

### MAE 94 FINAL PROJECT PROMPT

**Due: Friday, August 16th, 11:59 PM**

**Formatting Reminder:** The submitted work should follow the naming convention:

**“MAE\_94\_Project\_Group\_1\_Report.pdf”**

**“MAE\_94\_Project\_Group\_1\_CAD.zip”**

**“MAE\_94\_Project\_Group\_1\_Presentation.mp4”**

One is the full pdf report of all required writing and drawings for your design, one is a zip file of all solidworks CAD models, and the last is the mp4 version of your group's video presentation on the project. If you cannot export your presentation into mp4 format, you may upload your presentation onto YouTube and share the YouTube link in your report. Do not forget to include all member's names and UID in the beginning of the report. Any submission that does not follow the above-mentioned format will receive severe point deductions!

### Overall Final Project Prompt

In this final project, you are tasked to design a robotic manipulator in Solidworks that can be made in a simple machine shop or with a 3D printer. Employ all the drawings and schematics rules we learned in class. This design must obey the following rules:

- The design must be an assembly of at least **5 unique sub-assemblies**.
- Each sub-assembly must contain at least **5 unique parts**.
- The design arm must have at least **3 degrees of freedom** but can be up to 6.
  - Translation - x, y, z axis
  - Rotation - Roll, Pitch, Yaw
  - At least one of the DOF needs to be rotational
- The arm motion should be controlled by an electric motor.
- Theoretical calculations should be done in regards to the designs functionality or tasks.
  - Specifications and requirements must be concluded from these calculations.
- Dimensions must be stated both in metric and imperial units (one unit can be emphasized).

### Project Report Requirements

A sample report template will be uploaded to Canvas. Follow its example formatting, and you may use the below table as a checklist of what you must include. The amount of points each section is worth is also allocated.

Group Number:			
Presentation			
	Section Name	Percentage	Grade
	Intro & Concept	5%	
	Design	10%	
	Animation	5%	
	Manufacturing	5%	
	Conclusions	5%	
		Subtotal (30%)	
Report			
	Section Name	Percentage	Grade
	Preface	10%	
	Introduction	2.5%	
	Design Objectives	2.5%	
	Prior Work	2.5%	
	Concept	5%	
	Theory	5%	
	Specifications	15%	
	Manufacturing	5%	
	Conclusions	5%	
	References	2.5%	
	Appendices	5%	
	Writing & Formatting	10%	
		Subtotal (70%)	
Overall Total		100%	

### Project Presentation Requirements

Your group is to give a **8 - 10 minute** video presentation on your design project which will be due by week 10's first lab session. In the presentation, you must explain your systems production cycle. You may use the following time-chart as a general guideline. Your presentation **must** include an animation of your robotic arm CAD in motion achieving at least 3 degrees of freedom.

Section Title	Subsection Title	<del>Time</del>
Need/Motivation (1 mins)	<del>Introduction</del>	<del>0.5 min</del>
	<del>Prior Work / Scientific History</del>	<del>0.5 min</del>
Concept (2 mins)	<del>Concept Sketch</del>	<del>1 min</del>
	<del>Theories and Calculations</del>	<del>1 min</del>
Design (4 mins)	<del>Design Specifications</del>	<del>1 min</del>
	<del>Assembly and Sub Assemblies</del>	<del>2 min</del>
	<del>Powering the Device</del>	<del>0.5 min</del>
	<del>Working Motion / Task Completion</del>	<del>0.5 min</del>
Fabrication (1 mins)	<del>Manufacturing Parts and Tolerance</del>	1 min
Conclusions (2 mins)	<del>Objectives Achievement</del>	1 min
	<del>Future Work and Analysis</del>	1 min