View results

Respondent

31 Shaleen Vohra

09:57
Time to complete

Instructions:

Please adhere to the session word counts. Project leads must attend one SSC working group meeting post step 1 application submission. If you have any questions about the application process, please contact the SSC at Sustainability-Committee@illinois.edu.

1. Have you attended an SSC working group meeting? If not, please attend an SSC Working Group and present your project. Once working group attendance is complete, please return to complete your application.

   https://studentengagement.illinois.edu/student-sustainability/ssc/calendar/ *

   - (●) Yes
   - ( ) No

2. Please enter the date of the working group meeting you attended. As a reminder, the working group meetings are structured as follows

   - Energy + Transportation and Infrastructure working group.
   - Food & Waste + Land, Air, and Water working group.
   - Education and Justice working group.

   *

   2/20/2024

3. Date of Application *

   2/22/2024

4. Project Name: *

   Electric Boat Competition Team

5. Total Funding Requested From the SSC. *

   9929.51

   Please enter a number less than or equal to 10000

6. Project Lead Full Name: *

   Shaleen Vohra

7. Project Lead University Email Address *

   shaleen2@illinois.edu

8. Project Abstract: (In less than 100 words, briefly describe the project.) *

As part of our senior design project, a group of 12 Mechanical Engineering students will be participating in the 2024 Promoting Electric Propulsion Competition hosted by the American Society of Naval Engineers. The ASNE PEP Competition challenges students to design, fabricate, and race an electric boat against other participating universities. The goal of this yearly competition is to further sustainable and innovative values by promoting research into electric power propulsion. The competition takes place on April 15th at Virginia Beach and our team is seeking funding to help build a functional final product and provide ample findings to future teams.

9. Project Category *

- ○ Education & Justice
- ○ Energy
- ○ Food & Waste
- ○ Land, Air & Water
- ◉ Transportation & Infrastructure

All rolling application require a faculty/staff advisor.

Faculty and Staff Advisor

10. Full Name: *

Sameh Tawfick

11. RSO/Department *

Mechanical Science & Engineering

12. University Email Address: *

tawfick@illinois.edu

13. Do you have additional members? *

- ◉ Yes
- ○ No

Project Team Member

Additional Member

14. Full Name: *

Aniketh Rayudu

15. RSO/Department *

Mechanical Science & Engineering

16. University Email Address: *

arayudu2@illinois.edu

17. Do you have additional members? *

- (●) Yes
- ( ) No

Project Team Member

Additional Member

18. Full Name: *

Roy Mubarak

19. RSO/Department *

Mechanical Science & Engineering

20. University Email Address: *

royfm2@illinois.edu

UIUC Financial Contact

Financial Contact (Must be full-time UIUC employee)

21. Full Name: *

Blake Johnson

22. RSO/Department *

Mechanical Science & Engineering

23. University Email Address: *

bejohnso@illinois.edu

Project Questionnaire:

24. Is this project student led? *

- (●) Yes
- ( ) No

25. If applicable, have you received approval from Facilities & Services and/or site manager? *

- ( ) Yes
- ( ) No
- (●) N/A

26. If additional funding is required, do you have a plan for ongoing funding beyond SSC? (SSC cannot guarantee ongoing financial support) *

- ( ) Yes
- (•) No

27. Beyond SSC, do you have sources contributing funding or support (ex. staff time, external grants, etc.) to this project? *

- (•) Yes
- ( ) No

28. Have you applied for SSC funding previously? *

- ( ) Yes
- (•) No

29. Project Timeline:
(SSC funding agreements remain active for two years. List your project's timeline and major milestones.) *

January 23rd: Project kickstart
February 14th: End of the design phase
February 14th - March 9th: Assembly phase
March 18th - April 10th: Design testing phase
April 14th: Date of competition

30. Project Description:
(In 250 words or less, describe your project. What does your project hope to accomplish? What are your project's deliverables?) *

Each year, UIUC Mechanical Engineering Seniors are required to take ME 470, the capstone design course in their curriculum. This class assigns students into teams where they are meant to put their MechSE skills into practice towards a real-world project. Each student team is assigned a current MechSE professor as their faculty advisor to provide feedback and guidance. As part of our team's project, we will be obtaining resources and research from one of last semester's teams in order to participate in the Promoting Electric Propulsion Competition hosted by the American Society of Naval Engineers. This competition gives 30+ university teams the goal of designing and building a manned or unmanned boat that can be powered and steered using only electric power. The primary goal of the competition is to promote research and innovation in sustainable marine craft. As mentioned, the competition date is April 15th which only provides a few months for our team to prepare. The final product will be an electric propulsion boat that conforms to the ASNE 2024 competition guidelines and can complete the 5-mile race. For the design, we plan to utilize a fishing hull to maximize reliability and a stable center of mass, a dual propeller system, a single-centered rudder for steering, brushless motors, LiPo batteries, an electronic speed controller, and more to create an environmentally friendly boat design. This will be the first time UIUC is participating in the competition, therefore our team hopes to represent the university well.

31. Environmental Impact:
(In 200 words or less, how does your project increase environmental stewardship at UIUC? If applicable, what is the carbon, water, waste, and/or energy savings?) *

By getting UIUC involved in this competition, we will be giving light to countless current and future students as well as professors about the issue of greenhouse gas emissions from gas-powered boat propulsion systems. Ship propulsion currently accounts for approximately 521 million tons of carbon dioxide emissions annually. Research and development into electric-powered propulsion will provide movement towards decreasing these emissions. Beyond the marine industry, electric power applications are being investigated in countless other fields. Findings in these areas will encourage further examination and deter the usage of gas-powered machinery. Specifically in the engineering industry, more focus needs to be put on sustainable initiatives for transportation, machinery, and construction. This project is the beginning of pushing engineering forward toward cleaner practices.

32. iCAP Objective Correspondence:
(In 200 words or less, does your project aim to advance one or more of the Illinois Climate Action Plan's (iCAP) objectives? If so, how?)

A full list can be found here: https://icap.sustainability.illinois.edu/objectives

This project aims to advance the energy, transportation, and education themes of the iCAP objectives. Electric power is becoming increasingly important in the energy field, but somewhere this research is lacking is in the marine industry due to the difficulties that come with it. Our goal is to tackle these challenges and work to promote clean energy usage for marine craft. Further investigation and solutions to this issue will help to reduce emissions caused by marine transportation. Finally, this project aims to educate current and future participants about the importance of electric power and apply our knowledge to a real-world issue. By getting UIUC involved in the competition this year, we are opening doors for future students to understand the problem at hand and use our findings as a stepping stone to reducing marine emissions. The growing involvement in the PEP competition helps to educate students in the engineering field on how they can do their part to support sustainability.

33. Student Impact:
(In 200 words or less, how will this project benefit students? How will students be involved with this project? What educational components are in your project?) *

As a Capstone project for the Mechanical Engineering curriculum, the project is benefiting the research and design experience of our current team as well as future senior design teams assigned to the project. The results we obtain, tests we run, and information we learn will all be passed down to future year's students involved in the competition. Given that this is a national competition, our findings will not only be shared with future UIUC teams, but also other Universities hoping to get involved with the competition. Ship propulsion emissions are a serious, real-world issue that students can apply the skills and knowledge they've picked up throughout the past 4 years of engineering school. From the beginning stages of research to the design development and ideation processes, leading to the building and testing of our final design. Each step along the way provides ample learning opportunities through the application of the MechSE curriculum. Having the opportunity to learn in a setting like this is an incredible opportunity, but we want to ensure we have all of the resources possible to do so.

34. Please see attached file, please be very descriptive and fill out the budget and timeline Excel sheet, and submit it below.

https://studentengagement.illinois.edu/student-sustainability/ssc/docs/SSC-Supplemental-Budget-Timeline.xlsx

*

Electric Boat Competition Team Budget & Timel_Shaleen Vohra.xlsx