Ebikes! Challenge General Team Meeting

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Ebikes! 125-mile Challenge

GOALS:

To involve the engineering students, faculty, staff and friends in designing a never-before-achieved electric bike that has a range of 125 miles in a single battery charge.

To showcase the creativity, resourcefulness and design acumen of the students of the AJ Clark School of Engineering at the 125th Anniversary Celebration of the AJC School of Engineering in Fall 2019.

To choose the potential entries for UMD-Shanghai Jiao Tong Inter-University Electric Bike Design Competition Spring 2020

Steering Committee and Personnel

Richard Blanton, Director of Technical Operations, AJC School of Engineering

Kevin M. Calabro, Director, Keystone Program

Aris Cleanthous, Senior Manager Stanley, Black and Decker, Inc and Keystone Lecturer

William Fourney, Keystone Professor of Mechanical Engineering, former Associate Dean for Undergraduate Programs, AJC School of Engineering

Vincent Phuc Nguyen, Lecturer, Department of Mechanical Engineering

Romel Gomez, Keystone Professor and Associate Chair for Undergraduate Studies, Department of Electrical and Computer Engineering

Kara Stamets – Competition Coordinator

Email Contacts: (stametsk@umd.edu or rdgomez@umd.edu)

Important Dates

General Team Meeting: September 20, 2018, 5pm AJCH Forum

Preliminary Design Competition: October 24, 2018, 5pm AJCH

Competition 2 days: Fall 2019 TBA

Competition – Contest Eligibility

- Teams – open to all Clark School engineering students, members with no AJC affiliations are allowed provided at least a member of the team is a AJC registered student
- Team Advisor – each team is required to have a UMD faculty or staff as its advisor
- (Advisor minimal role: sign purchase orders and remind students of the importance of safety)

Competition Rules

- Commercial bikes are not allowed. This is a design competition. It is expected that the bikes will have unique features that commercially available bikes do not have.
- Components can be purchased individually.
- Bicycle must be powered by an electric motor under 1000 Watts.
- Bicycle must weigh less than 30kg.
- All riders must be affiliated with the University of Maryland as student, staff, faculty, alumni, board members, or corporate donors.

Competition Rules - Continued

The winner is the fastest bicycle (without external battery recharging) that completes the following in order:

- 50 miles without pedal assist (pure motor power) to be tested on a bicycle trainer (Cycleops Magnus Smart Trainer™) programmed calibrated with Power Tap p1™.
  - 25 miles on 0 grade track
  - 25 miles on a simulated campus route (UMD Shuttle 118 Gold Campus Connector Route, modified bypassing stops 2-9, 15)
- 50 miles on (UMD race track or oval)
- 25 miles on a (UMD Shuttle 118 Gold Campus Connector Route, bypassing stops 2-9 and stopping inside AJCH on every 3rd lap)

118 GOLD


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Competition Rules – Time Adjustments

Point system: Time will added or subtracted to the time trials based on the following schedule:

1. Engineering Design: +/- 1 hour
    - Product performance:
    - 50-mile motor only energy consumption (less energy, less time, based on aggregate team performance)
    - Mean: no time charge; 1 std dev: +/-15mins, 2 std dev: +/-30mins, 3 std dev:+/-1hour

Documentation and Reporting: +/- 30 mins

Design innovation and review based on jury of engineers: (elements drawn from solar decathlon): +/- 1hour

Market Potential: +/- 1 hour
    - Bill of materials; average +/- 30 mins
    - Craftsmanship and Aesthetics +/- 30 mins

Other Items

- Teams are expected to conduct their design and testing in a safe way. In order to abide by Univ. of Maryland legal requirements, teams must sign a liability waiver which indicates that you are aware of the risks and the responsibility for safety is yours and yours alone.
- Resources from external sponsors are allowed. There is no limit on the actual cost of the bicycle.
- There is no limit on the team and it's composition.
- Appropriate connectors to access the current and voltage of the battery source should be provided for remote monitoring of power consumption during operation.

Things to do

1. SIGN UP THE TEAM
2. SIGN LIABILITY FORM (unofficial, official to follow later)
   - - no form, no eligibility (SUBMIT PAPER FORMS)
     - Dr. GOMEZ OFFICE AV Williams 2313
3. PREPARE FOR PRELIMINARY DESIGN COMPETITION

Preliminary Design Competition for Team Subsidy (PDC)

Teams can apply for subsidy. Selection will be based on preliminary design concept presented to a panel of judges (closed doors). The top 12 teams will receive a minimum of $2000 to be used to purchase components. The best design concepts will further receive up to additional $2000, at the discretion of the judges. Preliminary design presentations will be held on Ebikes! Preliminary Design Competition, October 24, 2018, 5-7pm

Elements of Successful PDC

1. Each team will have an opportunity for a 10 minute elevator pitch
2. The judging merit will be based on the following
   - Details showing feasibility
     - Technical/ areas to focus on
     - Design and innovation beyond those in the market
     - Innovation
   - Team organization and management, logistics
   - Design Schedule
   - Safety Plan
   - Preliminary Budget

Questions?