



University of Dayton

Mechanical and Aerospace Engineering

Annual Report 2016-2017

From the Chair

2016-2017 was another strong year for the department. Our combined undergraduate and graduate enrollment is 1,077 students. We are 50th largest undergraduate Mechanical Engineering program in the country and more than one in ten UD students calls our department home.

Our students continued to excel and are honored with Academic All-American and research awards. From Fall 2016 through Summer 2017, 249 students from our department worked 333 co-op terms. Within six months of graduation, 95% of our students found full-time employment or enrolled in graduate school.



Our faculty and staff grew significantly in 2016-2017 as we welcomed four new Assistant Professors, a new administrative assistant, and a new lab manager. In Fall 2017, we plan to welcome a new Professor of Practice and begin a search for a Lecturer in thermal/fluid engineering.

Our faculty continued to excel in teaching, scholarship and service. Three faculty were honored with teaching awards. Two more faculty were named as Associate Editors of major research journals, bringing the total number of Associate Editors in our department to five. Faculty publications and sponsored research increased significantly. The faculty published 65 peer reviewed papers and conducted \$2.0M in sponsored research. Moreover, faculty were active in community helping modify toy cars for children with special needs.

ABET accreditors visited us in Fall 2016, and after a thorough review of our curriculum, faculty, resources, process for continuous improvement and student outcomes, granted the department full accreditation for the next six years. In his inaugural address, President Spina called for UD to become 'The University for the Common Good' and laid out major research objectives in Sustainability, Health and Bio-Sciences, and Autonomous Systems – all which are consistent with the actions, aspirations and contributions of our department. Please continue to follow our progress at:
https://www.udayton.edu/engineering/departments/mechanical_and_aerospace/index.php

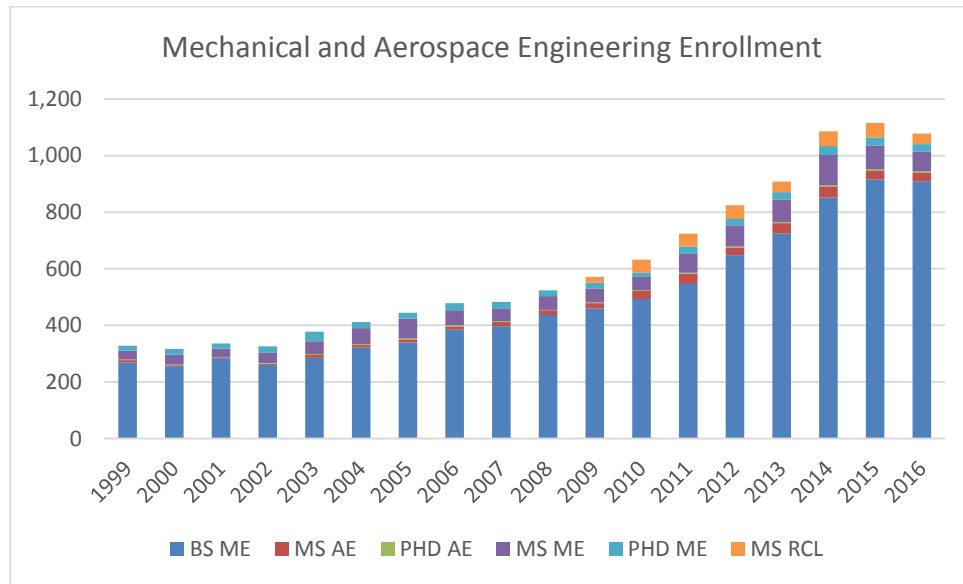
Sincerely,

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

Students

Enrollment and Graduation Data

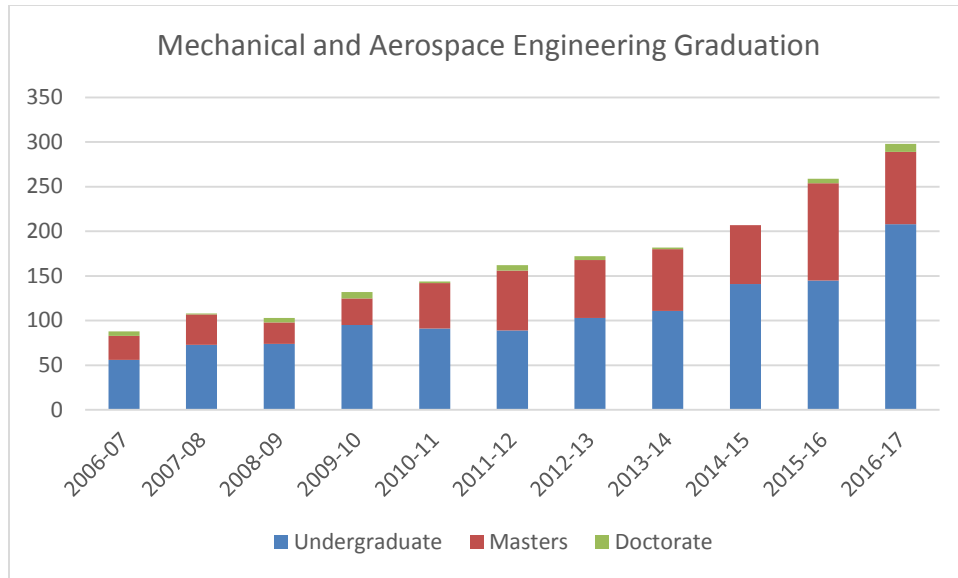
After several years of significant growth, both undergraduate and graduate enrollment have leveled off. We remain the single largest department in the University of Dayton and one of the few that offers B.S., M.S. and Ph.D. degrees. The Mechanical and Aerospace Engineering Department accounts for over 10% of all enrollment at UD.



Enrollment by MEE program is shown below:

	2010	2011	2012	2013	2014	2015	2016
BS ME	493	546	648	725	852	916	909
MS AE	28	36	27	36	39	29	30
PHD AE	4	4	4	3	5	6	5
MS ME	46	66	74	81	106	84	70
PHD ME	16	27	23	26	31	29	26
MS RCL	45	45	48	37	53	51	37
MEE G	139	178	176	183	234	199	168
Total	632	724	824	908	1,086	1,115	1,077

The number of students graduating has increased with enrollment. In 2016-2017, we granted 208 BME degrees, 81 MS degrees and 9 PhDs. The program graduation rate is very high; a detailed study of the 2006 – 2009 cohorts showed that 66% of undergraduate students who enrolled in MEE graduated with a BME degree from UD, and 14% graduated with another UD degree. 97% of our MEE students graduate in 9 semesters or less. We are 50th largest undergraduate Mechanical Engineering program in the country based on number of students graduating (ASEE Engineering By the Numbers: 2014-2015).



Fall 2016 Freshman Class

In Fall 2016, 128 students enrolled in our department as freshman. Statistics from the entering class are shown below. Typically, our freshman class grows by about 50 students after students who initially enroll in Discover Engineering select Mechanical Engineering as their major. The Fall 2017 entering class looks to be the largest ever with 191 students.

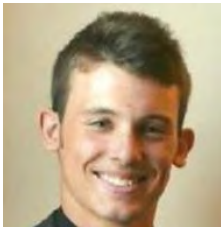
Total	128	Average GPA	3.89
Male	109	Average ACT	28.8
Female	19	Number with AP	77
Frac Female	0.15	Fraction with AP	0.60
International	3	Number from OH	57
Honors	49	Fraction from OH	0.45

Student Achievement

Congratulations to:

- Robert Stachler who won the AIAA/ASME Dayton Section Executive Board Young Engineer of the Year award.
- Christopher Beaschler (Football) and Hunter Johnston (Cross Country) for being named Academic All-Americans.
- Chris Beaschler for being named a finalist for the National Football Foundation (NFF) & College Hall of Fame 2016 William V. Campbell Trophy as the best football scholar-athlete in the nation.
- Mason Round who won the North American Die Casting Association David Laine Scholarship.
- Tanner Rolfe who won the American Association for Advancement of Science (AAAS) Science and Human Rights Coalition third annual student essay competition with his essay "Living Water: A Catholic Social Teaching Perspective on PFOA and Human Rights".
- Tanner Rolfe who won the "Best Overall Presentation" in the "Undergraduate Competition" at the Dayton Engineering Sciences Symposium for his talk entitled "Design and Prototyping of a Shape-changing Rigid-body Human Foot in Gait".

- Erin Peiffer who won the "Best Technical Presentation" in the undergraduate competition at the Dayton Engineering Sciences Symposium for her talk entitled "Testing of a State of the Art Rocket Barn".
- Madeline Beban who was selected for a Washington Internship in Science and Engineering representing ASHRAE.
- Lauren Rivera was runner up for the University Riley Award
- Sarah Hollis who won a best presentation award at the Dayton Engineering Sciences Symposium.
- Abdeel Roman who won a Science, Mathematics, and Research for Transformation scholarship from Department of Defense.
- Asa Palmer and Kayla Pariser who won NASA/Ohio Space Grant Consortium Scholarship awards.
- The UD Supermileage Team who placed 7th in the 2017 International SAE Supermileage Competition at the Eaton Proving Grounds in Marshall, MI by almost doubling our fuel economy from last year and finishing with a result of 529 miles per gallon. The team was led by Ryan Hoyt, Eric McGill, Daryl Osterloh, Hannah Olson.
- Vijay Gopalakrishnan, Alex Brogan, Zack Valigosky, Kathryn Sturtevant and Kelly Kissock who won an ASHRAE Best Technical Paper Award for "Improving Variable Speed Pumping Control to Maximize Savings".
- Graduation Awards
 - The Bernard F. Hollenkamp, '39 Memorial Award of Excellence to the Outstanding Senior in Mechanical Engineering: Brandi Gerschutz
 - The Martin C. Kuntz, 1912 Award of Excellence to the Outstanding Junior in Mechanical Engineering: Samuel Barnhart
 - The Class of 1902 Award of Excellence for Outstanding Mechanical Engineering Achievement: Hunter Johnston
 - The Brother Andrew R. Weber, S.M. Award of Excellence for Outstanding Service & Achievement in Mechanical Engineering: Lauren Rivera
 - Professor Henry Chuang Award of Excellence – Energy Conservation & Waste Management: Ryan Schuessler
 - Outstanding M.S. Research Award for Mechanical Engineering: Michael Ising
 - Outstanding Ph.D. Research Award for Aerospace Engineering: Tariq Khamlaj
 - Outstanding Ph.D. Research Award for Mechanical Engineering: Tim Vincent



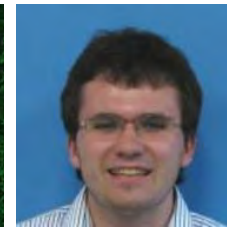
Hunter Johnston



Chris Beaschler



Tanner Rolfe



Robert Stachler



V. Gopalakrishnan
Kathryn Sturtevant

Co-operative Education

Our co-operative education program enables students to learn to succeed in a professional engineering environment. Overall, 78% of Mechanical Engineering students complete a co-op or internship before graduation. In Fall 2016 we started the Introduction to Cooperative Education course, which enrolled 184 MEE students. We continue to have more demand for our co-op students than we can fulfill. From Fall 2016 through Summer 2017, 249 students from our department worked 333 co-op terms. 89% of the placements were in Ohio. Our top 20 co-op employers are shown below.

GE Aviation	University of Dayton Research Institute
Emerson Climate Technologies, Inc.	Crane Pumps & Systems
GE Appliances	DRT Holdings, Inc.
Tenneco	Inteva Products, LLC
Parker Hannifin Corporation	Makino
Honda	Melink Corporation
Johnson & Johnson	Silfex Inc.
Midmark	Cargill, Inc.
Johnson Electric	Cornerstone Research Group, Inc.
Fecon, Inc.	Cummins Inc.

Flyer First Destination 2015-2016

The success rate for recent graduates is 95%; six months after graduation, 76% of our undergraduate students had full time jobs and 19% went to graduate school. Average salary for our graduates accepting full time work was \$60,115. 26 students continued to graduate school, with 23 of those students continuing at UD.

FLYER FIRST DESTINATION SURVEY 2015-2016

THE SCHOOL OF ENGINEERING



FIRST DESTINATION AFTER GRADUATION

DESTINATION	RESPONSES	PERCENTAGE
Employed	254	74%
Attending Graduate School	64	19%
Military Service	4	1%
Personal Interests	2	1%
Volunteer or Service Program	1	<1%
Post-Graduation Internship	1	<1%
Actively Seeking Employment	14	4%
Actively Seeking Education	0	0%
Unsure of Plans	3	1%

95%
SUCCESS RATE

343
TOTAL RESPONSES

88%
KNOWLEDGE RATE

Alumni Achievement

Congratulations to:

- Jon Dekar president and co-founder of Desin LLC who won an R&D100 award for Obi.
- Ryan Hoffman who was named a Principal at Heapy Engineering for his leadership on sustainability and energy.

Faculty and Staff

Faculty and Staff Listing

The Department has grown to 22 full-time faculty members and four staff members.

	Full-Time Faculty	Position	Expertise
1	Lowe, Robert	Assistant Professor	Engineering mechanics
2	Reissman, Tim	Assistant Professor	Controls and biomechanics
3	Reissman, Megan	Visiting Professor	Biomechanics
4	Gunasekaran, Sidaard	Assistant Professor	Aerospace
5	Chiasson, Andrew	Assistant Professor	Biomechanics
6	Kinney, Allison	Assistant Professor	Biomechanics
7	Heyne, Josh	Assistant Professor	Combustion
8	Perkins, Dave	Lecturer	Mechanical systems
9	Choi, Jun-ki	Assistant Professor	Design for environment
10	Henrick, Andrew	Lecturer	Thermal/fluids
11	Rumpfkeil, Markus P.	Associate Professor	Computational fluid dynamics
12	Bigelow, Kimberly E.	Associate Professor	Biomechanics
13	Altman, Aaron	Professor	Aerospace
14	Pinnell, Margaret F.	Associate Professor	Materials
15	Murray, Andrew P.	Professor	Mechanical systems
16	Kissock, Kelly	Professor and Chair	Energy
17	Kashani, Ahmad R.	Professor	Dynamic systems and controls
18	Ervin, Jamie S.	Professor	Thermal/fluids
19	Myszka, Dave.	Associate Professor	Mechanical systems
20	Hallinan, Kevin P.	Professor	Energy
21	Petrykowski, John C.	Associate Professor	Thermal/fluids
22	Jain, Vinod K.	Professor	Mechanical systems
23	Fehrman-Cory, Emily	Prof of Practice	Makers space, design
	Staff	Position	
1	Eric Grimm	Lab Manager	
2	Lindsey Temple	Administrative Assistant	
3	Sherri Alexander	Administrative Assistant	
4	Larry Collins	Flight Simulation Tech	

Faculty and Staff Additions

Over the year, we added six new faculty and staff who are already making great contributions in our classrooms and laboratories and to the administration of the department. Dr. Megan Reissman joined the department as an Assistant Professor after completing her Ph.D. at Northwestern University. Dr. Tim Reissman joined the department as an Assistant Professor after completing a post-doc at Northwestern University and a Ph.D. at Cornell University. Dr. Sid Gunasekaran joined the department as an Assistant Professor after completing his Ph.D. at the University of Dayton. Dr. Robert Lowe joined the department as an Assistant Professor after completing his Ph.D. at Ohio State University. Eric

Grimm joined the department as Lab Manager after graduating with B.S. and M.S. degrees from our program and working in industry and education. Eric is also coordinating the management of all laboratories across the School of Engineering. Lindsey Temple replaced Ginger Stuck as Administrative Assistant after working in real estate management. We wish Ginger Stuck well in her new role at the UD president's office after ten years in our department.



Megan Reissman Tim Reissman Sid Gunasekaran Robert Lowe Lindsey Temple Eric Grimm

Faculty Achievement

Congratulations to:

- Dave Myszka for receiving the 2016 School of Engineering Vision Award for Innovation.
- Andrew Chiasson for being named Associate Editor for the journal Geothermics.
- Andrew Chiasson for publishing a new text book Geothermal Heat Pump and Engine Systems: Theory and Practice.
- Tim Reissman for being named Associate Editor for the journal Assistive Technology.
- Allison Kinney for winning the Southwestern Ohio Council for Higher Education 2016 Faculty Excellence Award.
- Allison Kinney for winning the Dayton Delta Nu chapter of Pi Tau Sigma Professor of the Year Award.
- Bob Brecha for winning the College of Arts and Sciences Teaching Award.
- Jun-Ki Choi for winning the UDRI Research Fellowship Award.
- Dave Myszka and Haithem Murgham for being part of a team that filed the first patent from Emerson Climate Technologies' Helix research center."

Faculty Scholarship

The faculty published 26 archival journal articles and books and 39 peer-reviewed conference articles, compared to 17 archival journal articles and book chapters and 31 peer-reviewed conference articles last year. This equates to an average of 3.25 and a median of 3.50 peer-reviewed publications per tenure-track faculty member. They delivered 11 invited lectures. FY 2017 faculty research expenditures increased to \$1,998,339 compared to \$1,375,406 last year. Over the last two years, research expenditures have increased by 110%. Average research expenditures per tenure-track faculty member were \$99,917 and median expenditures were \$24,107. Research sponsors include:

American Society of Biomechanics	Kern Family Foundation
Chrysler Corporation	Kettering Health Network
City Of Dayton	National Science Foundation
Dayton Area Grad Studies Institute	Oak Ridge Institute for S & E
Dayton Power & Light	Ohio Department of Development
Emerson Climate Technologies	Tailoring DOE Modeling Tools
Evenflo Company	The University Of Tennessee
Flairsoft LTD LLC	Universal Technology Corporation
General Motors	US Department Of Energy
Goodwill Easter Seals	US Environmental Protection Agency
Ideation Techniques	US Federal Aviation Administration
Initial Transient Simulation	Vectren Energy Delivery
Innovative Scientific Solutions	VEGA Americas Inc

Curriculum Update

ABET Accreditation

ABET accreditors visited us in Fall 2016, and after a thorough review of our curriculum, faculty, resources, process for continuous improvement, and student outcomes, granted the department full accreditation for the next six years.