



University of Dayton

Mechanical and Aerospace Engineering

Annual Report 2014-2015

From the Chair

2014-2015 was another strong year for the Department of Mechanical and Aerospace Engineering. Both undergraduate and graduate enrollment saw strong growth, while the academic preparation of the incoming undergraduate and graduate students improved. Our students continued to excel. Many of them were honored with prestigious awards. The success rate of our recent graduates remains very high. Our faculty continued to excel in teaching, scholarship and service.



Dr. Eddy Rojas became Dean of the School of Engineering in July 2014. Dr. Rojas launched a school-wide initiative to develop a strategic plan. Our vision is "Igniting passion. Engineering the future. Making a difference." The strategic plan is available at: <https://www.udayton.edu/engineering/sp/index.php>

The department's principle challenge was accommodating continued enrollment growth. The teaching and advising loads of our full-time faculty are among the highest in the university, especially for a department with a robust graduate research program. We conducted searches for three new tenure-track faculty in the areas of energy, controls and aerospace. We hired Andrew Chiasson, an expert in solar and geothermal energy, to begin in Fall 2015. The searches for faculty with expertise in controls and aerospace engineering are on-going. We will also begin a search for an additional tenure-track faculty member. Thus, in 2015-2016 we will be conducting searches for three new faculty members to join us in Fall 2016.

The Department of Mechanical and Aerospace Engineering is clearly a flagship department within the University of Dayton. Please continue to follow our progress at: https://www.udayton.edu/engineering/departments/mechanical_and_aerospace/index.php

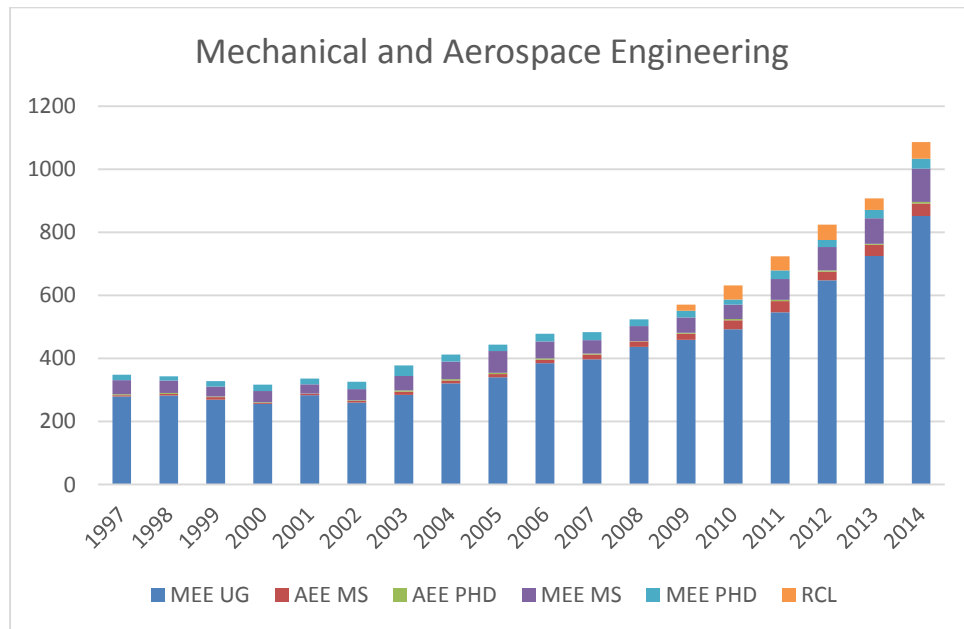
Sincerely,

J. Kelly Kiscock, Ph.D., P.E.
Chair, Department of Mechanical and Aerospace Engineering / Renewable and Clean Energy

Students

Enrollment

Over the last few years enrollment in the Mechanical and Aerospace Engineering Department has increased significantly. In the last three years alone enrollment grew by 50% from 724 to 1,086 students. Our rate of growth is 247% faster than Mechanical Engineering programs nationwide. We are the single largest department in the University of Dayton and one of the few that offers B.S., M.S. and Ph.D. degrees. Our department now accounts for over 10% of all enrollment at UD.



Source: UD Factbooks (http://www.udayton.edu/finadmin/ir/university_facts.php)

Enrollment by program is shown below:

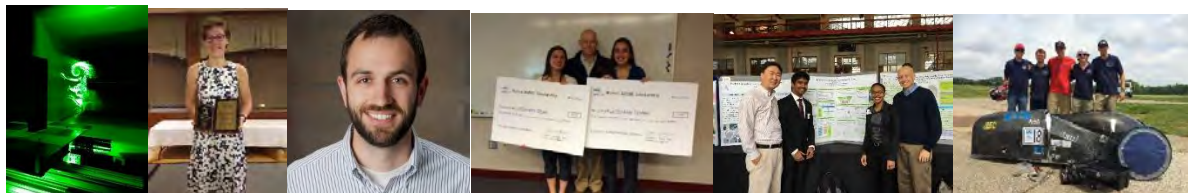
	Fall 2011	Fall 2012	Fall 2013	Fall 2014
MEE UG	546	648	725	852
AEE MS	36	27	36	39
AEE PHD	4	4	3	5
MEE MS	66	74	81	106
MEE PHD	27	23	26	31
RCL MS	45	48	37	53
Total	724	824	908	1,086

Fall 2014 Freshman Class

In Fall 2014, 197 students enrolled in our department as freshman. This was our largest freshman class ever. 13% of the class were international students. 19% of the class were females. The average ACT was 29.1 and the average high school rank was 76%.

Student Achievement

- Omar Memon received 1st place for the photo "Kokopelli Vortex" in the Art in Science Competition at the Dayton-Cincinnati Aerospace Sciences Symposium.
- The Wright B Flyer Silver Bird team (Denton Sagerman, Eunsung Shin, Alex Watt, Seth Wieging, Domenic Miccinilli, Matthew Pulfer) placed 2nd in the AIAA Region 3 Student Conference
- Abigail Spohn received the Student Leadership Award "Mary M. Shay Award for Outstanding Excellence in both Academics and Extracurricular Activities" and the "Society of Women Engineers SWE Outstanding Collegiate Member" award.
- Alex Watt, Katelyn Dvorsky and Matt Pulfer received awards at the International IT Flies Competition in Dayton Ohio for their innovative aircraft designs.
- Alexandra Brogan and Vijay Gopalakrishnan received the 2014 U.S. Department of Energy Excellence in Applied Energy Engineering Research Award
- Dustin Pohlman received the 2015 U.S. Department of Energy IAC Alumni Award
- Senia Smoot received best presentation in Biomedical Engineering at 2014 Dayton Engineering Sciences Symposium
- Caroline Feldman received the National ASHRAE Lynn Bellenger Engineering Fellowship
- Alex Brogan received the Dayton ASHRAE Chapter Rapier Commemorative Scholarship
- Megan Feldman received the Dayton ASHRAE Chapter Scholarship
- John Shultz received the Dayton ASHRAE Mark Keller Memorial Scholarship
- Vijay Jayaprakash received the Society of Asian Scientists and Engineers 2015 SASE Collegiate Star Award (Midwest Region) for founding the UD SASE Chapter.
- The UD Supermileage team of Matt Farkosh, Dan Sager, Daryl Osterloh, Travis Venanzi and Eric McGill achieved 195 mpg in the SAE Supermileage competition in Marshall Michigan on June 5, 2015.
- The UD Solarsplash team of Cory Bucksar, David Perkins, Tyler Edwards, Travis Bills, Yu Zheng, Mustafa Almashari placed 7th in the IEEE/ASEM Collegiate Solar Boat Championship in Dayton, Ohio on June 9-14, 2015.
- Matt Pulfer, Alex Watt and Rachel Petro led UD to a tie for first place with Glyndwr University based on their simulation of the Wright Flyer Silver Bird at the IT Flies 2015 UK event.
- Kevin Giaier received the Outstanding Research Award at the inaugural Graduate Student Showcase held on April 15, 2015.
- Many students presented research posters at the 4/15/2015 Stander's Symposium.



Kokopelli

Abigail Spohn

Dustin Pohlman

Alex Brogan and Caroline Feldman

Standers Symposium

Supermilage

Flyer First Destination 2013-2014

Six months after graduation, 96% of our undergraduate students have full time jobs or are going to graduate school. Salaries ranged from \$41,600 to \$84,000 with an average of \$59,458. 19% of undergraduates continued to graduate school at Kentucky, Case Western, Michigan, University of Dayton and other universities.

Faculty and Staff

The Department has 17 full-time faculty members and four staff members

	Full-Time Faculty	Position	Expertise
1	Henrick, Andrew	Lecturer	Thermal/fluids
2	Perkins, Dave	Lecturer	Mechanical systems
3	Kinney, Allison	Assistant Professor	Biomechanics
4	Heyne, Josh	Assistant Professor	Combustion
5	Choi, Jun-ki	Assistant Professor	Design for environment
6	Rumpfkeil, Markus	Assistant Professor	Computational fluid dynamics
7	Bigelow, Kimberly	Associate Professor	Biomechanics
8	Petrykowski, John	Associate Professor	Thermal/fluids
9	Pinnell, Margaret	Associate Professor	Materials
10	Myszka, Dave.	Associate Professor	Mechanical systems
11	Altman, Aaron	Professor	Aerospace
12	Ervin, Jamie S.	Professor	Thermal/fluids
13	Hallinan, Kevin	Professor	Energy
14	Jain, Vinod K.	Professor	Mechanical systems
15	Kashani, Ahmad	Professor	Dynamic systems and controls
16	Kissock, Kelly	Professor and Chair	Energy
17	Murray, Andrew	Professor	Mechanical systems
	Staff	Position	
1	Stuck, Ginger	Administration	
2	Alexander, Sherri	Budgeting and purchasing	
3	Strunks, Michelle	Academic coordinator	
4	Butts, Judi	Undergraduate advising	

New Additions

Dr. Josh Heyne joined the department as an Assistant Professor after completing his Ph.D. at Princeton University specializing in combustion. Dr. Allison Kinney joined the department as an Assistant Professor after completing a post-doc at University of Florida specializing in biomechanics. Judi Butts joined the department as an undergraduate advisor after advising students at Sinclair Community College. Both Josh and Judy were graduates from our undergraduate program.



Josh Heyne



Allison Kinney



Judi Butts

Part-time Faculty

In addition to the full-time faculty, we hired 24 part-time faculty with exceptional professional backgrounds to help teach our classes. About 30% of all MEE classes are taught by part-time faculty.

Faculty Achievement

- Kim Bigelow was promoted to Associate Professor with tenure.
- Aaron Altman was promoted to Professor
- Aaron Altman received the 2015 Affiliate Societies Council Outstanding Engineers' and Scientists' Award and the 2015 Alumni Award for Teaching
- Drew Murray was elected an ASME Fellow
- Drew Murray is Associate Editor, ASME Journal of Mechanism and Robotics
- Dave Myszka is Associate Editor, ASME Journal of Mechanical Design
- Eight MEE faculty received KEEN grants for teaching innovation

U.D. Mechanical Engineering faculty have now received five university teaching awards and three university scholarship awards, more than any other department.

Faculty Scholarship

In calendar year 2014, the 15 tenure-track MEE faculty and their students published 23 archival journal and 27 peer-reviewed conference papers, for an average of 3.3 publications per tenure-track faculty member. In academic year 2014-2015, total MEE research expenditures were \$953,406 for an average of \$63,560 per tenure-track faculty member. 12 of 15 MEE tenure-track faculty were engaged in externally-supported research. This is the fifth highest research expenditures of any academic department in the university behind Teacher Education, Electro Optics, Electrical and Computer Engineering, and Chemical Engineering.

Principle Investigator	Sponsor
Bigelow, Kim	National Science Foundation
Choi, Jun-Ki	Gosiger Inc
Hallinan, Kevin	Dayton Power and Light
Hallinan, Kevin	Vectren Energy Delivery
Hallinan, Kevin	National Science Foundation
Heyne, Josh	Federal Aviation Admin
Kashani, Ahmad	Chrysler Corporation
Kissock, J.K.	US Department Of Energy
Kissock, J.K.	Mid-Ohio Reg Planning Comm
Murray, Andrew	National Science Foundation
Myszka, Dave	Emerson Climate Technologies
Pinnell, Margaret	National Science Foundation
Rumpfkeil, Markus	Innovative Scientific Solutions
Rumpfkeil, Markus	Flairsoft LTD LLC
Altman, Aaron	UD Research Institue / WPAFB
Ervin, Jamie	UD Research Institue / WPAFB

Curricular Highlights

CO-OP

388 Mechanical Engineering undergraduate students and 10 RCL graduate students participated in the engineering COOP program. World class employers included: General Electric, Emerson Climate Technologies, Ford Motor Company, BMW, Cummins, Cargill, Ethicon, Honda, Parker Hannifin, UTC Aerospace Systems, Battelle, Go Sustainable Energy, Plugsmart and Energy Resource Solutions.

Senior Capstone Design

During the senior year, students choose from 109 sponsored design projects, taking ideas from problem, to concept, to detailed design, to prototype, to test in close collaboration with project sponsors.

ETHOS

Eight Mechanical Engineering students spent their summers developing appropriate technologies and expanding their world view through ETHOS: Dan Striebich and Olivia Bayer in Guatemala, Saehan Lenzen and Michael Stewart in Dominica, Michael Ising, Matt Lickenbrock, Maria Lupp and Ryan Schuessler in India.

RCL

The Renewable and Clean Energy master degree program continues to attract exceptional students, including students from 22 countries, five Fulbright Scholars, and four Brazilian Scientific Mobility Graduate Scholars. Graduates are in such high demand that an innovative internship program was launched to give students professional energy systems experience as part of their graduate program.