



## Final Project – “Design Your Own Car of the Future”

### Objective

Mentees will design a **complete vehicle concept** (like an OEM team), making technical decisions on **powertrain, drivetrain layout, gearbox, suspension, aerodynamics, ADAS, electronics, and sustainability**.

---

### Project Flow / Stages

#### 1. Vehicle Concept & Requirements

- Define target **vehicle type** (city EV, sports car, SUV, commercial truck, off-road buggy, etc.).
- Decide **use-case**: urban commuting, long-distance, off-road, high-performance, sustainable vehicle.
- Set **performance goals** (top speed, range, acceleration, passenger capacity, safety).

#### 2. Powertrain & Drivetrain Layout

- Choose **engine type**: IC engine, BEV, HEV, PHEV, hydrogen fuel cell.
- Decide **drivetrain**: FWD, RWD, AWD, in-wheel motors.
- Select **energy storage**: battery capacity, hydrogen tank size, fuel efficiency goals.

#### 3. Transmission / Gearbox

- Compare options: single-speed EV gearbox, CVT, DCT, or manual.
- Justify choice based on torque curve, efficiency, and application.



## Suspension & Dynamics

- Select suspension type: MacPherson, double wishbone, multi-link, air suspension.
- Define how it impacts ride comfort, handling, and off-road capability.
- Choose a braking system: ABS, regenerative braking, brake-by-wire.

## 4. Aerodynamics & Styling

- Basic shape design (SUV, sedan, coupe).
- Plan aero aids: spoiler, diffuser, active grille shutters, underbody panels.
- Simulate airflow using CFD (if tools available).

## 5. Electronics & ADAS

- Choose a sensor **suite**: camera, radar, LiDAR, ultrasonic.
- Define ADAS features: adaptive cruise control, lane-keep assist, automated parking, collision avoidance.

## 6. Sustainability & Innovation

- Define environmental impact: recyclable materials, energy-efficient components.
- Integration of solar panels, regenerative systems, or V2G (Vehicle-to-Grid).
- Lifecycle analysis: CO<sub>2</sub> footprint from production to disposal.

## Evaluation Criteria

- Technical Justification of Choices
- Creativity and Innovation in Vehicle Design
- Integration of Mechanical + Electrical + Software Knowledge
- Practical Feasibility and Sustainability