UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE of ENGINEERING

Senior Design Project Description

Company Name	MEES Motorsports	**Date Submitted**	*05/01/2020*
Project Title	FSAE Powertrain **(FSAE_POWER)**	**Planned Starting Semester**	Fall 2020

Personnel

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills:

Discipline	Number	Discipline	Number
Mechanical	6	Electrical	0
Computer	0	Systems	0
Other ( )	0		

Project Overview and Requirements:

Background:

The SAE International Formula SAE program is an engineering design competition for undergraduate and graduate students. The competition provides participants with the opportunity to enhance their engineering design and project management skills by applying learned classroom theories in a challenging competition. The engineering design goal for teams is to develop and construct a single-seat racecar for the non-professional weekend autocross racer with the best overall package of design, construction, performance and cost.

The concept behind Formula SAE is that a fictional manufacturing company has contracted a design team to develop a small Formula-style racecar. The prototype racecar is to be evaluated for its potential as a production item. The target marketing group for the racecar is the non-professional weekend autocross racer. Each student team designs, builds and tests a prototype based on a series of rules whose purpose is both to ensure onsite event operations and promote clever problem solving. The vehicle will be inspected in a series of tests to ensure it complies with the competition rules; in addition, the vehicle with driver will be judged in many performance tests on track. The rest of the judging is completed by experts from motorsports, automotive, aerospace and supplier industries on student design, cost and sales presentations.

Formula SAE promotes careers and excellence in engineering as it encompasses all aspects of the automotive industry including research, design, manufacturing, testing, developing, marketing, management and finances. FSAE Electric uses an all-electric powertrain.

Project

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This project will start with the existing KTM engine. A 1D engine simulation will be done using Ricardo Wave or GT Power. A restricted intake which complies with FSAE rules will be designed and a CFD simulation will be performed. An exhaust system will be designed to comply with FSAE Rules. The engine will be calibrated on the engine dynamometer.

Expected Deliverables/Results:

Deliverables include:

- Intake Manifold
- Exhaust System
- Engine Calibration

List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):

- Thermodynamics, SolidWorks, IC Engines