2.722J / EC.720 D-Lab: Design Spring 2018 v1.2

Week	Monday	Wednesday
1	**February 5** Registration Day – **No Class**	**Class 1 February 7** Introduction to D-Lab: Design Homework: watch IDEO Shopping Cart video
2	**Class 2 February 12** Intro to International Development w/ Amy Smith	**Class 3 February 14** Understanding User Needs and Market Research in Developing Countries
3	**Class 4 February 20 *(TUESDAY!)*** Prototyping for Appropriate Tech Start of Design Sprint	**Class 5 February 21** Product Specifications – Converting User Needs to Specifications
4	**Class 6 February 26** Concept Generation - Harald Quintus-Bosz guest lecture on brainstorming	**Class 7 February 28** Design Challenge Presentations Parameters of Design Challenge
5	**Class 8 March 5** Final presentations on Design Sprint	**Class 9 March 7** Concept Selection Methods
6	**Class 10 March 12** Intro to Industrial Design What is it?	**Class 11 March 14** Entrepreneurial Perspectives - how to engage the customer in the design process
7	**Class 12 March 19** Work on Design Challenge Shop time	**Class 13 March 21** Concept Design Review - Present your concepts
8	No classes this week - Spring Break	
9	**Class 14 April 2** Designing for User Experience	**Class 15 April 4** Design for Environmental Sustainability
10	**Class 16 April 9** Guest Lecture - Eric Solomonson	**Class 17 April 11** Product Development Economics
11	**April 16** Patriots Day - **No Class**	**Class 18 April 18** Design Review #2
12	**Class 19 April 23** Integration & Modularity	**Class 20 April 25** Product Testing & Validation
13	**Class 21 April 30** Guest Lecture - TBD	**Class 22 May 2** Guest Lecture - Eliza Squibb
14	**Class 23 May 7** Work on Design Challenge Shop time	**Class 24 May 9** Final Design Review in class ***SPRING D-LAB SHOWCASE* - May 12**
15	**Class 25 May 14** Implement Changes and Lessons Learned	**Class 26 May 16** Project Wrap up and Cleaning

2.722J / EC.720
Massachusetts Institute of Technology
D-lab: Design Spring 2018
M/W 3:30pm – 5:00pm
N51-350

Course Description
D-Lab: Design addresses problems faced by underserved communities with a focus on design, experimentation, and prototyping processes. Particular attention is placed on constraints faced when designing for developing countries. Multidisciplinary teams work on semester-long projects in collaboration with community partners, field practitioners, and experts in relevant fields.

Topics covered include design for affordability, design for manufacture, sustainability, and strategies for working effectively with community partners and customers.

Teaching Staff
Instructor Sorin Grama, grama@mit.edu
Instructor Jerome Arul, jarul@mit.edu
TA

Class Meetings
Monday and Wednesday
3:30pm to 5:00pm
MIT Room **N51-350**

Course Materials
Course materials are found on Stellar.
A course link will be shared with students.

Office Hours
Instructors and TAs will meet teams during the class, and Instructors can meet individual students during Office Hours.

Learning Objectives
· Learn about the design process
· Develop technical solutions for underserved communities
· Practice creative design in a real-world context
· Learn hands-on prototyping and manufacturing skills
· Develop problem solving and critical thinking skills
· Recognize the potential impact of designers and engineers in the world

Design Challenge
As this is a project-based course, the instructors provide a selection of design challenges that are connected to strong community partners and are appropriate for a team of students to make a significant contribution to within a semester. The challenges are often proposed directly by community partners or identified by D-Lab members whilst working in the field. Students select challenges based on their skills and interest, and are grouped into teams that have a diverse set

of skills and backgrounds represented. In areas where teams may have limited knowledge and experience, they can consult with D-Lab mentors, reviewers, staff, and other local experts.

It is important for teams to maintain regular contact with their community partners throughout the semester, as the design project is a collaborative process and dependent on input from people who are facing the challenges being addressed. After the semester, students may choose to continue their project by applying for summer fellowships to travel to their community partners and taking their work into one of the D-Lab classes focused on dissemination, such as Development Ventures, D-Lab: Design for Scale, and D-Lab: Supply Chains.

Design Sprint
The initial mini project will help students gain more familiarity with the D-Lab workshop and the design process in a short period of time, while getting to know and bond with their classmates by working in teams.

We believe in learning by doing, and the mini project teams are encouraged to get their hands dirty by creating as many quick iterations as possible. It is incredibly difficult to get very far on the challenge in such a short time, but by the end of the mini project, teams usually have at least learned more about a topic by having built rough prototypes / models. Please refer to the mini project assignment for more information.

Design Reviews
We will conduct a number of design reviews during the semester. In addition to instructors, TAs, and your peers, we might invite outside experts to participate in the reviews.

Final Presentations
Teams show their final prototypes of their Design Challenge during the D-Lab Spring Showcase, an annual event where D-Lab classes share their work from the spring semester with the MIT and greater Boston community. Student teams give short presentations/pitches and hands-on demonstrations of their projects. This is an opportunity for students to get questions and feedback from a larger audience and see what other D-Lab classes have been doing. The event is open to the public.

Reading Materials
Readings from a variety of sources will be assigned throughout the course. Students are expected to read carefully and be prepared to participate in class discussions.

Case Studies and Guest Lectures
Instructors and guest speakers will periodically offer lectures and case studies on a variety of technologies and how they relate to design in developing countries. Students should reflect on the material presented in class and investigate parallels to their own design projects.

D-Lab Workshop
The D-Lab workshop provides students with access to tools and equipment for prototyping and fabrication of a variety of materials (including wood, metal, plastics, electronics, and agricultural substances). Each team also has a small budget to purchase additional tools, materials and resources. There are transparent containers on shelves for project storage and a labeling system using colored tape.

Students are asked to be respectful of the shared space, equipment, and materials by asking about any uncertain items before using them. The shop is a community, which provides many opportunities for collaboration – innovative new ideas often happen when people working on different things collide and cross-pollinate.

There is also a D-Lab library with reference books and videos on many topics in development, which can be checked out. For any specialized equipment or resources that D-Lab does not have, students have access to other workshops and libraries. The MIT Mobius app lists the available machine shops and other maker spaces on MIT campus.

Safety

Safety is taken very seriously at D-Lab, and ***all students receive training and agree to the D-Lab workshop rules before working in the shop***. While students have the key code for 24-hour access the workshop, they cannot work alone and need to have a staff member present any time they are using unfamiliar equipment.

Attendance and Participation

A student's presence and involvement in class is important, as most sessions involve discussion, hands-on activities and exercises. Much of this work is also done in teams and would be affected by absent students. For the design projects, the level of a student's commitment and engagement will matter not only to the team, but to specific communities. As Amy often says, D-Lab is about working on real projects with real people, and with that comes a real responsibility.

Policies

Students with disabilities should consult with the Disability Services Office and instructor at the beginning of the semester to ensure timely support. Students must strictly adhere to the MIT Academic Integrity policy.

Evaluation

This is a twelve-unit class: three hours a week will be spent in class, three hours will be spent in scheduled group meetings and the remaining time will be spent on readings, homework and design projects.

Because much of the work for this class will be done during class time, attendance is essential. Students missing a class meeting should notify the instructors in advance and make arrangements to make up the work. Missing more than two sessions (classes or project team meetings) without making up the work will result in a reduced grade.

This class is graded on an A/B/C/F basis. Furthermore, it is a class where your work is impacting the lives of people around the world and we expect an appropriate level of commitment.