ME NEWS
University of Idaho
MECHANICAL ENGINEERING • FALL 2005

2005-2006 Capstone Takes on a New Look

ME Capstone Design, the ME Department's premier senior design course, is currently seeing some new changes. The past year's senior class topped out at 60 students, while 2006 projections put the senior class at 71. As a result of our expanding senior classes the past couple years, capstone projects were modified to accommodate this growth. In the spring 2005, ME424 (the first semester of the senior design sequence) was offered to help reduce the projected fall 2005 class size. In addition, ME424 and ME426 (both capstone classes) were offered in the summer 2005, and were taught by Steve Beyerlein and Edwin Odom. By offering these classes each semester, the workload typically observed in the ME Machine Shop, as well as the TA and faculty demands, were significantly reduced. This provided much better connection between the design teams, sponsors, and class instructors. Fall 04-spring 05 teams included over 22 design projects, while five design projects were sponsored during the summer 05. This fall (05), ME and EE have merged their respective capstone classes into one class in order to provide the best possible design teams. Steve Beyerlein, Don Elger, and Joe Law (EE) are the instructors for this year's capstone sequence. It is anticipated that once again over 20 design projects will be sponsored.

Typical of past years, ME student projects stole the show at the Engineering Design Expo, which was held May 1 at the Student Union Building. Award winners included "Airbag Automation," sponsored by Autoliv, and "UI Clean Snowmobile," sponsored by NIATT, while the People's Choice Award went to "Shot in the Dark," sponsored by ATK.

ME Seniors Hattie Hiatt and Jason Harwood explain their capstone project (Airbag Automation) to UI President Tim White during Expo 2005.

ME Senior Russell Schiermeier (right) describes the "quieter" aspects of the UI Clean Snowmobile design project to curious onlookers at Expo 2005.

Words from the Chair

Don Blackketter
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Professor and Chair

Dear Alumni and Friends,

Welcome to an exciting year of change in the ME Department. As you may know, Ralph Budwig has completed his term as chair, and I am honored to have been chosen to be the chair for the next four years. Ralph is headed off to Boise for a year jubilee (sabbatical) to rebuild his research and recharge his energy. I personally want to thank Ralph for his excellent leadership for the past five and half years. We have also gained three new or returning faculty members. Steve Penoncello is returning from the Dean's office after his year long sabbatical at Isothermal Systems Research. Richard Jacobsen is also rejoining the department after five years as the Lab Director at INEL. Dave Thompson is in our department after five years of being Dean of the COE. We welcome their help and enthusiasm.

We continue to grow. We graduated one of our largest classes with 60 BSME graduates. We also had 26 Master's and 3 Ph.D. students earn degrees. The ME Department awarded more than $102,000 in ME scholarships that includes a $15,000 graduate scholarship from former ME faculty member Richard Stewart. At the same time, our research expenditures were nearly $2M. Our Sr. Design program has always been a highlight of our curriculum. Steve Beyerlein and Ed Odom worked to improve it further by collaborating with the ECE Department to make the experience more interdisciplinary. Don Elger is leading an effort to take this one step further by collaborating with the College of Business in the development of a university-wide capstone entrepreneur program. Russ Porter has done a fantastic job in revamping our machine shop so that it continues to be the best and most modern shop in the university. At the other end, we have 81 new ME freshmen. We continue to lead the college in enrollment.

To meet our growing demands, the college and ME Department have initiated a campaign for a new building that will house our Sustainable Energy Research Facility. This facility will primarily be laboratory space to meet our increasing research and undergraduate lab needs. We have already obtained nearly $1M for the planning and site work on a building that is estimated to have a final cost of $10M. We are looking for a mix of private and federal funds to meet the goal. There is a naming opportunity for the building that may be of interest to someone. In light of this, it may be obvious that we will be increasing our emphasis on connecting with our alumni and friends. We are thankful for our alumni support, both in terms of gifts, donated equipment, and support of our Sr. Design program. I know that we have many other alumni that share our commitment to excellence. Don't forget to take advantage of the Idaho Tax Law that makes giving to the UI/ME almost painless!

The Advisory Board is becoming an increasingly important partner in our efforts to provide the best ME education in the northwest. We will be taking the advice from our board by adding several new members. The board is helping us prepare for our ABET review in the fall of 2007, and has helped us obtain equipment and provided insight into how we can improve our program. This next year, I will also ask them to help us in our Centennial Celebration in 2007. That's right, the College of Engineering will 100 years old in 2007; stay tuned for upcoming related centennial events. Thanks to all our current board members, and don't be surprised if I contact some of you to participate on our board.

As you can see, I am excited about our students and programs. We invite you to stop by or email at anytime. In fact, a good time to visit is during our spring Engineering EXPO which will be April 28, 2006. I am asking you to set this date aside now for a one-of-a-kind display of senior projects. EXPO is truly a UI Signature Event. I hope to see you soon...

Don

ME NEWS

ME News is the newsletter of the University of Idaho Mechanical Engineering Department, PO Box 440902, Moscow, ID 83844-0902.
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Any opinions expressed herein are those of the writers and do not necessarily represent the official position(s) of the university or its Board of Regents.

Editor : Bob Stephens

University of Idaho

Former ME Students Use Past Work Experience to Obtain Quality Jobs

Jennifer Bell, BSME 2001, MSME 2003, began work for the Boeing Company in 2001 as a Payloads Design Engineer, focusing on design of interior panels on the 747 jet. Lay-offs at the company after 9/11 prompted Jennifer to continue graduate work on the UI campus which she had begun through Engineering Outreach.

Her thesis work focused on modeling the stress state of composite specimens. Upon completion of the degree, Jennifer returned to Boeing in the Component Test Lab for the new Boeing 787. Her group is charged with conducting the wing-destruct test that determines the maximum flexibility of the aircraft wings.

Jay Zmuda, BSME 2005, has been engineering since learning in childhood that things come apart and can be reassembled. Encouraged to find an internship as a junior, Jay discovered the Quest Aircraft Company of Sandpoint, a firm focused on design and manufacture of an aircraft suited to the needs of humanitarian groups providing access to people in the most geographically-challenging regions of the world. Jay's internship as drafter and designer lasted for two summers and during UI holidays.

Quest provided an exemplary training environment as Jay was involved with the entire engineering process, from theory, to design, to final installation on the plane. His time at Quest showed how very applicable his education could be and he returned to school with an enthusiasm and vigor he had never before experienced. Jay is now a full-time engineer at Quest.

Jay takes a break while recreating in New Zealand

Upcoming Events

- The ME Department's fall barbecue was enjoyed by nearly 200 students, faculty, staff, and family members. Door prizes were an especially popular feature of the afternoon. Special thanks to ASME officers and members who organized the event.
- SUSTAINABLE ENERGY CONFERENCE:"Sustainable Transportation: On Campus and in the Community," on campus September 22-23. $50 conference registration; scholarships for students. For more information/registration, go to www.webs1.uidaho.edu/niatt/
- EXPO 2006, April 28, the exhibition of Capstone projects prepared by student teams for sponsors, private clients, or large companies takes place at the UI Student Union Building from 9:00 A.M. until the awarding of prizes late in the afternoon. The EXPO website is www.engr.uidaho.edu/expo/
- The ADVISORY BOARD will meet on Saturday, April 29, 2006, time TBA
- ASME — Associated Students of Mechanical Engineering, student group led by Professor Steve Beyerlein and elected ME majors. Activities for Fall include:
  Oct. 11 Senior Snapshot Day (at UI) and Career Fair (at WSU)
  Oct. 13 Micron presentation
  Oct. 21-22 Regional Student Leadership Conference
  Nov. 4 Tour Bayview Navy Base
  Dec. 6 Senior Snapshot Day
  Check the ASME website, www.uidaho.edu/student_orgs/asme
- Stay abreast of UI Mechanical Engineering news, log onto www.uidaho.edu/engr/ME/

Keep in touch!

We want to hear from you!

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UI Clean Snowmobile Challenge Team Pushes the Envelope in Engine Technology

UI ME Senior Russell Schiermeier puts the UI clean snowmobile through its paces during the handling event

Composed primarily of Mechanical Engineering students, the UICSC team achieved back-to-back first place victories in the Society of Automotive Engineers Clean Snowmobile Challenge in 2002 and 2003. These successes were accomplished using a four-stroke BMW motorcycle engine. While four-stroke engines are inherently cleaner than two-stroke engines, they are much heavier. Avid snowmobile riders still prefer the lighter and more powerful two-stroke engine.

The major drawbacks to carburated two-stroke engines are high exhaust emissions and poor fuel economy. As much as half of the entering fuel can exit the combustion chamber unburned, causing the infamous "blue smoke" and reducing fuel economy. To counteract these disadvantages, the UI Team developed a direct-injection two-stroke engine. In a DI two-stroke, fuel is injected directly into the cylinder at the optimal time for complete mixing and combustion. The UICSC team decided to adapt the DI system used on Evinrude's new two-stroke outboard E-TEC engines.

At the 2005 competition, the UI team placed second in the acceleration event, first in the oral presentation and second in the static display. The UI snowmobile was the lightest snowmobile at the competition, with a weight of 586 pounds with a full tank of fuel. It also cold-started easily at 0°F.

With help from a snowmobile manufacturer, the team is continuing its perfection of snowmobile direct-injection technology and intends to resume its winning ways in 2006.

More information on the competition can be found at: www.sae.org/students/snow.htm.

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