

# **Project Plan**

**I PRO 353: Fab Lab  
Spring 2010**

# I. TEAM CHARTER

## 1. Team Information

Name	Email Address
<b>Nikolai Arendovich</b>	narendov@iit.edu
<b>Anthony Bartolomei</b>	abartolo@iit.edu
<b>Joel Meno</b>	jmeno@iit.edu
<b>Muqadas Munir</b>	mmunir@iit.edu
<b>Maksym Ostapenko</b>	mostapen@iit.edu
<b>Anne Pham</b>	apham2@iit.edu
<b>Joseph Sanchez</b>	jsanch1@iit.edu
<b>William Sawyer</b>	wsawyer1@iit.edu
<b>Jesse Stepniewski</b>	jstepnie@iit.edu
<b>Terez Sturup</b>	tsturup@iit.edu
<b>Jimmy Ton</b>	jton@iit.edu
<b>Patrick Zhu</b>	pzhu2@iit.edu

Sub-teams:

Group 1: Public Outreach Team

Group 2: Operations Model Team

Group 3: Production Team

Name	Major	Skills/Interests	Experience	Expectations	Group
<b>Nikolai Arendovich</b>	Biochemistry (4th year)	Microsoft office suite, some photoshop,	Educational presentations at MSI, IPRO 325 - sustainable solutions in Peru,	Increase public awareness of of the FAB lab, better the use, better the view of the FAB lab	1
<b>Anthony Bartolomei</b>	Mechanical Engineering	MATLAB, Pro/E, Adobe Illustrator	Second IPRO, Shop, Mechanical Design	To gain a better understanding of how business models are made and implemented in science related topics.	3
<b>Joel Meno</b>	Aerospace and Mechanical	AutoCAD, MATLAB,	IPRO, shop, design,	Help MSI create a self-sustaining and efficient	1

	Engineering (4 <sup>th</sup> year)	Microsoft Office, film editing.	film	FABLAB open to the public.	
<b>Muqadas Munir</b>	Business Administration	Microsoft Office	Presentations made in other classes	Increase public awareness of the Fablab and design prototypes	3
<b>Maksym Ostapenko</b>	Computer Information systems  (4 <sup>th</sup> year)	PHP, MySQL, Java, HTML, CSS	Programming, web-development, tech support	Work with creative people, apply skills to solve real world problem	1
<b>Anne Pham</b>	Architecture (3 <sup>rd</sup> year)	Autocad, 3dmax, Adobe Photoshop, Illustrator, InDesign, Microsoft office	Shop, laser cutter	Design prototypes that enhance the FABLAB use	2
<b>Joseph Sanchez</b>	Business Administration  (Marketing)  (3 <sup>rd</sup> year)	Strategy and Planning, Marketing focus, writing and presentation.	No previous Ipro experience.	I want to help the FabLab become a self-sustaining, fully functional piece of the Museum's overall vision. I would like to bring attention to the FabLab, with hopes that the public will catch on and become curious about the project.	3
<b>William Sawyer</b>	Biochemistry (4 <sup>th</sup> year)	Microsoft Office, some Photoshop, some CAD, some machine experience	Class presentations, IPRO 325	Increase awareness and use of the MSI FabLab, take strides towards making it sustainable	2
<b>Jesse Stepniewski</b>	Business Administration (Finance)  (4 <sup>th</sup> year)	Business Planning, Microsoft Office, Forecasting	I PRO, I2P Competition	Design an acceptable and sustainable model for public FABLAB use.	3
<b>Terez Sturup</b>	Architecture  (5 <sup>th</sup> Year)	AutoCAD,  Adobe Creative Suite	Model shop, Laser Cutter, Previous Ipro	To attract more suitable users to take advantage of the potential of the Fab Lab.  To come up with a plan that allows for a smooth flow of patrons to the Fab Lab.	1

<b>Jimmy Ton</b>	Biomedical Engineering – Neural Engineering (4 <sup>th</sup> year)	Microsoft Office Suite, MATLAB	IPRO 358 – Design of an Innovative Fishing Hook; BME 419/420 – Design Concepts	Gain an understanding of the use of the machines within the FabLab and develop a way for others to do the same and further benefit from the FabLab.	2
<b>Patrick Zhu</b>	Biomedical Engineering – Cell and Tissue Engineering (4 <sup>th</sup> year)	Microsoft Office, MATLAB, AutoCAD/Desk, 3D Studio	IPRO 358 – Design of an Innovative Fish Hook, BME Design Concepts, House construction.	Create a product that will impress the target audience by showing the simplicity and precision of the machinery at the Fab Lab.	2

## 2. Team Identity



**Dream IIT, Design IIT, Fabricate IIT**

## ***2. Team Purpose and Objectives***

For this semester IPRO 353's purpose is to generate a steady public interest in the Fabrication Laboratory (Fab Lab) that is located in the Museum of Science and Industry (MSI) by reaching out to a target user base of retirees, inventors, craft hobbyist, and students. Feedback collected from these user groups will be used to create and establish a feasible program that sets out requirements for qualified users, provides new users with tutorials (or workshop), and implements a schedule for steady use of the Fab Lab by qualified users. The program will include a volunteer force such as a group of community service students trained in the lab that can oversee activities in the Fab Lab.

The team will fulfill this purpose by forming 3 task groups to meet the following objectives:

### *Team 1 – Public Opinion/Outreach*

- Attract target users and conduct case studies that follow and represent the user experience;
- Create programs/workshops to increase hands on interaction by target user groups;
- Document interviews, video testimonials to provide direct feedback on the functionality of the Fab Lab;
- Promote and market the full potential of the Fab Lab to the public;
- Organize a trial public exhibit of products created in the Fab Lab to promote the lab and garner public interest;
- Create a website to promote and coordinate use of the Fab Lab.

### *Team 2 – Production Team*

- Create a scale model of the Fab Lab;
- Use Fab Lab machines to make T-shirts to attract users;
- Create high detail example to demonstrate capabilities of the machines;
- Design a 3d Poster for public display;
- Make a series of videos demonstrating the use of machines;
- Create new manuals for future Fab Lab users;
- Develop a more unique brochure to attract immediate attention.

*Team 3 – Operations Model*

- Outline historical timeline and future plans moving forward;
- Plan for better public access so the lab is more accessible to the wider community;
- Plan for continued funding in order to minimize reliance on the museum's budget;
- Investigate the potential of private prototyping activity in the lab;
- Confirm MSI vision for Fab Lab;
- Identify and contact with all stakeholders in the Fab Lab;
- Make a formal presentation of results and ideas to MSI.

### ***3. Background***

Currently there are 34 Fabrication Laboratories spread across nine countries. What began as a rapid prototyping platform developed by the Center for Bits and Atoms at the Massachusetts Institute of Technology (MIT) in August 2007 has quickly emerged as the future of small scale industry. As such, Fab Labs are meant to encourage local entrepreneurs to take their own ideas from the drawing board and develop them into prototypes with the eventual goal being the start up of a local micro businesses. More importantly, Fab Labs also teach users critical skills in computing, electronics, programming, and CAD/CAM fabrication techniques; which remain a set of internationally recognized skills. A lab typically contains groups of off-the-shelf, industrial-grade fabrication and electronics tools, wrapped in open source software and programs.

I PRO 353 plans to continue on the path previously developed by its I PRO predecessor, I PRO 333, and ease out of the research and development of the Fab Lab, and focus further on the marketing and business aspect. Though the previous I PRO was able to further develop the possibilities of the Fab Lab, it faltered in the area of marketing and development of a proper business model to ensure sustainability for the years to come.

The goal of I PRO 353 is to maintain the previous ideologies of the MSI, which is to inspire the inventive genius in everyone, but also ensure that the Fab Lab is able to live up to the standards of which it had been developed. To do this requires first-rate marketing to a population with interest, and escalating the MSI Fab Lab to a level in which it can be self sustained for the years to come.

One dilemma which we are guaranteed to face is going to be living up to the expectations of our stakeholders. Though the task we have set before us is difficult, it is completely feasible, and with success will open the possibilities of the Fab Lab further than what had been seen before.

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#### **4. Team Values Statement**

##### **Integrity/Ethical Behavior**

###### *Model Behavior:*

As a team, our work must contain a sense of honesty and truthfulness. Our work must be efficient and accurate. Our team must act responsibly, and with a higher sense of accountability for our actions. Model ethical behavior involves an elevated moral code which relies on good will towards our teammates, the expression of thoughts and ideas that are solely our own, and nothing but our best effort towards the completion of our team's goals.

###### *Unacceptable Behavior:*

Unethical behavior, or behaving with a low sense of integrity, includes dishonesty about the progress of our work, plagiarism, and any irresponsible activities that may be detrimental to the completion of our team's goals. Further unacceptable behavior includes impulsive behavior, theft, and any carelessness that may place the safety of the team in jeopardy.

##### **Professionalism**

###### *Model Behavior:*

A team member exhibiting professionalism will be punctual for meetings as well as act with proper etiquette during the meetings and be courteous to the other members of the team, faculty, sponsors and outside parties. The team member will also dress properly for meetings and presentations throughout the life of the project. They will produce quality work and take initiative throughout the project in order to make sure all tasks are completed and that the best possible final product is produced.

###### *Unacceptable Behavior:*

A team member that does not display professionalism will consistently show up late to team meetings and presentations and interrupts others during the meeting effectively slowing down the productivity of the team. The member will also either fail to complete the work given to them or produce such poor quality work that is of no use to the rest of the team. Throughout the term the member

fails to take initiative and does not help others or do any work that was not explicitly given to them.

## **Respect**

### *Model Behavior:*

Team members are expected to listen to one another's ideas, act civilly towards one another, and show deference towards one another's beliefs, opinions, and backgrounds.

### *Unacceptable behavior:*

It is unacceptable for team members to degrade, humiliate, or otherwise demean anyone else on the team. A disregard for one another's ideas without careful consideration and deliberation is intolerable.

## **Accountability**

### *Model Behavior:*

Team member is expected to show up on time and contribute actively to respective group meetings. He or she is to fulfill obligations to group tasks on time and up to standard, providing valuable contributions to fulfilling goals and objectives. Team member should represent the IPRO consciously and be mindful of MSI's dependence on our team to bring new ideas.

### *Unacceptable Behavior:*

It is unacceptable for team members to fail to deliver on any assigned tasks and fail to contribute sufficiently to the end goals of the team. It is unacceptable to act irresponsibly when operating Fab Lab machines and disregard the responsibility to act in the best interest of the Fab Lab.

## **Communication**

### *Model Behavior:*

Another important team value is communication. No team can move forward in their efforts without communicating with one another. It is not only

important for the team to communicate with each other, but with current and possible future stakeholders as well. Team communication is the key in that each member has specific skills and knowledge that must be utilized and imparted to other members. The team plans on upholding this value by means of expressing ideas, participating actively during class time discussion, working as part of a team and not individualistically, asking questions, and making sure every team member gets the chance to speak.

*Unacceptable Behavior:*

It is unacceptable for team members to talk over others during class or the opposite of that to not actively participate in class. It is also unacceptable to fail to communicate with their sub team and the team as a whole as well as to display poor listening skills while others are talking or presenting.

## ***5. Conflict resolution***

First, we would like to recognize that once in a while there are situations that may prevent a person from being on time or be absent. Having said that, we do not want anyone to make a habit of unprofessional behavior. Since the IPRO program is supposed to prepare us for the real world we should try to deal with any conflict that arises professionally. If a person is frequently late, absent, is not doing his share of the work or there is some other problem then his sub-team members should speak with him and let him know that his behavior is unacceptable. Therefore, the person is made aware of the problem and has a chance to rectify. If the person does not rectify, then our team advisors will be notified and there will be a negative impact on his grade.

## II. PROJECT METHODOLOGY

### 1. *Work Breakdown Structure*

To achieve the wide range of goals that our team has set up, we recognized the need to break the team into three sub-teams. Each team is responsible for different areas of the project, but contributing complimentary to the main goal of our IPRO. Team members had chosen their respective sub-teams in accordance to their expertise and interests.

The overall team leader is Nikolai Arendovich who sets up an agenda for each class meeting and enforces activities to go according to the developed plan. Sub-teams leader were chosen to improve communications and cohesiveness between groups, overall team leader and advisors.

#### **Team advisors:**

Jim Braband  
Blake Davis

#### **Public Outreach team**

*Responsibilities:* To increase the awareness of the Fab Lab in Chicago by attending various exhibits, developing a website, make video testimonials and case studies and market the Fab Lab in other creative ways.

#### *Members:*

Joel Meno (Team leader)  
Nikolai Arendovich  
Maksym Ostapenko  
Terez Sturup

#### **Production team**

*Responsibilities:* To design and produce various projects that can be done in the Fab Lab, create manuals for future users and prepare the exhibits that our team is going to present on the IPRO day.

#### *Members:*

William Sawyer (Team leader)  
Muqadas Munir  
Anne Pham

Jimmy Ton  
Patrick Zhu

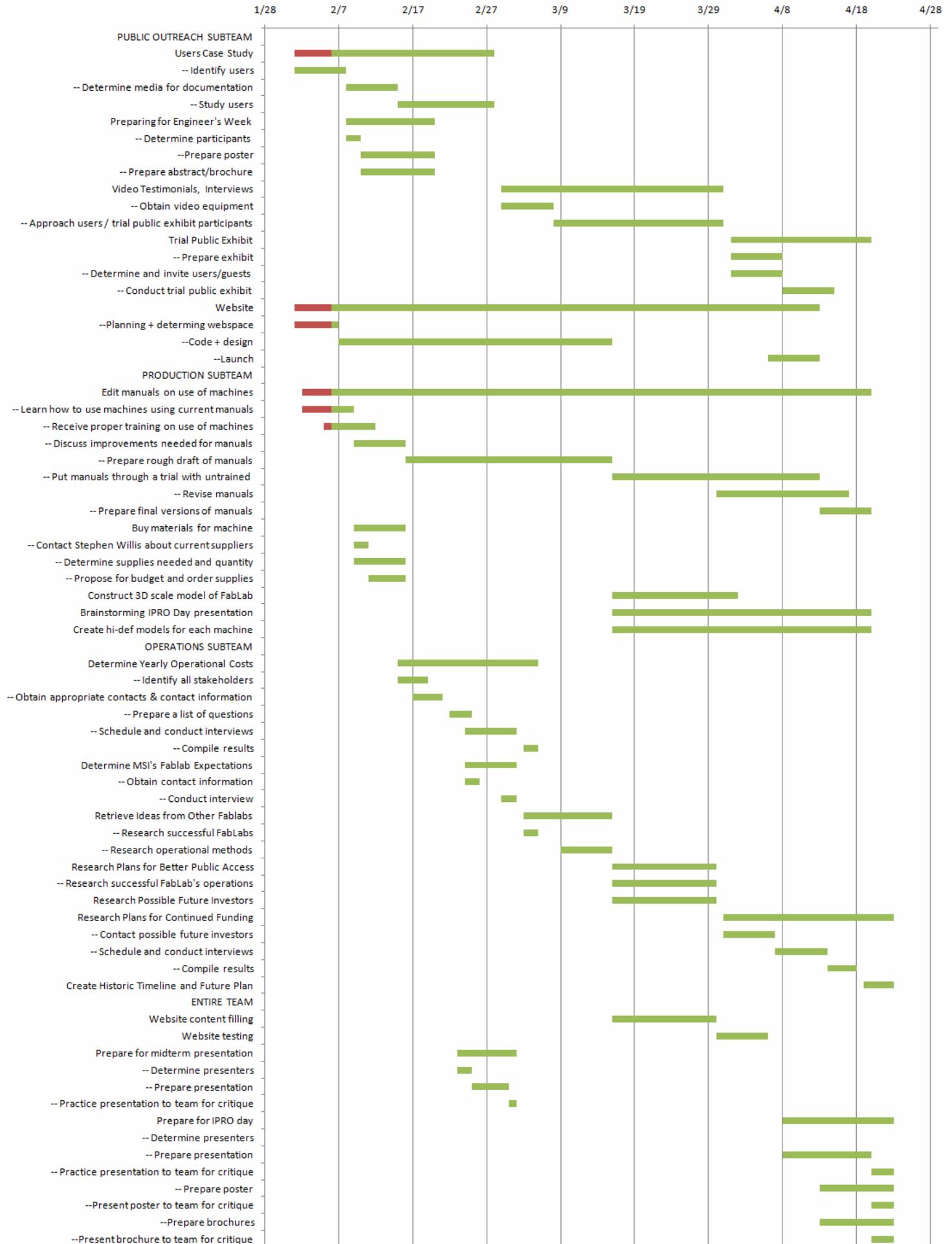
### **Operations Model team**

*Responsibilities:* To produce the operations plan on which Fab Lab can be sustainable and more accessible to public use, look for funding that will keep Fab Lab successfully running and providing great services.

*Members:*

Joseph Sanchez (Team leader)  
Anthony Bartolomei  
Jesse Stepniewski

## 2. Detailed plan of work



### ***3. Expected Results***

As a team, we will design a system that will make the Fab Lab a self-sustainable asset to the Museum of Science and Industry. We will be identifying potential market segments and devising a marketing campaign aimed at increasing the overall awareness of the Fab Lab. We also expect to use this revamped marketing campaign to revitalize interest in the Fab Lab from potential investors and volunteers. In addition to a viable business strategy, we expect to provide examples that highlight the potential uses of the Fab Lab both as an educational platform which can be used in conjunction with local school science programs, and as a prototype laboratory for aspiring inventors or entrepreneurs. Each sub-team will have its own specific expectations that will help carry out our main goal. This semester will end in a culmination of recommendations to the stakeholders.

#### **Operations planning**

The operations planning team will look at pre-existing Fab Labs in order to study the many different systems of operation. By assessing what has worked in the past in addition to past failures we will create an operations plan that will best fit the Fab Lab at the MSI. One of our goals is to analyze the costs of operating the Fab Lab in order to determine the pricing model that fully addresses the museum's needs. We will reach out to past and potentially future investors, with the hopes that we can generate the funding the MSI needs to make the Fab Lab a fully functioning addition to its overall mission. We will design a viable business model that will handle aspects of operation from exhibit format to general lab maintenance, utilizing the MSI's current resources as well as the prospect of potential volunteers.

#### **Public Outreach team**

The outreach team anticipates receiving valuable user feedback from target user groups of the Fab Lab. This feedback will be used directly in planning future endeavors of the Fab Lab, and its potential development into a community oriented center. Hard copies of user based research such as interviews, case studies and video testimonials will contribute to a more confident public campaign to promote the Fab Lab and attract more users. Tools such as a website and public exhibit will showcase results from direct public opinion and input. We will engage the current network of Fab Labs in an effort to provide links from our site to the global network of Fab Labs. We hope to also establish links to our site for potential users of the Fab Lab via the MSI main website. This would

enable the team to present a well-rounded marketing plan to Fab Lab managers in order to accommodate a consistent stream of Fab Lab users.

### **Productions team**

The production sub team aims to create several models using the equipment in the fabrication laboratory. There will be two types of models; the first type will be very detailed in order to demonstrate the capabilities of the Fab Lab machinery while the second type will be much simpler to show the ease of use of the Fab Lab.

For the detailed model, a scale replica of the actual Fab Lab in the Museum of Science and Industry will be created using the 3D printer or the laser cutter. A completed digital design of the model will be created using a special CAD program and will be displayed as well. These models will be made out of either a special polymer designed for use in a 3D printer or acrylic, respectively.

The simpler models will be created using the smaller machinery in the Fab Lab. Some of the designs will involve pieces of the model to be created using the machinery and then assembled together to form the completed product. These machines include the computer numerically controlled, CNC, cutters or the laser cutters. The models can range from being toys to accessories that would be difficult to create by hand. Overall, we aim to provide examples of the full capabilities of the Fab Lab.

### ***3. Project Budget***

<b>Item</b>	<b>Estimated Cost (\$)</b>
Transportation Reimbursement (3 vehicles x 10.4miles x \$0.50/miles x 30times)	\$234
Prototyping Material (e.g. 1' x 2' acrylic piece = \$15.00)	\$450
Website (Web domain=\$15, web hosting=\$15)	\$30
Public Relationship (meetings, marketing supplies, etc.)	\$100
<b>Total</b>	<b>\$814</b>

#### ***4. Designation of Roles***

*Minute Taker:* William Sawyer

*Agenda Maker:* Nikolai Arendovich

*Time Keeper:* Muqadas Munir (rotating)

*iGroups moderators:*

- Production Team: Jimmy Ton
- Public Outreach Team: Maksym Ostapenko
- Operations Team: Joseph Sanchez