



PSAU SAQR I: Shell Eco-Marathon Prototype Car

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TEAM PSAU SAQR I

We are Team SAQR from Prince Sattam bin Abdulaziz University (PSAU), dedicated to sustainability and innovation in mobility. Our participation in Shell Eco-marathon (SEM) 2025 reflects our commitment to advancing clean energy solutions and reducing fossil fuel dependency in alignment with Saudi Arabia's Vision 2030. Through this project, we aim to apply STEM expertise to develop efficient and sustainable transportation solutions. Our vehicle design is inspired by the SAQR (Arabian falcon), known for its aerodynamic efficiency and agility. The falcon's natural shape influenced our approach to creating a streamlined and energy-efficient vehicle, integrating aerodynamic optimization, sustainable materials, and advanced energy management.

OBJECTIVES

Design a highly efficient and sustainable vehicle that minimizes energy consumption, optimizes aerodynamics, and integrates eco-friendly materials, aligning with SEM 2025 goals and Saudi Vision 2030.

TEAM STRUCTURE

1. Vehicle body Design and Aerodynamics

- Developed the external design of the vehicle.
- Created CAD models and conducted CFD simulations for optimizing the aerodynamics.
- Reduced the drag thereby improving energy efficiency.

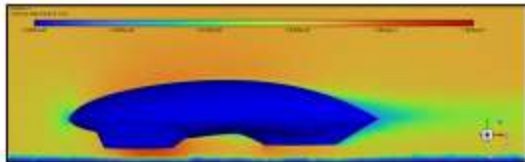


Fig 1: Velocity Contour

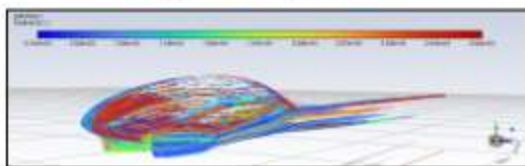


Fig 2: Velocity path-line

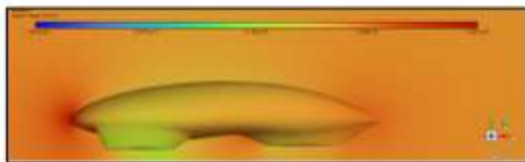


Fig 3: Pressure Contour

2. Engine and Transmission Design

- Selected a suitable engine and modified it to comply with SEM 2025 regulations.
- Designed and optimized the fuel injection system.
- Designed a transmission system that aligned with engine performance and minimum fuel consumption.



Fig 4: Transmission system

3. Chassis and Cockpit Design

- Designed a lightweight chassis.
- Designed a safe and ergonomic cockpit.

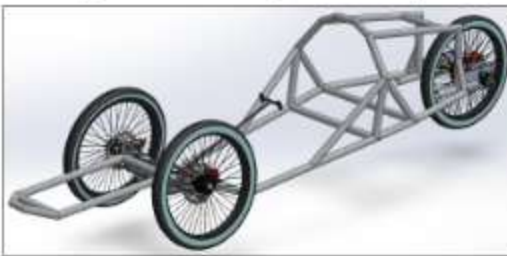


Fig 5: Chassis Design



Fig 6: Cockpit Design

4. Vehicles Body Manufacturing

Vehicle's body manufacturing and assembly.



Fig 7: External Body

5. Braking and Steering Systems Design

- Developed an efficient steering and braking system to reduce friction and increase stability.
- Implemented Ackermann steering geometry for precision and ease of control.



Fig 8: Steering & Braking Systems Design

6. The PSAU SAQR I

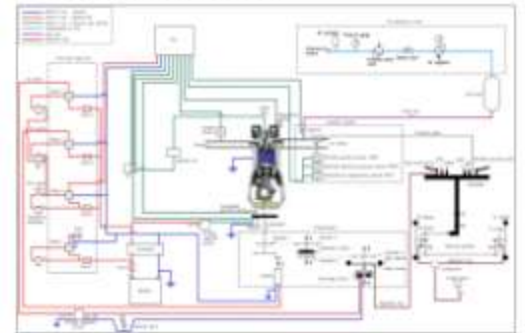


Fig 9: Block diagram of the car.



7. The Driver

- Acquired elegant driver suit, gloves, belt and helmet.
- Analyzed the Lusail circuit characteristics, including topology and geometrical requirements, to optimize on-track vehicle performance.

PSAU SAQR I TEAM MEMBERS

