**Task Description**

The body protects the vehicle from road debris and can provide some downward force. In previous years, the body has been constructed from carbon fiber and Kevlar in a vacuum bagging process. Though this process creates a perfect body, it is a lot of work for only one body panel. Therefore, the body of BR16 will be a combination of a carbon fiber nose cone and aircraft fabric (polyester fabric, a.k.a. Dacron) side panels, simplifying the construction process while still remaining lightweight. The Body Design Team is tasked with designing a sleek body in align with Bulldogs Racing Design themes. The finished body should be lightweight, minimize cross sectional area, and create some down force.

**Responsible Parties**

Jordan and Josh will work together to design and fabricate the body. Jordan will be in charge of delegating project tasks and completing deliverables on time.

**Deliverables**

Three designs (preliminary, transition, final), a fabricated body, and design process documentation.

**Budget**

(Provide as detailed budget information as possible)

|  |  |  |
| --- | --- | --- |
| 1 | Carbon fiber sheet: large roll in garage | $0 |
| 2 | Carbon fabrication materials: peel ply, breather, vacuum bags, etc. if not in the garage | $100 |
| 3 | Epoxy: West Systems 105/206 (1gal/.86qt) | $150 |
| 4 | Foam for noseplug: Owens Corning Foamular 250 or equivalent; qty 15 2” x 2’ x 8’ sheets | $300 |
| 5 | Polyester fabric (Dacron): 1.8oz lightweight material, $4.xx/yd (full width 60”) | $50 |
| 6 | Hardware: misc. costs | $50 |

**Resources (human and machine)**

(Provide a list of type of resource needed and time with resource)

* Discussion with other team members of Bulldogs Racing to design a complete stylistic body in line with Bulldogs Racing themes (ongoing)
* Possible access in Architecture school to make nose plug

**Time to complete**

(Provide a description of time to complete major aspects of work package)

* ~25 hours of initial design to be completed by Jordan and Josh followed by ongoing work with other members of Bulldogs Racing for style and overall aesthetic of body (over the course of 4 weeks)
* Up to ~25 hours/4 weeks for fabrication of nose cone plug (faster with architecture school with foam cutter if possible)
* Vacuum bagging for carbon fiber nose cone construction (~15 hours, 2 weeks)
* Fabrication of Dacron side panels (~10 hours, 1.5 weeks)
* Overall: 4 weeks of design in conjunction with review by other team members, then fabrication of the nose cone over the course of 6 weeks. After fabrication is complete remaining time can focus on graphics/paint job

*Update 11/20/15:*

* This timeline should hold provided the body is not being designed or fabricated in tandem with the seat/firewall. We are a couple of weeks behind on design because the body has been set aside while seat/firewall is designed.
* Pending drawings from Sida and review from other members, 2-3 more weeks of design followed by 6 weeks of fabrication.

**Measures of Success**

(Scales upon which the success of the design can be evaluated)

* Overall appearance and style of nose cone and body (rated from 1-10 by the team)
* Weight reduction from the body of BR14
* Reasonably optimized aerodynamics using Solidworks Flow Simulation (drag coefficient below around 1.0, from comparable FSAE cars without aero packages)
* Elimination of aerodynamic lift

**Required Inputs**

(Items or knowledge required from a previous step)

* Input from other Bulldogs Racing members about the desired appearance of the body of BR16
* Determine approximate optimal downforce and distribution of downforce considering competition speeds and car specifications like power output, tire data, etc.