

**Chair Re-Appointment,  
Department of Mechanical and Aerospace Engineering (MAE),  
College of Engineering and Computer Science (CECS),  
University of Central Florida (UCF)**

**Submitted by: Yoav Peles**

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## **Preface**

The Mechanical and Aerospace Engineering (MAE) Department was established in 1968. Over the years faculty and staff came and went, some leaving impressive legacies while others not so much. The Department also had its share of chairs — seventeen to be precise; each one served an average tenure of 3 years. Only one chair continuously served the department for more than 5 years. Namely, Dr. Ron Evans, who served at this position until 1978. MAE had some outstanding leaders. However, the rotating door of chairs coming and going has had some detrimental effects on the growth and well-being of the department.

In its early days, UCF had been primarily a teaching institute, and since 1982 it has gradually been transitioning to a top-notch research university. At the department level, this has translated to an ever-changing environment with a creeping demand and expectation from faculty to perform research at the highest level. Concurrently, undergraduate enrollment has been perpetually growing since the first cohort of six students graduated in 1971. Staff members have been at the forefront of this expansion, taking ever-increasing responsibilities.

Because of this tremendous change, the department has been strained. A stable and committed leadership enables the department and the college to continue on a promising path to position UCF as a prime research and teaching institute of the highest caliber.

Chairs are not sole owners of department successes. They are merely a conduit to enable talented faculty and staff members to excel. As such the accomplishments detailed here are collectively owned by the faculty and staff of this great department.

## **Vision**

The Mechanical and Aerospace Engineering Department is steadily enhancing its national and international standing as a premier research department. However, much is still needed to become a truly top-tier engineering research program of the uppermost echelon. This will require continuous growth of the PhD and master degree programs, support for the newly established doctoral degree in aerospace engineering, establishment of a new PhD in Bio-medical engineering, increased publications in elite and high impact journals, continuous increases in research expenditures, expansion of our collaboration with industry partners, and actively marketing and communicating these endeavors.

Hand-in-hand with MAE's research endeavor, we strive to unrelentingly improve the quality and effectiveness of the undergraduate program and produce better, more prepared and sought-after engineers. By the time MAE's students are ready to graduate, they should be able to comprehend a broad-base foundation of fundamental concepts pertinent to mechanical and aerospace engineering. We should also provide them with the tools to become lifelong learners and be able to acquire vastly new knowledge post-graduation. To do so, we will continue to support and grow the capstone design course, use technology to enhance course delivery mode, offer extended portfolio of Honors courses, leverage the Center for Distributed Learning's (CDL) university-wide initiatives, provide faculty with educational training opportunities to enhance teaching effectiveness, and support engineering education research by our lecturers and tenured faculty members. We will also endeavor into opportunities to better align our

curriculum with industry needs while at the same time enhancing students grasp of fundamental concepts.

A central piece of this vision is the investment in a vibrant and joyful research and educational community that supports and celebrates success. It also requires a sense of shared ownership and a common purpose and pride. We will continue our effort to become a global magnet for domestic and international students and scholars from diverse backgrounds, cultures, demographic groups, and genders.

### **Mission**

In short, to serve Florida's tax payers by providing exceptional educational experience to MAE students and prepare them for lucrative and challenging engineering positions in industry, national labs, and academia. We also serve the community by conducting world-class research that enhances the intellectual, cultural, environmental, and economic development of Central Florida. In addition, it addresses national and international issues in key areas, and establishes UCF as a major presence in Florida.

### **Goals of the unit**

To achieve the vision stated above, a detailed plan, hard work and a firm commitment are required. We will continue successful pursuits and initiate new ones.

### ***Research Prominence***

The quest for excellence in research requires a multipronged approach. The quality of the graduate program, the aptitude and appetite of research active faculty members, the quality (and quantity) of publications, research grants and contracts (especially high visibility ones), mentorship and support for faculty members (especially tenure track), visibility at the national and international levels, and the success of our PhD alumni backed by competent and energetic staff members are critical building blocks of a viable research enterprise.

### ***Graduate program***

Doctoral students are at the epicenter of our research endeavor. They run experiments, develop and run numerical simulations, interpret data, infer physics from the data, help undergraduate students participate in research, write papers, etc. As such, the quality and quantity of the graduate student population, mostly PhD students, are key indicators of the strength of the department and its national research standing. Thus, recruiting, retaining, and catering to exceptional graduate students and sustaining a large doctoral enrollment will continue to be major department priorities.

Over the last several years, the Graduate Program has explored avenues to increase the number of doctoral applicants. It is believed that a large pool of applicants results in a more selective cohort of PhD students. Last year, MAE's Graduate Office and MAE's Communication Office, i.e., Marisa Ramiccio,

successfully leveraged social media, advertisement, video editing, creation of print, digital and multimedia content, and the establishment of open-line of communications with prospective students for graduate recruitment. We will continue to perfect this endeavor and will also team with the college on recent initiatives by Dr. Ali Gordon, Associate Dean for Graduate Affairs, to actively recruit domestic and international graduate students. Such efforts will include partnerships with other Florida's universities, e.g., the University of North Florida, local recruitment events throughout the State, development of video-based promotional content, development of a more holistic approach to engage with prospective students (e.g., reply to students who e-mail inquiries to faculty members). Word-of-mouth can also be a powerful recruitment avenue. However, current students will only recommend UCF if their experience is positive — another reason to keep our students happy.

### *Support for PhD students*

The viability of the graduate program is closely related to the ability of the department and faculty members to secure funding to support PhD students. The Department responsibility lies in its ability to secure internal funding, such as GTAs, OR fellowships, and UCF Graduate Dean's Dissertation Completion Fellowship. Because of that, the Department will continue to strongly support Office of Research (OR) fellowships and advocate for a significant increase in GTA support. Faculty are responsible to secure external funding primarily through grants, but also through other means, such as NSF Graduate Research Fellowships and Fulbright Fellowships. For that reason, emphasis on expending contracts and grants capital to support an ever-increasing PhD population will be strongly emphasized. (The extent of graduate students' support is already included in the new MAE's AESP, to be effective next academic year.) Finally, the continued uptrend in MAE's research expenditure will have to be sustained.

### *Graduate courses*

The very large undergraduate enrollment has taken a significant toll on the graduate course portfolio. With the increased faculty count in recent years, reconsolidation of undergraduate courses, and growth of the capstone design program that supports adjuncts instead of full time faculty members, we will gradually expand graduate course offering from about 16 per semester today to about 20-25 in the next couple of years. New and more frequent courses in aerospace engineering, bio-medical engineering, and mechanical engineering will be offered.

### *Faculty hires*

One clear challenge facing the graduate program was repeatedly stated in the recent Academic Program Review held during January 22-23, 2019. The report mentioned that *"clearly the undergraduate load is, at a minimum, a major distraction in the delivery of graduate programs and pursuit of research excellence across all degree programs in the Department and perhaps across the entire College."* To partially remedy this state-of-affairs, the Department will hire several additional Lecturers to help alleviate the undergraduate program demand. Besides, and as stated in the section pertinent to the undergraduate

program in this report, it will greatly help serve MAE's undergraduate students. Finally, the department will hire a couple of additional tenure-track faculty members, potentially through the cluster hires.

### *Staff retention and support*

Staff members play a critical role in departments' affairs. However, the health and growth of the MAE's various endeavors are critically dependent on their competency and motivation. This requires a culture of sustained morale that rewards and celebrates success. While the department has few avenues to reward exceptional staff members, it can do much to create a welcoming environment in which employees are appreciated. We will continue to accommodate staff specific needs, such as flexible hours when possible, and will always attempt to advocate for them to the college and university.

### *Centers of excellence*

The launch of research centers/clusters has benefited the department immensely. The Center for Advanced Turbomachinery and Energy Research (CATER), established and headed by Dr. Jay Kapat, has been a focal point for a large group of faculty members, resulting in numerous grants and contracts — some large, high visibility collaborative grants, some smaller. The success of MAE's research endeavor is in large due to the scale of financial support and top-tier research orchestrated by Dr. Kapat and delivered by CATER's faculty members, students, and post-docs. While CATER has been facing some challenges, the department will continue to be committed to support and help the center grow to the best of its ability.

The department through the Biionix cluster, which was proposed in 2015 and was established mostly by MAE and MSE, had hired two faculty members, Drs. Qiushi Fu and Hwan Choi. Likewise, the Disability, Aging and Technology (DAT) cluster hired one faculty member for MAE, Dr. Joon-Hyuk Park. Other faculty members are also exploring partnership opportunities with the clusters. As such, MAE is committed to help the cluster develop and pursue a plethora of collaborative projects to become a hub for the bio-medical and mechanical engineering faculty members in the department. In addition, we will attempt to hire at least one additional faculty member from the DAT cluster.

### *Mentorship and support of junior faculty members*

The success of the junior faculty members will determine the future of this department. It takes enormous effort, dedication, and perseverance to establish a reputation as an eminent scholar who is in the forefront of intellectual discoveries. Launching a top rated experimental/computational lab, recruiting and retaining PhD students, writing competitive proposals, networking with leaders and colleagues in the field, effectively communicating success stories to scholars and program managers, and collaborating with competent colleagues are arduous and extremely time consuming efforts. While young faculty members are expected to gradually master these trades on their own, much can be done to mentor them. We will continue to assign a reduced teaching load to tenure-track faculty members throughout their tenure process. Likewise, the professional development workgroups that we offer to mostly young faculty members will continue with an emphasis on perfecting CAREER-type proposals. Office of Research Fellowships will continue to be aggressively pursued to help faculty boost their research outcomes. The

department chair will conduct biannual one-on-one meetings with tenure-track faculty members, and about once a year meetings with more senior faculty members. The chair's open-door policy will continue in an effort to provide guidance, set expectations, and resolve issues as they emerge.

*More specific goals tied to the five-year vision:*

- 1) The bio-medical engineering program will establish a new PhD program in the next couple of years, pending BOG approval;
- 2) More PhD students will graduate from our programs every year. A target graduation rate is set to 30-35 annually — about one student per tenure-earning/tenured faculty member on average annually.

### ***Undergraduate program***

The Department will undertake initiatives to better serve our undergraduate students. These include, hiring several exceptional lecturers, engaging in leading edge development pertinent to educational content, continuing to leverage more effectively technology in the classroom, encouraging faculty to engage in engineering education initiatives, and expanding Honors courses portfolio. Some of these activities are ongoing, some are new.

### ***Adaptive learning***

The department will organize and recruit a group of faculty members to take initiatives that will benefit students and at the same time will position UCF at the forefront of an engineering education revolution led by technology. More specifically, the department, UCF's Center for Distributed Learning (CDL), and potentially publishers (e.g., McGraw-Hill) will embark on a bold endeavor to develop adaptive learning models on a large scale. A portfolio of futuristic mechanical and aerospace engineering courses, which will be based on these models, will change the undergraduate textbooks' landscape. Dr. Andrew Dickerson already demonstrated the effectiveness of such models. With the help of our partners, primarily CDL, faculty members will collectively develop these adaptive learning foundation courses (e.g. dynamics, Thermodynamics, etc.). Research about the educational effectiveness of this effort will be carried out together with CDL's staff and MAE faculty.

### ***Interdisciplinary (I) design program (a.k.a., senior design)***

The tremendous overhaul of the I-design program (a.k.a., Senior Design program) ever since the arrival of Dr. Mark Steiner has provided a unique opportunity for the college, spearheaded by the department, to provide all engineering students with a unique industry-like experience to work in multi-disciplinary teams. The vision and determination of the I-Design leadership, Dr. Steiner and Mr. Kurt Stresau, has brought together capstone design coordinators across the college to expand the scope of the interdisciplinary effort. Aligning curriculum across department has proven to be a challenging, but feasible. Obtaining buy-in from other coordinators about the new module also required great effort. In

the coming years this effort will continue and will result in a unified college-wide program that is heavily supported by our industry partners. Funds for industry-sponsored projects will continue to increase with a target annual support of \$500k to \$1M.

#### *Advanced Manufacturing concentration*

Together with our industry partners (e.g., Autodesk, Machining Training Solutions, Technical Training Aids, and Levil Technologies), we will develop an Advanced Manufacturing concentration of several focused courses starting from the Freshman year that will include a range of topics, such as CAD/CAM, freshmen and sophomore years design/build/test projects, design for manufacturability, and quality assurance. Several existing courses offered by the department, EML 3022C - Introduction to Computer Aided Engineering, will be revisited and integrated into the concentration. These courses will employ extensive hands on experience tools, such as CAD/CAM tools, advanced machining, metrology and quality assurance, etc.

#### *More specific goals tied to the five-year vision:*

- 1) Expand mixed mode course offering to include at least the vast majority of the foundation courses and beyond;
- 2) Continue to leverage technology and university wide initiatives and resources to improve online content to better serve undergraduate and graduate students.
- 3) Offer 10-12 Honors courses annually to expand the personalized teaching environment within a very large undergraduate program. Project based learning models will be emphasized in these sections. This will form a cohort of exceptional students who are well prepared for graduate school and industry. Support for these courses will be provided by the Burnett Honors College.

### **Major Department's accomplishments in the last 5 years**

The department chair facilitates change and is a key person responsible to create an environment in which faculty and staff members are motivated and able to pursue initiatives that align with the department's mission and goals. As such, my accomplishments are co-owned with the exceptional group of faculty and staff members of this great department. In fact, in most cases, individual faculty and staff members are much more deserving of the recognitions mentioned below.

As evident from Table 1, the last five years has seen a rapid growth in several department's key initiatives that are aligned with UCF's strategic effort — research expenditure doubled, PhD enrollment almost doubled, PhD degrees increased by more than 60%, the number of PhD programs doubled, the number of MS programs increased by 50%, undergraduate enrollment increased by about 50%, undergraduate degrees awarded increased by 26%, and capstone design funds are markedly more than what they used to be. Resources have generally not kept pace with outcomes and the demand on departmental infrastructure and human capital is now more strained. While faculty headcount has increased from 30 to 44 (~47% increase), staff headcount has stagnated. Although internal support for graduate students has

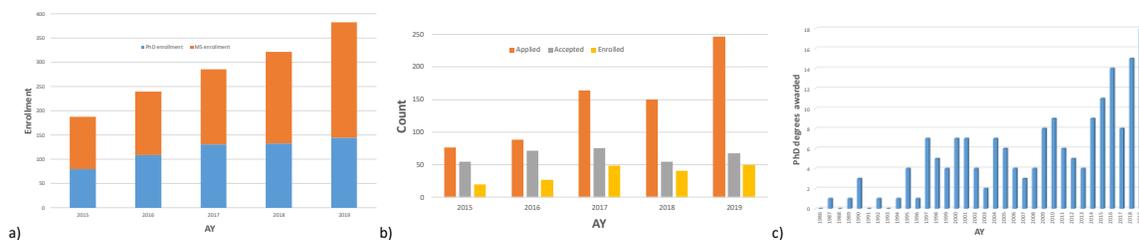
increased by 60%, primarily due to the OR fellowship, operating budget decreased by about 17%. A large group of faculty members is now nimbly and purposefully transforming MAE's educational landscape through a combination of technology-assisted lectures and grading (e.g., mixed-mode, EPC) and engineering education research.

*Table 1. By the numbers. MAE's available resources and outcomes in AY 19 compared to AY 15.*

	2015	2019	Multiplier
<b>Resources</b>			
Faculty headcount	30	44	×1.5
Full-time staff headcount	11	11	×1.0
Operation budget	\$268,419 (FY 15)	\$230,225 (FY 19)	×0.83
GTA/ORC fellowship	~37	59	×1.6
<b>Outcomes</b>			
Research expenditure	\$3.2M	\$6.6M	×2
PhD enrollment	80	145	×1.8
PhD degrees awarded	5-6	18	×3
G enrollment	188	383	×2
UG enrollment	2,732	3,876	×1.42
UG degree awarded	420	532	×1.26
PhD programs	1	2	×2
MS programs	2	3	×1.5
Capstone funding	~\$0	~\$300k	×∞
US and & report Ranking	103	65	×0.63

## Graduate program

Under the leadership of Dr. Jihua (a.k.a., Jan) Gou, the graduate program has undergone a transformative change. Enrollment in the PhD and MS programs steadily increased (Fig. 1a), applications to the doctoral program is skyrocketing (Fig. 1b), and the PhD degrees awarded have never been so high (Fig. 1c) — they are now three times the historical average of 5-6 annually. Our online mechanical engineering master's was ranked #1 in the recent Online Schools Report, beating heavyweight programs like Stanford University, University of Southern California, Johns Hopkins University, University of Illinois at Urbana-Champaign, Purdue University, University of Florida, North Carolina State University, Pennsylvania State University, and Texas A&M. These changes are a result of a strategic plan to significantly grow MAE's graduate program, with a special emphasis on the PhD program.



**Figure 1.** PhD and MS enrollment trends in the last five years (a), PhD applications trend (b), and PhD degrees awarded trend (c).  
Courtesy of Dr. Jan Gou.

## Aerospace engineering program

Ever since the master degree in aerospace engineering was approved in 1999, faculty members fancied a PhD program. As Dr. McBrayer stated in his paper titled "Aerospace Education at the University of Central Florida," an effort to implement a PhD program was attempted in 2004<sup>1</sup>. However, it took two exceptional and determined faculty members, Dr. Seetha Raghavan and Dr. Jeffery L. Kauffman, and fifteen additional years to bring this to fruition. With the help of several faculty members, over a period of about three years they had been tirelessly working on a proposal to establish a PhD program in Aerospace Engineering. The inaugural year saw an enrollment of thirty-three students, more than triple the expected enrollment, with the first student expected to graduate in the spring of 2020.

Before becoming a chair, I had concerns about the health of the aerospace program, which I believed was shared by some faculty members. Specifically the shortage of staunch aerospace faculty members. At the time, the department had about eight such faculty members. In the last five years this number almost doubled to 15 — a solid foundation for a strong and collegial cadre of eminent scholars.

## Bio-medical engineering program

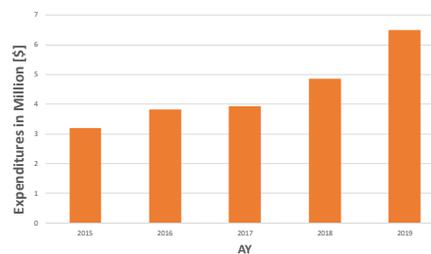
Dr. Alain Kassab has been working for more than a decade on an effort to establish a Bio-medical Engineering (BME) program at UCF. After some fruitless attempts and many setbacks, but great determination, he was finally able to establish a MS program in 2016. Because of his relentless advocacy,

<sup>1</sup> J.D. McBrayer, Chapter 54, Aerospace Education at the University of Central Florida, from Aerospace Engineering Education During the First Century of Flight, AIAA, pp. 692-699, 2004.

the department now has the backbone of an emerging bio-medical engineering program with eleven faculty members, up from four five years ago, working at the forefront of BME research. A combination of cluster, broad search, and program specific hires resulted in a group of exceptionally talented BME faculty members who call MAE their home. It is also worth noting that the department led, with MSE, the creation of the Bionix cluster, which includes a handful of affiliated faculty members across disciplines collectively working together. Faculty members, including the department chair, now share the belief that the BME program future is promising.

### **Eminence in research**

While this is somewhat difficult to quantify, faculty members are now publishing not only in the very top journals of their respective areas, but also in very high impact journals, such as *Science*, *Nature Communication*, *Nano Letters*, *Proceedings of the National Academy of Sciences (PNAS)*, *Small*, *Communications Physics – Nature*, and *Scientific Report*. Research expenditures steadily increased since 2015 (Fig. 2) and in 2019 MAE had the most in the College of Engineering and Computer Science. Equally important is the portfolio of funding agencies, which, besides the usual suspects (e.g., NSF, ONR), includes agencies never before seen at MAE including DoE, DoD, DARPA, NIH, DTRA, and ARPA-e. Moreover, several faculty members secured million dollars grants (e.g., Drs. Helen Huang, Subith Vasu, Kareem Ahmed, Jay Kapat, and Quanfang Chen).



**Figure 2.** MAE's research expenditure trend. In five years, expenditures steadily increased and is now slightly more than double than in AY 2015.

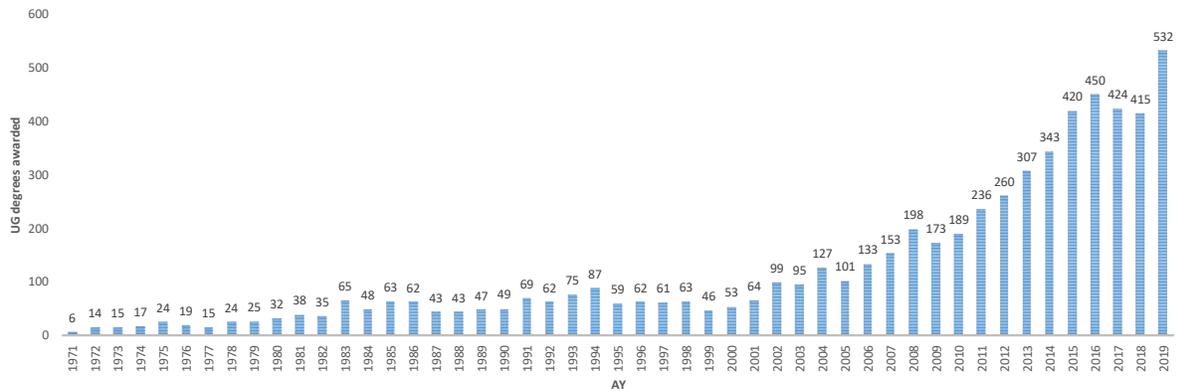
### **Mentorship and support of tenure track faculty members**

Support and mentorship for young faculty members have been of utmost importance. Over the last five years, the department held five semester-long workshops to help young faculty members master their proposal writing skills and provide mentorship about tenure and promotion expectations. The chair held one-on-one meetings with tenure-track faculty members on a regular basis in an effort to help them navigate through the tenure process and explore ways to align their professional growth with department's objectives. The chair also had an open-door policy to provide an additional layer of support to faculty members at all levels. A new reduced teaching load policy was implemented in 2015 that assigns one course per semester per tenure track faculty member up to tenure. In addition, many of our young faculty members, and also more senior members, benefitted from the OR fellowships.

### **Undergraduate program**

Data about undergraduate degrees awarded over the last 49 years has been revealing (Fig. 3). In AY 1999, 46 students graduated with a BS degree in mechanical or aerospace engineering; twenty years later it is an order of magnitude higher (532 to be precise). While the growth rate has diminished a bit lately, the number is still three times more than just a decade ago.

This steep increase in student population requires rethinking of our educational methods. In response to this need, the department has taken several major initiatives. The complete overhaul of the capstone

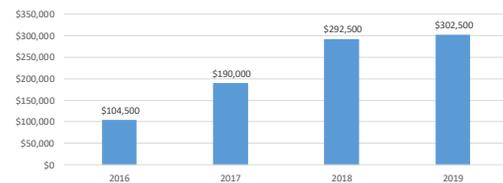


**Figure 3.** Undergraduate degrees awarded in mechanical and aerospace engineering at UCF. Data courtesy of Kamryn Lamons.

design experience, the engagement and leadership of MAE’s faculty members, mostly lecturers, in developing new teaching methodologies and engaging in SoTL initiatives, streamlining courses and eliminating service courses, adding Honors courses, and retaining a group of exceptionally competent lecturers all helped the department better serve its students.

### Capstone design

Five years ago, the department had a capstone design program on the verge of a complete collapse. Working 80 hours a week, Dr. Lionel Hewavitharana single handedly kept the program alive. However, on my first week on the job he abruptly submitted his resignation. Dr. Hewavitharana departure was a great loss, but we have come a long way in the last five years, and the program is alive and kicking. With Dr. Steiner at the helm, the program had been restructured, clear milestones have been implemented, teams have been scientifically assigned, the number of experienced engineers who are mentoring teams has been gradually increasing, industry partners value students’ experience much more than in the past, interdisciplinary teams are now the norm, and industry has been steadily increasing its financial support for projects (Fig. 4).

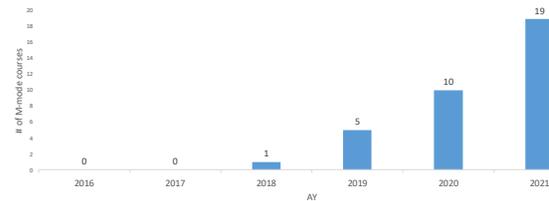


**Figure 4.** Capstone design funding. Courtesy of Dr. Mark Steiner.

### Technology, teaching, and SoTL

Over the last several years, MAE’s culture has been increasingly more conducive to initiatives pertinent to scholarship and teaching of learning (SoTL). Faculty members, such as Drs. Tian, Nader, Pal, Dickerson, Putnam, Das, Ilegbusi, Huang, Kassab, and Xu are enthusiastically leveraging university-wide and college-wide initiatives to integrate technology into undergraduate education. A growing number of courses are offered in mixed-modality and many are using the CECS’s Evaluation and proficiency Center (EPC). In AY

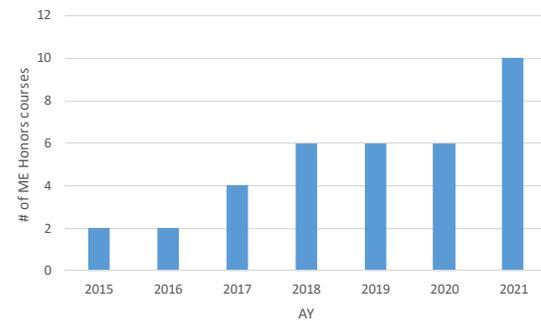
20/21 nineteen courses will be offered in mixed modality (the vast majority of mixed-mode courses offered by CECS); up from zero five years ago (Fig. 5). Transitioning to these emerging approaches has been fruitful, but also challenging at time. After several years of departmental experience, the effort is finally starting to pay off. Faculty members are much more comfortable with this type of modality and have gain invaluable experience about methods to better teach, which are shared in various forms including the Active Learning Workgroup, headed by Dr. Tian. The educational benefit and methods of these new tools are now actively studied by several faculty members (e.g., Drs. Tian and Nader) who also publish their results in conferences and archival journals. Faculty members are also participating in the CDL initiatives to develop new web-based models (e.g., Digital Learning Course Redesign Initiative). For the first time for the department, a prominent lecturer secured a 5-year educational grant, Dr. Pal for her NIH grant titled “A Biodesign Program in Rehabilitation Engineering,” (\$213k). Other lecturers have started exploring similar opportunities.



**Figure 5.** MAE’s mixed mode course offering trend. MAE started offering courses in mixed modality only in the spring of 2018. The department plans to offer 19 such courses in AY 2021. Data courtesy of Mr. Kamryn Lamons.

### Honors courses

In the past, MAE used to offer Honors courses only in Dynamic and Thermodynamics. We have gradually expanded the extent of the Honors course offering (Fig. 6), and in AY 20/21 the department will offer 11 such courses including Dynamics, Modeling Methods, Fluid Mechanics I, Thermodynamics, Solid Mechanics, Heat Transfer I, Introduction to Vibration and Control, and Locomotion and Design in Natural Systems. Honors courses offer learning experiences in small classrooms within a large program, and they help promote a culture of excellence in undergraduate education. It also helps relieve some of the pressure from the large classes.



**Figure 6.** The number of Honors courses in mechanical engineering. A five-fold increase over a period of six years. Data courtesy of Mr. Kamryn Lamons.

### Hires and faculty lecturers’ morale

MAE has been very fortunate to attract exceptional group of dedicated Lecturers/Instructors who are now the backbone of MAE’s educational enterprise. Initially this effort was challenged by frequent turnover. We finally have a cadre of loyal Lecturers and an Instructor who are expected to stay in the department for the long haul. This is due to a combination of good recruitment practices, the creation of an environment that values their contributions, the support for their initiatives (please see section about *Technology, teaching, and SoTL*), and the elevation of the importance of undergraduate education.

### *Management of the rapid increase in the undergraduate enrollment*

MAE's undergraduate enrollment increased from 2,732 in 2015 to 3,876 in 2019 (~42%). In response to this fast growth, the department took several measures. Sections of the same course were consolidated, service courses were eliminated, faculty members were assigned courses only within the MAE program, support (i.e., full-time faculty members assigned to the course) for the capstone design was decreased, and several additional faculty members were hired. In addition, grading has gradually been automated, and many courses have increasingly been leveraging technology.

### ***Establishment of a Communications Office***

In September 2016 MAE established a new staff position, Coordinator of Communications, in an effort to elevate the department visibility and broadcast MAE's achievements. The recruitment of an outstanding individual, Ms. Marisa Ramiccio, has dramatically boosted MAE's image in the eyes of our competitors, program managers, constituents, and potential recruitments (i.e., graduate students and faculty members). MAE now has a superb annual magazine, Momentum (Fig. 7), quarterly newsletters, copious multimedia news stories, numerous professional videos widely accessible on the web, a great website, as well as print material. The successful graduate recruitment in AY 2019 and the improved department's ranking is partially because of the establishment and successful recruitment of an outstanding Coordinator of Communications.



**Figure 7.** The cover page of MAE's 2<sup>nd</sup> Momentum magazine. Many department chair/head enviously stated that the quality and eye appeal of MAE's magazine are simply astonishing. Volume 3 will be available starting October 31, 2019.