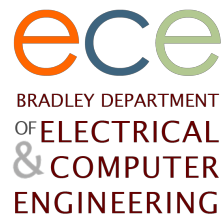


Virginia Tech

2013 SailBOT Team



WHO WE ARE

The 2013 spring semester marked the inception of the Virginia Tech SailBOT Team with the ultimate goal of designing and building a 2-meter long, fully autonomous sailboat for competition in the 2014 SailBot Regatta held in early June. Quickly the SailBOT Team swelled to over 65 undergraduate student members from multiple engineering disciplines. Team members represent several departments within Virginia Tech's exceptional College of Engineering including the Department of Aerospace & Ocean Engineering, Mechanical Engineering, Engineering Science & Mechanics, and Electrical & Computer Engineering.

Our team is lead and advised by Dr. Wayne Neu and Dr. Daniel Stilwell, who teach courses in the Aerospace & Ocean Engineering Department and the Electrical & Computer Engineering Department respectively.

This fall semester, eight team members are currently enrolled in an Independent Study course lead by Dr. Stilwell tasked with assisting with the designing and programing the vessel's control systems. Dr. Neu is also leading one student with an Undergraduate Research project related to the design of the boat's keel. In the spring semester the team plans to expand undergraduate research opportunities to include computational fluid dynamics analysis of the boat's hull and sails. Finally, the remainder of the team is made up of student volunteers encompassing all academic levels.

WHAT WE DO

Designing and building a 2-meter long seaworthy craft can be complicated enough as is, and when constructing a fully autonomous boat, the technical aspect intensifies greatly. Team members will need to incorporate (and build upon) their sense of understanding in the areas of aerodynamics, hydrodynamics, ship dynamics, electronics, programming, structural design, material properties, machining, and project management, just to name a few.

Our team's planned design includes the use of composite materials for a fiberglass and carbon fiber hull design (material selection dependent on budget), hydrodynamic keel and ruder design, and a set of aerodynamically designed sails to be used in a variety of wind conditions. Control surfaces (the main sail, jib sail and rudder) will be controlled via servos and winches with onboard microprocessors, running off of an Arduino platform. All aspects of design and construction must take into account the vessel's overall weight, as similar to a full scale racing-yacht, it is necessary to minimize and eliminate unnecessary weight to maximize vessel speed.

The team will enter to compete in the 2014 SailBot Regatta. This annual Regatta has been a growing event in recent years, with 16 entries in the latest competition (June 2013) from universities and colleges across North America. The winning team must score the highest number of points obtained from several categories including: a traditional sailing race to test the boat for an efficient design, a long distance race to test the endurance of the autonomous systems, a stationkeeping and navigation assessment to test the accuracy of the navigation system, and a formal presentation of the boat. Our goal is to place in the top three in each category in an effort to win the overall competition.

WHY WE NEED YOUR HELP

Based on a budget assessment by the University of British Columbia and U.S. Naval Academy SailBot teams, as well as internal estimates, the team predicts a \$10,700 operating budget for the year. This cost estimate includes both construction expenses and costs associated with transportation to the 2014 SailBot Regatta. A detailed budget outline is provided below:

Item	Cost	Details
Hull & deck construction	\$1,800	Carbon fiber, fiberglass, aluminum, manganese bronze, paint, etc.
Navigation equipment	\$950	GPS unit, anemometer, range finding system
Control equipment	\$950	Microprocessors, gyroscope/accelerometer(s), servos, etc.
Keel & rudder construction	\$350	Manganese bronze, lead shot, concrete, paint, etc.
Sails and rigging	\$850	Sail material (for heavy and light sails), spars, rigging, line, etc.
Projected Design & Construction Costs	\$4,900	
Travel to Smith Mountain Lake, VA	\$500	For rough water testing, travel in mid spring semester 2014
Travel to the San Francisco Bay area for the 2014 SailBot Regatta	\$2,500	Airfare for 6 students in early June 2014 (official dates/location have not yet been set by SailBot organization; www.SailBot.org).
Accommodations in the San Francisco Bay area for the 2014 SailBot Regatta	\$1,800	Hotel Accommodations for 6 students San Francisco Bay area in early June 2014
Transportation of boat	\$1,000	Cost to ship boat to and from the 2014 SailBot Regatta
Miscellaneous	\$250	Poster and document printing, team shirts
TOTAL Projected Expenses	\$10,700	

Through these cost estimates, it becomes clear that building and racing an autonomous sailboat is a costly endeavor, and the burden can not be fronted by one individual or organization. For this reason we are seeking corporate and personal donations.

SPONSOR BENEFITS & RECOGNITION

The Virginia Tech SailBOT Team is an all-volunteer, not-for-profit organization. Donations and University grants fully fund the entire design, construction, and transportation of the boat and students to the 2014 SailBot Regatta. Because of this, sponsors have a direct and essential influence on the over all success of the team. The team's current and potential sponsors are presented below:

Item	Amount	Details
Virginia Tech Student Engineering Council (SEC), Design Team Fund	\$950	Awarded
Virginia Tech Aerospace and Ocean Engineering, Engineering Fee Fund	\$6,000	Applied for
Society of Naval Architects and Marine Engineers (SNAME)	\$500	Seeking donation
Industry sponsorship	\$2,900	Seeking donation
Personal donations	\$350	Seeking donation
Projected Income	\$10,700	

Should you decide to support our teams endeavors through a tax-deductible contribution, your sponsorship will be recognized and greatly appreciated. With any donation amount your company's logo or name will be featured on the team's website with a hyperlink, and on all posters, presentations, documents and advertisements. Sponsorship opportunities are presented below, additional benefits may be given as appropriate.

Primary Sponsorship		Secondary Sponsorship
\$500 and up (in-kind and financial)	Donation Amount	\$250 to \$499 (in-kind and financial)
Up to 6" x 12"	Logo Sizing	Up to 4" x 8"
Positioned on sails for maximum exposure	Logo Location	Positioned on sails

As an added benefit, sponsorships help foster personal and business relationships with students that may endure long after the team members have graduated.

CONTACT INFORMATION

For additional information regarding the 2013-2014 Virginia Tech SailBOT Team visit our website or contact either of the student officers listed below. If you would like to pledge support to the team; physical donations can be made directly to the team by first contacting the Commodore, while monetary donations can be made by check, payable to the *Virginia Tech Foundation*, with “*For SailBOT Team*” specifically stated on the Memo line. **Thank you for considering providing support to the Virginia Tech SailBOT Team.**

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Mailing Address	Virginia Tech SailBOT Team Randolph Hall, RM 215, Virginia Tech 460 Old Turner Street Blacksburg, Virginia 24061
Commodore	Thomas Leo Shea III Ocean Engineering 2014 tlshea@vt.edu (410) 271-7472
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A SPECIAL THANKS TO OUR CURRENT SPONSORS

