



UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING

Senior Design Project Description

Company Name	<i>Schaeffler Group, USA</i>	Date Submitted	<i>11/08/2018</i>
Project Title	<i>Design of a Prototype for Chain Wedge Clutch</i> (SG WEDGE)	Planned Starting Semester	<i>Spring 2019</i>

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	5	Electrical	
Computer		Systems	
Other ()			

Company and Project Overview:

With 92,000 employees at 170 locations in more than 50 countries worldwide, Schaeffler is one of the world's largest technology companies. Our North American headquarters are located in Fort Mill, SC where the Automotive Technology Center resides. From the Tech Center, we lead global development of a new class of mechanical clutches which we call a “wedge clutch”. This innovation was patented by Schaeffler and is being studied in many future automotive applications including hybrid vehicle transmissions and AWD systems.

This senior project will be focused on developing a prototyping process for an entirely new construction of the wedge clutch which has been termed the “chain wedge clutch”. The team should design an interchangeable stamping tool to punch out wedge segments, an assembly fixture to facilitate positioning the many pieces required in the assembly, and a press tool to join all pieces.

<https://www.schaeffler.us/>

Project Requirements:

The scope of this project is limited to a prototyping process only. It will not include investigation of mass production processes or quality requirements. All designs for the clutch components will be supplied by Schaeffler. The students will be responsible for designs of prototype tooling, but Schaeffler will provide technical support regarding tooling design as needed. A detailed description of the project will be supplied at the kickoff meeting.

Expected Deliverables/Results:



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The finished project should include:

- A press tool (die set) designed to allow easy interchange of part specific stamping tools (punch and die) so that a range of wedge clutch segments can be produced in our prototype department presses.
- Additional press tooling as needed to coin the angled chamfer features of the wedge segment.
- A defined assembly process for positioning all clutch components and then staking the link pins to join the components together.
- Inspect instructions to verify only good parts are produced.
- Safety features to protect the operator from any risks in the processes.

Disposition of Deliverables at the End of the Project:

All hardware may be displayed at the expo and then shall be delivered to Schaeffler for use in our prototype department.

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

- There are no specific skills required beyond the basic understanding of mechanical engineering principles.