

IPRO 341: New Product Evaluation and Improvement Project Plan Fall 2009

Team Information

Team Roster:

- Jeffrey Bart, *Mechanical and Materials Engineering*
 - Strength/Skills: *Basic mechanical design and analysis, problem solving, writing*
 - Expectations: *Hope to gain mechanical design and analysis experience, gain a real world experience working with Versatility Tool Works, and develop team communication skills.*
- Sara Cantonwine, *Mechanical and Materials Engineering*
 - Strength/Skills: *MatLab, AutoCAD, ABAQUS (FEA program), leadership skills*
 - Expectations: *Win IPRO day while gaining experience working with a team and our sponsor, Versatility Tool Works.*
- Mark Ende, *Aerospace and Mechanical Engineering*
 - Strength/Skills: *General knowledge of materials, FEA, AutoCAD, Inventor*
 - Expectations: *To gain a real world experience, and work on communication skills in a team setting.*
- Arence Gowe
 - Strength/Skills: *MatLab, AutoCAD, DataStudio*
 - Expectations: *Learn to work in a team environment.*
- Thomas Hotz, *Mechanical Engineering*
 - Strength/Skills: *Experience in industry and construction, problem solving, designing, researching*
 - Expectations: *I expect our team to work cooperatively and efficiently to design a modern, yet very functional toolbox that leads us to win IPRO day.*
- Shahmeer Khaliqdina, *Electrical Engineering*
 - Strength/Skills: *Research, planning, testing*
 - Expectations: *As a member of this group, I would like to make a great improvement to this project from last 2 semesters as far as the strength and life of the drawer is concerned. I want to try my best to make sure we get as close to the expectations as much as possible.*
- Jae Lee, *Applied Mathematics*
 - Strength/Skills: *MatLab, Excel, data analysis*
 - Expectations: *Develop communication skills, gain knowledge of Finite Element Analysis, satisfy sponsor.*
- Raluca Ostasz, *Architecture*

- Strength/Skills: *Good drawing and design skills, aesthetic conscience, good public relation and marketing skills, organization*
- Expectations: *Get a better understanding of how a process from the beginning to end of designing a new object works.*
- Hyejin Park: *Materials Science Engineering*
 - Strength/Skills: *Organization, leadership*
 - Expectations: *Help communication between the testing team and design team.*
- Erica Pauley, *Mechanical Engineering*
 - Strength/Skills: *AutoCad, Inventor, MatLab, designing, creative thinking*
 - Expectations: *Gaining job experience and the ability to work as a team that achieves its goals*
- Raihan Rahman, *Electrical Engineering*
 - Strength/Skills: *Data Analysis, Excel, organization, research, quality assurance, dedication*
 - Expectations: *To exceed the expectation of the sponsor, so that they can make money from this product.*
- Saad Sarvana: *Mechanical and Aerospace Engineering*
 - Strength/Skills: *Analyzing deformations and stress calculations, conducting physical tests as well as hardness test on materials. Researching new ideas for improvement. Good leadership skills (getting the team to work together and efficiently.)*
 - Expectations: *Improve design and/or material to reach our goal of 20,000 cycles.*

Team Instructors

- William Maurer
- Sheldon Mostovoy

Team Mission

Our mission is to build a modern, functional, and longstanding toolbox with the cooperation of Versatility Tool Works that fits the needs of the employees at Amada. This will be done through progressive prototyping and testing that will lead to innovative designs. We will mind expenses to make critical selections that have the highest cost effectiveness. Additionally, we will exercise cooperation amongst the whole team by utilizing the assets each person brings.

Team Objectives

General Team Objectives

- Testing and evaluation of current and new designs.
- Develop next generation concepts for a toolbox using modern, innovative thinking.
- Meet the expectations of our sponsor Versatility Tool Works and our customer Amada.

Testing Objectives

- Replace guides from initial cabinet design and perform testing with new guides.
- Make modification to drawer guides to decrease deformation and increase lifetime.
- Make any modifications necessary to ensure the endurance of the drawer capacity to sustain 550 lbs.
- Successfully run 20,000 cycles before failure of guides.
- Distribute load evenly to minimize excess load on one side.

Design Objectives

- Determine how the current structure of the tool box model works
- Find possible improvements for the current design of a Tool Cabinet.
- Develop a design where the Tool Cabinet can remain functional and still have a unique look.
- Create possible solutions utilizing AutoCAD, ProEngineering, or Inventor and then test those designs in a Finite Element Analysis Program.
- Offer suggestions in regards to cost, size and strength of the design.
- Determine an effective tracking system to keep tools organized and tracked.

Background

The sponsor for this IPRO is Versatility Tool Works manufacturing company. The company specializes in producing precision tooling and sheet metal components. The company was established in 1972 as a tool and die operation, but has since expanded to have the most diverse product line in the industry. The company has recently decided to begin manufacturing custom tool storage cabinets.

In the past, the IPRO teams analyzed the tool storage cabinet and developed ways in which to improve the performance. Their finding included using stiffeners, accuride slides, and shot-peened slides. The sponsors were happy with their results and are still looking to improve on the product even more. In addition to the quality improvements, the IPRO teams have conducted market research surveys to identify the customer's view of the product. The response rate was low, as expected on any online survey, but the results, nonetheless, were encouraging.

Since Versatility Tool Works has been in cooperation with this IPRO, they have re-designed their line of tool cabinets utilizing the findings from the last 2 semesters.

Team Values Statement

The members of this IPRO understand the potential risks working with students in regards to intellectual property. As an innovative team, we will respect the property rights of Versatility Tool Works and/or any other company that is in cooperation with us.

Project Methodology

Team Structure

- Testing Team
 - Jaekwan Lee
 - Shahmeer Khaliqdina
 - Saad Sarvana
 - Raihan Rahman
 - Mark Ende
 - Hyejin Park
 - Jeff Bart

- Design Team
 - Erica Pauley
 - Arence Gowe
 - Thomas Hotz
 - Sara Cantonwine
 - Raluca Ostasz
 - Andrew Kitaka

Expected Results

- Insure the lifetime of the drawer guides surpass the expectations of the sponsor and consumer.
- Develop the next generation toolbox that suits the needs of our sponsor and consumer.
- Determine potential new markets for Versatility Tool Works.

Project Budget

The expected costs of IPRO 341 will involve transportation to and from the company, along with food during those meetings. There will possibly be the need to invest money for the building and testing of materials and components that will go into the prototypes.

Schedule of Tasks

Project Plan	September 11, 2009
Visit to Versatility Tool Works	September 18, 2009
Midterm Reviews	October 5-15, 2009 (full schedule TBA)
Ethics Reflective Report	November 11, 2009
Final Project Report (first draft)	November 20, 2009
Abstract/Brochure	November 30, 2009 (by 10:00 am)
Poster	November 30, 2009 (by 10:00 am)
Final Presentation	December 2, 2009 (by 12:00 pm)
Final Project Report (final version)	December 4, 2009 (by 10:00 am)

