Shell Eco-marathon Engine Team

Overview
The Shell Eco-marathon is a competition that challenges students to produce the most fuel efficient vehicles as possible. The goal of this project is to convert the Urban Concept vehicle to run on an internal combustion engine fuelled by compressed natural gas (CNG).

Objectives
- Convert a gasoline engine to run efficiently on CNG.
- Implement electronic fuel injection system.
- Rewire vehicle to accommodate safety mechanisms.

Approach
- Customer needs were assessed by reviewing the Shell Eco-marathon rules for CNG vehicles.
- Concepts were generated to determine the best solutions to accomplish the goal.
- Engine selection was determined by a weighted matrix to select the best option.
- Existing CNG vehicles and patents were researched to draw design inspiration from.
- FEA was conducted on structural components to ensure component reliability.
- An engine CAD model was created to aid in design.
- Various components were manufactures such as the intake, exhaust, engine mount, and wiring.
- The fuel injection system was tested to ensure all sensors functioned.

Outcomes
- Electronic fuel injection was implemented that will increase the overall fuel efficiency of the vehicle.
- An engine platform was established for future teams to further develop.
- The project cost was $1,930 and was within the allotted team budget.
- Recommendations have been provided to future teams to further improve the engine.
- Established a foundation for future teams to take on, improve, and be successful in the Shell Eco-marathon competition.