



UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING

UNC Charlotte – Lee College of Engineering Senior Design Program Company Information

Company Name	<i>Mechanical Engineering, Motorsports</i>	Date Submitted	<i>03/11/2019</i>
Project Title	<i>KTM 500 Engine Development</i> UNCC_KTM	Planned Starting Semester	<i>Fall 2019</i>

Funding:

What is the source of funds that will be used to cover all of the direct costs of this project?

Kulwicki Shop Budget

Is this source of funds already secured? Yes No

Technical Contact(s)*

	Technical Contact 1	Technical Contact 2	Technical Contact 3
Name	Dr. Charles Jenckes	Luke Woroniecki	
Phone Number		7-7306	
Email Address	cjenckes@uncc.edu	lworonie@uncc.edu	

*We would like to have more than one technical contact, so there is a back-up in case of travel, sickness, job re-assignment, etc.

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

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	3	Electrical	
Computer		Systems	
Other ()			

Project Overview and Requirements:



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The UNCC FSAE team utilizes different motors depending on the competition year and availability of resources. Often the motor is purchased and placed in the vehicle without much consideration for improvement, which often leads to a reduction in points for exhaust noise or loss of placement due to lack of power or inability to complete the different components of the competition. This project would provide a future team with a motor that has been specifically engineered to meet the requirements of the competition without requiring additional time from the team themselves to develop an engine.

The intention is to utilize an existing unused KTM 500 EXC motor and develop it to produce 60 horsepower naturally aspirated with restrictor. The project will include the development of a low restriction exhaust system with a high flow and noise reduction muffler. The developed engine would need to be able to withstand a 1 hr endurance run.

Expected Deliverables/Results:

Deliverables include:

All required course documents and deliverables

Full design package to include CAD drawings and flow calculations

Tuned intake plenum for high compression KTM 510cc single cylinder engine

- Wave tuning analysis
- CFD model for air flow through restrictor and plenum

Exhaust header design and muffler that complies to sound restriction for Formula SAE

- Wave tuning analysis
- Helmholtz resonator
- Light weight

High compression KTM 500 EXC engine

- Maximize BMEP
- Find weak points for endurance run
- Full engine calibration on Eddy Current Dyno

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

- Motorsports concentration
- Enrolled/Completed Automotive Powerplants MEGR3210
- Solidworks or other CAD software