



ME185 – Electric Vehicle Design

Form for Project Proposals

Spring Quarter 2012/2013

submit by March 29, 2013

ME185 is a project class where students prototype their ideas and bring electric bicycles, karts, cars, etc. to life. In order to reserve the entire quarter for the prototyping, students are requested to submit project proposals at the end of the winter quarter so that the instructors can make a decision, before the term begins, which projects will be worked on. Therefore, students, who want to work on a project in ME185, are requested to submit this form (see next pages) with their project proposals by March 29, 2013 to Sven Beiker (beiker@stanford.edu).

Course: ME185 – Electric Vehicle Design

Summary: This is a project-based class involving design and prototyping of electric vehicles. Students learn the fundamentals of vehicle design in class and apply the knowledge as they form teams and work on projects involving concept, specifications, structure, systems, integration, assembly, testing, etc. The class meets once a week to learn about fundamentals of vehicle design and coordinate sub-tasks. The teams of 3-5 will work on their projects independently.

Instructors: Chris Gerdes, Sven Beiker
TA: Ben Stabler

Times: Tuesdays, 3:15 – 4:30PM

Location: Volkswagen Automotive Innovation Lab (VAIL), 473 Oak Rd, Stanford

Prerequisites: Basic knowledge in vehicle design / dynamics, energy systems

Level: Advanced undergraduate / beginning graduate students

Grading: Letter

Units: 3

Enrollment: By instructors' permission, based on project proposal, project proposal must be submitted to beiker@stanford.edu by 3/29/13 (see also special instructions on next page and proposal form on page 3)

Website: <http://me185.stanford.edu>

Special Instructions for ME185, Spring 2013: Think Modular!

This year, we want to especially encourage concepts that focus on the modularity of powertrain and vehicle. That is, we would like you to think about what a modular powertrain (electric of course) can look like so that you can basically snap it on to a vehicle body based on the specific vehicle or use case. Here are two examples that might help you to get the thinking started:

1. For instance, assume that you typically have a vehicle with which you commute to work or run errands and that might be perfectly well equipped with relatively low power and short range. However, there are those days when you want to get to the beach with your three friends and the low power / short range specs just aren't going to do it – that is when you want to add another powertrain module to the vehicle for an additional boost. What could this modular powertrain look like? Or, you might also want this powertrain to be swappable in order to put under your fun-cruiser for the weekend and therefore you keep the power but swap the body. One set of wheels but indefinite vehicle options – wouldn't that be cool?

2. Or also think that electric vehicles, unlike ICE vehicles, are particularly suited to a modular design because they do not require complicated fuel, exhaust and cooling support systems. Imagine that you could walk into a car showroom and choose whatever car you wanted, and then drop in a modular powertrain that would meet your performance, range and cost requirements. Enthusiasts could even design their own vehicle without any advanced electronics knowledge. You could upgrade the range of your vehicle the same way you upgrade the RAM in your laptop. A ME185 project that tackles this problem might put together a business case for this idea and build an example powertrain module, and then pitch the idea to VCs and local EV companies at the end of the quarter.

*Now it is your turn – think modular, think boxes – but think outside the box!
Let your ideas flow and think about what a modular powertrain can look like...*

(download this form at <http://me185.stanford.edu>)

Team Members (ideally 3-5)	<i>names, program, level mark name of main contact person</i>
Project Title	<i>choose a descriptive title</i>
Project Objective	<i>which problem are you trying to solve? which purpose / use-case should your vehicle address?</i>
Proposed Solution	<i>which direction do you want to take toward your objective? what is new, unique, exciting, ...?</i>
Estimated Budget	<i>how much money will you need for parts etc? explain what you will need to purchase new / used, where from etc.</i>
Expected Result	<i>what will your final prototype be like (e.g. bike with motor, chassis with powertrain, existing vehicle converted to electric...)?</i>
Additional Details	<i>anything else we should know to make a decision regarding your proposal (can be text, links, pictures, ...)</i>