“Lobstar I” Human Powered Submarine Competition:

On Saturday June 21, 2009 six UMaine mechanical engineering seniors set out from Orono to attend the 10th International Submarine Race, which was held from June 22 to June 26, 2009 at the Naval Surface Warfare Center, Carderock Division, David Taylor Model Basin in Bethesda, Maryland. The competition is held every other year at the David Taylor Model Basin, a 3000-foot long test tank used for evaluating and testing military ship hull designs and other hydrodynamic testing.

The competition started with extensive safety reviews and both wet and dry safety inspections. But as the week progressed it became evident that UMaine had a machine that far exceeded the performance of anything that they had built in the past. Out of the all of the runs attempted, all except for one resulted in official times. This is for the team that in the past had only received a single official time. This is not to say that there were not challenges. After an initial dry test the electronic control system was removed from the submarine because of the lack of testing and lack of a full range of motion. The manual controls replaced the electronic controls before the first attempted run. Stability was a constant problem throughout the competition because of the design of the rudder mounting system. The submarine would roll on its side resulting in difficulty steering as well as distracting the operator from the power-producing task at hand.

Going into Friday, the last day of the competition however, the UMaine team was in second place behind the dominant team at the competition, Ecole de Technologie Superieure (ETS) from Montreal. This was not to last however, while UMaine was struggling with a severe roll and a lower time in their final run. University of California San Diego had
a nearly flawless run of 4.103 knots, beating out UMaine’s 3.936 knots to take second place less than an hour before the end of the competition. The dominant non-propeller machine Omer6 from ETS turned in the best competition time of 4.916 knots. The fastest propeller machine at the competition was Talon 1, from Florida Atlantic University, which passed through the speed trap at 6.298 knots.

The members of the team attending the competition were, Nick Gustafson, Jeremiah Richter, Kevin Hopkins, Sam Levinsky, Scott Prince and Mark Liimakka, all seniors in Mechanical Engineering at UMaine. More information is available at the team web site which was a part of their capstone experience working on the submarine.


ASME Coaster Car Competition:

The Coaster Derby is a gravity powered racing car competition. The idea is similar to Soap Box Derby, except the race is held on nearly 1 mile of steep and twisty campus road. The cars are required to maneuver and stop as well as coast effectively.

This year’s competition saw UMaine’s first ever entry, the “Black Bear” coaster car. The car, driven by Corey Vincent (3rd year ME student), unseated a three-year defending champion for first place in race part of the competition as well as winning “best design” and “best new entry.”

The team brought home $700.00 in prize money for the Mechanical Engineering department. They plan on recruiting more freshmen from MEE 101 to the team and making improvements on this year’s car to re-enter next year. The team is working on improving the car by making the suspension geometry adjustable, adding stiffer springs, adding four wheel disk brakes and doing some more cosmetic work so that they can beat the competition even more soundly next year!

A video of the competition can be found at http://www.youtube.com/watch?v=FvOM466ta2I
Professor Zhihe Jin Awarded 2009 Early Career Research Award:

Dr. Zhihe Jin is an Assistant Professor of Mechanical Engineering. He has demonstrated extraordinary talent as a faculty member since coming to the University of Maine in September 2005. Dr. Jin has made many outstanding contributions to theoretical and computational solid mechanics. Based on internationally accepted measures of research quality, Dr. Jin is one of the top researchers in the College of Engineering and belongs to a very elite group of researchers internationally. Dr. Jin is best recognized for his modeling of thermo-mechanical behavior of functionally graded materials, ceramics and composites. He has been successful in winning funding for his research from prestigious organizations such as The American Chemical Society – Petroleum Research Fund. He has also attracted support from very practically minded industrial companies like M-I LLC, an organization which builds equipment for the drilling and processing of oil and natural gas. This recognition derives from the practical importance of the problems Dr. Jin is pursuing and the fundamental nature of his contributions. Most recently, Dr. Jin is Co-PI on a $950,000 proposal focused on the optimization of tidal turbines for maximizing the energy extraction in an environmentally sensitive manner.

Formula SAE (Society of Automotive Engineers):

Things have really started to pick up and progress is being made on our first FSAE car! Many of the components have been ordered and work has begun in Crosby getting the frame cut, bent, and welded. The design groups in charge of different aspects of the car are working hard to meet challenging deadlines and as of late December the team has a full mock up of the car done in Solidworks. With these models the groups have made huge steps to solidify their basic design ideas into coherent and tested models that will be used on the car; several have put components through COSMOS to do stress and strain analysis as well as filling blackboards with calculations. Another big idea being tackled is developing a construction process for each designed part while simultaneously optimizing each component for weight and cost.

The job of tuning the engine, which comes off an Aprilia RXV550 dirtbike, has been taken on by two groups of seniors as their senior design projects. The teams have fully removed the engine from the bike and are currently in the process of mounting it and wiring it to a test stand. From there they will be able to hook it up to an engine dyno which will assist in the tuning process.

For a copy of the full 56 page design proposal contact team captain Luke Saindon on first class and keep an eye out for the latest team newsletter. A full webpage is also in the works for the team, it will include pages from each of the design groups as well as other information regarding the progress of the car.
Faculty Publications: