DESIGN AND MAKING: TURNING YOUR ENTREPRENEURIAL IDEAS INTO REALITY

APPL 412 SECTION 001

SPRING SEMESTER

INSTRUCTOR

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Office Hours: To be determined

TEACHING ASSISTANTS

To be determined

INTRODUCTION

In this class, students will go through the entire design and fabrication process for a semester-long project. The final outcome will be a prototype or process that meets an entrepreneurial need.

Students do not need to have previously identified an entrepreneurial need before taking this class. Students will work in groups on a needs assessment process to identify entrepreneurial ideas, which could emerge from discussions with stakeholders in the UNC community, local community, or around the country. From these ideas, they will choose a topic for their semester project, and then start work to design a device or process that addresses that need. For the “making” part of the class, students will fabricate prototypes or develop processes to address their need. Students will receive feedback from their stakeholders throughout this process.

Students will apply their entrepreneurial skills throughout this process. Lectures, in-class discussions, and brainstorming sessions will help to guide the students. They will use the resources of the BeAM makerspace to design and fabricate their project. They will receive appropriate background and training in both mechanical and electrical design to enable them to turn their ideas into reality.

PRE-REQUISITES AND TARGET AUDIENCE

Pre-requisite: ECON 125 Introduction to Entrepreneurship.

Students in any major can take this class. Students are required to get orientation and equipment training in the BeAM makerspace, ideally before taking this class, but they can also get trained in the first few weeks of the semester.

CLASS SIZE

Maximum 20 students working in groups of 4-5

STUDENT LEARNING OUTCOMES

By the end of this course, students should be able to:

- Perform a needs assessment to determine the most important needs to address
- Structure their time management over a semester-long project
- Operate within a budget
- Work as part of a multi-disciplinary team
- Use the library and online resources for background research
- Experience an iterative design process, getting feedback from stakeholders throughout
- Use CAD software and 3-D perspective drawing to design prototypes
- Use facilities in BeAM to fabricate prototypes
- Use principles of universal and human centered design to develop designs
- Communicate information about their projects, both in oral and written form

CLASS ACTIVITIES

Class will consist of lectures, discussions, brainstorming, and time to work on prototype fabrication. While students will be focusing on their own project, students will also be giving feedback to their peers throughout the semester. Students should expect to spend a significant amount of time outside of class working on their projects.

POLICIES AND PROCEDURES

- See BeAM safety guidelines
- Come to every scheduled class and let me know ahead of time if you cannot attend.
- Turn in written assignments on time; if they are one day late, I will deduct 25%, and if they are two or more days late, you will get a zero. If you need an extension, you must ask at least one day before the due date (you can avoid a grade deduction this way). If you miss a grade, it is your responsibility to make arrangements to get your assignment graded.
- When visiting and working with others outside of our class, conduct yourself in a professional manner
- You and your partners may decide to concentrate on different parts of your project but you should thoroughly understand how your entire device works.
- You and your partners should contribute an equal amount of effort toward your project. If you feel that you are working much harder than your partners, you should talk to your partner first, and then let one of us know if the situation does not improve.

SCHEDULE AND TOPICS

Week	Topic	Major assignment deadline
1	Introduction	
2-3	**Think:** Needs identification	Statement of project goals
4-5	**Listen:** Stakeholder identification and background research	Design specifications
6-8	**Plan and Design:** Brainstorm initial design ideas and prototyping methods	Mid semester prototype (proof of concept)
9	International standards	
10	**Evaluate:** Verification and Validation	Standards plan
11	**Clarify:** Technical communication	Project evaluation plan
12	**Making:** Project work	Draft of final report
13	Project work	Final project graded
14	Modifications to final project based on feedback	Project evaluation (verification and validation)
Exam week		Final report

HONOR CODE

I will let you know if an assignment should be done individually or as part of a group. While I encourage you to help each other for individual work, it is a violation of the honor code if you copy or obtain solutions from another student.

GRADING

Group grades	Percentage of final grade	Individual grades	Percentage of final grade
Final prototype	25%	Individual presentation and writing	15%
Mid-semester prototype	5%	Individual homework assignments	15%
Group homework assignments	10%	Peer and faculty evaluations	10%
Final group report and presentation	10%		
Lab notebook grades	10%		
Total	**60%**	**Total**	**40%**

Final letter grades will be calculated with the following grade scale:
A: >93.0
A-: 90-92.9
B+: 87.0-89.9
B: 83.0-86.9
B-: 80.0-82.9
C+: 77.0-79.9
C: 73.0-76.9
C-: 70.0-72.9
D+: 67.0-69.9
D: 60.0-66.9

ACCOMMODATION FOR STUDENTS WITH DISABILITIES.

The University of North Carolina – Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in difficulties with accessing learning opportunities. All accommodations are coordinated through the Accessibility Resources and Service Office. Please visit http://accessibility.unc.edu for more information.

I reserve to right to make changes to the syllabus, including project due dates and test dates (excluding the officially scheduled final examination), when unforeseen circumstances occur. These changes will be announced as early as possible so that students can adjust their schedules.