#### **IPRO 333**

The Goal: Creating Design-to-Prototype Learning Modules for the Fabrication Laboratory at the Museum of Science and Industry.







## DESIGN-TO-PROTOTYPE MODULES

- · Projects outlined for varying users of the fabrication Laboratory
- Outline consists of step by step instruction of how to go from computer design to machine fabrication





Part of laser cutter tutorial



# USERS OF THE FABRICATION LABORATORY

#### Museum Members

 Members with an interest in prototyping either pre-made projects, or their own inventions.

#### Open Access Users

• Visitors to the museum, including families from the community and individuals researching for work or for general interest in digital fabrication.

### Student Groups (Grades 3-6)

 Students who will be visiting in class groups to work on projects relating to their curriculum.

#### Science Achievers

- From local schools
- Being educated on the use of digital fabrication software and hardware





For 10 weeks

## OBJECTIVES

- Assess the needs of potential Fab Lab users
- Educate the Fab Lab employees By:

Introducing local expertise and IIT lab managers Researching the machines and their tutorials

- Define potential programs for the various user groups, as previously mentioned
- Align programs with the national and state standards for science education





## LONG-TERM ASPIRATIONS

- Create a safe workshop in which children can operate the machinery under the supervision of the museum staff
- Establish communication with other Fab Labs to facilitate the sharing of ideas, past experiences, successes, and failures
- Develop programs that are larger in scope and require time windows longer than those currently used by the Fab Lab (i.e., greater than 90 minutes in length)





# TEAM ORGANIZATION



## TEAM DESCRIPTIONS

TEAM 1:

Concentrate on designing and testing projects for general visitors to the museum and younger student groups.

TEAM 2:

Concentrate on designing and testing projects for the Science Achievers and members of the museum.

Regina Lamonica, and Jacqueline Villa will be the respective sub team leaders of Teams 1 and 2.



## PROGRESS

- Became familiar with the lab and the directors of the lab at the MSI
- Developed an understanding of what they want us to contribute towards the lab, as well as their general goals for the lab.
- Have established contacts with information resources (NSF standards, administration with detailed knowledge of the laboratory equipment, teachers and schools, and the Field Museum)
- · Have gathered technical data and instruction on the machinery
- Have arranged for two professors to visit the lab.
- Are in the process of designing projects, and general tutorials

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Left: Example of technical information from Shopbot CNC

Right: Laser cutter in process





# MAJOR OBSTACLES TO DATE

- · The lab directors knowledge of and ability to use the equipment is limited
- · They had very limited tutorials set up for the machines, lack of diverse usage
- There is currently no marketing promotion of the Fabrication Laboratory
- The size of the lab is limiting, in that it does not allow for large groups, or addition of machinery
- The lab's current budget is restricted disallowing for the addition of new machines and
   extensive use of materials
- Current issues with the method of instruction used by the lab directors

# ANTICIPATED CHALLENGES

- There are few anticipated challenges, although some potential problems could be
  - 1. If a machine cannot be fixed, and the lab does not have a budget to buy a new one, or new software
  - 2. Time constraints: insufficient time when we would be able to use the lab, or see it being used for extensive time periods.
  - If there is a lack of good informational feedback from the surveys, which limits our ability to improove the programs we will be designing.

