse for late work--back up your files often and leave yourself time to deal with emergencies. And for goodness sake, buy a stapler!

Please be careful to avoid plagiarism. Any case of academic dishonesty will be dealt with in accordance with University regulations.

The Honor Pledge is the central statement of the Stetson Honor System. All incoming students are expected to subscribe to the Pledge upon entrance to the university. They are asked to reaffirm the Pledge on a regular basis, by writing the word "Pledged" in front of their signature when they submit exams and papers.

Any student who feels that she or he may need an accommodation based on a disability or medical condition should contact the Academic Resource Center in 220 CUB (822-7127 or academicresources@stetson.edu) to coordinate accommodations for documented disabilities.

Schedule

This is a tentative schedule as we may get behind. However assignment due dates will not be moved up. Details of the assignments will be provided during the course of the semester.

<u>Date</u>	<u>Activity</u>	<u>Location</u>	<u>Due</u>
Monday, January 11	Introduction to the course	Classroom	Skills inventory
Wednesday, January 13	Tour, safety, equipment capabilities	IL	
Friday, January 15	Example projects	Classroom	

Monday, January 18	Martin Luther King Day (no class)		
Wednesday, January 20	Brainstorming session	Classroom	
Friday, January 22	Thingiverse & Tinkercad	Computer Lab	Assign 1a project idea
Monday, January 25	Making your first print	IL	
Wednesday, January 27	Rapid prototyping concepts	Classroom	Quiz 1 - Hallgrimsson
Friday, January 29	Rapid prototyping paper exercise	Classroom	Assign 1b sketch
Monday, February 1	Fusion 360 Overview	Computer Lab	Quiz 2- Bryden
Wednesday, February 3	Fusion tutorials	Computer Lab	
Friday, February 5	Fusion tutorials	Computer lab	Assign 2. 3D design & print
Monday, February 8	Fusion tutorials	Computer lab	
Wednesday, February 10	Fusion tutorials	Computer lab	
Friday, February 12	Fusion tutorials	Computer lab	
Monday, February 15	Fusion tutorials	Computer lab	
Wednesday, February 17	3D capture demonstration	Classroom	
Friday, February 19	3D capture lab	field	Assign 3 Fusion
Monday, February 22	Meshlab overview	Computer Lab	
Wednesday, February 24	Meshlab lab	Computer Lab	
Friday, February 26	STL file format lab	Computer Lab	
Monday, February 29	Spring Break (no class)		
Wednesday, March 2			
Friday, March 4			
Monday, March 7	Arduinos Overview	Computer Lab	Assign 4 Capture/Meshlab
Wednesday, March 9	Arduinos exercises	Computer Lab	
Friday, March 11	Arduinos exercises	Computer Lab	
Monday, March 14	Arduinos exercises	Computer Lab	Assign 5 Arduinos
Wednesday, March 16	Electronics power, components, wiring, prototyping	classroom	
Friday, March 18	Electronics soldering	IL	
Monday, March 21	Electronics lab	IL	project proposal
Wednesday, March 23	proposal defense 1	classroom	
Friday, March 25	Good Friday (no		

	class)		
Monday, March 28	proposal defense 2	classroom	
Wednesday, March 30	Advanced 3d printing: the chemistry	Classroom	
Friday, April 1	Advanced 3d printing: hardware control	Classroom	Assign 6 electronics
Monday, April 4	mentored lab work	IL	
Wednesday, April 6	mentored lab work	IL	
Friday, April 8	mentored lab work	IL	
Monday, April 11	mentored lab work	IL	
Wednesday, April 13	mentored lab work	IL	
Friday, April 15	mentored lab work	IL	
Monday, April 18	mentored lab work	IL	
Wednesday, April 20	mentored lab work	IL	
Friday, April 22	Guest Speaker	Classroom	
Monday, April 25	Project presentations 1	classroom	
Wednesday, April 27	Project presentations 2	classroom	
Friday, April 29, 4pm	final paper in lieu of exam		Final paper due