Re-Engineering for a Sustainable Future

The UH Mānoa College of Engineering is an indispensable facet of sustainable living in Hawai‘i and the Asia-Pacific region. It is recognized as leading the development of innovative solutions to meet the increasingly complex needs of our society.
ENROLLMENT

- From 2006 to 2015 engineering undergraduate enrollment has risen by 30% from 806 to 1,047. Pre-Engineering began in 2006 and has risen to a total enrollment of 289 in 2015. Thus the number of students studying for an undergraduate engineering degree has risen by 66%. The average number of graduate students enrolled is 178. Total College enrollment topped 1,000 for the first time since 1994 in 2011. Approximately 20% of the undergraduate students and 20% of the graduate students are female. Approximately 2% of the undergraduate students are international and approximately 32% of the graduate students are international.

- On a yearly basis, the College enrolls an average of 150 students as freshman every year and an average of 95 students transfer in.

FACULTY/STUDENTS

- Approximately 60% of students beginning studies as freshman in engineering graduate with a degree from UH in six years and approximately 45% graduate with an engineering degree in six years.

- On average, over the last three years, the College has awarded about 40% more bachelor’s degrees than the average of the four years prior to this period. Over the same comparative time period, 87% more women earned their BS degrees. To date, the College has awarded over 10,600 engineering degrees (BS, MS and PhD).

- The College has 51 tenure track faculty, five of whom are women. Twenty-one or 39% of the faculty have been hired since 2006. Faculty numbers in each of the College academic units has remained approximately unchanged since 2006 with 16 in civil and environmental engineering, 18 in electrical engineering and 14 in mechanical Engineering (another four are in the Dean’s Office and a research center).

- With 51 tenure track faculty, the undergraduate engineering student to faculty ratio is about 26:1. This is a favorable number compared to many mainland engineering colleges.

TUITION AND FEES

- Tuition and fees for undergraduate engineering in the 2015–2016 academic year are:
  - Freshman: Residents: $5,582 per semester (12 or more credits); Non-Residents: $15,758 per semester (12 or more credits)
  - Sophomore and up: Residents: $6,082 per semester (12 or more credits); Non-Residents: $16,258 per semester (12 or more credits)

- These figures include various levels of fees per semester. For sophomore students and up, $500 of these fees goes directly to the College for laboratory support.

Tuition and fees for graduate engineering in the 2015–2016 academic year are: $5,164 per semester for residents (8 or more credits) and $11,860 per semester for non-residents (8 or more credits).

- Over $340,000 was awarded by the College last year in scholarships.

BUDGET

- The College’s budget is approximately $17 million dollars annually, comprised of $10.3 million in state and tuition funding and student fees, $6.0 million in extramural funding, and $1 million in philanthropic gifts.

PROGRAMS

- The College houses four undergraduate degree programs in civil and environmental engineering, computer engineering, electrical engineering, and mechanical engineering. While this is a fewer number of disciplines than many U.S. mainland colleges offer, most U.S. graduate engineering programs can be entered through those offered at the College. The Computer Engineering Program was begun in 2010 and has grown successfully to 90 students in 2015.

- Undergraduate programs are accredited by the Engineering Accreditation Commission of ABET. Amongst ABET accreditation metrics are some that are less well appreciated and include: ability to (1) function on multidisciplinary teams, (2) understand professional and ethical responsibility, (3) communicate effectively, (4) understand the impact of engineering solutions in a global context, (5) recognize the need for and to engage in life-long learning, (6) know of contemporary issues. The College strives to continually improve these qualities in its graduating students, as well as the more traditional qualities associated with an engineer. All of the College
OUTREACH/COMMUNITY

- The College has been heavily involved in outreach to the Hawai‘i K-12 schools with at least three major events per year held at the College, and many visits to schools and career fairs around the state. The College has a full time staff member devoted to Science, Technology, Engineering and Mathematics (STEM) outreach. The State of Hawai‘i passed enabling legislation in the form of ACT 111 that allows it to fund STEM outreach and the College subsequently received ~$6M from the state to pursue STEM outreach from 2008–2011, including research experiences of teachers and robotics programs.

- The Dean of Engineering leads an “Engineering Consortium,” initiated in 2008, which involves all UH Campuses, and is directed at helping students from the Community Colleges enter an engineering or physical sciences program at a four-year college in Hawai‘i.

- In 2007 the College formed the Dean’s Council, comprised of almost 40 external community leaders with a strong desire to see the engineering profession in Hawai‘i thrive and grow stronger. With the Council’s help the College developed a strategic plan that developed the College’s three broad focus areas:
  - Sustainability
  - Infrastructure in Support of the Environment
  - IT and Cyber Systems

RESEARCH

- Since 2004, research expenditures from external funding sources has risen from approximately $4 million to $8.4 million per year. While approximately 40% of funding in 2004 was obtained from Federal set asides, all funding obtained by the College is now won competitively. The College has identified eight research clusters and a research center where it is building excellence and seeking to be national class:
  - Autonomous Systems and Robotics
  - Big Data and Cyber Security
  - Biomedical Engineering
  - Coastal Infrastructure
  - Computer and Computational Engineering
  - Sustainable Material and Manufacturing Technology
  - Renewable Energy and Island Sustainability
  - Water, Waste and Environmental Engineering

- The S1 tenure track faculty members attract approximately $6.0 million of external funding per year, which amounts to approximately $120,000 per year per faculty. The College is striving to raise this number to $250,000 per year per faculty on a par with most mainland colleges of engineering.

- The College hosts the Hawai‘i Center for Research Development Industry/Workforce

INDUSTRY/WORKFORCE DEVELOPMENT

- College faculty members regularly serve as members of organizing committees of international conferences held in Hawai‘i and many times are (co) chairs of these conferences. These faculty are regularly honored by the Hawai‘i Tourism Agency for bringing conferences to Hawai‘i and bringing international recognition to the College and the University.

- The College operates a Career Fair for its students every Fall and Spring semester with approximately 70 companies and organizations in attendance, representing both Hawai‘i companies and some larger employers from the West Coast of the US mainland.

- Non-scientific surveys of College graduates have indicated that approximately 60% of electrical engineers, 50% mechanical engineers, and 30% of civil engineers leave the state after graduating. UH Mānoa College of Engineering graduates who find careers on the mainland provide a very valuable pool from which Hawai‘i companies can draw on when they are searching for experienced engineers to hire.

- The College has graduated many engineers who have gone on to fill important positions and roles in Hawai‘i. The Hawai‘i Council of Engineering Societies (HCES) makes three awards annually marking the achievements of Hawai‘i’s engineers. Since 1964 College alumni have won the Engineer of the Year award 29 times, since 1984 College alumni have won the Young Engineer of the Year award 20 times, and since 2004 College alumni have won the HCES Lifetime Award eight times. We list the recent awards:

<table>
<thead>
<tr>
<th>Year</th>
<th>Engineer of the Year</th>
<th>Class</th>
<th>Young Engineer of the Year</th>
<th>Class</th>
<th>Lifetime Achievement Award</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>Brennon Morioka</td>
<td>(99)</td>
<td>Troy Ching</td>
<td>(07)</td>
<td>Stanford Yuen</td>
<td>(66)</td>
</tr>
<tr>
<td>2015</td>
<td>Gary Chock</td>
<td>(78)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>Jan Young</td>
<td>(79)</td>
<td>Timothy Lum Yee</td>
<td>(07)</td>
<td>Lawrence Agena</td>
<td>(64)</td>
</tr>
<tr>
<td>2013</td>
<td>Ronald Ho</td>
<td>(67)</td>
<td></td>
<td></td>
<td>Robert G. F. Lee</td>
<td>(71)</td>
</tr>
<tr>
<td>2012</td>
<td>Sheryl Nojima</td>
<td>(80)</td>
<td></td>
<td></td>
<td>Stanley Tamahana</td>
<td>(66)</td>
</tr>
<tr>
<td>2011</td>
<td>Florence Marcelo Ching</td>
<td>(97)</td>
<td></td>
<td></td>
<td>Manabu Tagomori</td>
<td>(57)</td>
</tr>
<tr>
<td>2010</td>
<td>Masanabu Fujikoa</td>
<td>(73,78)</td>
<td>Paulette B.L. Fujimori</td>
<td>(97)</td>
<td>James Honke</td>
<td>(73)</td>
</tr>
<tr>
<td>2008</td>
<td>Ken Hayashida</td>
<td>(83)</td>
<td>Cathy Leong</td>
<td>(96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>Bernard P. Kea</td>
<td>(62)</td>
<td>Jeffrey Kalani</td>
<td>(96,97)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>John Katahira</td>
<td>(93,95)</td>
<td></td>
<td></td>
<td>Stanley Kawahigashi</td>
<td>(63)</td>
</tr>
<tr>
<td>2004</td>
<td>Dennis Lee</td>
<td>(70)</td>
<td>Lorna Heller</td>
<td>(93)</td>
<td>Ted Kawahigashi</td>
<td>(57)</td>
</tr>
<tr>
<td>2003</td>
<td>Wallace Miyahira</td>
<td>(54)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>Wesley Segawa</td>
<td>(75)</td>
<td>Tony Lau</td>
<td>(92)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>Lester Fukuda</td>
<td>(76)</td>
<td>Brennon Morioka</td>
<td>(99)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Lisa Chan</td>
<td>(87)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HOW CAN YOU HELP THE COLLEGE?

• Give/create College scholarship funds to help needy and deserving students who want to pursue an engineering career.

• Talk passionately to Hawai‘i Legislators and UH Mānoa leadership about the importance of engineering to the State of Hawai‘i.

• Get involved with the College outreach and student retention activities.

• Sponsor interns in your company/organization.

• Support the College Alumni organization.

• Hire UH Mānoa College of Engineering student graduates.

• Give funds directly to the College.

• Regularly browse the College website for information and updates: www.eng.hawaii.edu

• E-mail Dean Peter Crouch: peter.crouch@hawaii.edu with your questions.