



**Company Information**

<b>Company Name</b>	TyCa Industries LLC	<b>Date Submitted</b>	7/19/2023
<b>Project Title</b>	Design and Build of an Improved Ratchet Strap Design (TYCA_RATCHET)	<b>Planned Starting Semester</b>	Fall 2023

**Senior Design Project Description**

**Personnel**

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills.

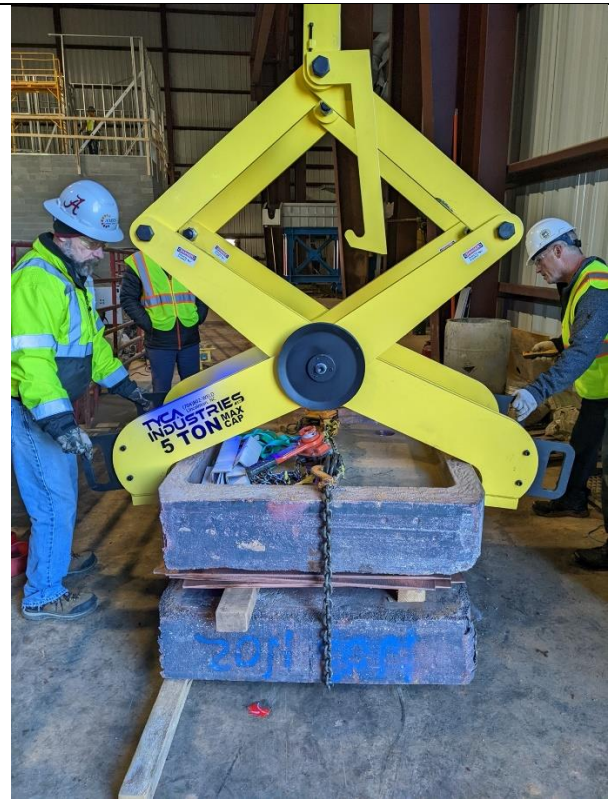
<b>Discipline</b>	<b>Number</b>	<b>Discipline</b>	<b>Number</b>
Mechanical	4-5	Electrical	
Computer		Systems	

**Company and Project Overview:**

TyCa Industries is a metal fabricator in Lincolnton, NC that focuses on custom designed solutions to solve customer’s problems. Anywhere from full automated lines down to simple lifting devices. The owner (Tyler Carpenter) graduated from UNCC MET program in 2011. Some examples of their work:



**INDUSTRIAL SOLUTIONS  
LABORATORY**



This project is partially supported by a grant from the NC Manufacturing Extension partnership, an organization that helps to support business and job growth for NC companies. To learn more about the NC MEP, click on this link: <https://www.ncmep.org/>.

### **Project Requirements:**

This project will examine existing ratchet straps and create a solution to common problems associated with the current designs on the market (difficult unwinding, rotation lock not releasing, etc.). This will be a premium ratchet strap, I envision something you would expect to see NASA or SpaceX using to secure loads i.e., machined side plates from aluminum or stainless-steel, stainless-steel bearings with O-rings or sealed bearings, knurling for grip where necessary, etc. Strapping shall be heavy duty and various hook designs will need to be evaluated. Hooks should be available “off-the-shelf.” Once a design is picked it will need to be scaled/redesigned for the other strap sizes (1”, 1.5” & 2”).



The finished cost for a production run of 200 should be ~\$25-\$35.

To the extent possible by the student team, do not infringe on any active patents during the design process.

**Expected Deliverables/Results:**

- SolidWorks assembly and all individual part files
- Mechanical drawings
- A working prototype

**Disposition of Deliverables at the End of the Project:**

Students are graded based on their display and presentation of their team's work product. It is mandatory that they exhibit at the Expo, so if the work product was tested at the supporter's location, it must be returned to campus for the Expo. After the expo, the team and supporter should arrange the handover of the work product to the industry supporter. This handover must be concluded within 7 days of the Expo.

**List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):**

- Mechanical should be proficient in SolidWorks
- Students selecting this project agree that any resultant IP developed will be owned by Tyca Industries.