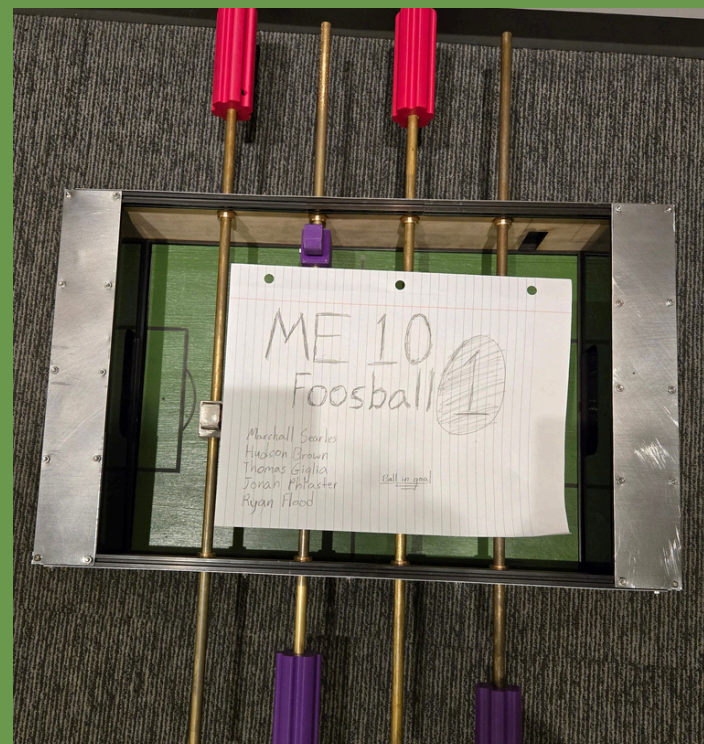


Small Foosball Table



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Our Project

For our ME10 course, we set out to design and build a fully functional foosball table that not only demonstrated our creativity but also allowed us to apply a variety of manufacturing techniques learned in class. The project challenged us to think critically about design, materials, and processes while fostering teamwork and hands-on learning.

Our goal was to create a durable, playable, and aesthetically pleasing foosball table using methods like sand casting, laser cutting, and 3D printing. Each component of the table was carefully first made in CAD using both onshape and Solidworks. After the design was finalized we crafted and assembled the table to ensure smooth gameplay and structural integrity. From designing custom players to aligning the rods and constructing the frame, this project served as a comprehensive introduction to engineering design and manufacturing processes.

Through this experience, we gained invaluable skills in fabrication, problem-solving, and collaboration—skills that we'll carry forward into future engineering challenges.



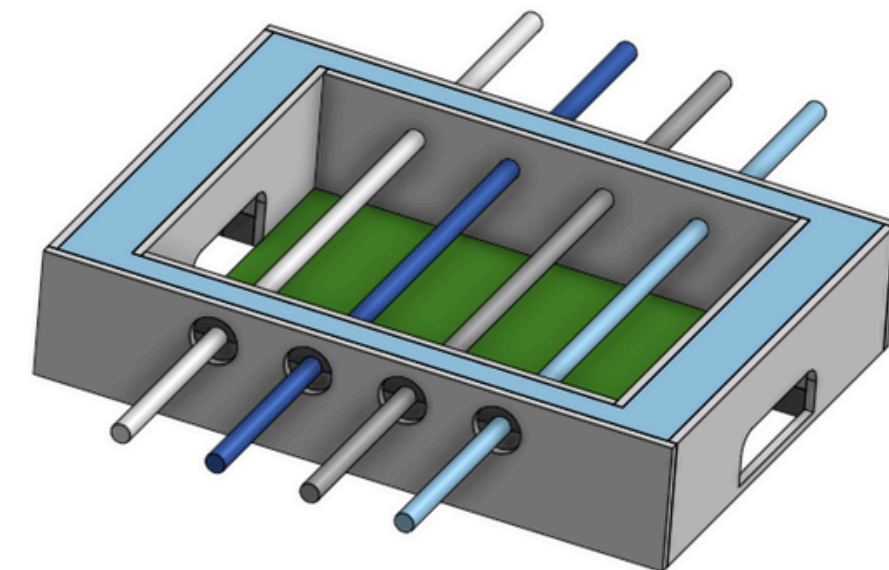


Manufacturing Methods Used

- Metalworking:
 - Bandsaw: Cut the rods to precise lengths for the player handles and rod system.
 - Jump Shear: Used to cut steel for the outer frame components and other structural elements.
 - Drilling: Drilled holes for attaching players to the rods and for other hardware connections.
- Wood and Acrylic Work:
 - Laser Cutter: Used for precise cuts and engraving on wood and acrylic components, including the playing field, walls, and aesthetic elements.
 - Sanding: Smoothed edges and surfaces of the wood and acrylic for a polished finish and safe handling.
- Casting:
 - Sand Casting: Fabricated the goalie pieces by creating molds in sand and pouring molten metal to create durable and custom-shaped players.
- 3D Printing:
 - Printed the remaining player pieces with lightweight plastic, focusing on aesthetics and playability.
- Assembly and Finishing:
 - Combined all components using screws, adhesives, and other joining techniques to ensure structural integrity.
 - Sanded and polished surfaces for a clean and professional look.

Learning Goals and Key Takeaways

- Master Manufacturing Techniques:
 - Improved skills of hands-on experience with tools such as the bandsaw, jump shear, laser cutter, sand casting molds CAD design and more
 - Learned the importance of precision in drilling and sanding to ensure smooth assembly and functionality.
- Understand Material Properties:
 - Explored how different materials (wood, acrylic, metal, and 3D-printed plastics) behave during cutting, casting, and assembly.
- Collaborate Effectively in a Team Setting:
 - Developed communication and teamwork skills while dividing tasks and ensuring each component met project requirements.
- Problem-Solving in Manufacturing:
 - Overcame challenges such as rod alignment, material tolerances, and failed casting
- Create a Functional Product:
 - Integrated various components into a cohesive design that met usability, durability, and playability goals.
- Develop Project Management Skills:
 - Balanced time constraints, material availability, and manufacturing schedules to complete the project on time.



Final Product

