Syllabus for IDS 493 Special Topics: Introduction to Rapid Prototyping
Fall Semester 2018
Capital University
Tuesday and Thursdays, 3:30 – 4:45, meets in BLIB 008 and the Prototyping Lab

Instructor: Dr. William Ball, Prototyping lab, Blackmore Library, billball@capital.edu, 614 230 2760. Office hours: Tuesdays and Thursdays 10 a.m. – 12 p.m.

Course Description: This is a project-based learning course using the design thinking process to design, build, and evaluate prototype devices. Students will work in teams and on an individual project of their choosing using the resources of Capital's Prototyping Lab. Objectives of increasing the student's creativity, critical thinking, problem solving, team work, and professional communication skills will be pursued while gaining experience with 3D design software, 3D printing, 2D design and fabrication tools, working with and programming electronics, and constructing physical models. No background required beyond a drive to create. 3 Credits.

Required Book:

Hallgrimsson, Bjarki. 2012. *Prototyping and Modelmaking for Product Design*. Laurence King Publishing. ISBN: 978-1856698764.

And other readings as provided and assigned.

Course Policies.

Grading

The distribution of grades varies tremendously from class to class. Given our relatively small class size, no true "grading on the curve" is possible. Yet within general guidelines, grading expectations are adjusted to my cumulative experience of teaching the subject, and the specific set of performances on a particular assignment/exam. Some general guidelines for overall course grades follow for you to keep in mind:

A, A- are marks of excellence, not averageness. To earn one of these grades a student has to complete all assignments on time and attend and participate actively in all, or virtually all, class sessions. In addition, a student has to rise above these basic expectations on each assignment, providing evidence of great attention to detail, a passion for learning, and considerable time invested outside of class. A grade of "A" is truly a special mark, earned by few, and indicating that the student's performance is among the best of those who have taken the course.
B+, B, B- are indications of good but not outstanding work. To earn a grade in the B range a student has to complete all assignments satisfactorily and on time, and attend and participate in most class sessions. A grade of B+ indicates a student has occasionally distinguished themselves on graded components in the class, but not consistently enough to move into the A range.

C+ through F are indications of substantial shortcomings in one or more major components of the course. Simply showing up and turning in largely complete assignments is C-level work. Less than that (i.e. failing to turn in major assignments and not attending regularly) endangers a passing grade.

The course grade will be based on 100 points, broken down into assignments as follows (further details of each assignment will be distributed well before it's due).

Due	Points	Item	
23-Aug	6	Discussion paper 1	
4-Sep	6	Discussion paper 2	
11-Sep	10	Group design 1 micro	
18-Sep	6	Tinkercad model	
25-Sep	10	Group design 2 macro	
2-Oct	6	3D print of tinkercad model	
4-Oct	6	Cricut project	
11-Oct	6	Microbit project	
18-Oct	8	Project proposal	
20-Nov	6	Instructor review	
27-Nov	10	Project presentation	
4-Dec	20	Project portfolio	
		2	2d project sketch
		2	3d project model hand made
		10	narrative
		2	3d model
		4	final prototype
	100	total	

Other Policies

Students are expected to do the reading, study, and project assignment prior to the beginning of the class period in which it is due. I will regularly call upon individual students to report to the rest of the class. This is a small class. There is no "back row" to hide in.

You may bring laptops/tablets/phones to class and to use them during class *for the purposes of note taking and working on class-related projects*. I do not expect to find you using them or other electronic devices for purposes unrelated to the class while we are in session.

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

You must monitor your Capital e-mail address for class updates.
Use of ILearn will be required for class.

You will need to sign the member agreement for the Prototyping Lab for class.

Assignments are due at the beginning of class on the due dates provided. Late work will lose 10 percent of its grade for every day that it is late, up to a maximum of 50 percent. 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. Give yourself time to redo a failed 3D print, realizing that others may be in the same situation. Please staple your written assignments before turning them in.
Please be careful to avoid plagiarism. Any case of academic dishonesty will be dealt with in accordance with University regulations.

Students enrolled in this course are expected to engage in a minimum of two hours of out-of-class student work per credit hour per week related to the course. Students enrolled in this course are subject to all governing University and academic unit policies. These policies contain important information about academic integrity, plagiarism, attendance, drop dates, incomplete grades, grade disputes, refunds, and human dignity. It is the student's responsibility to review these policies that may be found in the following sources: Undergraduate Bulletin or associated graduate bulletin or unit student handbook, Code of Student Conduct and Academic Integrity, and Student Handbook. Students in this course shall have access to disability services pursuant to the university disability policy. Students in this course shall have access to academic success services pursuant to the university policy.

Course Calendar

Please be aware that the following list is going to be altered as we go along, in particular to accommodate the semester project and guest speakers. Due dates will never be moved up.

Week	Date	Topic	Reading/assignment
1	21-Aug	Intro / tour	
	23-Aug	Who we are / design thinking 1	Discussion paper 1 due, readings per assignment
2	28-Aug	Safety & design assign. 1	Hallgrimsson, pp 43-64
	30-Aug	Safety & design assign. 1	
3	4-Sep	Prototyping process / ideas	Discussion paper 2 due, Hallgrimsson, pp 6-41
	6-Sep	3D design Tinkercad	
4	11-Sep	3D design alternatives / design 1 debrief	Group design 1 due, readings per assignment
	13-Sep	3D printing & design 2	Hallgrimsson, pp 65-73
5	18-Sep	3D printing & design 2	Tinkercad model due
	20-Sep	Cricut / 2d draw	Sketch video
6	25-Sep	Cricut / 2d draw	Group design 2 due, readings per assignment
	27-Sep	Microbits	
7	2-Oct	Other electronics	3D print from tinkercad due
	4-Oct	3D hand model / soldering	Cricut project due
8	9-Oct	3D hand model / soldering	
	11-Oct	Design thinking 2 / design 2 debrief	Microbit project due
9	16-Oct	Share 3d print/microbit/cricut	
	18-Oct	Proposal peer review	Project proposal due
10	23-Oct	Prototype to production / guest	
	25-Oct	Prototype to production / guest	
11	30-Oct	On demand topic	TBA
	2-Nov	On demand topic	TBA
12	6-Nov	Project work, instructor mentoring & review	
	8-Nov	"	
13	13-Nov	"	
	15-Nov	"	
14	20-Nov	"	
	22-Nov	Break, no class	
15	27-Nov	Presentations	Presentation due
	29-Nov	Presentations	Presentation due
16	4-Dec	Portfolio due day	Portfolio due

<u>Document history</u>
Initial submission 8/10/2018
Initial approval