Detailed course information for WDDC

This document describes what each WDDC student and project group should expect as far as class structure, responsibilities, deliverables, and resources during the term. If you have any questions, don't hesitate to ask Amos.

Instructors:
Amos Winter (awinter@mit.edu), PhD Candidate, Mechanical Engineering
Mario Bollini (mbollini@mit.edu), M-Lab member and Mechanical Engineer, Vecna
Amy Smith (abs@mit.edu), Senior Lecturer, Mechanical Engineering
Lecture: Tuesday and Thursday, 3:00 - 4:00 PM, Room 1-371
Lab: TBD

1) **Course breakdown** – The course units are broken into 2-2-5 corresponding to Lecture-Lab-Homework.
   a) Lecture – Each student is required to attend the lectures but is allowed to miss two during the semester. More than two absences without permission from one of the instructors will result in failing the course. Attendance will be taken at each class. Students are expected to arrive by 3:00pm. Lecture will start at 3:05pm.
   b) Lab – Each project team will choose its own lab time. The team needs to schedule two hours a week to meet with their lab instructor. The lab session is an important time to develop your project and get advice from you lab instructor. Set aside the same time every week to meet in order to insure everyone can attend.
   c) Homework – Homework will consist primarily of readings and short assignments to be handed in. Assignments will be due one week after being assigned. As the semester progresses less homework will be given to allow more time for the project.
   d) Grading – The course will be graded from A-F. Lab instructors will assign grades for all students in their section. Instructors will collaborate to ensure that there is equitable grading between lab sections. Half of the total grade is based on individual work and the other half is based on teamwork. Class and lab participation grades are based on both attendance and quality of in-class activity. The grading breakdown is:
      i) Class participation/homework: 10
      ii) Strategy presentation: 15
      iii) Concept presentation: 15
      iv) Most Critical Module (MCM) Presentation: 15
      v) Final presentation and prototype: 25
      vi) Team website: 20

      Teams' progress will be judged largely on presentations given at each project milestone. Presentation times will be chosen by the class in order to accommodate everyone's schedule. See the syllabus for milestones and the week of each presentation.

2) **Term project** – Students will form into lab groups, 3 to 5 members plus a lab instructor, to work on a project (either from the website or proposed by a student) for the term. While participating in the project, each group will have the following responsibilities:
   a) Collaboration – The project is meant to be a true collaboration between MIT students, experts who work in each project field, and local wheelchair technicians in developing countries. Each team is required to send a **weekly update email to both the project mentors and local partners** to demonstrate their progress and obtain feedback/ideas. Mentors and local partners will be assigned to project teams after the teams have been formed.
   b) Group meetings – Each project group is required to meet once a week for two hours with their lab instructor. It is up to the group and lab instructor to choose the best meeting time for all, which does not have to be the scheduled class lab time. The group is encouraged to pick a time that overlaps with open hours of facilities that might be useful to the project (e.g. the Hobby Shop, Edgerton Shop, Foundry, etc).
   c) Deliverables – Each group will need to produce the following deliverables:
      i) A PowerPoint presentation for the Strategy, Concept, MCM, and Final Presentation milestones.
      ii) A Poster and presentation to be presented at the MIT museum on Sat, May 8. The poster and presentation should summarize the team's work. Teams should also strive to have a prototype finished to show visitors of the museum.
      iii) Prototypes – A physical solution to each teams' MCM will be presented at the MCM presentation. For the final presentation, a functioning proof-of-concept prototype is expected. For example, if a team designs a new wheelchair frame, a fully-functioning device that demonstrates all the important features of the design and the manufacturability of the product is expected. The final project does not have to be a polished, refined product, but should be usable. For teams doing business plans or other projects that do not require hardware, a solution to the biggest obstacle of the project is expected at the MCM presentation, and a full plan of how to implement the group's work into a local partner workshop is expected at the final presentation. The final project should be developed to a point where it can be brought to the developing world and quickly made into a fully functioning prototype for further testing.

3) **Team websites** – Each team is required to make a website defining their project, introducing the team members, and chronicling the development of each milestone. The purpose of this requirement is to make all of the technology from WDDC open-source for the rest of the world. A website update will be due at each project milestone. Summer fellows that continue WDDC projects will be required to update the website corresponding to their project with their summer work. Teams' websites will be posted on the M-Lab website.

4) **Resources**
   a) Monetary – The class has a materials budget of approx. $4000. Teams will not have a fixed budget, as some teams will have to buy more things than others.

Anything that costs more than $100 should be cleared with the instructor. If you would like to purchase an item you can either:

i) Tell Amos where to buy it
ii) Buy it yourself and submit your receipt to Joan Hutchins for reimbursement

b) Manufacturing – The following manufacturing facilities will be accessible to WDDC students for their group projects:
   i) M-Lab/D-Lab workshop (E34, Dennis Negle shop manager) – this shop has many general prototyping tools and materials. It also has many materials found in developing countries. Dennis has a lot of experience with appropriate technology. This shop will be available 24/7 on the conditions that people only use tools on which they are trained and that they work with a partner.
   ii) The Edgerton Shop (Room 44-023, Mark Belanger shop manager) – This shop is good for machining and cutting metal parts.
   iii) The Hobby Shop (Room W31-031, Ken Stone shop manager) – This shop is good for woodworking and has a waterjet.
   iv) The MIT Foundry (Room 4-010, Mike Tarkanian shop manager) – This shop is where to go to get things welded and learn to weld.
c) Parts – WDDC has multiple locally-made wheelchairs and handcycles that teams can use. Teams should not destroy any of these devises, but are welcome to modify or use parts from them. If a team would like to make a "permanent modification" to one of these devices, ask an instructor first. Also, M-Lab has tons of bicycle parts from developing countries around the world that can be used for prototyping.
d) Lab/storage space – WDDC will have use of M-Lab and the bicycle storage room that are part of the D-Lab space in E34.
e) People – Utilize your Mentors, Community Partners, and Lab Instructors to the fullest. They have a wealth of knowledge in your project area and will greatly broaden the skill set of your team.

5) Fellowships – In the past few years, over 20 students have traveled abroad to continue projects from WDDC and M-Lab. Most of those trips have been funded by either the MIT Public Service Center or the IROP program (run through the UROP office). Those who would like a fellowship will have to propose a project (most likely a continuation of their class project) within the guidelines of one of the PSC fellowships (Independent, Network, or Focus) or apply for IROP funding. To be fair to all interested students, proposals will be submitted to, judged by, and awarded through the PSC or IROP office, not by the WDDC instructors. Alison Hynd, coordinator for the fellowships and the IDEAS competition, will be coming to class to talk about all funding opportunities to continue work from WDDC. Other funding opportunities are available. If you are interested in working on WDDC stuff during the summer, please talk to Amos or the PSC or the UROP office as soon as you can.