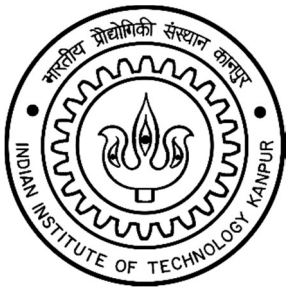
TA 201 PROJECT
2017-18 SEM 1



FORMULA CAR

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Tutor: Anish Upadhyay
Lab Incharge: Anil Kumar Verma

Members:

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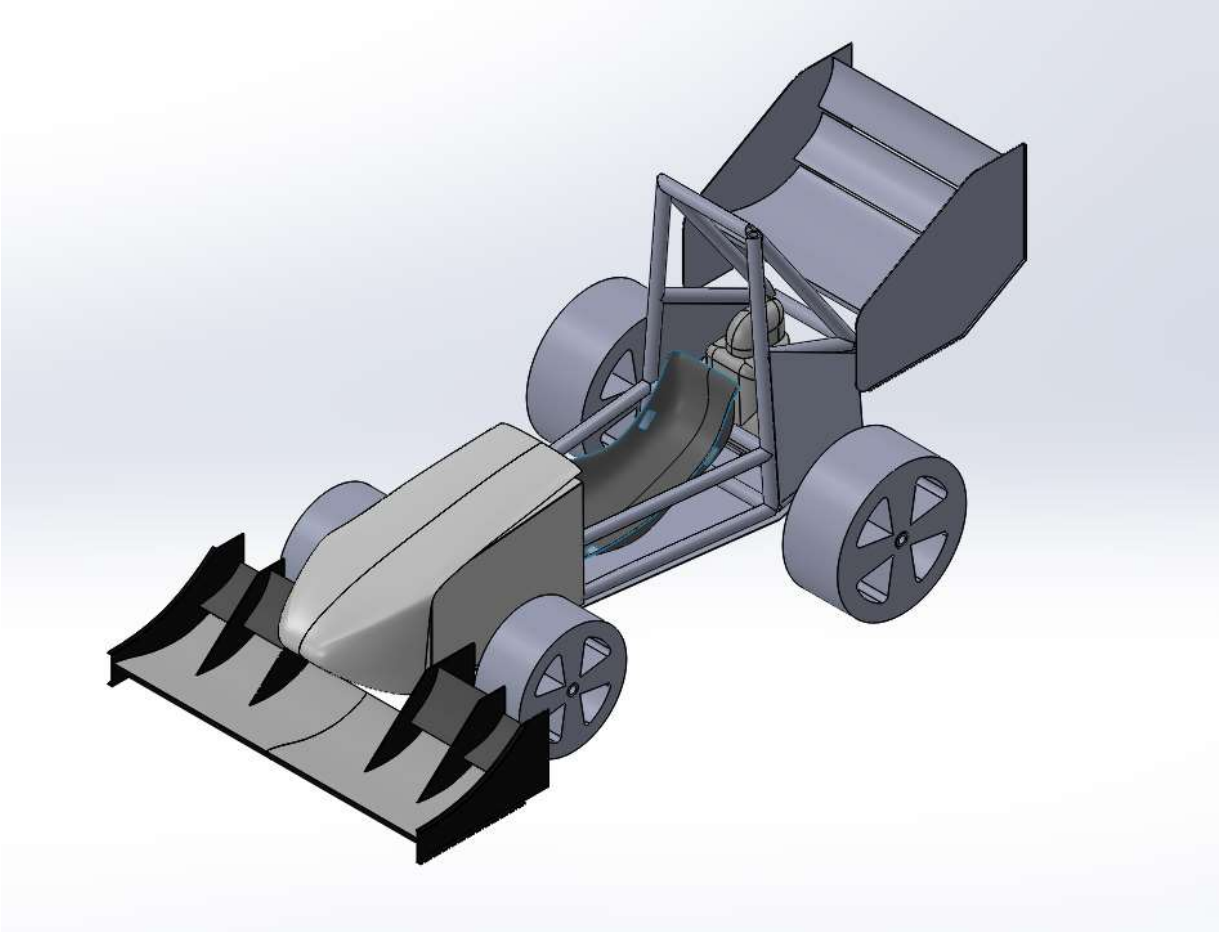
2. Shubham Singh (160674)
3. Yash Chandnani (160818)
4. Yash Mahajan (160822)

Project:



INTRODUCTION:

We aim to make model of Formula Car, using various manufacturing processes learnt in the TA201 course like Brazing, Welding, Casting, Forging, Swaging, Powder Metallurgy, Rolling, Sheet Metal Cutting, folding etc.
The project will involve 6 lab turns, each of 3 hrs for completion (as planned).

Table of Contents:

TABLE OF PARTS:

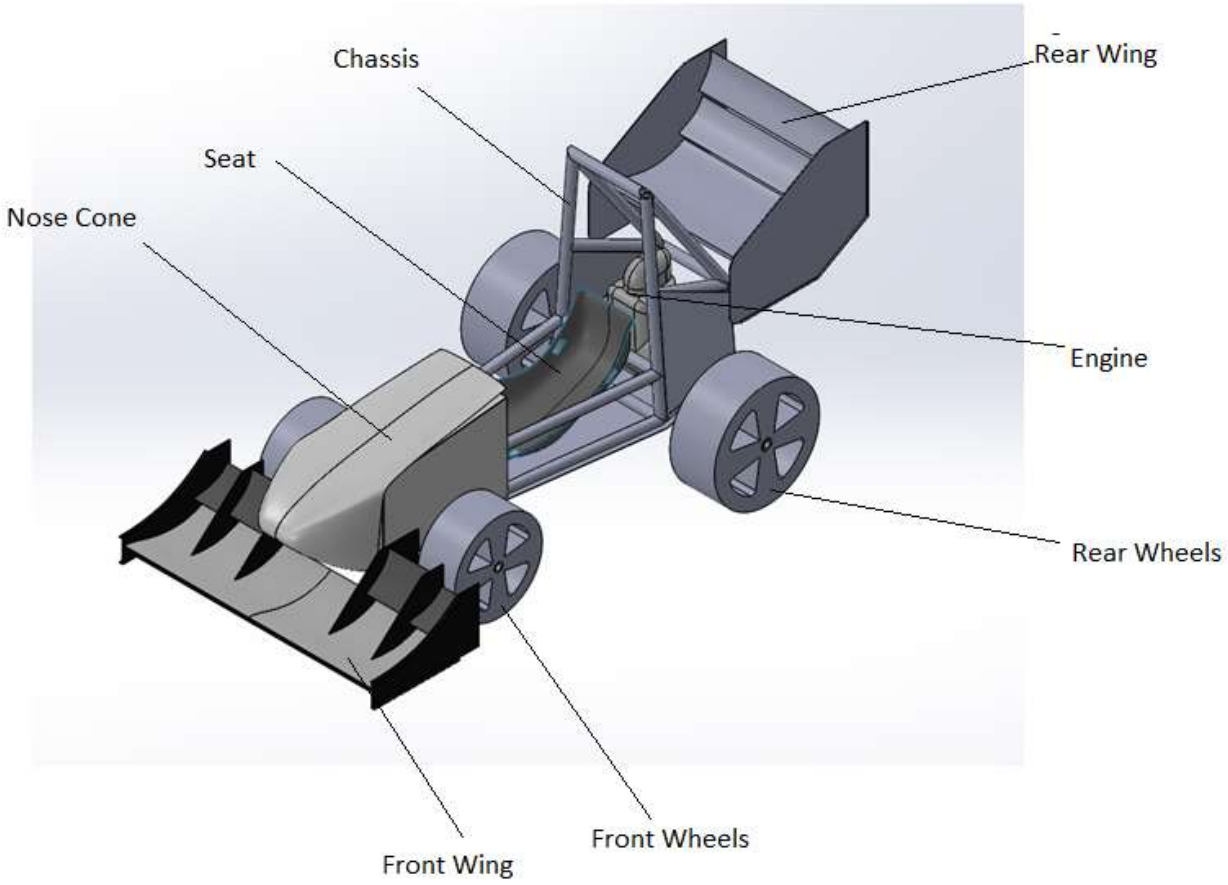
Materials to be used:

Material

1. Mild steel round rods (8 mm)
2. Mild steel round rods (6 mm)
3. Mild steel round pipe (10 mm)
4. Mild steel sheet (0.35 mm)
5. Thermocol
6. Aluminium

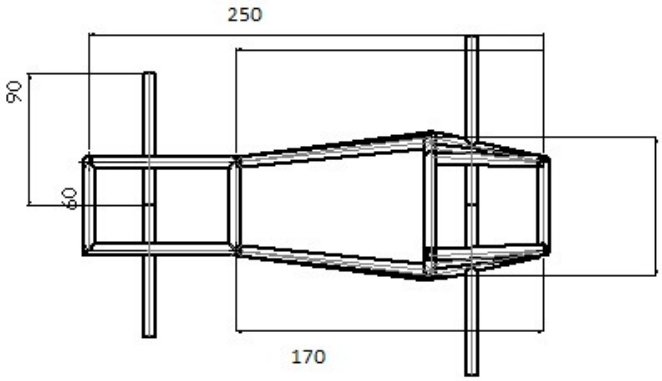
DRAWINGS:

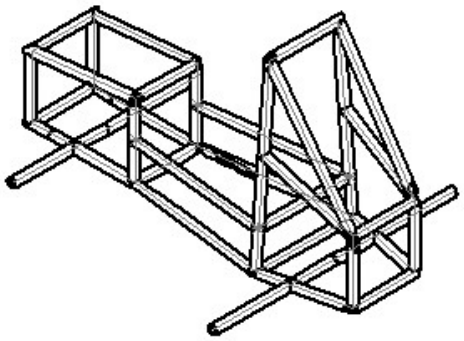
CAR:

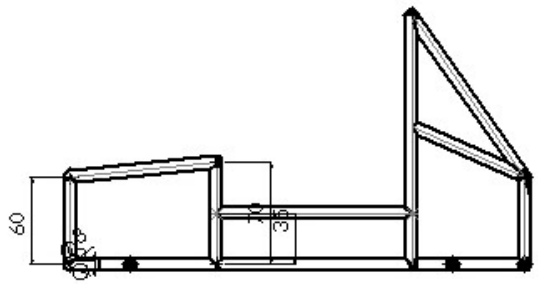


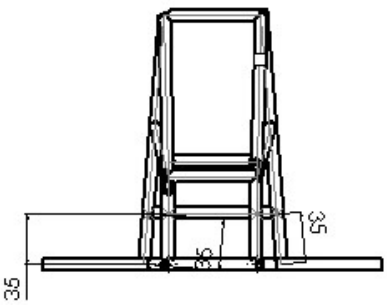
1. Chassis:

Chassis will be made by welding rods of different lengths to form the structure as shown.
This will probably take 2 weeks.
Other parts will be subsequently welded or brazed into the chassis.2 rods will be given for axle of the car.



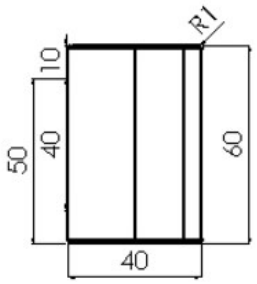


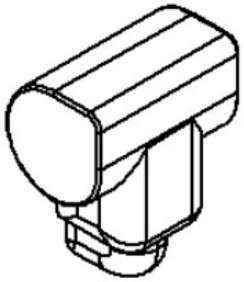


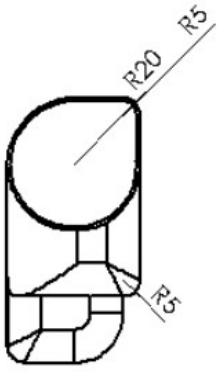


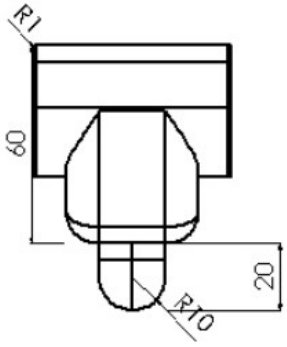
2. Engine:

Engine will be made by casting. Pattern for casting will be made by thermocol, which will then be casted using aluminium.



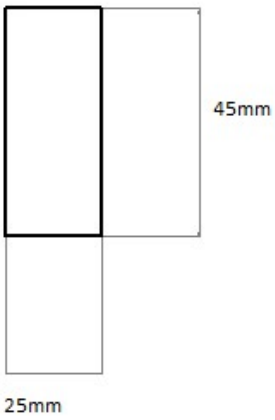


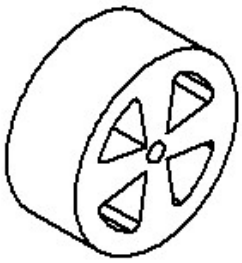


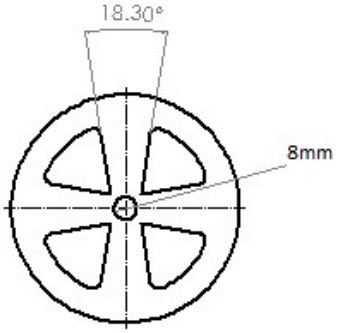


3. Front Wheel:

Wheels will be made by casting process using thermocol pattern, and then casting by aluminium metal.

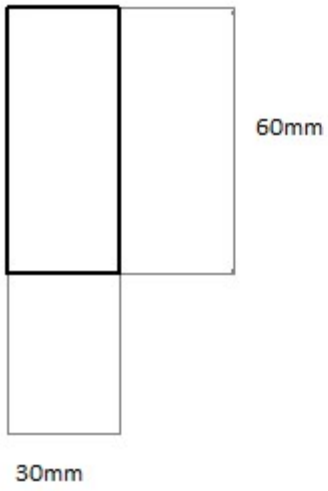


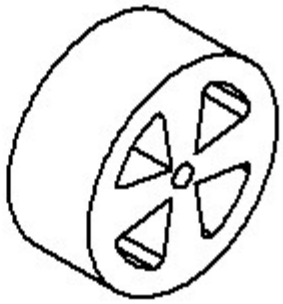


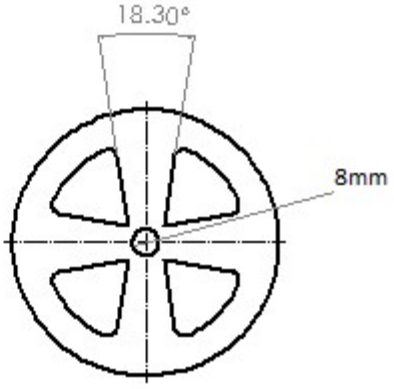


4. Rear Wheel:

Wheels will be made by casting process using thermocol pattern, and then casting by aluminium metal.

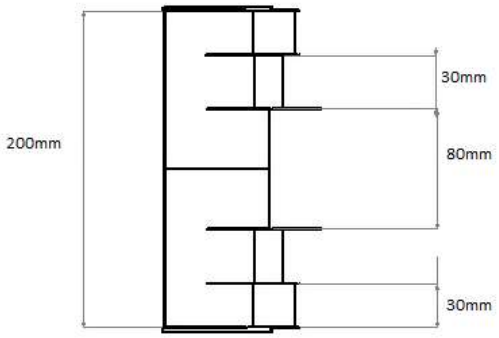


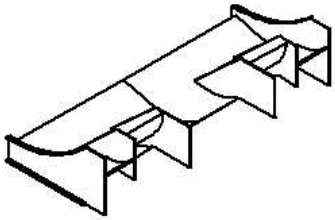


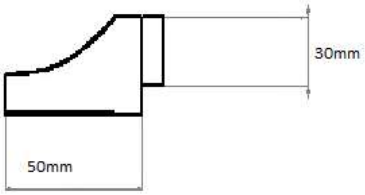


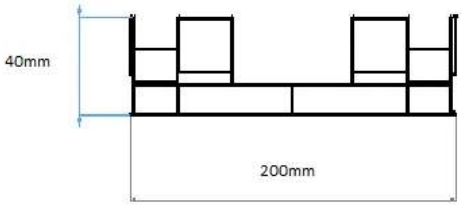
5. Front Wing:

It will be made using sheet metal processes.
Various sheet metal pieces formed will either be joined by brazing or knocked up joint.
Wings will be joined with chassis using small metal sheet pieces which will be brazed on chassis as well as wings.



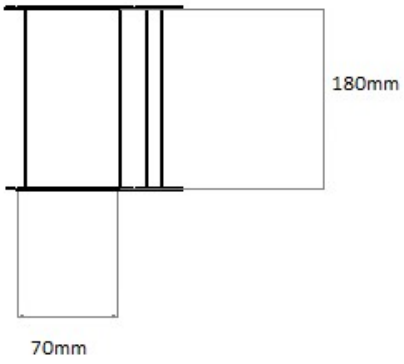


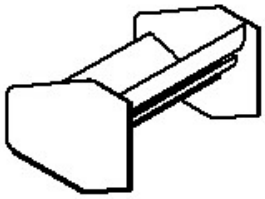


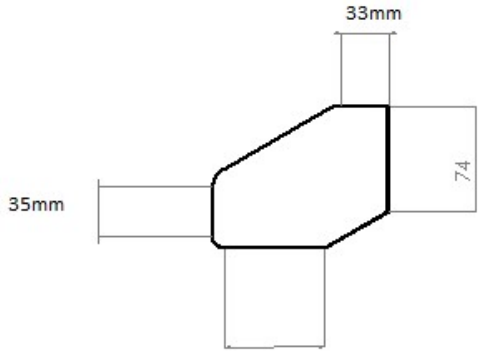


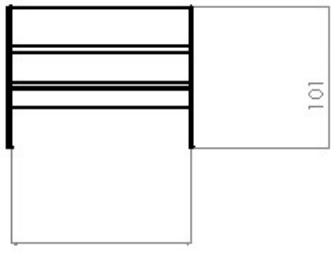
6. Rear Wing:

It will be made using sheet metal processes.
Various sheet metal pieces formed will either be joined by brazing or knocked up joint.
Wings will be joined with chassis using small metal sheet pieces which will be brazed on chassis as well as wings.



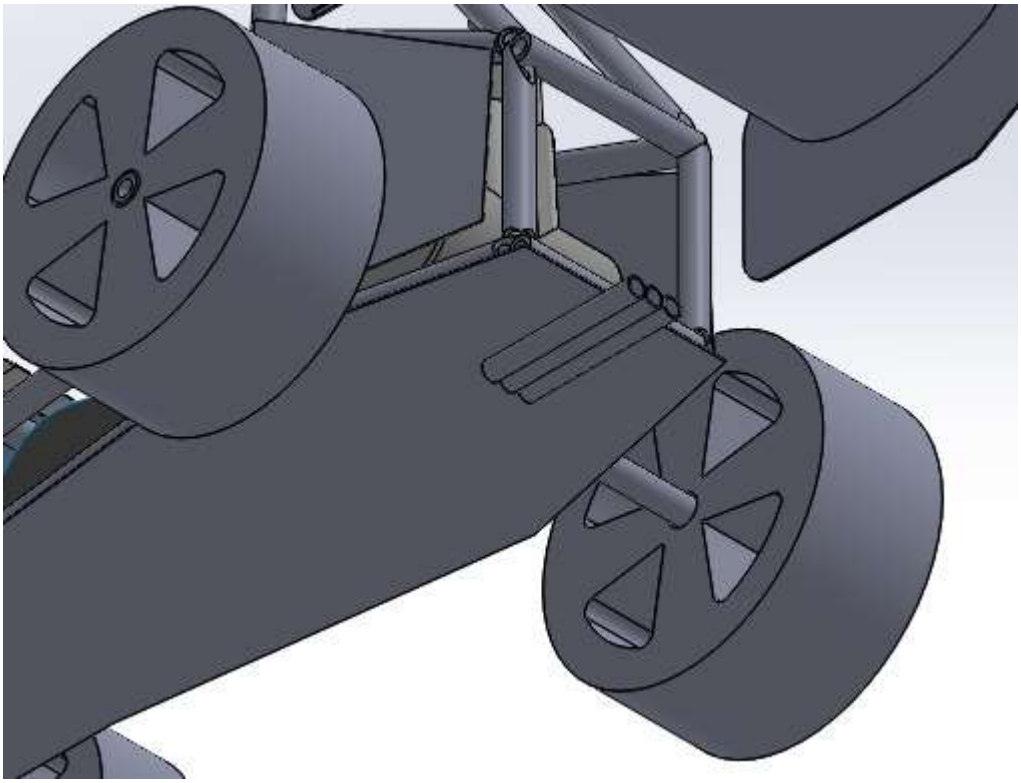






7. Exhaust:

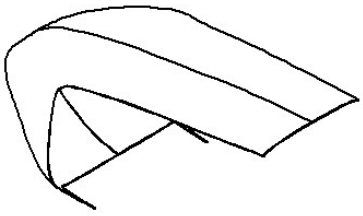
Exhaust pipes are simple mild steel tubes which will be of proper lengths, and three such pipes will be welded to main chassis.

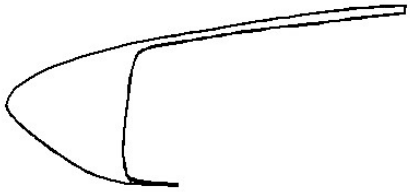


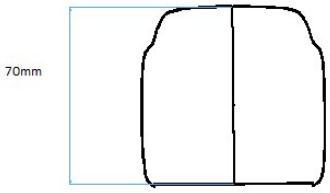
8. Nose Cone:

Nose cone will be made by Sheet metal forming, and will be joined to other metal sheets, adjacent to it, using knocked up joint or brazing.

The nose cone would be curved by using the mallet.

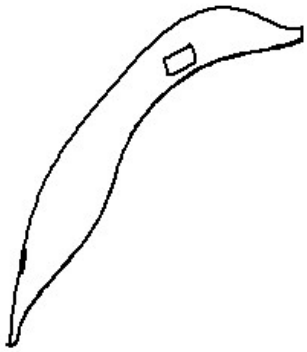


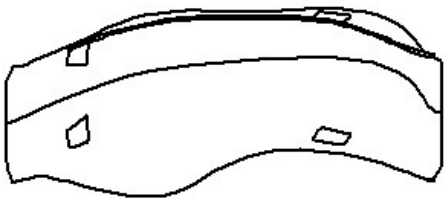


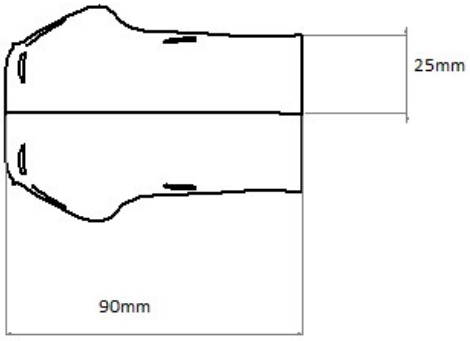


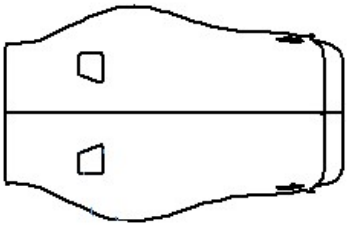
9. Seat:

The seat would also be formed using sheet metal forming and would be welded to the chassis of the car.









Processes to be used:

1. Molding and Casting :- To create wheels and engine of car.

2. Welding :- To weld rods together to create chassis of car, shaft of wheels to body of car and exhausts to engine of car.

3. Sheet Metal Forming:- Form Sheet metal required to cover chassis, for nose cone ,seat and wings of the car.

4. Knocked-up Joining :- To join nose cone of the car with the sheet metal on body of car.

5. Brazing:- To join wings and seat of formula car to body of car.

Work Distribution (Week-wise cum Member-wise)

Week 1:-

All students:- Using mild steel rods to construct the chassis. We will weld the rods together to construct the chassis.

Week 2:-

Student 1 & 2:- Completing the welding of the chassis and finishing the structure.

Student 3 & 4:- Start making the cast of the engine.

Week 3:-

Student 1 & 2:- Start sheet metal work. Using sheet metal to form the cover of the chassis, nose cone and using appropriate sheets to cover various parts of it.Making the seat of the car .

Student 3 & 4:- Completing the cast of the engine.Braze it to the sheet metal at the back of the car. Making the front and the back wings of the car.

Week 4:-

Student 1 & 2:- Use knocked-up joining to join nose cone. Using brazing to join the different sheets and to be used as the cover of the chassis.

Student 3 :- Join the wings to the car using brazing.

Student 4:- Braze shaft of wheels to car. Make exhaust pipes and braze it to engine of car.

Week 5:-

Student 1 & 2:- Making the cast of two of the wheels using thermocol(or one of them with machining if possible) and join it.

Student 3:- Using forging to create 3rd wheel and join it.

Student 4:- Using powder metallurgy to form 4th wheel and join it.

Week 6:-

All students:-Complete all the tasks that have remain unfinished. Completing the joining of the car and finishing it up. Performing some modifications as required.