Mechatronics Engineering Design Portfolio

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Toronto Metropolitan Formula Racing (formerly Ryerson Formula Racing) Engineering Design Team

About TMFR: "Toronto Metropolitan Formula Racing (TMFR), formerly Ryerson Formula Racing, is an engineering-led student team that designs and manufactures a formula-style racing car to compete in Formula Society of Automotive Engineers (FSAE) events around the world."

Design Collaboration: The team collaborates with each other on their system updates on the engineering software such as GrabCAD Workbench. GrabCAD Workbench is used by companies to support the design of physical products of all sorts - from basic screws to jet engine brackets at GE, to robotics that zap germs. According to the company site, GrabCAD was founded with the goal of bringing together all the tools engineers need to manage and share CAD files into one easy to use platform.

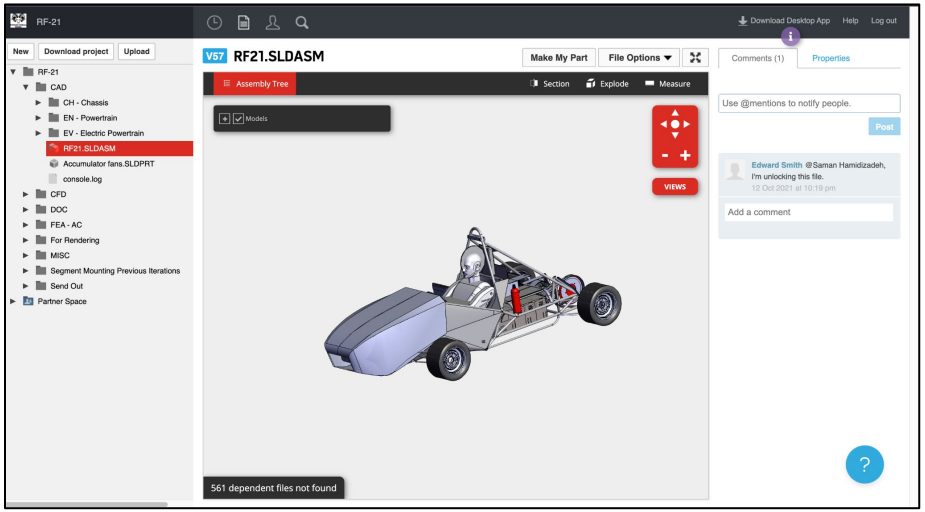


Figure: Model of the Toronto Metropolitan Formula Racing (Ryerson Formula Design) Car in GrabCAD software.

Link to TMFR's official website:
https://www.tmformularacing.com/

Design of a Mechanical Arm Mechanism
(Manufacturing Fundamentals Group Project)

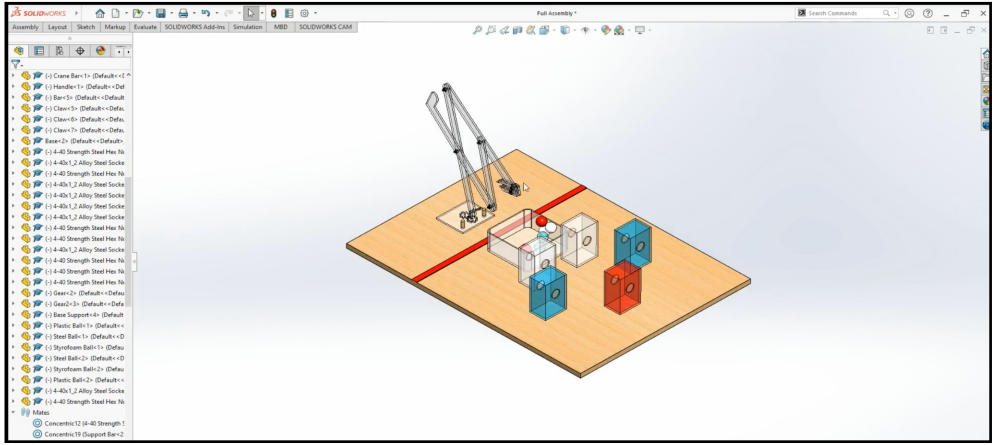
Project Outline Link:
https://drive.google.com/file/d/1GJ1Wkzb0vgOS0Z-I8z13VD5uquHnoL8P/view?usp=share_link

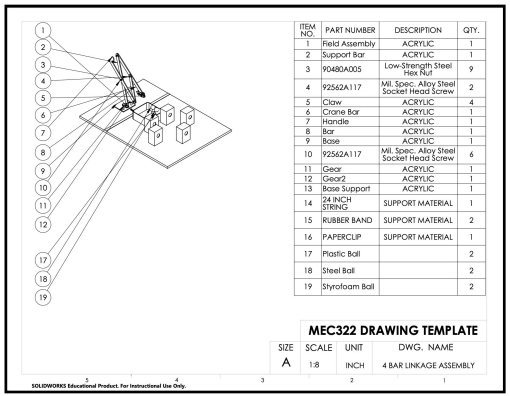
Purpose: To design and create a mechanism that could transfer 3/4 " Styrofoam (white), plastic (blue) or metallic balls (red) from a container into their designated coloured boxes.

Team: Project was completed in teams of 4 members to design an appropriate mechanism with given design and material constraints by applying GD&T. Personal focus was in designing the CAD models for specific subsystems.

Project Requirements: Components were designed to be able to fit on an 8' x 11' sheet of acrylic to be laser cut and be able to function on the 2-dowel pin baseplate.

Contributions: Designed CAD assembly for playing field for SolidWorks simulation, modeled functional assembly of base and sliding mechanism utilizing standard off-the-shelf, designed claw mechanism and created DOM and set of working drawings.





ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Field Assembly	ACRYLIC	1
2	Support Bar	ACRYLIC	1
3	90480A005	Low-Strength Steel Hex Nut	9
4	92562A117	Mil. Spec. Alloy Steel Socket Head Screw	2
5	Claw	ACRYLIC	4
6	Crane Bar	ACRYLIC	1
7	Handle	ACRYLIC	1
8	Bar	ACRYLIC	1
9	Base	ACRYLIC	1
10	92562A117	Mil. Spec. Alloy Steel Socket Head Screw	6
11	Gear	ACRYLIC	1
12	Gear2	ACRYLIC	1
13	Base Support	ACRYLIC	1
14	24 INCH STRING	SUPPORT MATERIAL	1
15	RUBBER BAND	SUPPORT MATERIAL	2
16	PAPERCLIP	SUPPORT MATERIAL	1
17	Plastic Ball		2
18	Steel Ball		2
19	Styrofoam Ball		2

MEC322 DRAWING TEMPLATE

SIZE	SCALE	UNIT	DWG. NAME
A	1:8	INCH	4 BAR LINKAGE ASSEMBLY

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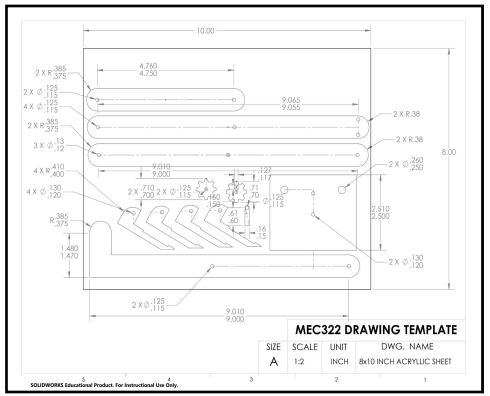

MEC322 DRAWING TEMPLATE

SIZE	SCALE	UNIT	DWG. NAME
A	1:2	INCH	8x10 INCH ACRYLIC SHEET

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