

## Portable Workbench

**Sponsor:** Innovative Tools and Technologies INC.

**Sponsor's General Mission or Business Statement:** Innovative Tools designs and manufactures work and parts management systems for the automotive repair market worldwide. Its products enhance customer efficiency, smooth workflow, eliminate clutter, save space, and improve profitability.

**Sponsor's Advisor, Title, and Phone Number:** Jason Cox, General Manager, (651) 415-0733

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**Team Member Names:** Sarah K. Anderson, Anthony (Tony) P. Bombardo, Kevin M. Flaherty, John J. Labouliere

**Senior Design Clinic I-II (ENGR 480-1) Project Description:** The team was asked to redesign a prototype workbench. This needed to be light, collapsible, rugged, and portable.

### Major Design Requirements:

- Cheaper to manufacture
- Able to be used in automotive, aviation, and manufacturing industries
- Easy for one person to carry
- Easier to Manufacture
- Comfortable working height
- Less than 35 lbs.
- Durable
- Aesthetically pleasing
- Collapsible
- Removable Center Piece

**Senior Design Project Summary:** Working from an existing prototype, this project focused on redesigning a portable workstation so that the final product would be ready to manufacture. After researching pre-made parts, materials, manufacturing costs, and tables currently on the market, several concepts were designed using basic principles of structural engineering. The focus remained on making the table stronger, lighter, more durable, and more portable – all while maintaining the spirit of the original design. After consulting with engineers from 3M and using Ansys to simulate possible designs, the project moved into the prototyping stage. Using a physical prototyping system called Berkey, two final designs were merged into one hybrid design which was stronger, used less material, was easier to use, and appeared more aesthetically pleasing. After building a second prototype to test strength and usability, a third prototype was built to test for marketability, and to present to Innovative Tools as the final design recommendation.



CAD Drawing of Design



Actual Design