

# Bowl Manufacturing Apprentice

Engineering, Art and Production

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## Background:

Craft based studio environments fall under many operational models. One particular model is where the artist hires apprentices, in a training capacity, to rough out the form/shape of a product and the artist finishes off the intricate details. This maintains the artist's style while at the same time provides training and exposure opportunities for the emerging artists. It is also the foundation for increasing the studio's cash flow. This model forms the one of the motivating factors behind this project initiative.



**Figure 1: Vortex Series (California Redwood Burl), by USA artist Gary Stevens.**

The second motivating factor for this project is lean manufacturing. On an increasing basis, the manufacturing sector in Canada is exposed to international trade and competition for sales and maintaining profit margins is becoming more of a challenge. Lean manufacturing practices is a key factor in their survival. One way to address this challenge is with investing in automated manufacturing opportunities.

Craft based business are no exception. They are also feeling an increased pressure from global emerging markets and need to undergo changes to help them compete in the competitive market place locally, nationally and internationally. Applying Engineering automated manufacturing capacities to the craft industry is at the heart of this project initiative.

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## Description:

This project is titled *Bowl Manufacturing Apprentice*. It centers on the research and development of a CNC machine to assist in the manufacture of bowls. The major pieces of equipment, stepper motors, precision rotary table, Foredom flexible shaft router system and linear slides, have been procured so the Research Team can focus on integrating and developing the system.

Through engineering process design and development the engineering team will envision, evaluate, finalize, build and test this Bowl Manufacturing Apprentice using their talent and ingenuity.

## Engineering Team:

This project is targeted towards a team of electrical and computer engineers, who have an aptitude towards mechanical engineering, would like to be part of the *Bowl Manufacturing Apprentice* project and apply their skills to realize a state of the art customized CNC bowl manufacturing machine. This team will have the skills necessary to design, fabricate and integrate a cross disciplinary project and work together to meet the project's milestones.

In a bit more detail, the mechanical side of the project will include integrating the mechanical components together, designing and fabricating a few minor parts, interface plates, designing and fabricating a Foredom Tool Holder and several other general components. The electrical and computer side of the project will include integrating the electrical components together, PIC board, designing peripheral application specific circuit(s) and developing a custom software interface package to draw the bowl design and translate this information to drive the mechanical components.

The final deliverables will include *Bowl Manufacturing Apprentice* prototype and drawings, performance evaluation, source code to the control interface software and associated documentation.



Figure 2: Vortex and Firedance Series by Artist Gary Stevens.