1 OVERVIEW
This was an active and eventful year for the College of Engineering. We were very active in faculty recruiting of eleven exceptional new faculty and our continuing search for the Founding Chair of the Department of Medical Engineering. Our research productivity was outstanding and continued to increase in number of proposals submitted, number of research awards, federal research awards, patents and disclosures, peer-reviewed papers, citations, and returned F&A rates. We created the first-ever College of Engineering Academy of Distinguished Engineering Educators (ADE2) to focus on teaching excellence. The first cohort of ADE2 members were elected and are already actively participating in key educational projects, including the complete re-design of the first-year design experience made possible by hours freed up in the curriculum across all departments by the new GenEd requirements. We were also accepted into the National Academy of Engineering’s national Global Challenges Scholars Program (GCSP) and join an illustrious group of Colleges of Engineering in creating a program of distinction for our most outstanding students. Our focus on outreach continued with successful hosting of the Roboticon competition in the SunDome, a very active Engineering Expo, our 4th successful Engineering Honors Gala, and many expanded and updated tours. This year we created Engineering Day and hosted over 150 IB, AP students and 30 STEM teachers. Approximately 70 volunteers – students, staff and faculty – helped to support this event showing that it’s a college-wide event. Our efforts to build a funded research relationship with U.S. Special Operations Command (USSOCOM) continued this year. We made significant progress in standing up the Institute of Applied Engineering (IAE) as a USF DSO and the programmatics at SOFWERX continue to expand. Our work with SOCOM is highly recognized by the Tampa Bay community. As part of our ongoing expanding community-engagement, the College was a Silver Sponsor for the Synapse Innovation Summit. At the event we presented both on the main stage as well as in individual sessions. The College had a booth that was very active with lots of visitors, as well as a presence at the SOFWERX/SOCOM area. Overall, it was a busy and productive year.

1.1 Engineering Honors
Our 4th Annual Engineering Honors event was held at The Straz Center for Performing Arts. Eight alumni and friends of the College were recognized for their outstanding contributions to the field of engineering, academia and the College. A sold out crowd of more than 200 guests were entertained by concert pianist Franz Mantini, who is also an electrical engineering alum. Provost Ralph Wilcox co-hosted the event and Mark Schreiner, Assistant News Director / Host of University Beat WUSF Public Media emceed.
1.2 Roboticon Tampa Bay 2017

The College sponsored ROBOTICON Tampa Bay 2017 for the second time since the event was moved to the Sundome. More than 1,000 K-12 student teams from Florida converged on the USF Sundome for competition and fun. It was a great representation of our College to prospective students.

1.3 Institute of Applied Engineering

Over the past year, the USF College of Engineering has made great progress in advancing the Institute of Applied Engineering, a not-for-profit organization chartered with providing engineering solutions to Department of Defense and other government and industry partners.
In September 2017, the College of Engineering hired a recently retired Air Force colonel to lead the effort to establish the Institute. In October, we presented an overview of the Institute to the President and Provost, to include how its mission and core competencies support the USF System and College of Engineering. Based on their feedback, in February 2018 we proposed to the USF Board of Trustees’ Strategic Initiatives Committee that the Institute be a new, Direct Support Organization supporting USF. They endorsed the formation of the new DSO, and requested planning details be provided to the Finance Committee in order to obtain final approval. Since then, the Institute team has been building the plan, to include the Board of Directors governance structure; initial staffing, facilities, and IT requirements; and a preliminary operating budget. The Institute team is currently working closely with USF’s Business and Financial leadership along with General Counsel to finalize the plan, and are on track for final approval by the Board of Trustees in summer 2018 to formally stand up the organization and commence operations.

1.4 SOFWERX

SOFWERX is a US Special Operations Command sponsored platform for innovation, located in the heart of Ybor City. SOFWERX leverages its growing ecosystem (now with over 9k members) to promote divergent thought, and neutral facilitation with the goal of bringing the right minds together to solve SOCOM’s toughest challenges.

The USF partnership with SOFWERX plays a key role in providing a unique academia perspective, with students and faculty members actively assisting in helping solve challenges. The partnership promotes the advancement of Science, Technology, Engineering and Mathematics (STEM) in the Tampa area. The SOFWERX and USF partnership continues to grow in several areas. USF established a permanent presence at SOFWERX, hiring a full-time Director, USF SOFWERX Operations.

The USF/SOFWERX Internship program is in its second year. The program is a true partnership promoting hands-on experience for undergraduate and graduate students, solving difficult real-world challenges. The intern program has grown significantly over the last year, increasing from seven paid undergraduate students in Spring 2017 to thirty paid interns in Spring 2018. The Spring 2018 cohort includes twenty-two undergraduates, six graduate and two PhD students. USF COE acts as the umbrella organization, responsible for administration of the intern program, regardless of the college the intern is attending. The students have a variety of majors including Mechanical Engineering, Electrical Engineering, Computer Science, Physics, Information Technology, Data Analytics, Robotics, Cyber Security, Graphic Design and Business.

The USF COE was also recently awarded a second contract in support of SOCOM’s Small Satellite program (Cube Satellite) at SOFWERX. USF’s mission is to identify, develop, prototype and test
next generation small satellite technologies to support SOF-relevant missions. In the near future, USF will provide three space launch small satellites to USSOCOM.

We held our Spring External Advisory Board (EAB) meeting at SOFWERX. Our special guest was Ms. Lisa Sanders, Director of Science & Technology at USSOCOM who presented her research priorities and described the technical challenges facing Special Operations Command. We also were welcomed by Mr. Tambrein Bates, Director of SOFWERX who presented an Executive Summary of SOFWERX followed by an insider’s tour. The meeting concluded with Dr. Marvin Andujar (CSE) and students allowing the board members to attempt flying drones with a brain interface.

![Engineering Advisory Board meeting at SOFWERX.](image)

We are very proud of the relationship that we have established with SOFWERX and USSOCOM. Our students and faculty supporting SOFWERX are on the cutting edge of ground breaking innovation and research right here in the Tampa area.

1.5 Synapse Innovation Summit

The College was a Silver Sponsor for the Synapse Innovation Summit in March. Dean Bishop and Jamie Chilton presented a workshop on Accessing the University Talent Pipeline. Jose Zayas-Castro was a panelist on the main stage discussing tech transfer and keeping talent in the Tampa Bay area by having jobs for them.

![Dean Bishop, Career Counselor Jamie Chilton, and Executive Associate Dean Zayas-Castro at Synapse.](image)
1.6 BS in Cybersecurity

The pre-proposal for BS Cybersecurity is on track to be on the workplan for next year. After unanimous approval by APAC, it was approved by CVAP. It was on the BOG APPRise site, open for comments. We received none. It is on track for approval by ACE (May), BOT (June), and BOG (June), so that it gets on the 2018/19 USF Workplan. The BS in Cybersecurity major was launched in spring 2018 with 36 students currently enrolled. This new program was created to meet growing demand for cybersecurity expertise in Florida and in the nation. This new program was created in partnership with the College of Arts and Sciences, Muma College of Business, and College of Business at USF-SM. We expect the first graduates from the program in 2019.

1.7 BS in Biomedical Engineering

Our two-year approval process is coming to near completion for our new undergraduate major in BME. All of the USF approvals are in place, including most recently, a unanimous approval by APAC. We expect to receive FL State Approval in June, including BOG. Biomedical Engineering bought in their inaugural class in the fall of 2017. These students averaged over a 4.36 high school grade point average and ACT math scores averaged 31 out of 36 and SAT math scores average 724 out of 800. Over 57% of the new incoming students were female.

1.8 Engineering EXPO

Engineering Expo—a completely student run organization—had another excellent EXPO event. For 45 years this event has served as the first exposure to STEM that many elementary students receive and excellent recruitment tool for future. Over 10,000 students, teachers, and families attended Engineering Expo this year including Boy Scouts and Girl Scouts troops. Corporate exhibitors included TECO, Gopher Resource, Honeywell, FLATE, MOSI, Lockheed Martin, and NASA. This was the third year EXPO continued the Schools Activity, and also extended it to Saturday for the general public. This activity was successful, and they had a good turnout both Friday and Saturday. The USF Engineering Expo App for cell phones was improved and worked for both Android and iOS.
1.9 Engineering E-Textbook Initiative

Dr. Kyle Reed, Dr. David Murphy, Dr. Rebecca Cai and Dr. Michael Celestin have piloted and adopted the Engineering E-textbook Initiative in the Fall 2017 semester to combat the high prices of engineering textbooks. Monica Metz-Wiseman (USF Libraries) piloted this initiative with our College. Students pay only $45 for the E-textbook, and have perpetual rights to the online version of the textbook while at USF and after graduation. In the Spring 2018, a university-wide committee headed by Dr. Thomas Weller has been formed to explore this issue.

1.10 Faculty Recruiting

**Computer Science and Engineering**
Dr. Shaun Canavan, Asst Professor
Dr. John Licato, Asst Professor
Dr. Mehran Mozaffari Kermani, Asst Professor
Dr. Robert Karam, Asst Professor
Dr. Marvin Andujar, Asst Professor

**Electrical Engineering**
Dr. Mahshid Rahnamay Naeini, Asst Professor

**Mechanical Engineering**
Dr. Bonnie Roberts, Instructor I
Dr. Oscar Rios, Instructor I

**Industrial and Mgmt. Systems Engineering**
Dr. Devashish Das, Asst Professor
Dr. Walter Silva-Sotillo, Instructor I

**CUTR**
Dr. Mouyid Isla

1.11 Eminent Scholars Lecture Series Spring 2018

**DR. JENNIFER LEWIS**
Engineering Dean
University of CA – Davis

**DR. LANCE COLLINS**
Joseph Silbert Dean of Eng.
Cornell University

**DR. WAYNE CLOUGH**
President Emeritus GA Tech
Secretary Emeritus Smithsonian

- Toward simulation-based design of particle handling processes
- Cornell Tech – New NYC campus focused on 21st century digital technology
- Is climate change an engineering problem or a science problem?
Dr. Julia Ross
Torgeson Dean of Eng.
VA Tech

Our world is changing ... are we?

Dr. Justin Schwartz
Marcus Dean of Eng.
Penn State

Redefining engineering in the modern age

1.12 USNWR Graduate Program Rankings

<table>
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<td>Engineering - Overall</td>
<td>2019</td>
<td>105</td>
<td>110</td>
<td>99</td>
<td>100</td>
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<td>90</td>
<td>Down</td>
</tr>
<tr>
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<td>N/A</td>
<td>N/A</td>
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<td>N/A</td>
<td>N/A</td>
<td>NC</td>
</tr>
<tr>
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<td>N/A</td>
<td>N/A</td>
<td>100</td>
<td>Up</td>
</tr>
<tr>
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<td>87</td>
<td>94</td>
<td>76</td>
<td>Up</td>
</tr>
<tr>
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<td>77</td>
<td>N/A</td>
<td>81</td>
<td>77</td>
<td>80</td>
<td>Down</td>
</tr>
<tr>
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<td>2019</td>
<td>89</td>
<td>102</td>
<td>105</td>
<td>82</td>
<td>83</td>
<td>96</td>
<td>Down</td>
</tr>
<tr>
<td>Engineering - Electrical / Electronic</td>
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<td>59</td>
<td>59</td>
<td>64</td>
<td>48</td>
<td>56</td>
<td>Down</td>
</tr>
<tr>
<td>Engineering / Communications</td>
<td>2019</td>
<td>42</td>
<td>58</td>
<td>45</td>
<td>46</td>
<td>44</td>
<td>39</td>
<td>Up</td>
</tr>
<tr>
<td>Engineering - Industrial / Manufacturing</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>NC</td>
</tr>
<tr>
<td>Sciences – Computer Science</td>
<td>2019</td>
<td>101</td>
<td>101</td>
<td>101</td>
<td>101</td>
<td>102</td>
<td>Down</td>
<td></td>
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<tr>
<td>Information Technology</td>
<td>2019</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>NC</td>
</tr>
</tbody>
</table>

*Ranking could be a tie with one or more school(s).

Figure 1.1. College and Program Rankings.
1.13 New Faculty Fellows in 2018

Clifford Henderson, professor and chair ChBME, was elected an AAAS Fellow in the Engineering Section for “distinguished research contributions to the fields of functional materials, microlithography and nanomanufacturing, and for leadership contributions to advance chemical and materials science and engineering.”

Sarina Ergas, professor CEE, was selected a 2017 Fellow AEESP (Association of Environmental Engineering and Science Professors).

Larry Hall, distinguished university professor CSE, was elected Fellow of AIMBE (American Institute for Medical and Biological Engineering).

Tom Weller, professor and chair EE, was named Fellow IEEE (Institute of Electronics and Electrical Engineers).

Robert Frisina, distinguished university professor BME, was selected as a Fellow in the 2017 Class for the Biomedical Engineering Society.

David Eddins, professor BME, was elected Fellow of AIMBE (American Institute for Medical and Biological Engineering).
1.14 Research Highlights

Learning to walk again after a stroke can be difficult. Kyle Reed’s (ME) Gait Enhancing Mobile Shoe—created on a 3D printer—is known as the GEM Shoe. It recently completed clinical trials. The work was funded by the Eunice Kennedy Shriver National Institute of Child Health & Human Development (NIH NICHD award #R21HD066200), Moterum LLC, and the Florida High Tech Corridor.

Daniel Yeh and his research recently shipped and installed a NEW Generator to South Africa. NEW Generator recycles water for toilet flushing which cuts down on demand and also provides nutrients for fertilizing local gardens. This research is funded through a $1.4M Bill and Melinda Gates Foundation grant.

David Murphy (ME) received a 2017 Early Career Research Fellowship from the Gulf Research Program of the National Academies of Sciences, Engineering, and Medicine.

Maya Trotz (CEE) is the PI on a $3M NSF grant over five years for “Collaborative Research: NRT-INFEWS: Systems Training for Research on Geography-based Coastal Food Energy Water Systems (STRONG-CFEWS).”

Tom Weller and Jing Wang (EE) were recently awarded a $360,000 NSF GOALI with industry partner MTron of Orlando. The aim of the project is to investigate packaging technologies for high frequency microelectronic circuits that will provide critical performance enhancements for next generation wireless systems.

John Licato (CSE) was awarded the Air Force Office of Scientific Research Young Investigator's Program award. It is an honor and a grant of $450K over three years.

Andres Tejada-Martinez (CEE) has been awarded a $1M grant from the Gulf of Mexico Research Initiative (GoMRI) for a project titled “Turbulent Vertical Mixing and the Formation of Oil Particle Aggregates (OPAs): LES, Measurements and Modeling”. The goal of the project is to investigate numerically and through laboratory and field measurements how turbulence in inner shelves induced by winds, waves, tides and surface heat fluxes promotes mixing of oil and sediments leading to the generation of OPAs.

Anda Iamnitchi (PI) and Larry Hall (both with CSE) received a $1.7M DARPA grant to examine how fast and in what ways different kinds of information travel through online social media. They are collaborating with College of Arts and Science sociology professor, John Skvoretz.

Alfredo Weitzenfeld (CSE) received a $1M collaborative NSF grant with the University of Arizona. RI: Medium:Collaborative Reasearch: Experimental and Robotics Investigations of Multi-Scale Spatial Memory Consolidation in Complex Environments.
1.15 Enhanced Social Media

The College has increased its efforts to reach more students, more potential students and the community at large through social media channels. During Roboticon Tampa Bay in October, the college took over the USF Snapchat account to send immediate updates in the form of videos as the competition progressed. We took over the USF Snapchat again during Engineering Expo in February. In an effort to help manage the size of the audience during the Induction to the Profession Ceremony, the Communications and Marketing team performed a Facebook Live video stream of the December ceremony. The event garnered more than 400 live views and more than 1,200 views of the recorded ceremony. Facebook Live will once again be implemented at the upcoming May Induction, which will feature simultaneous Live streaming during both ceremonies.

In February, the College hired a part-time social media coordinator to concentrate efforts on increasing posts and followers, as well as creating consistent messaging and event coverage. Since February, initial results are showing a significant increase in mentions over all media channels – mentions are the number of followers who push your message to their followers. To reach current students a strong focus has been concentrated on Instagram with followers have increased 75%, while Facebook followers have increased only 10% during the same period (1Q18).
2 Academics Update

2.1 Student Enrollment and Statistics

The College of Engineering is not planning to grow, but instead plans to manage a balanced and stable enrollment with increasing overall student readiness and student success.

![Graph showing Annual Unduplicated College Student Headcount](image1.png)

Figure 2.1. Total student enrollment.

![Graph showing Student Enrollment by Degree Type](image2.png)

Figure 2.2. Student enrollment by degree type.
Figure 2.3. BS degrees awarded 10-year trend.

Figure 2.4. MS and PhD degrees awarded 10-year trend.
2.2 Talent Acquisition

1. **Identify both students and schools** from which to recruit students capable of being accepted into USF and with demonstrated stamina to survive the rigor of the COE programs and flourish as a COE graduate. We visit with students from high schools (currently 32) that have been identified with the highest achieving graduated COE students (students with >4.0 GPA), for the years 2011 to 2016. Engage with students and teachers from schools hosting rigorous academic programs such as IB, AP, Dual Enrollment, and homeschools. Target schools that teach/support engineering-related and experiential learning programs, such as magnet, and STEM; and connect with students, parents, coaches, etc., through venues that promote experiential learning and engineering/STEM co- and extracurricular activities (such as FIRST Robotics, STEM competitions, Science Fairs, COE EXPO, etc.).

2. **Heighten awareness of USF and COE as a top tier commodity for education, innovation and Entrepreneurship** among State of Florida high school sophomores, juniors, seniors, parents, and educators (teachers, counselors, administrators).

3. **Foster connections between prospective students, USF and COE** through standard and enhanced communications and conversations to create imagery in the minds of potential students for them to visualize how a COE BS degree and skills learned in the COE will facilitate development of their own personal passions, dreams and goals.

4. **Cultivate engagement with campus culture** including students, research labs and tours, showcases, fairs, etc. for prospective students to actively experience the benefits and outcomes of USF COE.

5. **Introduce students repeatedly to USF and COE** through communications; including social media to reinforce the USF COE community with examples of knowledge, skills, and abilities; evolving technology, creative innovation, and techniques to bringing ideas to production through entrepreneurship.

6. **Invest in students of talent** through offers of early engagement and access to high impact practices such as summer or first year REUs, on campus work opportunities, engineering dual enrollment courses, access to experiential learning labs, etc., and simplify the decision to apply to and accept admissions at USF.
The COE Talent Acquisition Program was initiated in the Summer 2017. The first school-based meeting was held with 50 Hillsborough County high school science teachers at Armwood High School to re-introduce them to USF and COE, the rigor of the academics and the high impact practices available to COE students. Since then (and to date) the COE has met with over 170 teachers through various venues, including 60 school based meetings; 5 COE classroom visits; held 20 engineering days; and made 85 teacher contacts through COE events and competitions - Roboticon, EXPO, THEA Balsawood Bridge Building, FIRST, and NASA.

Through the science teacher connections to their classrooms and students, the COE launched the Envision Tour held on October 16, a Hillsborough County non-student school day. Given teacher recommendations, eleven academically talented juniors and seniors with interests in engineering visited select COE laboratories for half of the day. In the spring semester, the COE hosted a similar Envision Tour for a technically-based minority high school program for 8 students and two teachers. Four of these students have accepted to attend COE in 2018. Similar to the Envision Tour, but on a smaller scale, college visits with laboratory tours are also conducted on request for high profile students such as National Merit Scholars finalists (2) and students who are children of “friends of the COE” - these account for a total of 13 laboratory tours.

Working in close association with Hillsborough County School District, The College hosted 150 IB, AP students and 30 STEM teachers during Friday’s Engineering Day. Approximately 70 volunteers – students, staff and faculty – helped to support this event. The high school students were an enthusiastic group of mostly juniors and seniors, and we hope this will lead them to join the USF engineering program. USF Admissions provided application and scholarship information and CUTR students played the Transportation Millionaire game during lunch. Building on this success the COE will continue to expand connections into two or three other nearby county school districts (possibly Manatee, Pinellas, or Pasco) for the 2018-19 academic year. Recently the COE

USF INTO hosted a SuperFam Showcase for INTO recruiters at the Marshall Student Center on December 5 and 6. More than 120 recruiters from around the world met with College representatives to learn more about programs, student success, and tour COE engineering labs. Similar tours were held on December 15 and January 26 (18 and 15 recruiters respectively). Dean Bishop presented an overview of the college.
The COE supports the Admissions Office in informing prospective students about engineering through multiple venues, including the Bulls Unite admitted student event held for students who are newly admitted to the University but have not accepted their admission to USF. These students, known as admitted-not-committed students have until May 1, the National Decision Day to accept their admissions to USF. The event (held in February and March) is all day and provides an opportunity to attend campus tours, college academic information sessions, housing tours, financial aid sessions, etc. After the COE academic session, some families came to the COE and participated on the Facility Tour and Advising Sessions. **The COE collected 167 contact cards from three separate Bulls Unite events.** Similarly, **Stampede-to-Success** was held in September and is geared mainly toward prospective students in their junior year or below of high school. The goal is to provide an opportunity for a potential student to experience and to preview the university and subsequently prepare for admissions throughout their senior year. **The COE collected 82 student contact cards from this event.**

**COE Facility Tours:** The COE offers facility tours that are led by COE Ambassadors. **The COE conducted 75 facility tours in 2017-18.** The tours are available at 1:00 pm each week day (student day), no appointment is required and the tour takes about one hour and is led by a talented COE Ambassador who is trained on a specific route through the College to showcase classrooms, computer labs, Success Center, Hall of Flags, Mini-Circuits Design for X Labs, and provides an opportunity for a prospective student to candidly capture the COE student perspective. Much of the College of Engineering visit is project the engineering culture to the prospective students. These students may be choosing their institution based on outcome of their college visit experience. Many prospective students want to view the classrooms to visualize the class sizes, witness the state of the technology in use, and to walk through the facilities to determine if they will feel comfortable and find success in the COE environment. These students want to see if the physical structures are maintained, is the learning environment conducive to success, what are classroom sizes and how far apart are the buildings. The facility tour influences the prospective student’s decision to attend USF. The personality and experiences of the Ambassador is a critical component for the success of the Tour.

**Outreach Events.** The COE supports and participates in community outreach programs by invitation. Invitations can include, but are not limited to, visits to a middle or high school classroom to present on an engineering topic or host a demonstration or serve as a judge at STEM technical competition. These events are now being supported by the College Ambassadors ESTEAM student organization.

Once a contact has been established, the COE maintains connections through repeated communications with the prospective students, families, and educators. After we have obtained
a contact card through one of the venues described above, the COE sends out an initial email that includes a “Did You Know?” series of links with examples of evolving technology, creative innovation, faculty, and student achievement to reinforce their positive USF COE experience. Frequently first communications are established through the ENG INFO Inbox where the COE has placed “Request Info” links on the COE “Future Students Undergraduate Programs” page of the COE website. The “Request Info” link is located directly under the description of each of the six engineering departments. Clicking on the “Request Info” link redirects the prospective student to the page “About the College” which can be accessed directly through the link: [http://inforequest.eng.usf.edu/](http://inforequest.eng.usf.edu/). After the prospective student submits the completed form, the information is delivered to the ENG INFO Inbox. Upon reading the inquiry, the responder hits “Reply All” to generate a “Welcome to the College of Engineering” email back to the prospective student. The Welcome Letter provides information relating to programs of interest, and college links to department websites, scholarships, and tours. While many Inquiries take only a few minutes to generate, others can be more involved in answering specific questions. While the initial correspondence typically begins with a request for information, frequently a telephone communication will initiate the request to the COE and the ultimate goal of bringing a academically talented engineering minded student to apply to USF. **The College responded to 596 Requests in 2017-18.**

Conversations as to how best to invest in students of talent so they will engage with the COE are just now being launched. Considerations are being conducted to offer early placement into REU labs (such as the Biomedical Engineering Program), early access to precollege students to the Mini Circuits Design for X Labs; providing availability of COE FIRST Alumni students as project reviewers for FIRST competitions; etc. Collaborative engagement will be necessary across the COE to provide enough access and opportunities to meet the demand of these talented prospective students.

### 2.3 Retention, Academic Progression and Graduation rates

**Quality of our students:** The incoming student quality continues to increase. Last fall we had over 53% of our students with an admission’s adjusted high school grade point average (HSGPA) equal to or above 4.00. The students in the new degree program in Biomedical Engineering averaged over a 4.36 high school grade point average, their ACT math scores averaged 31 out of 36 and their SAT math scores averaged 724 out of 800. Over 57% of the new incoming students were female.
In the Fall 2017, the College of Engineering proposed changing our incoming student profile with the limitation of a minimum HSGPA of 3.4, but the proposal was placed on hold as the university is seeking a comprehensive solution to some of the issues we are experiencing with our incoming students’ profile and academic performance. We have been asked to hold off on discussing our request to increase the HSGPA admission requirement in Undergraduate Council until the larger, university-wide discussion is complete.

Additionally, the College of Engineering terminated our Engineering Science graduate programs, which has seen low enrollment in recent terms, in an effort to strengthen the quality of our graduate students. The programs were terminated in 2017.
<table>
<thead>
<tr>
<th>Summer / Fall Cohort</th>
<th>Final Cohort N</th>
<th>Retained Type</th>
<th>Retained Same College</th>
<th>% Retained Same College</th>
<th>Retained Campus</th>
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<tr>
<td>2012</td>
<td>633</td>
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<td>476</td>
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<td>89%</td>
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<td></td>
<td></td>
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<td>76%</td>
<td>540</td>
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<td>85%</td>
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<td>91%</td>
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<td>602</td>
<td>89%</td>
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<tr>
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<td>Retained</td>
<td>507</td>
<td>80%</td>
<td>581</td>
<td>91%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Retained 2.0 GPA or above</td>
<td>499</td>
<td>78%</td>
<td>567</td>
<td>89%</td>
</tr>
</tbody>
</table>

Figure 2.6. First year retention rates.

Expansion of the learning teams continue as they are showing higher retention rates for those students who participate in the teams.

1. The College for the second time in its history obtained more than a 90% first year retention rate. For the 2016-2017 the College achieved a 91.4% first year retention rate.
2. For 2016-2017 year, course-based learning communities yielded a 94.8% retention rate. Doubling the engineering course-based learning teams significantly improved our first year retention rate for male students. The number of learning teams increased to 27 and were continued into the Spring 2016 and 2017. Male engineering students on the learning teams achieved a 94.6% first year retention rate despite being significantly weaker students than those who were not on learning teams.
3. Engineering Living Learning Community—which served 109 new students—reached a new high of 94% for the first year retention rate.
Percentage of students who graduate without excess hours: As seen in the table below, students without excess hours continue to increase for the FTIC students.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTIC</td>
<td>109</td>
<td>138</td>
<td>44%</td>
<td>101</td>
<td>140</td>
<td>42%</td>
<td>114</td>
<td>127</td>
<td>47%</td>
<td>159</td>
<td>139</td>
</tr>
<tr>
<td>AA Transfer</td>
<td>98</td>
<td>62</td>
<td>61%</td>
<td>94</td>
<td>52</td>
<td>64%</td>
<td>99</td>
<td>98</td>
<td>50%</td>
<td>133</td>
<td>35</td>
</tr>
<tr>
<td>Other Transfer</td>
<td>33</td>
<td>82</td>
<td>29%</td>
<td>48</td>
<td>78</td>
<td>36%</td>
<td>40</td>
<td>69</td>
<td>37%</td>
<td>72</td>
<td>50</td>
</tr>
<tr>
<td>Grand Total</td>
<td>240</td>
<td>282</td>
<td>46%</td>
<td>243</td>
<td>270</td>
<td>47%</td>
<td>253</td>
<td>294</td>
<td>46%</td>
<td>364</td>
<td>224</td>
</tr>
</tbody>
</table>

Figure 2.7. Percent Undergraduates without Excess Hours by Student Type.

2.4 Student Awards

Ilia Bautista Adames (Electrical Engineering), Jorge Calabria (Civil & Environmental Engineering), Earnest Hansley (Computer Science and Engineering), Emma Lopez-Ponnada (Civil and Environmental Engineering) received McKnight Doctoral Dissertation Fellowship Awards.

Erica Dasi (Civil & Environmental Engineering) was awarded a GEM PhD Fellowship by Lawrence Berkeley National Laboratory.

Erica Dasi (Civil & Environmental Engineering) received Honorable Mention Recognition from the Ford Foundation Fellowship Competition.

Colleen Naughton PhD’16 (Civil & Environmental Engineering) was awarded a AAAS Science & Technology Policy Fellowship. She is the third PhD graduate from the College in the past four years to receive this prestigious award.

Willie McClinton (Computer Science and Engineering) received a first place Best presentation award during the NSF funded Emerging Researchers National (ERN) Conference in STEM in Washington, DC.
Sophia Abraham (Mechanical Engineering) was awarded a 2018 Summer Undergraduate Research Fellowships (SURF) at the National Institute of Technology and Standards (NIST) in Gaithersburg, MD.

Willie McClinton (Computer Science and Engineering) and Matlock Mennu (Mechanical Engineering) were both awarded 2017 Summer Undergraduate Research Fellowships (SURF) at the National Institute of Technology and Standards (NIST) in Gaithersburg, MD.

Alireza Dayerizadeh, ’15, was awarded an NSF Graduate Research Fellowship. He is a PhD student in Electrical Engineering at North Carolina State University.

https://www.freedm.ncsu.edu/people/alireza-dayerizadeh/.

2.5 Undergraduate Curriculum

The College of Engineering is undergoing a major curriculum revision in integrating the enhanced general education (GenEd) requirements into our curriculum. We have successfully integrated the Intellectual and Practical Skill layer courses into all our majors. The courses in these categories are:

<table>
<thead>
<tr>
<th>Course</th>
<th>Gen Ed Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGN 3000L Foundations of Engineering Lab</td>
<td>Creative Thinking</td>
</tr>
<tr>
<td>EGN 3443 Probability and Statistics for Engineers</td>
<td>Information and Data Literacy</td>
</tr>
<tr>
<td>EGN 3615 Engineering Economics with Social and Global Implications</td>
<td>Human and Cultural Diversity</td>
</tr>
<tr>
<td>EGS 3720 Globalization and Technology</td>
<td>Human and Cultural Diversity</td>
</tr>
</tbody>
</table>

Figure 2.8. Course with curriculum revisions.

Note that these GenEd courses are tailored to the major and are, in fact, required courses.

Freshman Design Experience: With the new GenEd requirements, we also proposed the 3-credit hour experiential learning platform for all engineering students, which has a tremendous evidence-base in engineering retention. The literature supports that such a course will help in creating, nurturing, and enhancing an engineering mindset. This is particularly important for first year students who are typically not registering for engineering courses and focusing on relevant science and math fundamentals. This course will leverage the College’s participation in the “Pathways to Innovation” project (sponsored by Stanford University and VentureWell), where we partnered with 16 other schools to promote “design thinking” in the undergraduate curriculum.
<table>
<thead>
<tr>
<th>Engineering Curriculum Review Status Report</th>
<th>More than 120 credit hours?</th>
<th>8 semester plan?</th>
<th>4 semester plan?</th>
<th>Predetermined cycle of course delivery?</th>
</tr>
</thead>
<tbody>
<tr>
<td>drop</td>
<td>Yes</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed</td>
</tr>
<tr>
<td>down</td>
<td>No</td>
<td>In Progress</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
<tr>
<td>menu</td>
<td></td>
<td>Not Yet</td>
<td>Not Yet</td>
<td>Not Yet</td>
</tr>
<tr>
<td>options</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>No</td>
<td>Completed</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
<tr>
<td>Information Technology</td>
<td>No</td>
<td>Completed</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
<tr>
<td>Biomedical Engineering</td>
<td>Yes</td>
<td>Completed</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>Yes</td>
<td>Completed</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>Yes</td>
<td>Completed</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>Yes</td>
<td>Completed</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>Yes</td>
<td>Completed</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>Yes</td>
<td>Completed</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
<tr>
<td>Industrial Engineering</td>
<td>Yes</td>
<td>Completed</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
</tbody>
</table>

Figure 2.9. Snapshot Provost’s Curriculum Report Part A.

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>drop</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>down</td>
<td>In Progress</td>
<td>In Progress</td>
<td>Not Applicable</td>
<td>1</td>
<td>In Progress</td>
<td>In Progress</td>
</tr>
<tr>
<td>menu</td>
<td>Not Applicable</td>
<td>Not Yet</td>
<td>No</td>
<td>2 or more</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>options</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>Not Applicable</td>
<td>In Progress</td>
<td>No</td>
<td>0</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Information Technology</td>
<td>Not Applicable</td>
<td>In Progress</td>
<td>Yes</td>
<td>0</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Biomedical Engineering</td>
<td>Not Applicable</td>
<td>In Progress</td>
<td>No</td>
<td>0</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>Not Applicable</td>
<td>In Progress</td>
<td>No</td>
<td>0</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>Not Applicable</td>
<td>In Progress</td>
<td>No</td>
<td>1</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>Not Applicable</td>
<td>In Progress</td>
<td>No</td>
<td>0</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>Not Applicable</td>
<td>In Progress</td>
<td>No</td>
<td>0</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>Not Applicable</td>
<td>In Progress</td>
<td>Yes</td>
<td>0</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Industrial Engineering</td>
<td>Not Applicable</td>
<td>In Progress</td>
<td>No</td>
<td>0</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Figure 2.10. Snapshot Provost’s Curriculum Report Part B.
2.5.1 Specialized Accreditation

In parallel with all the curriculum and assessment requirements and planning, the College of Engineering is preparing for ABET specialized accreditation, which will evaluate the curricula in the 2020 cycle. Additionally, we are one of the first cohorts that will have to manage the data and assessment under the previous outcomes, as well as transition into the new set of outcomes. The College of Engineering has brought Dr. Delcie Durham, Professor Emeritus, on board to
coordinate and manage such an important and critical transition. Needless to say, the College of Engineering will focus primarily on ABET accreditation in the next two (2) years. However, there are substantial similarities between USF’s internal assessments and ABET accreditation requirements.

There is considerable correlation between several key elements of the comprehensive curriculum review in the **USF 2018 Assessment Planning Process and Timeline for USF Tampa Undergraduate Programs on a Calendar Year Assessment Cycle** and the **2019-2020 ABET Accreditation of Baccalaureate Engineering Programs**.

There are eight (8) ABET criteria for accrediting engineering programs, which are “*intended to foster the systematic pursuit of improvement in the quality of engineering education that satisfies the needs of its constituencies in a dynamic and competitive environment.*”

While ABET has always required rigorous program and student outcomes assessment processes, revisions recently approved (2016, 2017) by the ABET EAC now require systematic assessment of actions implemented to improve the quality of the learning experience. The reasoning is similar to the SACSCOC directive regarding “seeking improvement”

The three year assessment cycle described above will get us the evidence needed by SACSCOC for our Fifth Year Compliance Certification Report (due March 15, 2021) showing compliance with the recently revised SACSCOC Principles of Accreditation. These revised Principles require that USF “provides evidence of seeking improvement based on analysis of the results ... (of assessing) student learning outcomes for each of its educational programs”. To SACSCOC, “seeking improvement” means implementing action plans. Developing an action plan without implementing it is not seeking improvement. (Programs with specialized accreditation that do not move to a triennial assessment cycle but rather remain on an annual assessment cycle will be required to incorporate evidence of seeking improvement into their annual assessment reports. Institutional Effectiveness will work with such programs to develop the least burdensome approach to ensuring compliance with SACSCOC requirements.)

**Figure 2.13.** SACS Fifth Year Compliance Certification.

Specifically, **Criterion 3: Student Outcomes; Criterion 4: Continuous Improvement;** and **Criterion 5: Curriculum** include and meet all the planning requirements of the USF key elements 1, 2, and in part for 3 – 5. ABET’s focus on improving the quality of engineering education requires that each program develop and publically post Program Educational Objectives (Criterion 2) that are “*consistent with the mission of the institution, the needs of the program’s various constituencies, and these ABET criteria*”. Program Educational Objectives, Student Outcomes, course mapping of performance indicators with direct assessment methods and review timelines and assessment outcomes must all be provided in the Self-Study prepared for the accreditation visit.

Since the 2013-2014 ABET visit, there have been substantial revisions to **Criterion 3: Student Outcomes** and **Criterion 4: Continuous Improvement**, and other minor changes. The College of Engineering has been proactive in addressing the continuous improvement of the engineering
programs, establishing an ad-hoc College ABET Coordination Committee in 2015 that meets
several times each semester. The committee discusses best practices, addresses the implications
and implementation of the various changes in the criteria, and updates all faculty on ABET
requirements. Excerpts from the Self-Study Reports for the 2013-2014 ABET visit demonstrate
both the processes and the assessment of student outcome performance that has been
successfully conducted within each of the engineering programs on an ongoing basis. The change
in Criterion 4 adds the requirement to assess the continuous improvement in student outcomes
resulting from implementation and evaluation of curricular and/or pedagogical changes within
courses. This is a direct match with the USF requirements stated above, meeting the need “to
implement action plans”.

The programs in the College of Engineering must also address the other significant changes in the
ABET criteria, specifically transitioning from the ABET mandated eleven student outcomes (a-k)
to the new student outcomes (1-7) that were approved October 20, 2017 and appended to the
ABET Guidelines and Self-Study Template Questionnaire for 2018-2019 as being applicable for the
first time for USF’s 2019-2020 ABET Visit. Since most programs correlated SACs-related student
learning outcomes with specific ABET student outcomes in the past, it is important that continued
matching of these student outcomes, with implementation is clearly documented in the
transition. With the ABET Accreditation Visit in 2019, USF Engineering programs must focus first
on assuring successful reaccreditation.

The program must have documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering. Student outcomes are outcomes (1) through (7), plus any additional outcomes that may be articulated by the program.

(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
(3) an ability to communicate effectively with a range of audiences
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Figure 2.14. ABET Criterion 3 Student Outcomes.
Each Engineering discipline may require additional student outcomes for a particular program, such as those added to Mechanical Engineering (l, m, n, o) for the 2013-2014 Self-Study that are highlighted in the figure above. Each instructor is responsible for conducting the data collection to evaluate the performance of the students in the course and make any changes within the course. The ABET Program Coordinator and the ABET Committee and the Undergraduate Committee systematically review the courses, the attainment of the student outcomes, and the relationship to the program educational objectives (PEO).

These changes require all of our programs to undertake an extensive transition during 2018, from the assessment process mapping of the current 11 (+) student outcomes across the courses in the curriculum to the new student outcomes; and updating the direct measures and rubrics within each of the courses to meet the new, even more stringent, requirements.

**ABET Criterion 4 Continuous Improvement**

The USF timeline states that programs are required to expand on the matrix, to include tables showing specific courses components (not course grades) that are assessed to demonstrate attainment of the student outcomes, and the quantitative performance of the students on these components, evaluated against the prescribed performance indicator set for that student outcome.

| 2018: | Develop a curriculum map showing the courses in which learning outcomes are introduced, reinforced, mastered, and assessed and a plan for assessing revised SLOs; collect assessment data; use the collected data to pilot test the feasibility of the assessment measures and processes described in the plan; and (if needed) revise the assessment plan. |

**Figure 2.15. 2018 USF timeline to develop curriculum map.**

**ABET Criterion 5 Curriculum**

Engineering program curriculum must meet a defined set of minimum course requirements that includes 30 semester credit hours of a combination of college-level mathematics and basic sciences with experimental experience appropriate to the program; 45 semester credit hours of engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design; a broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives; a culminating major engineering design experience . . . based upon knowledge and skills acquired in earlier course work.

Each undergraduate program in the College of Engineering must meet the requirements of providing a curriculum map that includes identification of required courses, elective courses, prerequisites, and the set of ABET defined courses.
Subsequent to the preparation of Self-Study for the 2019-2020 ABET visit, the programs will be assessing the impact of changes made within courses and curriculum as part of the sustainable continuous improvement process. This will meet SACS requirements as well as ABET requirements for evaluation of implementation of changes.

2.5.2 Class Scheduling

The College of Engineering has inventoried its offerings and is working internally to determine which actions can take to address class-sizes in an effective and cost efficient manner. Department Chairs are reviewing what each one can do and at what cost; various templates have been drafted. As it is known, the College of Engineering has the uniqueness “on-line hybrid” model, which adds complexity. Concurrently the Dean’s office continues to interact with the Provost Office and the Office of Decision Support to assure what the rules are well understood and considered in any action.

2.5.3 High Impact Practices

**Capstones:** College of Engineering strongly embodies many diverse avenues for high impact practices. A few are mandated by ABET such as design project experiences. The senior design projects have a strong impact on our students’ learning. Many times, the departments invite industry advisory board members to final project demonstrations and presentations. Many of the engineering disciplines need a two-semester capstone project-based experiential practice. This fits very well with an earlier iteration of GenEd requirements in which two (2) HIPs were presented and communicated. The subsequent version, however, had to accommodate ENC 1102; in doing so, this merged one (1) of the HIP requirements with the Ethical Reasoning and Civic Engagement (ERCE) requirement. These are important elements in engineering training and are an important part of our curriculum. However, they are tied very deeply to the discipline, and engineering curriculum experts plan to propose the two HIPs in the major.

**Internships and Corporate Connections:** We strongly push our students towards internships and deep immersion into an industry. Many of our students intern in companies for more than a semester. This is one of the most valuable experiences for our students, and we have encouraged them despite the impact on the 4-year graduation rate, as this activity increases their chance of
getting a better job after graduation. With a strong partnership with University Career services, last year, we connected our students to over 160 companies. A few examples of our strongest industry partners who hire our students are: Bausch+Lomb, CAE USA, Citi, Cognizant Technology Solutions, Deloitte, Duke Energy, Emerson, FBI, FDOT, GE Aviation, GE Aviation, Health First, Honeywell, Johnson & Johnson, JPMorgan Chase & Co., L3 Aviation Products, Lockheed Martin, NASA, Naval Air Systems Command (NAVAIR), Naval Surface Warfare Center, Nextech, NextEra Energy, Inc., Nielsen, Power Grid Engineering, LLC, Qorvo, Quest Diagnostics, Raymond James, Raytheon Company, Revature LLC, Rooms To Go, SCS Engineers, Seminole Electric Cooperative, Inc., Southwest Florida Water Management District, Stantec, Tech Data Corporation, The MITRE Corporation, The Mosaic Company, The Walsh Group, and Verizon. We have also developed relationships with multiple companies that recruit our students directly by hosting career days with the College of Engineering. A few examples of these companies include: Intel, SRD Engineers, Lockheed Martin, GFA International, Inc., SOFWERX.

**Education Abroad:** The team from USF World came and met with the College’s Undergraduate Coordinators, as well as interacted with our Engineering Student Services Advising team. Multiple initiatives from CUTR, IMSE, and ME and Chem Eng, EE and CSE are in the pipeline. IMSE is also working to launch a study abroad program at Pontifica Universidad Catolica de Valparaiso in Chile. Mechanical Engineering has made some progress in the 4-Year Global Roadmap with Heather Jarema as the lead-contact person. Chemical Engineering is exploring a possibility with the University of London. The Computer Science and Engineering department will be hosting the first NSF-sponsored International Research Experience for Undergraduates (REU) and Study Abroad program (the city of Oviedo, Spain), which is led by Dr. Miguel A. Labrador. While Electrical Engineering is also exploring relationships with the UK and Latin America.

### 2.7 NAE Grand Challenge Scholar Program (GCSP)

The National Academy of Engineering (NAE) solicited the College of Engineering to participate and propose a Grand Challenge Scholar Program (GCSP) at USF. The proposal was selected Spring 2018 and will be launched at 2018 Fall. The program is geared to motivating future engineers to solve society’s greatest challenges. The GCSP@USF College of Engineering is now peer to many prestigious engineering schools, such as, ASU, BU, CMU, CWRU, Duke, Georgia Tech, NCSU, Rice, Olin, Penn State, UT-Austin, UIUC, Virginia Tech, WSU.

National Academy of Engineering has identified 14 grand challenge areas categorized into four (4) broad topics: **Sustainability** (Make solar energy economical; Provide energy from fusion; Develop methods for carbon sequestration; Manage the nitrogen cycle; Provide access to clean water), **Health** (Advance health informatics; Engineer better medicines), **Security** (Prevent
nuclear terror; Secure cyberspace; Restore urban infrastructure), and Joy of Living (Reverse engineer the brain; Enhance virtual reality; Advance personalized learning; Engineer the tools of scientific discovery).

The program has five pillars: Research (mentored research/project experience in a Grand Challenge area), Interdisciplinary curriculum (connected to research in more than one discipline), Entrepreneurial activities (practical training/business model application in the field of engineering), Global vision & outreach (multicultural perspective and approach to grand challenge problem solving), and Social awareness (service learning and community outreach). Only top 20 students will be inducted into this program annually. Each scholar will have to pursue all the pillars at a required level and one of the pillars at a recommended higher level.

The GCSP cohort is proposed to be a community of practice, and is planned to provide a social co-curricular learning platform. Special attention is given in planning such that scholars leverage the gen-ed and core courses as much as possible for the required level, but spend most of their activities in research/national challenges/competitions. An info session was advertised to high achieving first-year students within just a week of receiving the notification and approval from NAE, and much interest is seen. The cohort will start fall 2018.

2.8 Academy of Distinguished Engineering Educator (ADE²)

In 2018, the University of South Florida’s College of Engineering established the Academy of Distinguished Engineering Educators (ADE²) to promote and support excellence in education, create a convergence of enhanced student learning experiences, aid the professional enrichment of faculty, and empower excellent educators.

**Mission:** (1) Promote curricular/co-curricular innovation, evidence-based curricular change and a scholarly approach to the education mission; (2) Foster globally-engaged, culturally-competent and inclusive engineering practices and principles; (3) Create an empowering mechanism for excellent educators; (4) Explore a culture of alternative mechanisms to impart transferrable skills as technology changes; and (5) Provide a forum for education leadership and advice for the Dean, Associate Dean, and Departmental Curriculum Planners.

**Member benefits/incentive:** Each member will receive a $4,000 per year stipend for professional development activities.

**Eligibility Requirements:** Members must be a tenure-track faculty or a full-time instructor of the USF College of Engineering with at least 5 years of full-time academic experience at the time of application in an institution of higher learning.
**Selection Process:** Nomination was solicited in February 2018. Members are selected based on their commitment to teaching and learning, their background and experiences of promoting curricular innovation, fostering globally engaged, culturally competent and inclusive engineering practices and principles, and providing a forum for educational leadership. Current members of the Academy are Autar Autar Kaw, Kingsley Reeves, Miguel Labrador, Scott Campbell, Jonathan Gaines, and Ken Christensen.

The Engineering Ambassadors (TEAM) has completed its first full year giving tours to hundreds of prospective students.
5 RESEARCH UPDATE

This was a very active research year for the college with improvements over last year in every area, including patents, publications, citations, and research expenditures.

Figure 3.1. Engineering Patents.

Figure 3.2. Engineering Publications.
Figure 3.3 Engineering Citations.

Figure 3.4 Engineering Research Expenditures.
4 ACADEMIC DEPARTMENT REPORTS

4.1 Chemical and Biomolecular Engineering

4.1.1 Faculty Points of Pride

- Dr. Clifford Henderson received a 2018 USF Outstanding Faculty Award.
- Dr. Clifford Henderson was named a Fellow of the American Association for the Advancement of Science (AAAS).
- Dr. Clifford Henderson was elected to serve on the Career and Education Operating Council and the Executive Board of the Programming Committee for the American Institute of Chemical Engineers.
- Dr. Clifford Henderson served in 2017 as the Conference Chair for the 61st International Conference on Electron Ion and Photon Beam Technology and Nanofabrication held in Lake Buena Vista, FL.
- Dr. Robert Frisina was named a Distinguished University Professor for the University of South Florida.
- Dr. Babu Joseph was awarded an Outstanding Faculty Award from USF by President Genshaft.
- Dr. Bill Lee was elected a Diplomate of the International Board of Forensic Engineering Sciences.
- The department has successfully recruited two new faculty who will begin Fall 2018. Dr. Ramon Gonzalez, who is currently a Professor at Rice University, joins the department as a 21st Century World Class Scholar and as a world-renowned expert in metabolic engineering and biomanufacturing of chemicals.
- Dr. David Simmons, who is currently an Associate Professor at the University of Akron and was recently awarded a National Science Foundation CAREER Award, will join the department in Fall 2018 and bring his internationally recognized research on polymers and soft matter with a particular focus on computational materials science and engineering to complement the growing strengths of the department in polymers and functional materials.
- Dr. Venkat Bhethanabotla delivered a keynote talk entitled “Acoustic Wave Biosensors” at the IEEE-ICST conference in Sydney, Australia in December 2017.
- The Department of Energy funded a new $630,000 project entitled “ATE Collaboration Outreach and Engagement Project” for which Dr. Richard Gilbert is a co-PI.
• Dr. Babu Joseph delivered an invited Plenary Seminar entitled “Production of liquid fuels from biomass,” at the Biomass and Energy Conference held in Las Vegas, NV in November 2017.

• Dr. Anna Pyayt received a University of South Florida Excellence in Innovation Award for 2017. Dr. Pyayt also was invited to participate in the Technology Showcase for the U.S. Congress in 2017.

• Dr. Norma Alcantar received a 2018 Jewish National Fund Fellowship.

• Dr. Norma Alcantar received a 2017 USF Outstanding Faculty Award and a 2017 Core Fulbright Scholar Award.

4.1.2 Student Points of Pride

• The USF AIChE (American Institute of Chemical Engineers) Student Chapter was awarded the AIChE Outstanding Student Chapter Award for a 6th consecutive year, an honor bestowed to only 10% of the AIChE student chapter in North America.

• The USF AIChE Chem-E-Car team placed in the top 5 teams at the 2018 Southeastern Regional Conference Chem-E-Car Competition. Their finishing in the top 5 out of more than 30 teams qualifies the team to compete and race at the national competition in Pittsburgh, PA in October 2018.

• Molly Skinner was selected as a National Finalist for Society of Women Engineers 2017 Technical Poster Competition.

• Molly Skinner was the winner of the USF Research Colloquium-Excellence in Research Award

• Molly Skinner also was awarded a Graduate Research Fellowship to participate in the “IRES: Call Me Glober-Under-represented Undergraduate Bioengineering Research in Singapore,” program for Summer 2018.

• Jakin Delony, a Ph.D. student working under the supervision of Dr. Clifford Henderson, was awarded a USF University Graduate Fellowship.

• Zeinab Veisi, a Ph.D. student in Dr. Norma Alcantar’s group, was awarded a Dorothy M. and Earl S. Hoffman Travel scholarship to attend the 2017 AVS International Symposium.

• Idri Tulloch received a Travel Grant to the Emerging Researchers National Conference.

• Katty Pierre received a travel award to attend the ABRCMS Conference.

• A department alumnus, Dr. Dawn Fox, was selected to receive a OWSD-Elsevier Foundation Award for Early Career Women Scientists in the Developing World in 2018.

• Rupin Singh won 2nd Place for his presentation at the International NanoBio conference in January 2018.
4.1.3 Activities to Increase UG and GR Online Education

ChBME currently has several of its undergraduate courses prepared for online delivery including its ECH 4323 Process Dynamics and Control course, its EGN 3433 Modeling and Analysis course, and its ECH 4267 Transport Phenomena II course. However, those courses have not been offered in an online format in the past year due to the fact that past offerings have not been preferred by current undergraduate students as measured both by enrollments and course survey responses. The Undergraduate Curriculum Committee in the department is currently reviewing the plan for online UG education as a part of its comprehensive undergraduate curriculum reform and revision process which is due to be completed by Fall 2018. Currently, it is likely that online UG courses for a number of the department’s courses will be offered in upcoming years as a means for coop and internship students to continue their coursework while gaining valuable engineering work experiences. The Graduate Studies Committee in the department is currently evaluating the possible needs for online graduate education courses within the department, particularly as they pertain to the M.S. programs within the department.

4.1.4 National Faculty Award Application and Nominations

Dr. Clifford Henderson was named a Fellow of the American Association for the Advancement of Science (AAAS).

4.1.5 Student Success

The Department of Chemical and Biomedical Engineering has implemented a plan for actively attracting and recruiting more graduate students to its M.S. and Ph.D. programs from Florida, across the nation, and around the world. The department has sent teams of faculty and graduate students to staff graduate school recruiting booths at both the fall 2017 AIChE Annual Meeting and the 2018 AIChE Southeastern Regional Student Conference and will continue this process of active recruiting at a number of upcoming national and international meetings. In addition, the department is helping host an NSF-REU program under the direction of Professor Venkat Bhethanabotla in advanced functional materials which brings in talented undergraduate students from across the country to conduct research each summer. Such REU programs provide both an excellent training opportunities for students and a terrific platform to expose students to all of the wonderful things USF has to offer. The department is also in the process of modifying its graduate student recruiting model to a “pool based” model where incoming graduate students will be supported for their first semester and given the chance to interview with various faculty
research groups before they are assigned to a particular group by the end of the fall semester of the year they enter the program.

At the undergraduate level, the department continues to work with its extremely strong AIChE Undergraduate Student Chapter to host outreach activities with local middle schools and high schools. The AIChE student chapter also perennially hosts one of the largest Engineers Week activity areas in which local primary school students from elementary through high school are exposed to interesting experiments and demonstrations involving chemistry and chemical engineering.

**Withdraw Drop Fail**

The only course in the department which has had any significant fraction of WDF grades is ECH 3023 Material and Energy Balances. That course is the first substantial course in the major for undergraduate engineering students in the department (as is typical at other peer departments as well) and as such the higher than average WDF grade rates in the course are reflective of the shift in thinking and level of course material complexity encountered in upper level engineering courses in the major. It is not uncommon in other peer departments to see similarly higher than average WDF rates (e.g., WDF grade rates in the Georgia Tech Material and Energy Balances course is >25%). In order to help our undergraduate students make the transition to these upper level courses, and in particular the ECH 3023 course, the department has made changes to its ECH 3002 Intro to Chemical and Biomedical Engineering course (which is a pre-requisite for the ECH 3023 course) to substantially expand and increase the rigor of content in that course that can serve as a primer and preparatory experience to better prepare students for the transition. This change in the ECH 3002 course has seen an almost 50% increase in the passing rate of students taking ECH 3023 course.

**Re-evaluate class schedule and 8 semester undergraduate degree plan**

The Department of Chemical and Biomedical Engineering (ChBME) is in the middle of a comprehensive curriculum review and revision process, with the expected result being a new ChBME undergraduate curriculum being made official in the 2018-2019 catalog. Among the many goals for the new curriculum are: (1) expanding the engineering experience over all 4 years (8 semesters) of a student’s undergraduate career at USF to better allow the student to focus on the core engineering subjects in a less compressed time frame and to integrate them more broadly with the full undergraduate curriculum, (2) provide room and flexibility for students to incorporate more cooperative education or internship work experiences into their program of study, and (3) providing a more structured sequence of credits that can allow for students to
tailor their undergraduate degree coursework to better prepare them for particular fields of employment within chemical and biomedical engineering or for pursuit of advanced graduate degrees.

**Expand Education Abroad participation by programs, faculty, and students**

The Department of Chemical and Biomedical Engineering (ChBME) is currently in the process of completing a comprehensive undergraduate curriculum review and revision. As a part of that process which is expected to conclude in the 2018-2019 academic year, the department is looking to establish two well-defined, department led study abroad experiences for its undergraduates. The two experiences, one targeted for students to experience in the summer between their sophomore and junior years and one targeted for students to experience in the summer between their junior and senior years, will consist of core engineering courses that will be taught by USF faculty in collaboration with faculty from partner schools abroad. Currently the department is in discussions with several potential partner universities abroad that have the facilities to host such programs and which are located in regions of the work that would be of benefit to the department’s students.

4.1.6 Growing Resources

**Explore potential new revenue streams**

The Department of Chemical and Biomedical Engineering is in the process of defining and initiating two new study abroad programs which will likely be offered for the first time in Summer 2019. In addition, the department is actively engaged with the College of Engineering in looking for ways to expand industrial and government research contracts through the new USF Institute for Applied Engineering.

**Growth in online education with a particular focus on delivery of complete online degree programs**

The department, through its Undergraduate Curriculum Committee, has been actively discussing online education in the department for its undergraduates. Current plans call for the creation of online versions of more undergraduate courses, whereby such courses would be made available to undergraduates who are on cooperative education or internship work opportunities so that they can continue to progress further toward their degree completion even while on work assignments. There is no plan at the moment to move to a substantially or completely online program for undergraduates pursuing the B.S. in Chemical Engineering given the hands-on laboratory and team design project components of the curriculum. At the
graduate level, the focus currently is on growing the Ph.D. degree programs and the research portfolio of the department, neither of which benefit from online educational programs, and thus at the current time it is felt that use of department resources on online education at the graduate M.S. degree level is not appropriate.
4.2 Civil and Environmental Engineering

4.2.1 Student and Faculty Highlights

- Dr. Gray Mullins was promoted to the Fellow grade of the American Society of civil Engineers

- Joel Raney, Civil Engineering ’11 – CEO of Raney’s Inc., has won a 2018 USF Outstanding Young Alumni Award

- Dr. Maya Trotz won highly competitive 5-year NSF Research Grant for $2.5 million

- Dr. Daniel Yeh wins $1.1M grant from the Bill and Melinda Gates Foundation

- Dr. Andres Tejada-Martinez wins $1M grant from The Gulf of Mexico Research Institute

- Dr. James Mihelicic awarded Excellence in Environmental Engineering and Science Education (E4) award from American Academy of Environmental Engineers and Scientists

- Structures Graduate Structures Student Success in International Big Beam Competition

- Doctoral student Yuan Wang won prestigious Transportation Research Board (TRB) award.

- Doctoral student Erica Dasi won the Roy W. Likins Scholarship awarded by the American Waterworks Association (AWWA) Florida Section

- The design team Need for Sneed (Pete Zydek, Tyler Brenfleck, Steven Rousseau, Emanuel Delgado, Mike Tavlin) took first prize in the FWEA (Florida Water Environmental Assoc.) Student Design Competition in the wastewater division. They represented Florida in the National Competition at WEFTEC in Chicago in September 2017.

CEE has revived the Eluminate sections since 2016 and have increased the enrollment by 38%
The civil engineering program climbed 18 spots in the 2019 USN&WR rankings.

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering - Overall</td>
<td>2019</td>
<td>105</td>
<td>110</td>
<td>99</td>
<td>100</td>
<td>89</td>
<td>90</td>
<td>Down</td>
</tr>
<tr>
<td>Engineering - Biomedical Engineering / Bioengineering</td>
<td>2019</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>NC</td>
</tr>
<tr>
<td>Engineering - Chemical</td>
<td>2019</td>
<td>88</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>100</td>
<td>Up</td>
<td></td>
</tr>
<tr>
<td>Engineering - Civil</td>
<td>2019</td>
<td>90</td>
<td>N/A</td>
<td>91</td>
<td>87</td>
<td>94</td>
<td>76</td>
<td>Up</td>
</tr>
<tr>
<td>Engineering - Computer Engineering</td>
<td>2019</td>
<td>N/A</td>
<td>77</td>
<td>N/A</td>
<td>81</td>
<td>77</td>
<td>80</td>
<td>Down</td>
</tr>
<tr>
<td>Engineering - Electrical / Electronic / Communications</td>
<td>2019</td>
<td>89</td>
<td>102</td>
<td>105</td>
<td>82</td>
<td>83</td>
<td>96</td>
<td>Down</td>
</tr>
<tr>
<td>Engineering - Environmental / Environmental Health</td>
<td>2019</td>
<td>N/A</td>
<td>59</td>
<td>59</td>
<td>64</td>
<td>48</td>
<td>56</td>
<td>Down</td>
</tr>
<tr>
<td>Engineering - Industrial / Manufacturing</td>
<td>2019</td>
<td>42</td>
<td>58</td>
<td>45</td>
<td>46</td>
<td>44</td>
<td>39</td>
<td>Up</td>
</tr>
<tr>
<td>Engineering - Mechanical</td>
<td>2019</td>
<td>132</td>
<td>132</td>
<td>N/A</td>
<td>124</td>
<td>105</td>
<td>126</td>
<td>Down</td>
</tr>
<tr>
<td>Sciences – Computer Science</td>
<td>2019</td>
<td>101</td>
<td>101</td>
<td>101</td>
<td>101</td>
<td>102</td>
<td>102</td>
<td>Down</td>
</tr>
<tr>
<td>Information Technology</td>
<td>2019</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>NC</td>
</tr>
</tbody>
</table>

*Ranking could be a tie with one or more school(s).
Faculty mentoring

Systematic and effective faculty mentoring is now available in Transportation, Environmental and Materials specialties of the department.

Growth of internships

CEE Dept. has initiated a long-term partnership with Crisdel Group Inc., of South Plainfield, NJ, to provide multiple internships to CEE undergraduates.

Updated CEE graduate enrollment figures

<table>
<thead>
<tr>
<th>Academic Year 2017-2018</th>
<th>Degrees awarded</th>
<th>Total enrollment</th>
<th>Newly admitted students</th>
<th>Newly enrolled students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>7</td>
<td>81</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>Masters</td>
<td>32</td>
<td>76</td>
<td>161</td>
<td>74</td>
</tr>
</tbody>
</table>

Figure 4.2.3. CEE Graduate enrollment
4.3 Computer Science and Engineering

4.3.1 Overview

The last year was a very active and productive year for the Department of Computer Science and Engineering. One new degree program was started, growth in degrees awarded continued, key education-focused projects were completed and are ongoing, research expenditures increased, and faculty and staff hiring brought new people to the Department.

New degree program: The BS in Cybersecurity major was launched in Spring 2018 with 36 students currently enrolled. This new program was created to meet growing demand for cybersecurity expertise in Florida and in the nation. This new program was created in partnership with the College of Arts and Sciences, Muma College of Business, and College of Business at USF-SM. We expect the first graduates from the program in 2019. The Department currently houses four undergraduate programs – Computer Science, Computer Engineering, Information Technology, and Cybersecurity.

Growth in degrees awarded: The Department has seen very large increases in degrees awarded per year for its undergraduate and graduate programs. In the past five years, growth has been phenomenal.

- The undergraduate program has more than doubled degrees awarded from 143 BS degrees awarded in AY1213 to (expected) 290 BS degrees awarded in AY1718.
- The graduate program has more than tripled MS degrees awarded from 26 MS degrees awarded in AY1213 to (expected) 80 MS degrees awarded in AY1718.
- The graduate program has more than doubled PhD degrees awarded from 6 PhD degrees awarded in AY1213 to (expected) 14 PhD degrees awarded in AY1718.

Major education-focused project completed: In partnership with UCF and FIU, we have successfully completed the CSIT TEAm project funded by the BOG. Governor R.E. LeMon stated “The Board is very impressed with the performance results and feels as if the $15M investment was well spent.” (note that this $15M was for all TEAm projects, not just the CSIT project). The USF part of the TEAm project was a partnership effort with the College of Engineering, College of Arts and Sciences, Muma College of Business, Kate Tiedemann College of Business at USF-SP, and College of Business at USF-SM. From the benchmark year of AY1213 to the end of AY1718, the Department has more than doubled its yearly production of BS degree with Computer Science and Information technology producing the most degrees.
**Major education-focused project ongoing:** In partnership with UCF and FIU, we are now in the second year of a $5 million NSF S-STEM program named “Flit-Path”. This project will provide $1M in direct scholarships to Department undergraduate students based on financial need and academic standing. In Spring 2018, 37 first and second year students were being funded at a $5K per year level (to continue through graduation) and 12 last year students were being funded at a $2.4K level.

**Research expenditures:** The research expenditure for computer science and engineering in FY16-17 was 2.6 million, which is a 44% increase over $1.8 million FY15-16.

**Faculty hiring:** Five new Assistant Professors joined the Department in Fall 2017 to replace vacancies left by retirements and faculty moving to other universities partially restoring the total tenure-track faculty to 25. We are still short by two tenure-track faculty; two BSIT lines were vacated by retirement and death, which have not been filled. The new Assistant Professors are:

- Dr. Marvin Andujar received his PhD in Human-Centered Computing from the University of Florida, Gainesville. He is a pioneer in the area of brain-computer interface, in particular, using it to control drones. He is recipient of a $300K grant from Intel to support his dissertation research. Dr. Andujar is already recognized by prestigious fellowships, namely NSF Graduate Research Fellowship and GEM Fellowship, and is a Generation Google Scholar and Intel Scholar. To date, Dr. Andujar has published 11 papers in highly competitive, peer-reviewed journals and conferences.

- Dr. Shaun Canavan received his PhD degree from SUNY, Binghamton. His research involves analyzing video and other 3D/range data for a wide range of applications in hand gesture interfaces for next generation virtual and augmented reality systems, sign language interfaces for communicating with the deaf, sketch recognition for police photo lineup, and gaze detection for autism. He has published 18 papers, including one selected for a best paper collection and one “Most Cited Image and Vision Computing Article.” He also holds a patent for his invention.

- Dr. Robert Karam received his PhD from the University of Florida, Gainesville, and previously worked as a biomedical engineer at L. Stokes Cleveland VA Medical Center. Dr. Karam’s expertise is in bio-implantable systems, hardware security of IoT, and reconfigurable computing. He received the best paper award at the IEEE Biomedical Circuits and Systems Conference, and has published 12 journal and 15 conference papers. His research is highly interdisciplinary and he is looking forward to building collaborations with USF Health, the VA, and Biological Sciences.
• Dr. John Licato was an assistant professor at Indiana University - Purdue University, Fort Wayne. He researches AI, automated reasoning/argumentation, and cognitive robotics, collaborating with experts in psychology and philosophy. He has published 31 papers and is recipient of the Air Force Office of Scientific Research Young Investigator’s Program Award (roughly $450K). During his doctoral studies at Rensselaer Polytechnic Institute, he received the RPI Founder’s Award of Excellence. He is also a co-PI on an AFOSR grant with RPI and UIUC.

• Dr. Mehran Mozaffari Kermani was an assistant professor at Rochester Institute of Technology. He is a recipient of the prestigious NSERC Post-Doctoral Research Fellowship and several faculty awards. A leading expert in cryptographic hardware security, Dr. Mozaffari Kermani publishes high-impact research in the top journals of his field. He has published 47 papers, and has been granted a total of roughly $1.2M from federal funding agencies, namely, DoD Army Research Lab and NIST. He serves as Associate Editor for the IEEE TVLSI, the IEEE TCAS I, and the ACM TECS.

Staff hiring: One new advisor and one new front-office staff (Academic Program Specialist) joined the Department in the last year. The Department now has a professional advisor for the first time ever – John Morgan - for its four undergraduate programs. The Department now has three front office staff dedicated to its undergraduate programs – Mayra Morfin joining the Department in March to support our new BSCyS program.

4.3.2 Points of pride and significant accomplishments

Student News

USF's First National Hackathon Competition

March 29, 2018  The Department of Computer Science and Engineering and the Society of Hispanic Professional Engineers (SHPE) successfully hosted USF's first national hackathon competition, Hack-A-Bull, March 24-25. SHPE is the first student chapter to host a national hackathon competition. SHPE USF partnered with Major League Hacking (MLH) to be a part of their 2017-2018 Season.
Flit-Path "Cohort A" scholarships granted to twenty-six pre-CS, CpE, and IT students

March 28, 2018  Twenty-six first-year Computer Science, Computer Engineering, and Information Technology students have been awarded a four-year $20,000 scholarship as part of the Department’s NSF S-STEM Flit-Path project. The scholarships are part of a $5 million, five-year grant from NSF awarded to USF, UCF, and FIU in support of the collaborative Florida IT Pathways to Success project.
Flit-Path "Cohort B" scholarships granted to twelve pre-CS, CpE, and IT students

February 2, 2018 Twelve seniors in Computer Science, Computer Engineering, and Information Technology have been awarded a one-year $2,440 "completer grant" scholarship as part of the Department's NSF S-STEM Flit-Path project.

Flit-Path "Cohort B" scholarships granted to twenty pre-CS, CpE, and IT students

April 20, 2017 Twenty senior Computer Science, Computer Engineering, and Information Technology students have been awarded a one-year $2,440 "completer grant" scholarship as part of the Department's NSF S-STEM Flit-Path project.

Flit-Path "Cohort A" scholarships granted to fourteen pre-CS, CpE, and IT students

April 20, 2017 Fourteen first-year Computer Science, Computer Engineering, and Information Technology students have been awarded a four-year $20,000 scholarship as part of the Department's NSF S-STEM Flit-Path project.

Willie McClinton awarded first place for presentation at 2018 ERN Conference, Washington, DC

March 28, 2018 Computer Science and Engineering undergraduate student Willie McClinton was awarded first place for his oral presentation at the 2018 ERN Conference in Washington, DC. McClinton is an undergraduate research assistant in CSE’s Neuro-Machine Interaction Lab under the guide of Assistant Professor Marvin Andujar.

Two Students Develop Study App with the Student Innovation Incubator at USF

March 4, 2018 With the help of the Student Innovation Incubator (SII), two sophomore students, William Rondon and Chad Townsend, created a mobile study application.

Adjunct Instructor and Two Students Attend SheHacks at Boston University

February 6, 2018 Patricia Wilthew, Amber Hamlet, and adjunct instructor Richard Rauscher attended SheHacks at Boston University January 26-28. SheHacks is an event dedicated to femme empowerment in a male-dominated tech industry. During a 36-hour hackathon, women and femme non-binary individuals participate in workshops, learn new languages and programming.

Qua'on Thomas on the USF Student Spotlight

January 24, 2018 Junior Qua’On Thomas, Computer Science major, was recently featured in a USF video compiled for the Florida Legislature. Qua’On is also the secretary of the National Society of Black Engineers (NSBE).
Department of Computer Science and Engineering at Grace Hopper 2017

October 24, 2017 Over 18,000 women in technology and more than 200 companies were present at the Orange County Convention Center in Orlando, Florida from October 3rd to October 6th.

CSE students at the Grace Hopper Conference in Orlando.

Student Team awarded Honorable Mention at IEEE Vast Challenge 2017

October 2, 2017 At the IEEE Vast Challenge 2017, held on October 1, 2017 in Phoenix, Arizona, the USF Department of Computer Science and Engineering student team of Sulav Malla, Anwesh Tuladhar, and Ghulam Jilani Quadri received an Honorable Mention.

Master's thesis by CSE student is in top 25 theses accessed on ProQuest

September 20, 2017 A thesis written by Bader Albassam, a student of the Department of Computer Science and Engineering at the University of South Florida, was recently recognized
as one of the top 25 accessed dissertations and theses during the month of July 2017.

**Wellness App created by CSE students has a successful pilot**

**August 28, 2017** During the Spring 2017 semester, the "MoBull Wellness" app was developed by Department of Computer Science and Engineering students Matthew Chan, Maxwell Busenbarrick, and David Gonzalez.

**CSE welcomes Joshua Pericles, 2017 Tillman Military Scholar**

**August 22, 2017** The Department of Computer Science and Engineering welcomes Joshua Pericles, a Computer Engineering student who is also one of only 61 2017 Tillman Military Scholars.

**Student Ran Rui awarded Best Paper Runner-Up at SSDBM2017**

**July 14, 2017** CSE PhD student Ran Rui was awarded Best Paper Runner-up at the 29th International Conference on Scientific and Statistical Database Management (SSDBM2017, Chicago) for a paper titled "Fast Equi-Join Algorithms on GPUs: Design and Implementation."

**Ashley Suh awarded CREU for research**

**June 27, 2017** Student Ashley Suh was awarded a $3,000 stipend for her research project, "Using Persistent Homology to Drive Interactive Graph Drawing," from the CREU. The proposal for funding was submitted by Dr. Paul Rosen, who will be Suh's faculty mentor throughout her research.

**Four CSE students awarded the A. Richard Newton Young Student Fellow Award**

**June 10, 2017** Four students from the Department of Computer Science & Engineering received the A. Richard Newton Young Student Fellow Award to attend DAC in Austin, TX later this month.

**Scholarships awarded to 8 undergraduate and 2 graduate students**

**May 23, 2017** A diverse group of students were awarded several different scholarships due to their academic achievements.

**Graduate student Ghada Zamzmi featured as IAPR "The Next Generation"**

**May 11, 2017** Ghada Zamzmi was featured in April 2017 IAPR (International Association of Pattern Recognition) Newsletter as "The Next Generation" of pattern recognition researchers.

**Graduate student Rekha Govindaraj receives Provost's Teaching Assistant Award**

**April 22, 2017** Rekha Govindaraj received the 2016-17 Provost's TA award in the STEM
Osniel Quintana earns Goldwater Honorable Mention
April 2, 2017 Osniel Quintana, a junior in the Department of Computer Science and Engineering, is a 2017 Goldwater Honorable Mention. Osniel seeks to obtain a PhD in computer science in the area of artificial intelligence.

Faculty Research News
Srinivas Katkoori and team awarded $50,000 NSF ICorps Grant
March 19, 2018 An interdisciplinary team from College of Engineering (Dr. Srinivas Katkoori and Mr. Rajeev Joshi) and College of Nursing (Dr. Hsiao-Lan Wang) have been awarded the National Science Foundation (NSF) ICorps grant for $50K to evaluate market viability for PAfitMe.

Department of Computer Science and Engineering achieves higher ranking for MSIT Program
February 6, 2018 According to the U.S. News & World Report, the Department of Computer Science and Engineering has been ranked no. 23 in the nation for the online Masters of Science in Information Technology (MSIT) program.

Shaun Canavan awarded $50,000 from AWS Machine Learning Research Awards Program
January 31, 2018 An innovator in his field, Assistant Professor Shaun Canavan has been awarded an unrestricted $50,000 grant and $100,000 AWS promotional credit from Amazon's AWS Learning Machine Research Program.

Dmitry B. Goldgof Received the National Science Foundation SSTR Phase I Grant
January 10, 2018 The National Science Foundation has awarded a $224,417 STTR Phase I Grant, "Microscope-based Technology For Automatic Brain Cell Counts Using Unbiased Methods," to Stereology Resource Center, Inc. under the direction of Drs. Peter Mouton (PI) and Dmitry Goldgof. Dr. Goldgof, professor and vice chair for the Department of Computer Science and Engineering, will be collaborating with Dr. Mouton to research the use of microscopic technology to count brain cells.

Computer Science and Sociology Researchers Team Up for DARPA Grant
December 11, 2017 News travels fast on the Internet and a $1.7 million grant from the Defense Advanced Research Projects Agency (DARPA) will fund researchers from USF's College of Engineering and Department of Sociology in the College of Arts and Sciences to examine how fast and in what ways different kinds of information travel through online environments, including social media.
Faculty Receive NSF Grant to Detect Cyberbullying

October 2, 2017 A research team at the University of South Florida received a grant from the National Science Foundation (NSF) to explore a different approach to detecting cyberbullying in the digital communications of young adolescents.

Alfredo Weitzenfeld awarded $494,420 from NSF

September 18, 2017 The award was granted in support of the project, "RI: Medium: Collaborative Research: Experimental and Robotics Investigations of Multi-Scale Spatial Memory Consolidation in Complex Environments."

Sriram Chellappan awarded $28,000 from NSF

September 1, 2017 The award was granted in support of the project, "EAGER: PPER: Collaborative: Cellphone-Enabled Water Citizen Science for Data and Knowledge Generation, and Sharing: WatCitSci."

REU Program Travels to Oviedo, Spain

August 5, 2017 The Research Experience for Undergraduates (REU) and Study Abroad program, headed by Dr. Miguel A. Labrador, traveled to the city of Oviedo, Spain, from May 21 to July 29.

Professor Miguel Labrador (far left) with students and faculty in Oviedo, Spain.
Dr. Hao Zheng received $30,000 from Intel for supporting graduate research

May 25, 2017 Dr. Zheng was awarded a gift from Intel, through an internal program that supports research to benefit society.

Yao Liu awarded a Department of Defense DURIP grant

March 23, 2017 Yao Liu has been awarded a Department of Defense DURIP grant titled "Towards Wireless Physical Layer Security Leveraging Massive and Distributed MIMO Radios" for $200,000.

Innovation News

Yu Sun receives five new patents in the last year

August 31, 2017 Dr. Yu Sun was recently granted a patent titled "Techniques to Enable Robot Intention Expression" (#9,744,672, Issued on August 29, 2017). Dr. Sun has now received five patents in the last year

Patent granted to two Department faculty and two CSE graduate students

May 5, 2017 Professors Jay Ligatti and Dmitry Goldgof along with Department graduate students Cagri Cetin and Jean-Baptiste Subilis were granted United States Patent 9,659,160, "System and Methods for Authentication using Multiple Devices."

In the News

Teaching Computers to Analyze Satellite Images

Friday, March 30, 2018 USF A.I. technology wins third prize at international intelligence challenge.

Mauricio Pamplona Segundo and Sudeep Sarkar interviewed for The Next Platform

March 20, 2018 Department of Computer Science and Engineering Postdoctoral Scholar Mauricio Pamplona Segundo and Department Chair Professor Sudeep Sarkar were featured in The Next Platform on February 28, 2018 for their work with geographic information systems.

Cell Phone Users to Help Protect Water Supply

September 27, 2017 USF engineers will use data and information posted to social media to help municipal planners take a more comprehensive approach in addressing challenges to our water supply.

CSE faculty patent featured in recent USF news article

June 7, 2017 On June 6, 2017, USF News released an article featuring the Department of Computer Science & Engineering's very own Jay Ligatti and Dmitry Goldgof.
Shanie Lightbourne named as outstanding staff for the College of Engineering

June 1, 2017 The University of South Florida has named five College of Engineering staff members for the 2016 Outstanding Staff Awards. Included in those five is the Department of Computer Science and Engineering’s Lashanda Lightbourne.

Faculty Awards

Professor Goldgof and the Engineering Faculty Receive Research Achievement Awards

January 31, 2018 Dmitry B. Goldgof, professor and vice chair in the Computer Science and Engineering Department, received the Outstanding Research Achievement Award.

John Licato awarded AFOSR Young Investigator’s Program Award

October 12, 2017 Dr. John Licato, an Assistant Professor at the USF Department of Computer Science and Engineering, was recently selected as a recipient of the Air Force Office of Scientific Research Young Investigator's Program (YIP) Award.

Lawrence Hall awarded IEEE SMC Joseph G. Wohl Outstanding Career Award

October 11, 2017 Dr. Lawrence Hall of the USF Department of Computer Science and Engineering, was recently selected as a recipient of the IEEE SMC Joseph G. Wohl Outstanding Career Award, established in 1991.

Collaborative Paper granted Best Paper Award

October 3, 2017 A collaborative paper, between the University of South Florida and three other universities, published in the January-March 2016 edition of the journal IEEE Transactions on Multi-Scale Computing Systems (TMSCS), was awarded the Best Paper Award for 2017.

Sudeep Sarkar awarded William R. Jones Outstanding Mentor Award

September 30, 2017 Dr. Sudeep Sarkar, department head and professor at the USF Department of Computer Science and Engineering, was recently selected as a recipient of the William R. Jones Outstanding Mentor Award by the Florida Education Fund.

Jay Ligatti awarded Excellence in Innovation Award

September 25, 2017 Dr. Jay Ligatti, a professor at the USF Department of Computer Science and Engineering, was recently selected to receive the Excellence in Innovation Award from USF Research & Innovation.

Rangachar Kasturi awarded IAPR/ICDAR Outstanding Achievements Award

August 15, 2017 After having been nominated for this award, it was granted to Rangachar Kasturi by a committee for "seminal research in document image analysis and graphics
recognition, and for outstanding leadership to the international pattern recognition community."

Adriana Iamnitchi and Yao Liu granted Faculty Outstanding Research Achievement Award
August 15, 2017 Adriana Iamnitchi and Yao Liu, both professors for the Department of Computer Science and Engineering, have been selected to receive a Faculty Outstanding Research Achievement Award from the Research Council at USF Research & Innovation.

Alumni News
Seng Sun, founder and CEO of Sun View Software and an alumni of USF CSE, received the Entrepreneurial Excellence Award in April 14, 2018 from the college.

USF CS&E alumni won Tampa Bay Tech awards:
Jeremy Rasmussen (CTO, Abacode Cybersecurity) won Tampa Bay Technology Leader of the Year, and Ray Carr (CTO, Occam Technology) won Tampa Bay Technology Executive of the Year.

Alumnus Jeremy Ramos receives College Outstanding Young Alumni Award
April 16, 2017 Jeremy Ramos (BSCpE, 1999) has received the College of Engineering Outstanding Young Alumni Award given to an engineer under the age of 40 who has distinguished themselves through professional practice and service to the college, engineering profession, and society at large.

Alumnus co-founded company Unifi rakes in $17.5 million in new funding
March 18, 2017 Startup Unifi has raised $17.5 million in a recent round led by Scale Venture Partners. The San Mateo-based startup has raised $32 million to date

4.3.3 Academics

Complete Online Undergraduate Degree Programs
- BSIT, Information Technology/ITC/EN

Complete Online Graduate Degree Programs
- MSIT, Information Technology/ITC/EN

The Department offers BS and MS degree programs that are hybrid online and face-to-face. The BS in Information Technology (BSIT) degree program has seen a very large increase in degrees awarded and SCH generated in the Department in the past five years.
The MSIT program is a new program and has not yet experienced a significant growth but is expected to do so in the next few years if applications to the graduate programs continue to increase overall. The MSIT program has been revamped (working with the USF Graduate School through the Grad Council) to be more attractive to both domestic and international students. The changes made started having effect in fall 2017.

4.3.4 Areas of Focused Performance Improvement

Significantly reduce occurrence of high DWF sections

The Department has had courses with high DWF rates in the past for its BS in Computer Science, BS in Computer Engineering, and BS in Information Technology degree programs. These degree programs are very demanding programs and some students do not understand the time commitment needed for success. We have done three things to reduce high DWF rates.

1. The first is to do a better job in permitting to allow only those students who are on track for achieving Department program admission criteria into our lower-level pre-admit courses.
2. The second is through better advising we try to make sure that students fully understand the time commitment needed to be successful in the three BS programs in the Department.
3. We are also turning lower-level pre-admit courses introductory courses into face to face to increase student engagement in the courses. We have found that about a third of the students in online classes are not engaged, especially towards the beginning of the semester when formative concepts are taught.
Significantly increase the number of federal research grant submission

In FY 2016-17, to date, 80 proposals were written requesting $49 million, of which 34 were funded totaling awards of $3.9 million.

In FY2015-16, 75 proposals were written requesting $33 million, of which 25 were funded totaling awards of $3.3 million.

In FY2014-15, 52 proposals were written requesting $30 million, of which 24 were funded totaling awards of $2.4 million.

Develop, implement, and evaluate a systematic and effective mentoring program for faculty in the college.

CSE has a mentoring program for pre-tenure faculty in the department. Each assistant professor after their first semester suggests possible mentors. The chair then confirms willingness on part of the mentor and pairs them. The department has a written guideline that describes the expectations of this relationship. The minimum expectation is that the mentor and mentee will meet regularly, at least once a year, to discuss progress and to strategize steps to take. The chair also keeps a close eye on the progress and effort, through annual evaluations, made by the pre-tenure faculty, assisting and advising as needed. In the coming year, we plan to reevaluate this strategy to refine or replace as needed.

Promote and enhanced level of student engagement with the USF Office of UG Research

CSE has had an active NSF-funded REU Site in the department continuously since 2005. This site has enrolled an average of 10-15 students every year from USF and many other universities around the country with special emphasis on minorities and students from under-represented groups in computer science and engineering. The participation of Hispanics, African American, and women has been 65%, 10%, and 22%, respectively. The site has been very successful in convincing students to pursue graduate studies. With 8% of the participants enrolled in doctoral programs and 23% in masters programs. The site has proven to be a very good recruiting tool for the department, as several of the participants have obtained their PhD and masters’ degrees from CSE.

In 2017, the site implemented a pilot program with NSF running the program in the University of Oviedo in Spain. The idea was to provide students with the benefits of a research experience and a study abroad experience at the same time. This program is being arranged in collaboration with NSF, USF World, and the University of Oviedo.

The College of Engineering has been a pioneer in research for undergraduates. For many years, this site and the other REU sites in the college and other colleges has been running the Research
Day where all REU participants present their research works in a poster competition. The Office of Undergraduate Research has always been active in this event.

### 4.3.5 REPUTATION AND PARTNERSHIPS

- USF CSE is in the top 16.5% (rank 30) of Computer Science departments at US public universities, according to Academic Analytics 2016 based on Scholarly Research Index using default weights for grants, articles, conferences, awards, and citations.

- However, our reputation lag our accomplishments, the most recent 2019 US News & World Report ranked our Computer Engineering program in the 50th place among public universities.

- U.S. News places USF’s graduate computer information technology program at No. 23 in the nation, a six-position improvement from 2017.

- Research expenditures for fiscal year 2016/2017 totaled $2.6 million. This is above the national norm of $100,000 per tenure-track faculty of a public institution with 20-35 tenure-track faculty (2016 Taulbee Survey, CRA).

- The Department was ranked in the top one-third of all Computer Science programs by Research Quality in the 2010 National Research Council database assessment of research doctorate programs.

   We used Academic Analytics peer identification tool to identify public AAU institutions that have similar performance profile as us. Specifically, the tools identified institutions with based on similarity of value of five, normalized, indicators:

   - Articles/faculty,
   - Awards/faculty,
   - Citations/faculty,
   - Conference Proceedings/faculty, and
   - Federal Grants/faculty.

   We identified departments of computer science of the AAU public universities as aspirational peers to those that have one or two indicators similar to our department.

   1. Georgia Institute of Technology: 36 faculty members
   2. University of California, Santa Barbara: 31 faculty members
   3. Michigan State University: 32 faculty members
   4. SUNY Stony Brook University: 46 faculty members
   5. The Ohio State University: 43 faculty members
6. Indiana University Bloomington: 50 faculty members
7. University of Florida: 33 faculty members
8. Purdue University: 47 faculty members
9. SUNY University at Buffalo: 36 faculty members

We are low in terms of number of tenure track faculty compared to the aspirational peers. However, the comparison shows that the department has strong results in awards, citations and conference proceedings but it definitively needs to improve the number of articles and, more importantly, the federal grants metric. We expect these quantities to improve, as the department grows in size, comparable to aspiration peers.

### 4.3.5 New degree programs for 2017 USF Work Plan

**Spring 2018: Launch of the new BS in Cybersecurity Degree program** The Department of Computer Science and Engineering (CSE) has a total of eight-degree program with 25 tenure track and 10 instructors. It offers BS, MS, and PhD degrees. The Department has four BS programs, they are Computer Science (CS), Computer Engineering (CpE), Information Technology (IT), and Cybersecurity (CyS). The CS and CpE programs are ABET accredited, the IT and CyS programs are not ABET accredited, yet. It has three MS programs in Computer Science (CS), Computer Engineering (CpE), and Information Technology (IT) and one PhD program in Computer Science and Engineering.

The BSIT and BSCyS is mostly online and the MSIT can be completed fully online or with some classes taken online and others in a traditional face-to-face mode.

Discussions with Department of Industrial and Management System Engineering about a joint MS degree in Engineering Analysis are ongoing and CSE is exploring with Innovative Education online options.

All CSE degree programs have high productivity.

- The Department has 35% of the total College undergraduate enrollment with less than 25% of the total faculty in the College.
- The Department has an undergraduate student-faculty ratio of 57 in the College.
- The Department has the 2nd highest PhD load per faculty in the College.

The graph below shows the fall enrollments that we have experienced in our department over time, this trend is faster than even the national trend. In approximately six (6) years, the enrollment in our undergraduate programs have more than doubled, from less than 320 students to more than 800.
At the graduate level, the situation is similar. The graph below shows the enrollment in our graduate programs over time. Similar to the undergraduate growth, our graduate enrollment has almost doubled from 113 students in 2010 to 208 in 2017.

4.3.6 Student Success

In addition to the NSF-funded REU site, the department has been very active in the recruiting of talented minority students to our graduate programs.

- Every year, the department enrolls excellent students from our partner
FLGSLAM institutions and from partner institutions from Puerto Rico and Latin America.

- Special recruiting visits to partner institutions take place every year and recruiting ads are also included in booths that the college has in conferences.
- In addition, direct emails to chairs of computer science programs in Florida and other targeted institutions around the country and overseas are sent in search of qualified students.
- Every year CSE tries to recruit around 10 new PhD students with financial aid (TA ships) to keep the doctoral program running at steady state.
- Many admitted students are individually contacted to convince them to join CSE graduate programs.
- Dr. Jing Wang holds a K-12 "roadshow" and visits local K-12 schools with the Women in Computer Science and Engineering (WICSE) group.

The Department has carefully aligned the undergraduate catalog eight-semester plans with course scheduling. Following are some of the specific efforts to accelerate progress to degree completion.

- For all four BS programs in the Department, all core courses (with only one exception that is fully managed) are offered every fall and spring semesters with many core courses also being offered in the summer semester.
- A sufficient number of technical elective courses are also offered each semester – including summer – to enable students to follow the catalog plans. In all cases, the courses listed in the catalog eight semester plans for summer are offered every summer.
- CSE verified that there is no reason that a student cannot complete a BS in Computer Science, BS in Computer Engineering, BS in Information Technology, or BS in Cybersecurity program in eight semesters plus one summer.
- The BS in Computer Engineering program is 128 hours requiring a heavier per semester load than the BS in Computer Science and BS in Information Technology. Many of our students do gain experience through part-time internships in Tampa Bay area high-tech companies – these internships can (and do) slow down the progress of students (students take fewer course hours when they have an internship). With the new GenEd, there is a possibility that BS in Computer Engineering can be reduced to 120 hours, but we have to study its impact on ABET accreditation.
- CSE manages course sizes to ensure that all student can get a full schedule.
- CSE tracks enrolled hours and we ask all students who do not have a full schedule (this at the end of the registration period) to see the Department Advisor. The Dept. works with these students one-on-one to get them a full
schedule. CSE has been very successful with this approach having only one or two students per semester who cannot get a full schedule (this is due to some constraint in the student’s schedule that we cannot resolve)

The Department hires both undergraduate and graduate students for front office, technical support, and other administrative and technical positions. Approximately six students are hired in this capacity in any given semester.

The Department also hires Department graduate students as teaching assistant – about 60 full-time TAs per semester – to support the large and growing degree programs in the Department. OPS and FWS funding is used to pay these students for their work. The Department is beginning to explore ideas for undergraduate TAs and/or peer advisors – this would increase undergraduate employment opportunities in the Department.

The department traditionally has a strong research emphasis, and therefore it is continuously studying ways to improve its doctoral program. The doctoral program was recently modified to accelerate the time to degree and increase the research productivity of the students and faculty.

- The total number of credits was reduced from 90 to 72 and a new graduation requirement was introduced to help students revise the state-of-the-art in their areas of research earlier in the program.
- In fall 2017, new modifications were introduced to streamline the qualifier examinations and include new requirements that will give students more research time and earlier in the program. This increase in research time is targeting the increase of publications and research productivity of students and faculty.

4.3.7 Growing Resources

Currently the revenue generated by the unit in just tuition dollars alone (aside from research grants) is more than the total expenditures from all sources (E&G plus from other sources, such as INTO, Innovative Ed., etc.) of the department. Taking into account state appropriations, **CSE is brings in revenue twice the amount spent on it!**
As discussed above the BSIT and BSCyS program and the MSIT program is a hybrid one, with 13% of all undergraduate students in the College of Engineering were BSIT students. CSE is currently working with Innovative Education to perform a quality audit of the form and delivery of the course contents for all courses in the BSIT program. CSE is also working toward gaining ABET accreditation for the BSIT/BSCyS program in 2021. In fall 2020, there will be a mock ABET visit. Fall 2021, will have the formal ABET visit for the BSIT program and all other programs in the Department and College.
4.4 Electrical Engineering

4.4.1 Faculty Points of Pride

- EE Distinguished Professor Richard Gitlin was inducted into the Florida Inventors Hall of Fame. Dr. Gitlin was also named to the James Madison High School Wall of Distinction, [http://www.jamesmadisonalumni.org/wall.html](http://www.jamesmadisonalumni.org/wall.html) that includes other notables such as Carol King, Bernie Sanders, and Ruth Bader Ginsburg.

- EE Assistant Professor Selcuk Kose received the USF Outstanding Researcher Award. Dr. Kose also received his third Cisco Research Award and was invited to present his research in the Cisco Research Center System and Platform Security PI Summit to the distinguished engineers and Senior Directors within Cisco.

- EE Professor Thomas Weller was elevated to the rank of Fellow of the IEEE. The EE Department now has 5 IEEE fellows, the largest number it has ever had.

- In summer 2017 alone, EE faculty were awarded 7 grants from the National Science Foundation; the investigators are C. Ferekides, S. Kose, N. Ghani, Z. Lu, J. Wang, T. Weller and Y. Yilmaz. Overall, there were 40 research awards totaling over $3.5M.

- The EE Department faculty now has 35 full-time faculty members, setting a new high-water mark.

<table>
<thead>
<tr>
<th>Year</th>
<th># Proposals</th>
<th>Amount of Proposals</th>
<th># of Awards</th>
<th>Amount of Awards</th>
<th>Research Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-2015</td>
<td>98</td>
<td>$29,841,450</td>
<td>48</td>
<td>$4,695,942</td>
<td>$3,801,244</td>
</tr>
<tr>
<td>2015-2016</td>
<td>102</td>
<td>$109,081,140</td>
<td>51</td>
<td>$6,213,941</td>
<td>$3,670,549</td>
</tr>
</tbody>
</table>

Figure 4.4.1. Faculty research proposal submissions and awards.

4.4.2 Student Points of Pride

- MSEE student Sayed Abdullah Sadat was awarded the 2017 Golden Bull Award! The Golden Bull Award is one of USF's highest honors given annually (in the spring semester) to up to 20 deserving undergraduate and graduate students who encompass the spirit of USF and have demonstrated its values.

- Mohamed Mounir Abdin, a doctoral student in the Department of Electrical Engineering and the Center for Wireless and Microwave Information Systems (WAMI), was awarded
the prestigious IEEE Microwave Theory and Techniques Society (MTT-S) Graduate Fellowship for 2018.

- EE Undergraduate Students **Charles Curtiss and Kiran Shila** received the 2017 Professor Rudy Henning endowed scholarship. Dr. Rudy Henning was the visionary who in 1996 saw the potential for creating a comprehensive program in research and education in wireless & microwave circuits and systems. The award provides up to two $250 awards each year to undergraduate students who demonstrate outstanding technical potential in the area of wireless engineering and a strong interest in helping others.

- **Evans Bernardin**, EE PhD Student, received a BMES Career Development Award.
- **Weize Yu**, an EE PhD graduate, secured a tenure-track assistant professor position at Old Dominion University.
- **Eduardo Rojas**, an EE PhD graduate, secured a tenure-track assistant professor position at Embry-Riddle Aeronautical University.
- **Longfei Wang**, an EE PhD student, was awarded the Chih Foundation Research and Publication Award.

### 4.4.3 Online Education

<table>
<thead>
<tr>
<th>Year</th>
<th>Ugrad On-Line SCH</th>
<th>Grad On-Line SCH</th>
<th># Fully On-Line Ugrad Courses</th>
<th># Fully On-Line Grad Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-2015</td>
<td>108</td>
<td>300</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2015-2016</td>
<td>157</td>
<td>356</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2016-2017</td>
<td>423</td>
<td>288</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

*Figure 4.4.2. Online courses growth.*

Fully on-line courses are those with complete, pre-recorded and posted course content.

### 4.4.4 National Faculty Awards

In 2014-2015, two EE Department faculty members (Larry Dunleavy and Tom Wade (Emeritus)) applied or were nominated for IEEE Fellow. In 2015-2016, three EE Department faculty members (Larry Dunleavy, Huseyin Arslan, and Tom Wade) applied or were nominated for IEEE Fellow. Tom Weller was also nominated for Florida Academy of Inventors Fellow. In 2016-2017, one EE Department faculty member (Tom Weller) applied or was nominated for IEEE Fellow and one EE Department faculty member (Selcuk Kose) was nominated for the USF Outstanding Researcher Award.
4.4.5 Withdraw Drop Fail

In 2016-2017 the Department had 11 UG sections with WDF rates >25%. Of these,

- 7 sections were 4000-level sections attached to a graduate (6000-level) course and none of these had enrollments of more than 4 students, so that at most only 2 students needed to drop to exceed the 25% level. The department has taken steps to improve undergraduate advising practices, to help students make more informed choices about challenging undergraduate technical electives.
- 4 sections were small laboratory sections, all with enrollments below 7. In these sections the DWF rates were ~33%, so one student made the different of being above or below the 25% threshold.

4.4.6 Junior Faculty Mentor Program

The EE Department has a junior faculty mentoring program. All junior faculty are assigned a senior faculty member (or two) as a mentor. Recently, the department’s Faculty Advancement Committee has developed a new process to ensure more regularity in the feedback it receives from faculty mentors.

4.4.7 Research Experiences for Undergraduates

The EE Department participates in the REU program and the director of the COE REU Program is an EE faculty member. In 2016-2017 school year, more than 20 undergraduate students worked in the research labs at the Electrical Engineering Department. Almost half of them worked as volunteers, and the rest were funded either directly through a grant or supported partially by the College of Engineering REU program. The majority of the students participated in an REU poster presentation event. Also at least one undergrad student was the co-author of a journal publication.

4.4.8 USNWR Rankings

USF EE is in the top 28% (rank 41 of 144) of Electrical Engineering departments at US public universities, according to Academic Analytics 2016 based on Scholarly Research Index using default weights for grants, articles, conferences, awards, and citations. US News & World Report (2018) ranked the Electrical Engineering program in the 50th place among public universities.
The department has five IEEE fellows, two NAI fellows, one AIAA fellow, one AAA fellow, one NAE member, one member of the Florida Inventors Hall of Fame, five NSF CAREER awardees and one AAAS fellow. The department has produced an average of over 170 publications, 3,500 citations and 12 issued patents per year over the last 5 years. Over the five-year period there have been 28 license agreements and 4 new start-ups.

The peer departments selected for comparison by the EE Department are the University of Iowa, the University of Buffalo and the University of Kansas. All three are AAU member institutions and ranked slightly higher than the USF EE Department. Buffalo and Kansas have comparable faculty sizes, while Iowa is ~30% smaller in faculty count. The USF EE Department is currently producing more PhD degrees per TTF than the three peer institutions, and is at approximately the median value in terms of MS degrees per TTF. The primary weakness area is research expenditures per TTF, where USF is comparable to Kansas and Buffalo, but below Iowa.

<table>
<thead>
<tr>
<th>School</th>
<th># EE Faculty</th>
<th>Overall Rank</th>
<th>Expenditures/TTF</th>
<th>MS Deg/TTF</th>
<th>PhD Deg/TTF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>21</td>
<td>Top 75</td>
<td>$302K</td>
<td>0.62</td>
<td>0.33</td>
</tr>
<tr>
<td>Buffalo</td>
<td>29</td>
<td>Top 75</td>
<td>$128K</td>
<td>5.9</td>
<td>0.31</td>
</tr>
<tr>
<td>Kansas</td>
<td>31</td>
<td>Top 75</td>
<td>$166K</td>
<td>0.71</td>
<td>0.19</td>
</tr>
<tr>
<td>USF in 2017</td>
<td>35</td>
<td>Top 80</td>
<td>$135K</td>
<td>1.85</td>
<td>0.48</td>
</tr>
<tr>
<td>USF in 2026 (goal)</td>
<td>45</td>
<td>Top 50</td>
<td>$250K</td>
<td>2.5</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Figure 4.4.3. AAU peer program rankings.

The aspirational peers selected for this comparison are the University of Maryland (College Park) and Northwestern University; both are AAU member institutions. The faculty size and productivity metrics of these schools are consistent with those identified for the USF EE Department in the 2026 strategic plan. The USF EE Department is currently under-producing PhD degrees per TTF compared to both aspirational peers, but is producing a relatively strong number of MS degrees per TTF. The primary weakness area is research expenditures per TTF. With growth in the size of the faculty, and bringing in more research active faculty, it is expected that expenditures and PhD degree production will increase.

<table>
<thead>
<tr>
<th>School</th>
<th># EE Faculty</th>
<th>Overall Rank</th>
<th>Expenditures/TTF</th>
<th>MS Deg/TTF</th>
<th>PhD Deg/TTF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maryland</td>
<td>61</td>
<td>Top 15</td>
<td>$225K</td>
<td>3.1</td>
<td>0.84</td>
</tr>
<tr>
<td>Northwestern</td>
<td>50</td>
<td>Top 30</td>
<td>$320K</td>
<td>0.56</td>
<td>0.54</td>
</tr>
<tr>
<td>USF in 2017</td>
<td>35</td>
<td>Top 80</td>
<td>$135K</td>
<td>1.85</td>
<td>0.48</td>
</tr>
<tr>
<td>USF in 2026 (goal)</td>
<td>45</td>
<td>Top 50</td>
<td>$250K</td>
<td>2.5</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Figure 4.4.4. AAU peer graduate degree rankings.
The following annual productivity metrics for the Electrical Engineering Department summarize key outputs:

- Average number of proposals submitted: 95
- Average research expenditures: $3.69M
- Average number of publications: 167
- Average number of citations: 3,499
- Average number of patents: 11

<table>
<thead>
<tr>
<th>Year</th>
<th># Publications</th>
<th># Citations</th>
<th>PhDs Graduated</th>
<th>Ugrad SCH</th>
<th>Grad SCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-2015</td>
<td>152</td>
<td>3123</td>
<td>16.5</td>
<td>7241</td>
<td>4611</td>
</tr>
<tr>
<td>2015-2016</td>
<td>198</td>
<td>3764</td>
<td>10</td>
<td>7624</td>
<td>5359</td>
</tr>
<tr>
<td>2016-2017</td>
<td>134</td>
<td>3873</td>
<td>17</td>
<td>7601</td>
<td>5989</td>
</tr>
</tbody>
</table>

Figure 4.4.5. EE Dept. productivity.

4.4.9 COMMUNITY OUTREACH

The EE Department has continued to build its relation with the magnet programs at Middleton High School, and intends to replicate activities with other Tampa Bay area high schools in 2018-2019. Key activities in 2016-2017 were the development of two fully on-line undergraduate courses that will be offered to Middleton students under the dual-enrollment program. EE Professors Drew Hoff and Steve Saddow have contributed to expand their summer Biomedical Engineering Camp for high school students, extending it from 1 week to 2 weeks in the past year.

The EE Department also initiated a new sequence of 3, 1-credit hour courses into its BSEE program which have an emphasis on service learning and community partnership. The courses Professional Formation of Engineers (PFE) 1, 2, and 3 connect the freshman engineering experience to the senior capstone design course by weaving professional skills and competencies (see Career Readiness at National Association of Colleges and Employers – http://www.naceweb.org/career-readiness/competencies/career-readiness-defined/ through the students’ sophomore and junior years. A key characteristic of the PFE - which is taught by a professor of practice with over 10 years of industrial experience - is the engagement of students with industry professionals and experiential learning activities beyond the university environment (service projects, community engagement, internships etc.) Course activities range from career planning, development and completion of a personalized qualification plan based on each student’s professional goals, innovative design, project management, professional ethics,
and entrepreneurship. Students in the inaugural class (PFE 1) have already identified a high impact project - a sustainable "Container Farm" - and have organized into several teams (equivalent to a real company) for the development and prototyping of the farm.

At the senior level, the BSEE program curriculum continues to strengthen community ties through the TRUE Partner Network. This is a network of local and regional companies that team with the department in the senior capstone design effort. A meeting of network companies held in July 2017 included Manitowoc/Welbilt, Florida Power & Light, RCA Solutions, DeliverLogic, NREC, GE Instrument Transformers, and Withlacoochee River Electric Cooperative, Inc. In the first year, nearly 20 BSEE graduates have participated in projects that initiated from the TRUE Partner Network.

### 4.4.10 STUDENT SUCCESS

#### Undergraduate

The EE Department has revised its 8 semester undergraduate degree plan and its planned summer offerings, to better align with its new BSEE program and improve the availability of courses across the 7 new sub-discipline tracks.

The EE Department employs undergraduate students through the work study program and graduate students for TA/GA/RA positions (total invested in hire TA/GA/RA is $660,000 for Fall and Spring of 2016-17).

#### Graduate

The EE Department, as part of its new strategic plan, is evaluating time-to-degree for its doctoral program and considering improvements that will optimize the period from the qualifying exam to candidacy. These improvements will include improved research training for graduate students, and more uniformity across the faculty in terms of pre-candidacy expectations.

The EE Department is developing a number of new graduate courses in the area of systems science and cybersecurity, and will pursue the creation of an on-line certificate program for working professionals.
4.5 Industrial and Management Systems Engineering

Industry Consortium for IMSE (icIMSE)

IMSE department continues to bring real life industry project-based experiential learning opportunities for BSIE students. This year students are working on projects at companies like Florida Hospital, Johnsons Control, Raymond James, and Raytheon. The participating companies are invited to attend the 5th Annual Industry Consortium meeting on April 20, 2018 where all students groups will present their projects. The projects will be judged and the best project team will receive an award (plaque and cash) at the senior banquet.

Portfolio Driven Mentoring and Advising at IMSE

IMSE department continues to mentor BSIE students to develop and maintain a portfolio of accomplishments in the areas of leadership, community engagement, global exposure, undergraduate research, mental & physical health, and scholarship. Students are advised and encouraged to expand their portfolio along those dimensions by showing various avenues for enhancements. Students are encouraged to set goals and shown expansive portfolios of other current and past students as examples.

Senior Banquet to Recognize high Achieving Graduates

IMSE department is set to host a senior banquet for all graduating seniors. At the banquet, the award winners will be announced and honored with plaques and cash awards. The awards that will be given will recognize individual accomplishments: outstanding graduate, outstanding leadership, outstanding community engagement, outstanding research, and group accomplishments: best industry consortium project, and best senior design project. The individual awardees will have the opportunity to address the graduating class. Annual banquet is set for May 3, 2018.

IMSE Advisory Board Hosts a Transition to Profession Panel:

Members of the IMSE advisory Board hosted the 3rd Annual “Transition to Profession” panel discussion for graduating BSIE, MSIE, and MSEM students on April 5th, 2018 at CUTR. Various topics that were discussed in the panel are:

- Key differences between “student-life” and “work-life” & Interviewing (Lead: Brandon Faulkner, Partner, Holland and Knight)
- Look beyond the Engineering Department in a Corporate Culture (Lead: Jose Calderin, Zaeples, Inc., IT Director)
- Performance Management Teamwork and Meeting (Lead: Raymond LaCour, Sr. Vice President, Raymond James)
• E-mail Etiquette & Communication (Lead: Ron Weller, General Manager and Vice President, Air Products and Chemicals)
• Many careers – One Degree (Lead: Cindy Amor, Consulting Engineer, TECO)

IMSE Published Annual IMpulSE Newsletter Magazine:
IMSE department published its 3rd Annual Newsletter Magazine highlighting faculty, student, and alumni accomplishments. 1000 copies of the newsletter were printed and mailed to all Industrial Engineering department chairs across U.S. universities and some overseas, and selected alumni of the BSIE, MSIE, MSEM, and PhD programs.

IMSE Upgrades its Manufacturing and Automation Laboratory
IMSE department undertook a significant upgrade of its Manufacturing and Automation Laboratory that is used for training its undergraduate students. With the upgrade, students will be able to practice more hand-on implementation of factory automation, robotics, product design and 3-D manufacturing/printing, and program and design of control systems. These are among the essential skills that industrial engineers need to be successful in industry.
4.6 Mechanical Engineering

4.6.1 Areas in Need of Focused Performance Improvement

Faculty members are evaluated based on proposal submissions as PI and Co-PI. They are provided data on their relative performance within the department and compared to top departments around the country. The following table shows total proposals submitted by mechanical engineering faculty as PIs:

<table>
<thead>
<tr>
<th>Annual Year</th>
<th>Proposal Amount Requested-PI</th>
<th>No. of Proposals Submitted-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-17</td>
<td>$29,022,823</td>
<td>45</td>
</tr>
<tr>
<td>2015-16</td>
<td>$28,007,323</td>
<td>46</td>
</tr>
<tr>
<td>2014-15</td>
<td>$15,395,707</td>
<td>37</td>
</tr>
<tr>
<td>2013-14</td>
<td>$13,815,145</td>
<td>45</td>
</tr>
</tbody>
</table>

Figure 4.6.1. Federal grant proposals.

Mechanical engineering faculty members have regular discussions on adding on-line content to our curriculum. Dr. Autar Kaw is one of the pioneers in this field and has been guiding our faculty on achieving this goal. Although we are not offering required classes online, we are using hybrid and flipped pedagogies in various classes. We are offering two MOOCs in numerical methods and introduction to matrix algebra. Dr. Kyle Reed is teaching a partially on-line version of a graduate course in Haptics. It is based on videos created last year.

As illustrated in the table below, the ME department has a stable Doctoral student enrollment over the last five academic years. One of the strategic missions of the ME department is increasing the Doctoral student enrollment. To attain this goal, the department is increasing the number of federal research grant submissions over prior years and making concerted effort on recruiting highly-talented, top performing Doctoral and Master’s students.

<table>
<thead>
<tr>
<th>Annual Year</th>
<th>PhD Degrees Awarded*</th>
<th>Total PhD Enrollment</th>
<th>Newly Admitted PhD Students</th>
<th>Newly Enrolled PhD Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017-18</td>
<td>6</td>
<td>42</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td>2016-17</td>
<td>6</td>
<td>43</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>2015-16</td>
<td>10</td>
<td>37</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>2014-15</td>
<td>5</td>
<td>45</td>
<td>34</td>
<td>11</td>
</tr>
<tr>
<td>2013-14</td>
<td>5</td>
<td>40</td>
<td>23</td>
<td>11</td>
</tr>
</tbody>
</table>

Figure 4.6.2. PhD trends over five years.

*Does not include PhD degrees awarded by department faculty as major or co-major professors in other departments: 2013-14 (4); 2014-15 (1); 2015-16 (2); 2016-17 (1); 2017-18 (2)
We routinely nominate faculty members for national awards. Some of the recent examples include Robert Foster Cherry Award, Ralph Coats Roe Award, ASEE SE Outstanding New Mechanics Educator Award, ARO, AF, ONR and ARO Young Investigator Programs, NSF CAREER award, and SAE Ralph R. Teetor Educational Award will be receiving the 2017/18 ASEE Ralph Coats Roe Award later this year. This award is sponsored by the Mechanical Engineering Division of ASEE and it includes $10,000 honorarium.

Students usually enter the ME Department during their junior year. In addition, entrance requirements are based on Calc 1, Calc 2 and Physics 1 courses generally taken during their first couple semesters.

The overall ME Department WDF percentage rates appear to be steady or decreasing. The following table shows the WDF grades as totals and percentages of all grades during the last six years:

<table>
<thead>
<tr>
<th>Grade</th>
<th>2017</th>
<th>%</th>
<th>2016</th>
<th>%</th>
<th>2015</th>
<th>%</th>
<th>2014</th>
<th>%</th>
<th>2013</th>
<th>%</th>
<th>2012</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>71</td>
<td>2.61</td>
<td>77</td>
<td>3.16</td>
<td>59</td>
<td>2.80</td>
<td>28</td>
<td>1.62</td>
<td>33</td>
<td>2.18</td>
<td>40</td>
<td>3.03</td>
</tr>
<tr>
<td>D</td>
<td>126</td>
<td>4.63</td>
<td>108</td>
<td>4.43</td>
<td>106</td>
<td>5.03</td>
<td>59</td>
<td>3.40</td>
<td>61</td>
<td>4.03</td>
<td>65</td>
<td>4.92</td>
</tr>
<tr>
<td>F</td>
<td>72</td>
<td>2.65</td>
<td>95</td>
<td>3.90</td>
<td>58</td>
<td>2.75</td>
<td>37</td>
<td>2.14</td>
<td>40</td>
<td>2.65</td>
<td>45</td>
<td>3.41</td>
</tr>
<tr>
<td>Total (All Grades)</td>
<td>2,722</td>
<td></td>
<td>2479</td>
<td></td>
<td>2109</td>
<td></td>
<td>1733</td>
<td></td>
<td>1512</td>
<td></td>
<td>1320</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.6.3. WDF trends over six years.

4.6.2 Priority Areas

Faculty and Research Excellence

Our new tenure track faculty members are assigned mentors. They are evaluated and provided feedback on an annual basis by tenured faculty and department chair. Department’s tenure track faculty members have received 3 NSF CAREER awards in recent years and most junior faculty members have received multiple NSF grants. Instructors are evaluated by senior faculty through classroom visits. Over the last few years Dr. Delcie Durham was the overall mentor for the new faculty and Dr. Autar Kaw has played a significant role as a mentor for teaching assignments. Dr. Rajiv Dubey has been mentoring Dr. David Murphy, and since his research is related to Marine Science, he has been also receiving mentoring from Dr. Kendra Daly from USF College of Marine Science. Other new faculty and instructors are also mentored on a regular basis by various faculty.
The ME Department has active research faculty with ongoing research projects. Undergraduate students work on many of these projects. In addition, the Department faculty participate in the REU student program. As an example of engagement, a new faculty member who will be joining the department in Fall 2018, has already contacted the USF Office of Undergraduate Research and the Honors College regarding recruitment of REUs.

Reputation and Partnerships

As shown in the table below, we have been comparing our graduate degree and research expenditures with top 30 mechanical engineering departments. We are comparable to the 25th percentile of the top 30 mechanical engineering departments in all categories. We are higher than median in MS degrees and headcount per faculty.

<table>
<thead>
<tr>
<th></th>
<th>MS Deg/TTF</th>
<th>PhD Degree/TTF</th>
<th>MS HC/TTF</th>
<th>PhDHC/TTF*</th>
<th>RE/TTF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>4.72</td>
<td>1.42</td>
<td>7.36</td>
<td>8.67</td>
<td>$920,000</td>
</tr>
<tr>
<td>75th Percentile</td>
<td>2.69</td>
<td>0.98</td>
<td>4.22</td>
<td>4.75</td>
<td>$634,000</td>
</tr>
<tr>
<td>Median</td>
<td>2.07</td>
<td>0.67</td>
<td>3.40</td>
<td>3.74</td>
<td>$537,000</td>
</tr>
<tr>
<td>25th Percentile</td>
<td>1.59</td>
<td>0.50</td>
<td>2.31</td>
<td>3.05</td>
<td>$400,000</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.15</td>
<td>0.38</td>
<td>0.07</td>
<td>2.05</td>
<td>$279,000</td>
</tr>
<tr>
<td>USF ME AY2014-2015</td>
<td>2.13</td>
<td>0.67</td>
<td>5.40</td>
<td>3.21</td>
<td>$201,000</td>
</tr>
<tr>
<td>USF ME AY2016-2017</td>
<td>3.27</td>
<td>0.47</td>
<td>5.47</td>
<td>2.87</td>
<td>$221,293</td>
</tr>
</tbody>
</table>

Figure 4.6.4.

Top 30 ME Depts.  *Data from 2013-14

Even though we are not ready for a new degree program, we have a certificate program in robotics and our faculty members are major professors for several PhD students in biomedical engineering. A new faculty member in the department specializes in biofluidics and has been exploring collaboration with marine science in his niche area of research.

Student Success

The ME department is actively recruiting and hiring highly-talented, top performing Doctoral and Master’s students. One of the successful recruitment strategies is to actively recruit and post PhD recruitment flyers at the largest annual interdisciplinary mechanical engineering conference in the world, American Society of Mechanical Engineers International (ASME) Mechanical
Engineering Congress and Exposition (IMECE). ASME IMECE 2017 was hosted in Tampa, FL. The ME department and College of Engineering made significant investment in sponsoring some of the events at this conference. The ME department in collaboration with the office of graduate studies, has initiated significant effort on recruiting McKnight Doctoral Fellowship students. Last year, the Office of Graduate Admission applauded the ME department for timely review of all graduate applications, noting the department had zero applications without decision at the time, one of the few in the University. Department Chair and Graduate Advisor discussed graduate school opportunities at an ASME student chapter meeting in fall 2017.

The ME Department WDF percentage rates appear to be steady or decreasing. The following table shows the WDF grades as totals and percentages of all grades during the last six years.

<table>
<thead>
<tr>
<th>Grade</th>
<th>2017</th>
<th>%</th>
<th>2016</th>
<th>%</th>
<th>2015</th>
<th>%</th>
<th>2014</th>
<th>%</th>
<th>2013</th>
<th>%</th>
<th>2012</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>71</td>
<td>2.61</td>
<td>77</td>
<td>3.16</td>
<td>59</td>
<td>2.80</td>
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<td>33</td>
<td>2.18</td>
<td>40</td>
<td>3.03</td>
</tr>
<tr>
<td>D</td>
<td>126</td>
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<td>108</td>
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<td>59</td>
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<td>61</td>
<td>4.03</td>
<td>65</td>
<td>4.92</td>
</tr>
<tr>
<td>F</td>
<td>72</td>
<td>2.65</td>
<td>95</td>
<td>3.90</td>
<td>58</td>
<td>2.75</td>
<td>37</td>
<td>2.14</td>
<td>40</td>
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<td>2109</td>
<td>1733</td>
<td>1512</td>
<td>1320</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.6.5.

Six year grade distribution trend.

The ME Department class schedule is fine-tuned every semester to maximize course offerings and minimize course schedule conflicts. The Department degree plan is adjusted as needed to improve pedagogy and progress to degree completion.

We employed more USF students as part-time employees where appropriate.

<table>
<thead>
<tr>
<th>USF Students Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Year</td>
</tr>
<tr>
<td>2017/18</td>
</tr>
<tr>
<td>2016/17</td>
</tr>
<tr>
<td>2015/16</td>
</tr>
<tr>
<td>2014/15</td>
</tr>
</tbody>
</table>

Figure 4.6.6. Student Employees
As illustrated in the table below, the mean time to degree in doctoral programs in the ME department is well within the expected range for an engineering discipline. The ME department is strategically focusing on few students that are taking longer than expected to defend their PhD dissertations. The ME chair and graduate coordinator met with the students and have implemented a limit to the total number of semesters the students are supported by departmental TA.

<table>
<thead>
<tr>
<th>Annual Year</th>
<th>PhD Degrees Awarded / Headcount</th>
<th>Mean Years</th>
<th>Minimum Years</th>
<th>Maximum Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-17</td>
<td>6</td>
<td>4.75</td>
<td>3.00</td>
<td>6.75</td>
</tr>
<tr>
<td>2015-16</td>
<td>10</td>
<td>4.62</td>
<td>2.75</td>
<td>7.42</td>
</tr>
<tr>
<td>2014-15</td>
<td>5</td>
<td>4.87</td>
<td>4.00</td>
<td>6.42</td>
</tr>
<tr>
<td>2013-14</td>
<td>5</td>
<td>3.52</td>
<td>3.00</td>
<td>4.42</td>
</tr>
</tbody>
</table>

*Figure 4.6.7. Four-year time to degree trend.*

*Does not include PhD degrees awarded by department faculty as major or co-major professors in other departments: 2013-14 (4); 2014-15 (1); 2015-16 (2); 2016-17 (1); 2017-18 (2)

**Growing Resources**

Faculty members in the department are working on several industry funded projects. We have received 4 NSF IUCRC grants during the past 4 years. These grants promote cutting-edge pre-competitive fundamental research in science, engineering, technology area(s) of interest to industry and that can drive innovation and the U.S. economy. IUCRCs offer a platform for significant leveraging of financial investment by members to accelerate the knowledge base in emerging technological and manufacturing sectors and develop an industrially savvy workforce to benefit US economy (NSF). A state of the art virtual reality system CAREN (Computer Assisted Rehabilitation Environment) is made available at cost to local industry and hospitals for clinical studies and research.

Mechanical engineering faculty members have regular discussions on adding on-line content to our curriculum. Dr. Autar Kaw is one of the pioneers in this field and has been guiding our faculty on achieving this goal. Although we are not offering classes online, we are using hybrid and flipped pedagogies in various classes. We are offering two MOOCs in numerical methods and introduction to matrix algebra. Dr. Kyle Reed is teaching a partially on-line version of a graduate course in Haptics. It is based on videos created last year.
NSF funded Bulls-Engineering Youth Experience for Promoting Relationships, Identity Development, and Empowerment (Bulls-EYE PRIDE) summer program led by Dr. Jonathan Gaines in the mechanical engineering department will develop, implement, and evaluate culturally relevant and comprehensive engineering design experiences for underrepresented middle-grade students (grades 6, 7, and 8) that are designed to increase students’ STEM competency, awareness and motivation to pursue STEM-related careers, and inter-personal and life skills. This activity is likely to result in recruitment of underrepresented minorities to USF engineering as FTIC students.

2017-18 Points of Pride & Significant Accomplishments

Mechanical Engineering Faculty

Autar Kaw: Awarded 2017-2018 ASEE Ralph Coats Roe Award (March 2018)

David Murphy: Awarded the National Academies’ Gulf Research Program 2017 Early-Career Research and Science Policy Fellowship (August 2017)

Jonathan Gaines: Received a $450,000 National Science Foundation award entitled “Engineering Youth Experience for Promoting Relationships, Identity Development, and Empowerment” (August 2017)

Stephanie Carey: Received a NASA award entitled “Biomechanics for Enhancement & Verification of Countermeasure Analysis Tools for Human Exploration Missions.” (August 2017)

Nathan Crane: Received a National Science Foundation I-Corps award entitled “Improved Approach to Polymer Sintering.” (July 2017)

Tansel Yucelen: Received a subcontract through Universal Technology Corporation from the U.S. Air Force entitled “Verification and Validation of Adaptive Hypersonic Vehicle Control Algorithms” (March 2017)

Wenjun Cai: Received a National Science Foundation award entitled “Optimizing Wear and Corrosion Resistance of Superlattice Coatings through Atomic-Scale Design.” (March 2017)

Wenjun Cai: Received 2017 TMS Young Leaders Professional Award (March 2017)

Jonathan Gaines: Received a National Science Foundation award entitled “Bulls-Engineering Youth Experience Promoting Relationships, Identity Development, and Empowerment (Bulls-EYE PRIDE).” (March 2017)

Stephanie Carey: Received a NSF Planning Grant: I/UCRC for iPERFORM Center for Assistive Technologies to Enhance Human Performances (PI: Stephanie Carey; Co-PI: Rajiv Dubey, Stephen Sundarrao, Redwan Alqasemi, Kyle Reed). (February 2017)
**Mechanical Engineering Students**

**Justin Nussbaum:** Awarded the Innovation Crossroads post-doctoral fellowship (April 2018)

**Amber Gatto:** Winner of the 10th Annual Graduate Student Research Symposium (March 2018)

**Jeffrey Golabek:** Received Second Place in the USF Mini-Circuits Design for X Laboratory Design and Build Contest (February 2018)

**Ehsan Arabi:** Finalist in the 2018 AIAA GNC Conference Graduate Student Paper Competition (November 2017)

**Kaitlin Lostroscio:** Awarded NASA Space Technology Research Fellowship (October 2017)

**Francesca Moloney:** Awarded the American Solar Energy Society John and Barbara Yellott Award for 2017 (September 2017)
4.7 Medical Engineering

4.7.1 Faculty Excellence

Professor and Chair Robert Frisina was named a Distinguished University Professor and elected Fellow in the Biomedical Engineering Society; one of a total of 150 BMES Fellows nationally with

4.7.2 Patents

With Drs. Venkat Bhethanabotla, Chemical and Biomolecular Engineering; Dr. Joseph Walton, Communication Sciences and Disorders; and Parveen Bazard, PhD, recent BME Doctoral Graduate; we were awarded US Patent # 9,937,359, entitled: “Plasmonic Stimulation of Electrically Excitable Biological Cells”

4.7.3 Publications

Recent Articles in Higher Impact Journals

*denotes authorship by one of Dr. Frisina’s Students:


4.7.4 International Conference Organizers

Drs. Frisina and Shannon Salvog were Conference Organizers for: “Aging and Speech Communication, 7th International NIH Research Conference”, University of South Florida-Tampa, October 2017.

4.7.5 Student Success

Tanika Williamson PhD and Andrea Lowe PhD, both recent graduates of our Biomedical Engineering PhD Program, won competitive Travel Awards to the recent International Meeting of the Assoc. for Research in Otolaryngology in San Diego, where they presented their new BME research findings in the application area of hearing loss and deafness.
4.8 Center for Urban Transportation Research

4.8.1 Research Highlights

Dr. Pei Sung Lin, CUTR Program Director, has received grants totaling over $8.3 million. Included in this total are multiple Florida DOT grants, focusing on pedestrian and bicycling safety, totaling over $7 million.

Lisa Staes, CUTR Program Director, has received grants totaling over $4.6 million. Her program focuses on transit safety and standards development. Within that total is $2.5 million in awards from the Federal Transit Administration.

Dr. Pei Sung Lin and Lisa Staes are two of the top ten researchers within USF. [https://reports.research.usf.edu/Report/Awards/Top_Awardees](https://reports.research.usf.edu/Report/Awards/Top_Awardees)

a. CUTR awards totaled over $18.5 million.
   i. Federal - $2.9 million – 11 awards
   ii. State - $15.1 million – 57 awards
   iii. Other - $.5 million – 19 awards

4.8.2 Points of Pride

Faculty

Dr. Robert L. Bertini is a former CAREER Award recipient, as well as Fellow, American Society of Civil Engineers; Fellow, Institute of Transportation Engineers; and Senior Member, IEEE; Dr. Bertini taught the “Sustainable Transportation” course.

Dr. Pei Sung Lin is the Edward A. Mueller District 10 Transportation Engineer of the Year; Fellow, Institute of Transportation Engineers; Received the International Chinese Transportation Professionals Association Distinguished Service Award; Dr. Lin was appointed as a faculty member within the Civil & Environmental Engineering department.

Dr. Seckin Ozkul received the Rising Start Program Award by the Institute of Transportation Engineers.

Dr. Chanyoung Lee has been appointed to the Federal Highway Administration’s new Motorcyclist Advisory Council.

Dr. Sisinnio Concas has accepted an appointment to the TRB Committee on Transportation Economics (ABE20)
Dr. Cong Chen has also been named as a young member of the TRB Committee on Safety Data, Analysis and Evaluation (ANB20)

CUTR Faculty Teaching

Dr. Bertini – Sustainable Transportation

Dr. Polzin – Public Transportation

Jennifer Flynn – Transportation & Society

Dr. Lin – Traffic Systems Engineering

Dr. Achilleas Kourtellis – Transportation Engineering 1

Dr. Zhenyu Wang – Transportation Safety

Students

The USF ITE student chapter won the Florida Section Traffic Bowl; then went on to compete at the international competition to be held along with the ITE Annual meeting, in Toronto. This year’s student team comprises Ms. Manvitha Rajalingola, Mr. Kurt Lehmann, Mr. Ashok Sampath and Mr. Richard Driscoll.

Ph.D. student Amir Ghiasi presented a U.S. DOT T3e Webinar on Wednesday February 8, 2017, "Connected Autonomous Vehicles on a Mixed Traffic Highway—Speed Harmonization, Capacity Analysis, and Lane Management"

Richard Driscoll was named the NCTR Student of the Year.

Staff

Kristin Larsson for received the USF College of Engineering Outstanding Staff Award.

4.8.3 Areas of Focused Performance Improvement

CUTR submitted 73 proposals with a total value of 19,846,058

- State of FL – 44 submissions – value of 15,599,763
- Federal – 9 submissions – value of 3,460,161
- Other govt. / municipal – 15 submissions – value of 646,113
- Private – 5 submissions – value of 140,021

4.8.4 National Faculty Awards

Dr. Robert L. Bertini is an ASCE Fellow and an IEEE Senior Member.
Dr. Pei Sung Lin is the Edward A. Mueller District 10 Transportation Engineer of the Year and received the International Chinese Transportation Professionals Association Distinguished Service Award.

Dr. Seckin Ozkul received the Rising Start Program Award by the Institute of Transportation Engineers.

4.8.5 Momentum within CUTR

Director Robert L. Bertini has continued his efforts in building strong relationships with the international, national, state, and local communities. In July he was invited by the Chinese Overseas Transportation Associate (COTA) to their 17th annual International Conference of Transportation Professionals. He was honored to speak during multiple sessions, and was inspired by the high speed rail between Beijing and Shanghai. Also in July, he spoke as part of the FHWA sponsored International Symposium on Transportation & Traffic Theory, held at Northwestern University. Florida Senator Jeff Brandes and CUTR Director Robert Bertini had an excellent discussion with a great audience about the Future of Transportation at SciCafe St. Petersburg in May 2017. Robert Bertini chaired a great session on "Roadway Assets for CVs and AVs" at the Second Annual Texas A&M Transportation Technology Conference in May.

Director Bertini also provided leadership in accomplishing the MOU signing, between USF and the City of Tampa. University of South Florida President, Judy Genshaft, and The City of Tampa Mayor, Bob Buckhorn, signed an MOU on March 20, that signifies their willingness to work together to implement technologies that will improve the lives of its citizens and create a more effective and efficient government.

CUTR continues to hold a pivotal role in the testing and improvement of connected and automated vehicles through their sponsored work and relationship with THEA. CUTR was the primary organizer of the Automated Vehicles Summit, held in November 2017.

Phil Winters, CUTR's Transportation Demand Management (TDM) Program Director discussed Best Workplaces for Commuters in this great article in the Raleigh, NC News & Observer.

CUTR was honored to welcome FDOT District 7 Secretary Steinman to campus for a visit with new CUTR Director Robert Bertini and the CUTR leadership in March 2017.

CUTR's Sean Barbeau, Ph.D presented his recent work, "Concept of Operations for Deploying a Mobile Transit Fare Collection App" in a TRB 2017 lecture session.

In March, we were happy to welcome Paul Larrousse, Director of the National Transit Institute (NTI) at Rutgers University to CUTR.
4.8.5 15th Annual CUTR Transportation Awards

The fifteenth annual CUTR Award Event, which now includes an annual induction into the Florida Transportation Hall of Fame, continues to draw a large number of guests, building bridges between the research faculty of CUTR and the statewide community of stakeholders in the transportation industry. The inductee into the Florida Transportation Hall of Fame for 2017 was ex-mayor of Miami, Maurice Ferré.

![2016 Transportation Award recipient Maurie Ferré (l), with USF System President Judy Genshaft, and CUTR Director Robert Bertini.](image)

4.8.5 Inside CUTR

April 2017, CUTR has 196 employees and in April 2018, there are 80 students (9 GRA, 71 OPS).

<table>
<thead>
<tr>
<th>Total Number</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>#Employees</td>
<td>196</td>
</tr>
<tr>
<td>Female</td>
<td>83</td>
</tr>
<tr>
<td>Male</td>
<td>113</td>
</tr>
<tr>
<td>Administrative</td>
<td>14</td>
</tr>
<tr>
<td>Graduate Research Assi</td>
<td>9</td>
</tr>
<tr>
<td>Non-Student OPS</td>
<td>47</td>
</tr>
<tr>
<td>Regular Faculty</td>
<td>38</td>
</tr>
<tr>
<td>Staff</td>
<td>15</td>
</tr>
<tr>
<td>Student OPS</td>
<td>71</td>
</tr>
<tr>
<td>Visiting Faculty</td>
<td>2</td>
</tr>
</tbody>
</table>

![Figure 4.8.1. Employees and Students working at CUTR](image)
CUTR again participated in the 2017 homecoming parade.

### 4.8.6 CUTR Student Success

**Yuan Wang (PhD)** and **Kurt Lehmann (MS)**, were this year’s co-winners of the Georgia Brosch Memorial Transportation Scholarship

**Richard Driscoll** was named the NCTR Student of the year award winner for 2017.

CUTR Students **Kurt Lehmann and Richard** Driscoll both participated in the International Collegiate ITE Annual Traffic Bowl Competition in Toronto, Canada.

CUTR Planning Program Director **Kristine Williams** participated in the Hillsborough County Planning Commission’s Future Leaders in Planning (FLIP) program designed to introduce **area high school students** in grades 9-11 to the planning profession.

**Graduate students of the Sustainable Transportation course** taught by Kristine Williams of CUTR presented their final complete street design concepts for Morgan Street in Downtown Tampa on April 27 to an expert panel.

CUTR hosted visiting scholar Daniel Kress, who is a member of the German Air Force, and lives in Munich, Germany.
5 Development

Activity within the College of Engineering Development Office continues to increase as we continue to travel both in Florida and nationally to identify more potential donors to the College. Personal visits have increased over the same time period last year and the College’s pipeline is increasing. Cultivation of donors has included invitations to home USF football games and Tampa Bay Lightning hockey games, utilizing the USF Foundation suite. More scholarship donors are having Our Gold Envelope program which puts scholarship donors together with their student recipients is proving to be extremely popular as more and more donors are having positive experiences. Stewardship of donors now includes a fully functioning acknowledgement letter system where every donor to Engineering receives at least one thank you letter. Major gift donors are being recognized on the Ewall and at Engineering Honors, both of which are based on cumulative giving to Engineering. The Development Office has also been successful in identifying individuals for Departmental Advisory Boards and the Engineering Advisory Board. A group of alumni and friends has been assembled and are holding House Parties to encourage others to become involved with the College. A proposal has been submitted to a donor for the expansion of the Mini-Circuits Design for X Laboratory and interest continues to grow for a new Engineering building.

Of special note: Of the current the USF: Unstoppable Campaign total of $1,063,026,328, gifts to Engineering total $235,758,797, or 22.2 %.

Figure 5.1. Comparison of Gift Commitments shows a 38% increase from FY2017 to FY2018 for the same time period of July 1 - March 24.
A comparison of donors to the College of Engineering shows a 4% increase from FY2017 to FY2018 for the same time period of July 1 - March 24. Increases or decreases in the number of donors is most significantly influenced by the USF Annual Fund.

**Figure 5.2. Donor Comparison**

**Figure 5.3. History of giving by fiscal year.**

*excludes large software gifts from Keysight and Cadence.*
This graph shows a 5-fiscal year history of giving to the College of Engineering, plus the current fiscal year through March 31, 2018. This gift history excludes large software gifts-in-kind from Keysight and Cadence. The average total for FY2013, FY2014, FY2015 and FY2016 is $1,171720. FY2017 more than doubled the average at $2,712,497 and the current FY2018, at $1,885,318, has already passed the average total and is on track to be another record year.