eCOLAB 4.0

"Innovative, collaborative and interoperable tools for improved higher education curricula on sustainable Industry 4.0 manufacturing"

F1 TEAM. Create a competitive race team for F1 races for scaled races

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Task 1. F1 TEAM. Create a competitive race team for F1 races for scaled races

1. Team Formation and Planning

Form a team: Create a team of 6-8 students and assign roles like Team Manager, Main Engineer, Design Engineer, Graphic Designer and etc.

Create a business plan: Develop a comprehensive business plan, including a budget and a sponsorship plan to secure funding from sponsors. (How much money will need and who are possible investors, maybe there is other way to get funding for this project? Be creative)

Design team identity: Create a team name, logo, uniforms, and a team website or etc.

2. Design and Analysis

Design the car: Use 3D CAD software (like Solidworks or Fusion 360) or other program like FreeCAD or Blender to design a car that adheres to the competition's technical regulations. (Use general dimensions length, width, height. That means, Your model will be more shape of vehicle. Later on it could be developed to real vehicle)

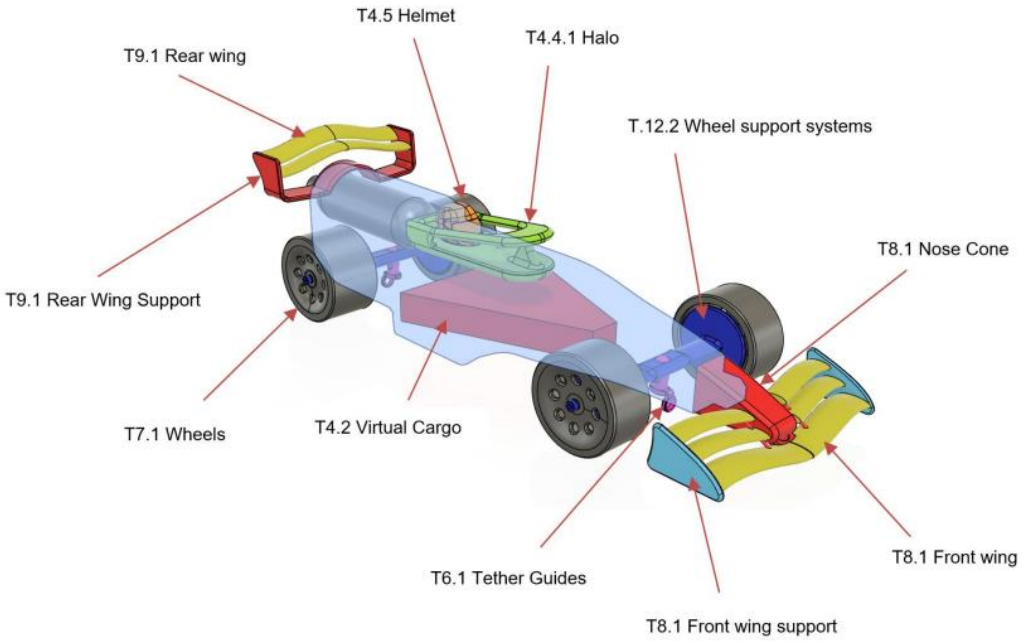

Figure 1. F1 race car

Analyze aerodynamics: Use virtual wind tunnel/CFD software (Ansys, Solidworks or other program like VSPAERO) to predict the effects of drag and lift on the car's design.

Iterate on the design: Based on the analysis, make adjustments to the design to improve performance.

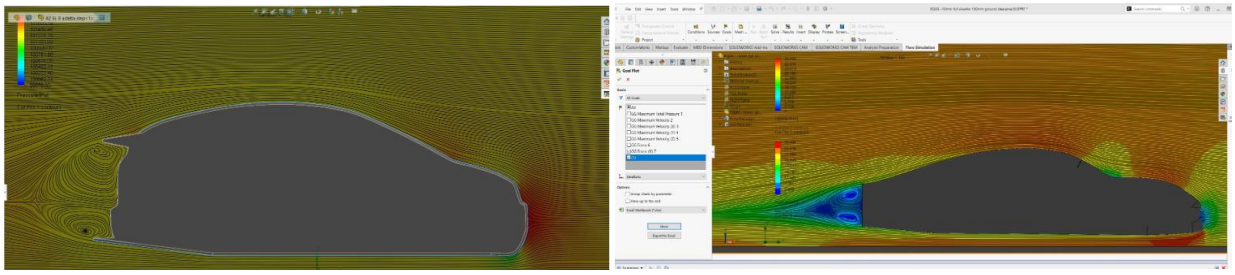

Figure 2. CFD simulation example

3. Manufacturing (on this stage isn't necessary)

Use CAM software: Use CAM software to translate the 3D CAD design into a machine-readable file.

Machine the car: Use a CNC system to cut and manufacture the physical car based on the CAM file.

(You can skip this step and move to the next, just present what materials will be used and include into budget)

4. Presentation and Racing

Create a portfolio and pit display: Prepare a portfolio and an engaging pit display to showcase the team's work to the judges.

Develop a verbal presentation: Prepare a concise, verbal presentation to deliver to the judges.

Links for more detail info and encouragement:

- https://corp.formula1.com/formula-1-to-support-re-branded-stem-racing-programme-and-inspire-the-next-generation-through-education/
- https://www.stemracing.com/
- https://www.ansys.com/academic/students/student-teams/stem-racing
- https://www.ansys.com/academic/students/ansys-student

Evaluation will consist of:

- Teamwork;
- Problem-solving process, offered solutions;
- Technical – engineering achievements;
- Presentations of process to success or poster;
- Collaborative work.