1 OVERVIEW

This was an active and extremely productive year in the College of Engineering. Many new and innovative projects were initiated this year, including the new Department of Medical Engineering, SOFWERX, the development and presentation of the Bulls LEAD faculty and student leadership workshop, hosting the FIRST Robotics Competition in the Sun Dome, a sold-out Engineering Honors Banquet, and a very successful Engineering Research Day with more than 100 students presenting posters and a record number faculty judges.

We named two new department chairs—Dr. Sudeep Sarkar in Computer Science and Engineering and Dr. Cliff Henderson in Chemical and Biomedical Engineering. We also named two new Associate Deans—Dr. Sanjukta Bhanja as Associate Dean for Academic Affairs and Dr. Fred Mannering as Associate Dean for Research. We named two new faculty endowments—Qiong (Jane) Zhang as the first recipient of Vasant Surti Faculty Fellow and Xiaopeng (Shaw) Li as the first recipient of Susan A. Bracken Faculty Fellow. The Susan A. Bracken Faculty Fellowship is a new endowment that became active this year. Our faculty recruiting season was very successful with 18 additional tenure/tenure track (9), instructors (8), and assistant visiting professor (1).

The COE co-chaired the annual Engineering Deans Institute (in Miami) this year and we were a major sponsor. We are aggressively engaging the U.S. engineering deans to provide situational awareness on the many excellent activities in our college to help in the peer assessment that are key to our national ranking.
Dean Bishop co-chaired panel discussion on the commercialization of space travel at the ASEE Engineering Deans Institute.

The College of Engineering continues its climb in the USN&WR graduate rankings. This year we moved up 11 places ending at 89th overall and 55th among publics. Most departments also improved in the national rankings.

<table>
<thead>
<tr>
<th>Program</th>
<th>USF Rankings*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering - Overall</td>
<td>110</td>
</tr>
<tr>
<td>Engineering - Biomedical</td>
<td>NR</td>
</tr>
<tr>
<td>Engineering / Bioengineering</td>
<td>NR</td>
</tr>
<tr>
<td>Engineering - Chemical</td>
<td>NR</td>
</tr>
<tr>
<td>Engineering - Civil</td>
<td>NR</td>
</tr>
<tr>
<td>Engineering - Computer Engineering</td>
<td>77</td>
</tr>
<tr>
<td>Engineering - Electrical / Electronic / Communications</td>
<td>102</td>
</tr>
<tr>
<td>Engineering - Environmental / Environmental Health</td>
<td>59</td>
</tr>
<tr>
<td>Engineering - Industrial / Manufacturing</td>
<td>58</td>
</tr>
<tr>
<td>Engineering - Mechanical</td>
<td>132</td>
</tr>
<tr>
<td>Sciences - Computer Science</td>
<td>101</td>
</tr>
<tr>
<td>Information Technology</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Figure 1.1. 2018 USNWR Program Rankings
1.1  Research Highlights

Biomedical Engineering Professor Robert Frisina, Lois B. Travis, M.D., Sc.D., the Lawrence D. Einhorn Professor of Cancer Research at the IU School of Medicine and a researcher at the Indiana University Melvin and Bren Simon Cancer Center, studied for the first time the cumulative effects of cisplatin-based chemotherapy on hearing levels in testicular cancer survivors through comprehensive audiometry measurements. They found that increasing doses of cisplatin were associated with increased hearing loss at most of the tested frequencies, involving 4, 6, 8, 10, and 12 kHz. The research was published June 27 in the Journal of Clinical Oncology.

The National Institute of Arthritis and Musculoskeletal and Skin Diseases of the National Institutes of Health has awarded a research grant to Piyush Koria, associate professor in the Chemical and Biomedical Engineering Department, to develop novel therapies for healing chronic wounds. The
public health and economic impact of chronic wound care is staggering, with an estimated annual cost upwards of more than eight billion dollars. The two-year award in the amount of $343,575 could have significant impact on the approximately 15 million people in the United States, particularly the elderly and diabetics that suffer from venous leg ulcers, pressure sores and diabetic foot ulcers. These wounds are difficult to treat and often lead to amputation.

Professor Chris Passaglia received an NIH $1.4M RO1 Grant for Glaucoma Research. Glaucoma is a leading cause of blindness for millions of Americans. According to the American Academy of Ophthalmology as many as three million Americans have glaucoma, but only half of them know it. The National Eye Institute of the National Institutes of Health (NIH) recently awarded Biomedical Engineering Passaglia a four-year, $1.4 million RO1 grant to continue his novel research for the treatment of glaucoma.

Mechanical Engineering Professor Autar Kaw received an NSF award in the amount of $299,823 to continue his research to improve the flipped classroom through adaptive learning.

Miguel Labrador, Professor in Computer Science and Engineering has developed a new app to help people with congestive heart failure. Working with Ponrathi Athilingam, PhD, an assistant professor in the College of Nursing, they created a mobile applications for Android Devices called HeartMapp, which contains six modules that help people evaluate their heart condition daily.

Mechanical Engineering Assistant Professor Tansel Yucelen received an NSF award in the amount of $250,000 Along with co-PI Eric Butcher, University of Arizona for their research that will significantly advance autonomous navigation and control capabilities for cooperative multivehicle systems, by incorporating realistic vehicle and communication models, and resilient decentralized estimation and control strategies.

Richard D. Gitlin, a University of South Florida Distinguished Professor is among the eight inventors announced today as the 2017 inductees of the Florida Inventors Hall of Fame (www.FloridaInvents.org). Gitlin is a State of Florida 21st Century World Class Scholar, and the Agere Systems endowed Chair in USF’s Department of Electrical Engineering. Gitlin, who holds 60 U.S. patents, is being recognized for his innovative research and development in digital communications, broadband networking, and wireless systems that transformed communication technology. Most notably, Gitlin is the co-inventor of DSL (Digital Subscriber Line), which allowed Internet access over telephone networks. He has more than 40 years of leadership in the communications and networking industry.
CSE faculty researchers **Rangachar Kasturi, Dmitry Goldgof and Yu Sun** along with doctoral students are working with staff at Tampa General Hospital to match emotions with facial expressions. Their Research was recently featured on **Tampa Bay Fox 13**. The researchers are working with nurses in the neo natal unit that are tending to newborns have been able to tell the subtle difference between a baby’s cry of hunger and that of pain. That ability to distinguish those differences is now being combined with continuous facial expression recognition software in hopes of offering a new way to help health care providers more precisely gauge whether a baby is experiencing pain or simply needing a diaper change. Neonatal experts in the USF Health Morsani College of Medicine are partnering with facial expression recognition experts in the USF College of Engineering to build data that combines known information collected through facial expression recognition capabilities and the known information from nurses who have years of training and on-the-job experience using the neonatal infant pain scale (NIPS).

2 POINTS OF PRIDE AND SIGNIFICANT ACCOMPLISHMENTS
2015/2016

2.1 Rapidly expanding student growth and tuition income generation
The total annual unduplicated headcount (new & continuing) shows a rapid growth to nearly 7000. The growth over the past five years has averaged nearly 10% year over year. During the same time period the student contact hours (SCH) rose over 58%. Computer Science and Engineering has experienced the most significant growth accounting for 28% of the entire college SCH. The COE SCH generated over $26M in net tuition in 2016-2017.

![Figure 2.1. COE Enrollments](image-url)
Figure 2.2. COE Enrollments by Dept.

Figure 2.3. COE Credit Hours
2.2 Living and Learning Community and Learning Teams
Our Engineering Living learning Communities continue to thrive. We posted a 94% retention rate for the 116 students in the Engineering Living and Learning Communities (ELLC). The program provides in the hall tutoring resources, peer mentors, social and academic activities along with faculty involvement for the students.

2.3 Bulls Engineering Success Training BEST program
The Bulls Engineering Success Training (BEST) program provides selected undergraduate students in the College of Engineering an interdisciplinary, industry-based capstone design experience. A BEST team of six students completes an industry-contributed project in two semesters and each student earns up to six credit hours towards their degree. All BEST students are supervised by a College of Engineering faculty member and mentored by an industry partner. The BEST program is coordinated by Professor Ken Christensen in the Department of Computer Science and Engineering. The BEST program prepares students for their first job in industry and is a great way for companies to help prepare the next generation of practicing engineers. Participating companies benefit directly from having a project completed and gain recruiting advantages in hiring new engineers. In 2016 there were four BEST projects as follows:

- One project from CAE completed
- Two projects from Leapdoctor completed
- One new project from Leapdoctor started

2.4 SOFWERX Collaboration
We launched a link with SOFWERX and established an active internship program with SOCOM. SOFWERX is a partnership between the Doolittle Institute and the United States Special Operations Command (USSOCOM). USF is now an on-site resident at the SOFWERX facility.
Ybor. As stated on the website\(^1\), “SOFWERX is designed as a very dynamic environment designed to create a high rate of return on collision for all participants,” and SOFWERX encourages the “Promotion of divergent thought and neutral facilitation, the goal is to bring the right minds together to solve challenging problems.” The internship program includes students from USF, as well as other Florida universities. The COE manages the SOFWERX internship program under the direction of Dr. Steve Saddow. This relationship will ultimately lead to expanded research opportunities in cyber, space, UAS, data analytics (computer science centric), robotics and automation, sensing, and other areas yet to be defined.

\(^1\) [http://www.sofwerx.org/](http://www.sofwerx.org/)

### 2.3 Eminent Scholars Lecture Series

The 2017 COE *Eminent Scholars Lecture Series* again featured four engineering deans. This is a continuation of our strategy developed and implemented first last year to engage engineering deans as a key element of our aggressive approach to inform the academic community about the wonderful work underway in the college. Given that national ranking is 25% peer assessment (by deans), this strategy makes good sense and it appears our strategy is working as our peer assessment increased 0.2 on the 2018 graduate rankings from 2.1 to 2.3. We estimate that each 0.1 increase in peer assessment will give an average bump of 2.7 spots. This year we jumped 11 spots in the graduate rankings, so half of our rise in the rankings can be attributed to the increase in peer assessment.

\(^1\) [http://www.sofwerx.org/](http://www.sofwerx.org/)
2.4 Faculty and Student Points of Pride

2.4.1 Academic Affairs

Dr. Mary Goodwin, director of Engineering Student Services, received a **Champions Award** that honors faculty, staff or students exemplary in inspiring excellence in the student success movement.

Dr. Mary Goodwin Receives Champions Award

2.4.2 Chemical & Biomedical Engineering Department

*Faculty*

Chris Passaglia was awarded $1.4M NIH R01 grant to study glaucoma treatments.  
Piyush Koria was awarded $343k NIH grant to develop therapies for chronic wounds.  
Robert Frisina serves as PI on the renewal of a 5-year NIH Program Project Grant ($9.1M) aimed at elucidating the biological bases of age-related hearing loss,  
Yogi Goswami was inducted into the Florida Inventors Hall of Fame.  
Robert Frisina inducted as Fellow into the American Institute for Medical & Biological
Norma Alcantar received Core Fulbright U.S. Scholar Achievement and also awarded USF 2016 Excellence & Innovation Award for exceptional achievement in innovation and research. Babu Joseph received a Fulbright-Nehru Academic and Professional Excellence Award (Teaching and Research) to conduct research on: Conversion of Biomass to liquid fuels at the Indian Institute of Technology Bombay, Mumbai.

Students
Pradipta Das received a USF Presidential Fellowship
The AIChE Student Chapter of USF won the AIChE Outstanding Chapter Award for the 5th year in a row. The award is bestowed only to the top 10% of chapters in the United States and Canada.
Romario Jashari, current president of the USF AICHE student chapter, also received a 2016 Donald F. and Mildred Topp Othmer National Scholarship Award. The award is given to chemical engineering students for their outstanding academic achievement and involvement in student chapter.

2.4.3 Civil & Environmental Engineering Department
Faculty
James Mihelcic will receive the 2017 Environmental Engineering Excellence award from the American Academy of Environmental Engineers and Scientists.
Maya Trotz was elected Vice President of the Association of Environmental Engineering and Science Professors.
Jane Zhang and Xiaopeng Li, each received and NSF CRISP project grant.

Students
USF students won the first place nationally in the Student Video competition conducted by the Environmental Engineering and Science Foundation.
Joshua Benjamin has been awarded a USF Presidential Fellowship and has accepted to attend USF as a doctoral student.
Michelle Platz has been awarded a NSF Graduate Fellowship and has accepted to attend USF as a doctoral student.
Emma Lopez-Ponnada received an NSP EAPSI Singapore Fellowship.

2.4.4 Computer Science & Engineering
Faculty
AAAS Fellow - Computer Science and Engineering - Dmitry Goldgof
AIMBE Fellow - Computer Science and Engineering - Dmitry Goldgof
NAI Fellow - Computer Science and Engineering - Sudeep Sarkar
NSF CAREER Award - Computer Science and Engineering - Yao Liu
SIGDA Outstanding Young Faculty Award - Computer Science and Engineering - Swaroop Ghosh
Department faculty receive Florida Center for Cybersecurity Collaborative Seed Awards
Students
Shamaria Engram awarded an NSF Graduate Research Fellowship Program
Sam Hawkins, graduate student, awarded Editor’s Choice

2.4.5 Electrical Engineering

Faculty
Finalized a complete overhaul of a modernized BSEE program that will go into effect in the fall 2017 semester. One significant change is an increase in technical elective hours from 12 to 27, allowing our students to develop significant depth in EE sub-discipline areas.

EE Professor Huseyin Arslan was elevated to the rank of Fellow of the IEEE. The EE Department now has 4 IEEE fellows, the largest number it has ever had.

The EE Department successfully hired 5 new faculty members, adding strength to its growing security expertise and strengthening its biomedical-related program.

The EE Department enrolled 381 graduate students, believed to be the largest graduate enrollment in EE since the department started.

Students
William Serrano-Garcia received an NSP EAPSI Singapore Fellowship.
Juan De Dios Castro was inducted into to Phi Kappa Phi.

2.4.6 Industrial and Management Systems Engineering

Faculty
Improved faculty research by a 60% increase in external grants proposal submission.

Dr. Kingsley Reeves, associate professor, Industrial and Systems Management Engineering, received an Academic Excellence Award for outstanding contributions to improving student success by implementing technologies, techniques or practices that transform the student experience.

Industry Consortium of IMSE (icIMSE) grew to include two new members: Holland and Knight (law firm) and Florida Hospital.

BSIE enrollment more than doubled in last 4 years, and MSIE program has grew from 15 FTE in F13 to 54 FTE in F16.

Students
Student chapter of the Institute of Industrial and Systems Engineers (IISE) received the Gold Award (the highest recognition from IISE) the fourth year in a row.

2.4.7 Mechanical Engineering

Faculty

Tansel Yucelen: Received a National Science Foundation Award entitled “Collaborative Research: Resilient Decentralized Estimation and Control for Cooperative Rigid Body Multivehicle Systems.” (October 2016).

Autar Kaw: Received a National Science Foundation Award titled “Transforming a
2.4.8 Center for Urban Transportation Research

**COENG Strategic Plan:** CUTR is synchronizing its strategic plan so it rolls up to the COENG and USF strategic plans.

**Increased co-ops and internships:** CUTR continues to offer internship and employment opportunities to USF students and provides connections and entrees to internship and professional employment with transportation firms and agencies.

**National Faculty Awards:** New CUTR Director Dr. Robert 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. Pei-Sung Lin is Fellow, Institute of Transportation Engineers.

3 AREAS OF FOcUSED PERFORMANCE IMPROVEMENT

3.1 Federal Grant Proposals Submitted

3.1.1 College of Engineering Research

Associate Dean for Research Fred Mannering conducted an overview of proposal submissions and awards for the College of Engineering.
Figure 3.1. Trends in submitted proposals

Figure 3.2. Trends in requested amounts on proposals
Figure 3.3. Trends in funded amounts on proposals

Figure 1 shows the number of submitted proposals have been on a general upward trend. Although requested amounts have varied and declined somewhat for federal proposals (Figure 2), the federal awarded amounts have reached their highest level in 2016 ($14M).

3.1.2 Chemical & Biomedical Engineering
The importance of increasing our research program support has been emphasized at ChBME faculty meetings and the internal faculty annual reporting structure has been modified to highlight its importance and provide increased weight for efforts in this area to the evaluation of faculty performance.

<table>
<thead>
<tr>
<th>Year</th>
<th>Proposals Submitted</th>
<th>Requested Amounts</th>
<th>Proposals Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>19</td>
<td>$10,564,749</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>26</td>
<td>$12,989,965</td>
<td>6</td>
</tr>
<tr>
<td>2015</td>
<td>31</td>
<td>$18,746,505</td>
<td>4</td>
</tr>
<tr>
<td>2014</td>
<td>34</td>
<td>$36,710,874</td>
<td>4</td>
</tr>
<tr>
<td>4 year Total</td>
<td>110</td>
<td>$79,012,093</td>
<td>14</td>
</tr>
</tbody>
</table>

Figure 3.4. CHBME Federal Proposals

3.1.3 Civil & Environmental Engineering
Federal Proposals:
### Proposals Submitted Requested Amounts Proposals Awarded Proposals Funded

<table>
<thead>
<tr>
<th>Year</th>
<th>Proposals Submitted</th>
<th>Requested Amounts</th>
<th>Proposals Awarded</th>
<th>Proposals Funded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>11</td>
<td>$6,758,105</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>24</td>
<td>$14,794,657</td>
<td>8</td>
<td>$3,487,080</td>
</tr>
<tr>
<td>2015</td>
<td>17</td>
<td>$5,418,158</td>
<td>4</td>
<td>$886,885</td>
</tr>
<tr>
<td>2014</td>
<td>13</td>
<td>$3,420,736</td>
<td>2</td>
<td>$99,897</td>
</tr>
<tr>
<td>2013</td>
<td>5</td>
<td>$4,881,864</td>
<td>1</td>
<td>$3,113,037</td>
</tr>
</tbody>
</table>

**Figure 3.5. CEE Federal Proposals**

3.1.4 Computer Science & Engineering

In FY2015-16, 46 proposals were written requesting $13 million, of which 23 were funded totaling awards of $5 million. In FY 2016-17, to date, 26 proposal have been written requesting $12 million. There is clearly a shift towards putting together larger proposals.

<table>
<thead>
<tr>
<th>Year</th>
<th>Proposals Submitted</th>
<th>Requested Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017 Federal</td>
<td>146</td>
<td>$73,894,599</td>
</tr>
<tr>
<td>2017 Non Federal</td>
<td>113</td>
<td>$135,997,925</td>
</tr>
<tr>
<td>2016 Federal</td>
<td>102</td>
<td>$49,883,334</td>
</tr>
<tr>
<td>2016 Non Federal</td>
<td>116</td>
<td>$12,560,546</td>
</tr>
</tbody>
</table>

**Figure 3.6. CSE Federal Proposals**

3.1.5 Electrical Engineering

In 2014-2015 the EE Department submitted 62 proposals (PI) for a total dollar amount of $28.6M. In 2015-2016 the EE Department submitted 71 proposals (PI) for a total dollar amount of $23.1M.

3.1.6 Industrial and Management Systems Engineering

External funding proposals submitted in 2016-17 $4,864,825.00 (till March) compared to total submission in 2015-16 $2,967,565 (all year).

3.1.7 Mechanical Engineering

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>2015-16</td>
<td>$11,255,935</td>
<td>34</td>
</tr>
<tr>
<td>2014-15</td>
<td>$15,570,348</td>
<td>36</td>
</tr>
<tr>
<td>2013-14</td>
<td>$10,544,039</td>
<td>26</td>
</tr>
</tbody>
</table>

**Figure 3.7. ME Federal Proposals**

3.1.8 Center for Urban Transportation Research
CUTR submitted 67% more proposals, in terms of dollar value, to federal agencies in 2016 versus 2015 ($5.8M in 2015, and $9.7M in 2016).

3.2 Appoint new Facility Security Officer

Successfully Mr. John Harrington as the USF FSO after a national search process. Mr. Harrington has many years of experience and came to us from the RAND Corporation.

3.3 Activities to Increase UG and GR Online Education

3.3.1 Academics

This is the current list of online degree and certificate programs. Complete Online Undergraduate Degree Programs
- BSIT, Information Technology/ITC/EN

Complete Online Graduate Degree Programs
- MSIT, Information Technology/ITC/EN
- MSEM, Engineering Management/EMA/EN

Complete Online Graduate Certificate Programs
- Systems Engineering
- Technology Management
- Total Quality Management
- Transportation Systems
- Analysis Wireless Engineering
- Smart Grid Power Systems --- pending course proposal approval; partially online

3.3.2 Chemical & Biomedical

Currently, ChBME does not have active UG or GR online education programs. In prior years, an online version of UG ECH 4323 Process Dynamics and Control course and an online version of UG EGN 3433 Modeling and Analysis of Engineering Systems were taught several semesters. Neither course was particularly popular with current UG students as measured both by enrollments, lagging very far behind traditional classroom based courses in enrollment, and by course survey responses. ChBME is again analyzing and discussing how and if such online courses would be a good fit for the department moving forward at both the UG and GR level. It is a topic scheduled for discussion at an upcoming faculty retreat scheduled tentatively for late May 2017.

3.3.3 Civil & Environmental Engineering

CEE has discussed the possibility of introducing Eluminate sections in more and more Transportation Engr. and Environmental Engr., courses starting this fall. All efforts will be made to implement the outcome of the above discussions.
3.3.4 Computer Science & Engineering

The Department offers BS and MS degree programs that are fully online. 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 two below graphs show the growth in degrees awarded and BSIT SCH generated.

The BSIT has grown 155% in degrees awarded in the past five years and 121% in SCH in the past four years (no SCH data was available for AY1213).

The MSIT program is a very 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 will “kick in” in fall 2017.

![Figure 3.8. CSE Online BSIT Programs](image)
3.3.5 Electrical Engineering

In 2015 the Department generated 108 on-line credits hours in the UG program and 300 online credit hours in the GR program. In 2016 the Department generated 157 online credits hours in the UG program and 356 online credit hours in the GR program. In 2016 the EE Department had one UG course that was fully on-line. By the end of 2017 we expect to have three UG courses that are fully online.

3.3.6 Industrial and Management Systems Engineering

IMSE offers almost all of UG and GR I classes in either hybrid (online/face-to-face) mode or fully online. In fall 2017 22 out 30 courses will be available hybrid/online. Both our MSIE and MSEM programs can be completed completely online.

3.3.7 Mechanical Engineering

Mechanical engineering faculty members have regular discussions on adding online 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 ME is not offering required classes online, they are using hybrid and flipped pedagogies in various classes. ME offers two MOOCs in numerical methods and introduction to matrix algebra.

3.4 Growth of Co-ops and Internships

Numerous Florida-based companies are invited on campus every semester and have routinely interviewed and recruited our students. A few examples are Nielsen, Honeywell, Raytheon, Jabil, TechData, Harris Corporation, Qorvo, Lockheed-Martin, Ashley Furniture, CAE, Mosaic, Nextra, Skanska, Citi, JP Morgan, Raymond James, Tampa Electric and NASA.

We have established relationships with local Florida-based companies through our industrial advisory boards, alumni and faculty-connections. These companies reach out to departmental
coordinators and/or student advising/campus-wide career services to recruit and interview students for internships.

A few Florida-based companies where our students have routinely interned are: GE Aviation, HNTB Corporation, Skanska, Citi, JP Morgan, Raymond James, Tampa Electric, Spartaon Electronics, Deloitte, Pall Aeropower Corporation, QTM Inc., Aerosonic Corporation, ConMed Linvatec, West Pharmaceutical Service, Sun Hydraulics, KHS USA, INC, Sensidyne, LP, Tribridge and Manitowoc Foodservice, Inc. (now Welbilt, Inc.).

<table>
<thead>
<tr>
<th></th>
<th>Co-Op</th>
<th>Internships</th>
<th>Graduate Internships</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-2016</td>
<td>103</td>
<td>254</td>
<td>38</td>
<td>423</td>
</tr>
<tr>
<td>2014-2015</td>
<td>91</td>
<td>135</td>
<td>26</td>
<td>272</td>
</tr>
<tr>
<td>2013-2014</td>
<td>92</td>
<td>48</td>
<td>14</td>
<td>188</td>
</tr>
<tr>
<td>2012-2013</td>
<td>74</td>
<td>12</td>
<td>8</td>
<td>118</td>
</tr>
<tr>
<td>2011-2012</td>
<td>52</td>
<td>5</td>
<td>0</td>
<td>73</td>
</tr>
</tbody>
</table>

Figure 3.10 Companies are contacted regular basis and internships have been doubling every year.

### 3.5 National Faculty Award Application and Nominations

As per https://awards.research.usf.edu/, the College of Engineering has received the second largest number of awards in the university to date.
3.5.1 Civil & Environmental Engineering

Professors Sarina Ergas and James Mihelcic were both named Fellow of Water Environment Federation. Jim was also named Fellow of the Association of Environmental Engineering and Science Professors.

Professor James Mihelcic received the 2017 Environmental Engineering Education Excellence (E4) Award from the American Academy of Environmental Engineers and Scientists (AAEES).

3.5.2 Computer Science & Engineering

Professor Dmitry Goldgof was named an AAAS Fellow and an AIMBE Fellow. Professor Sudeep Sarkar was named an NAI Fellow.

Professor Yao Liu was awarded an NSF CAREER Award.

Professor Swaroop Ghosh was awarded the SIGDA Outstanding Young Faculty Award.

Within the College of Engineering, the Department of Computer Science and Engineering has the largest number of faculty awards to date both within the college and in the entire university system.

<table>
<thead>
<tr>
<th>TOTAL USF FACULTY AWARDS SORTED BY COLLEGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department</td>
</tr>
<tr>
<td>Computer Science and Engineering</td>
</tr>
<tr>
<td>Chemical &amp; Biomolecular Engineering</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>Civil and Environmental Engineering</td>
</tr>
<tr>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Industrial &amp; Management Sys Engineering</td>
</tr>
<tr>
<td>Center for Urban Transportation Research</td>
</tr>
</tbody>
</table>

Figure 3.12. CSE Faculty Awards

3.5.3 Electrical Engineering

In 2014-2015, The EE Department faculty applied or were nominated for two IEEE Fellows, Larry Dunleavy and Tom Wade (Emeritus). In 2015-2016, the faculty applied or were nominated for three IEEE Fellows, Larry Dunleavy, Huseyin Arslan, and Tom Wade. Tom Weller was also nominated for Florida Academy of Inventors Fellow.

3.5.4 Mechanical Engineering

ME routinely nominates 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
3.6 Stabilization and Growth of GRII enrollment

Review and processing time for GARs, especially for international students, is being evaluated and expeditiously streamlined for efficiency with the intent to expedite admissions and subsequent enrollment.

* PhD Degrees Awarded for 2016-2017 includes only summer 2016 and fall 2016.

<table>
<thead>
<tr>
<th>Department</th>
<th>Academic 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>Chemical &amp; Biomedical Eng</td>
<td>2016-2017</td>
<td>5</td>
<td>53</td>
<td>146</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>2015-2016</td>
<td>9</td>
<td>56</td>
<td>177</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>2014-2015</td>
<td>9</td>
<td>60</td>
<td>178</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>2013-2014</td>
<td>9</td>
<td>58</td>
<td>191</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>2012-2013</td>
<td>9</td>
<td>63</td>
<td>402</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>2011-2012</td>
<td>6</td>
<td>63</td>
<td>241</td>
<td>12</td>
</tr>
<tr>
<td>Civil &amp; Environmental Eng.</td>
<td>2016-2017</td>
<td>7</td>
<td>82</td>
<td>321</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>2015-2016</td>
<td>12</td>
<td>82</td>
<td>546</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>2014-2015</td>
<td>13</td>
<td>82</td>
<td>379</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>2013-2014</td>
<td>9</td>
<td>88</td>
<td>400</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>2012-2013</td>
<td>10</td>
<td>90</td>
<td>226</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>2011-2012</td>
<td>17</td>
<td>101</td>
<td>305</td>
<td>20</td>
</tr>
<tr>
<td>Dean's Office</td>
<td>2016-2017</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2015-2016</td>
<td>2</td>
<td>49</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2014-2015</td>
<td>2</td>
<td>61</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013-2014</td>
<td>4</td>
<td>145</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2012-2013</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2011-2012</td>
<td></td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>2016-2017</td>
<td>7</td>
<td>126</td>
<td>947</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>2015-2016</td>
<td>12</td>
<td>119</td>
<td>1,498</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>2014-2015</td>
<td>17</td>
<td>120</td>
<td>1,301</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>2013-2014</td>
<td>13</td>
<td>123</td>
<td>1,182</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>2012-2013</td>
<td>18</td>
<td>126</td>
<td>1,001</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>2011-2012</td>
<td>7</td>
<td>127</td>
<td>701</td>
<td>23</td>
</tr>
<tr>
<td>Engineering Computer Science</td>
<td>2016-2017</td>
<td>2</td>
<td>94</td>
<td>844</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>2015-2016</td>
<td>10</td>
<td>92</td>
<td>1,224</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>2014-2015</td>
<td>7</td>
<td>73</td>
<td>886</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>2013-2014</td>
<td>7</td>
<td>68</td>
<td>811</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>2012-2013</td>
<td>6</td>
<td>62</td>
<td>1,057</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>2011-2012</td>
<td>8</td>
<td>70</td>
<td>935</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>2016-2017</td>
<td>2</td>
<td>25</td>
<td>289</td>
<td>9</td>
</tr>
</tbody>
</table>
3.7 Increases in Undergraduate Student Success, Retention, Progression, and Graduation

The College for the first time in its history obtained more than a 90% first year retention rate. For the 2015-2016 the College achieved a 91.4% first year retention rate.

Doubling the engineering course-based learning teams significantly improved our first year retention rate for male students. Learning teams were increased to 20 from just 10 the year before, allowing an additional 105 students to participate. In addition, learning teams were added for the first time for the spring semester of 2016. Male engineering students in the learning teams achieved a 91.6% first year retention rate (Table 1) despite being significantly weaker students than those who were not in learning teams. This helped the College obtain a 91.4% overall retention rate for the first time in its history. Overall, the first year retention rate for male engineering students was 91.1%. Our female students always do very well as they achieved a 92.2% retention rate for the 2015-2016 cohort.

<table>
<thead>
<tr>
<th>Year</th>
<th>Admits</th>
<th>LTM Males</th>
<th>Total Male Admits</th>
<th>% of Males in LTM</th>
<th>% Retained Univ</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>118</td>
<td>492</td>
<td>24.0%</td>
<td>88.1%</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>103</td>
<td>481</td>
<td>21.4%</td>
<td>78.6%</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>121</td>
<td>531</td>
<td>22.8%</td>
<td>87.6%</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>226</td>
<td>527</td>
<td>42.9%</td>
<td>91.6%</td>
<td></td>
</tr>
</tbody>
</table>

Efforts are being made to support the weakest students to help us continue to improve retention, progression, and graduation rates.
Our Engineering Living learning Communities continue to thrive. We posted a 94% retention rate for the 116 students in the engineering living and learning communities (ELLC). The program provides in the hall tutoring resources, peer mentors, social and academic activities along with faculty involvement for the students.

We know that by increasing the number of students receiving greater than a 2.00 GPA their first semester, we can increase our retention rate and our graduation rates (Table 2).

<table>
<thead>
<tr>
<th>Cohorts</th>
<th>After First Year, # Males Retained@Univ</th>
<th>% Males Retained @ Univ</th>
<th>After First Year, # of Females Retained</th>
<th>% Female Retained @ Univ</th>
<th>All Students % Retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>324</td>
<td>92.0%</td>
<td>55</td>
<td>96.5%</td>
<td>92.8%</td>
</tr>
<tr>
<td>2012</td>
<td>410</td>
<td>94.9%</td>
<td>104</td>
<td>92.9%</td>
<td>94.7%</td>
</tr>
<tr>
<td>2013</td>
<td>394</td>
<td>93.1%</td>
<td>112</td>
<td>94.1%</td>
<td>93.4%</td>
</tr>
<tr>
<td>2014</td>
<td>419</td>
<td>92.7%</td>
<td>121</td>
<td>97.6%</td>
<td>93.9%</td>
</tr>
<tr>
<td>2015</td>
<td>460</td>
<td>93.9%</td>
<td>120</td>
<td>95.2%</td>
<td>94.4%</td>
</tr>
</tbody>
</table>

Figure 3.15. 1st Year Retention Rate of Students with a 2.00 or greater GPA their first semester

Note: Graduation rates are over 77% for those students who receive 2.00 GPA or better their first semester.

Quality of students continue to increase. For the first time in the College’s history, more than 50% of the new students entering the class of 2016 had an adjusted high school grade point average (HSGPA) of at least 4.00. Students with over a 4.00 HSGPA, average over a 93% first year retention rate and over an 80% graduation rate.
Significant improvements have been made in progression and graduation rates for engineering since 2012 when the first retention programs were put in place (Table 3.17, 3.18, 3.19). First year retention in engineering has, on average, increased to 77% from 70%; second year retention has increased to an average of 62% from a past average of 51%; and third year retention has increase to 53% up from 43.6%.

Table 3.17. First year retention in Engineering

<table>
<thead>
<tr>
<th>4 years prior to 2012</th>
<th>Average of 2012, 2013, 2014, 2015</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>77%</td>
<td>111%</td>
</tr>
</tbody>
</table>

Table 3.18. Second year retention in Engineering

<table>
<thead>
<tr>
<th>4 years prior to 2012</th>
<th>Average of 2012, 2013, 2014, 2015</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>51%</td>
<td>62%</td>
<td>121%</td>
</tr>
</tbody>
</table>

Table 3.19. Third year retention in Engineering

<table>
<thead>
<tr>
<th>4 years prior to 2012</th>
<th>Average of 2012, 2013, 2014, 2015</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>43.6%</td>
<td>53%</td>
<td>121%</td>
</tr>
</tbody>
</table>

Face-to-face advising meetings are a strong component of any retention program. The College’s advising contacts continue to increase, resulting in increasing retention of students (Figure 2). During the fall 2016 semester alone, there were over 8,198 advising contacts for pre-departmental engineering students compared to fall 2011 of just 3144 an increase of over 261%.

Figure 3.20. Fall Semester Advising Contacts
<table>
<thead>
<tr>
<th>Term</th>
<th>Undergraduate Student FTE</th>
<th>Estimated Faculty FTE</th>
<th>Student-Faculty Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2012</td>
<td>2,901</td>
<td>107</td>
<td>27</td>
</tr>
<tr>
<td>Fall 2013</td>
<td>3,203</td>
<td>115</td>
<td>28</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>3,518</td>
<td>108</td>
<td>33</td>
</tr>
<tr>
<td>Fall 2015</td>
<td>3,841</td>
<td>110</td>
<td>35</td>
</tr>
<tr>
<td>Fall 2016</td>
<td>4,075</td>
<td>116</td>
<td>35</td>
</tr>
</tbody>
</table>

Figure 3.21. Student to Faculty Ratio

**Undergraduate Student Enrollment**

![Graph showing undergraduate student enrollment from 2011-2012 to 2015-2016](image)

Figure 3.22. Undergraduate Student Enrollment
3.7.1 Excess Hours

Last Year, Excess Hours were reduced as depicted in the following table.

**AY 1516**

<table>
<thead>
<tr>
<th>Row Labels</th>
<th>With Excess</th>
<th>Without Excess</th>
<th>Nbr of Students</th>
<th>% without Excess Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTIC</td>
<td>139</td>
<td>159</td>
<td>298</td>
<td>53%</td>
</tr>
<tr>
<td>OTHER_STUDENTS</td>
<td>50</td>
<td>72</td>
<td>122</td>
<td>59%</td>
</tr>
<tr>
<td>TRANS_W_AA</td>
<td>35</td>
<td>133</td>
<td>168</td>
<td>79%</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>224</strong></td>
<td><strong>364</strong></td>
<td><strong>588</strong></td>
<td><strong>62%</strong></td>
</tr>
</tbody>
</table>

**AY 1415**

<table>
<thead>
<tr>
<th>Row Labels</th>
<th>With Excess</th>
<th>Without Excess</th>
<th>Nbr of Students</th>
<th>% without Excess Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTIC</td>
<td>127</td>
<td>114</td>
<td>241</td>
<td>47%</td>
</tr>
<tr>
<td>OTHER_STUDENTS</td>
<td>69</td>
<td>40</td>
<td>109</td>
<td>37%</td>
</tr>
<tr>
<td>TRANS_W_AA</td>
<td>88</td>
<td>109</td>
<td>197</td>
<td>55%</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>284</strong></td>
<td><strong>263</strong></td>
<td><strong>547</strong></td>
<td><strong>48%</strong></td>
</tr>
</tbody>
</table>

*Figure 3.24. Excess Hours*
3.7.2  The Engineering Ambassadors (TEAM)

The first group of Engineering Ambassadors were selected this past fall. This group of elite students are actively involved with showing prospective students and families the College of Engineering. Regular tours are now offered every day at 1 p.m. for families visiting the campus. On special Saturday recruiting events such as Stampede for Success, TEAM has hosted prospective students and their families, giving tours and answering questions about what it is like to be an engineering student!

3.7.3  E-Council

Since its infancy the Engineering Council has increased student government funding from 60% of requested funds to 100%. They have also been an integral part of uniting the student organizations and ensuring they work together to accomplish goals, maximize student networking, and self-improvement. In collaboration with the Dean they have also been organizing leadership development seminars for student members to ensure the future of USF engineering organizations remain strong and a vital hands on real world application for students to practice what they've learned in their classes.

3.7.4  Bulls Lead Program

A student leadership program—named Bulls Lead—was developed by the Dean’s Office working with external experts at the Callahan Group and Dyer Global specifically for the E-Council (an organization comprised of the engineering student groups and formerly recognized by the Student Government). We established the Bulls Lead (Leadership Empowerment for Action and Discovery) as a people-focused, technical leadership initiative for the E-Council. Bulls Lead prepared E-Council leadership to think and lead as they work to solve challenges through life-enhancing, technical innovation and to align the student leadership with COE Strategic Plan. Bulls Lead had as it main objective transforming engineering leadership by instilling the ultimate imperative of putting people first when it comes to technology development.

A leadership program was developed by the Dean’s Office working with external experts at the Callahan Group and Dyer Global specifically for the faculty. This comprised two workshop in the fall and one workshop in the spring. The first workshop was developed and presented by the Dean Bishop entitled “What is an Academic Leader?” and the remaining two workshops were presented by the Callahan Group and Dyer Global entitled “The Resilient Leader” and “Leading Others.”

3.7.5  45th annual Engineering EXPO

Engineering Expo, a completely student run organization, had another excellent EXPO event. Over 12,000 students, teachers, and families attended Engineering Expo this year. 500 boy scouts and
girl scouts attended and 8,700 students from area schools attended.

There were 56 corporate exhibitors such as: TECO, Gopher Resource, Honeywell, FLATE, MOSI, Lockheed Martin, and NASA. Other Non-USF Exhibitors included the Environmental Protection Commission, Florida Water Works Association, American Water Works Association, Protosmiths, and Hillsborough area clubs.

This was the second 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.

This was the first year using the USF Engineering Expo App for cell phones, the App worked for both Android and iOS. It will be continued and improved upon for next year.

This was also the first year of Engineering Expo Lecture Series. Two lectures were offered on Friday and Saturday. Expo will continue this exciting new initiative.

The student leaders have established relationships with the program leaders of GEAR-UP with the intent to create a foundation for high school Engineering Expo Clubs. The goal is to establish these clubs in high schools so students can take on STEM projects and present them at the Engineering Expo. EXPO will collaborate with other COE Student Organizations to participate by mentoring the Expo Clubs and their projects. This initiative will target minority students but will be available for all students.

USF Engineering Expo website was greatly improved and provided important information for visitors and exhibitors alike. It included information about lecturers, exhibitors, FAQS, downloadable maps, schools packet, registrations gallery, and visitor guidelines.
 https://expo.eng.usf.edu/index.html

A new method for tracking student drop off and student pick up at Juniper Poplar was implemented. The leadership purchased two-way radios and used a strong volunteer force to keep track of bus arrival and student arrivals to ensure an efficient process. This initiative improved this process enormously and allowed the entire process to flow very smoothly.

3.7.6 Direct Admission to College and Department

Dr. Sanjukta Bhanja is exploring this and the National Academy of Engineering Grand Challenge Scholar Program.

3.8 Significantly reduce occurrence of high WDF sections

3.8.1 Chemical & Biomedical Engineering

The only course ChBME offers that has had a very large fraction of WDF grades is ECH 3023 Material and Energy Balances. That course is historically the first substantial course in major for ChBME UG students and it is not uncommon for similar courses at other Chemical Engineering departments to also see high WDF grade fractions (e.g., at Georgia Tech the WDF % is normally >25%) and attrition in that first major course. However, in an effort to better prepare USF students for the ECH 3023 course and aid in their transition into major classes, ChBME has adjusted the content of and increased the rigor of its introductory course, ECH 3002 Intro to Chemical &
Biomedical Engineering, which is also now a pre-requisite for ECH 3023. Because these changes were only made back in spring 2016, ChBME does not have much data yet on the outcomes, i.e., only one semester of feedback data. However, students taking ECH 3023 in fall 2016 that had the new modified ECH 3002 pre-req course had a pass rate of 66%, compared to a pass rate of 47% for those who did not. ChBME will continue to analyze the results of these changes and look to enhance these results with further changes and new programs. ChBME is currently working to initiate a formal UG mentoring/tutoring program for its UG program. Discussions are underway with the AIChE Student Chapter to serve as a vehicle through which such a mentoring/tutoring program could be organized and supported by the student body itself.

3.8.2 Civil & Environmental Engineering

Statics is one of the high WDF courses. The undergraduate advisor feels that one of the major reasons for this is that 50% of the students work a full-time job and commute from distant places, and do not have adequate time for preparation for rigorous gate courses like Statics. Making scholarships available to students who cannot afford college expenses could mitigate this problem.

3.8.3 Computer Science & Engineering

The Department has had courses with high WDF 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 two things to reduce high DWF rates in upper-level courses.

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.

3.8.4 Electrical Engineering

In fall 2016 the Department had no UG sections with WDF rates >25%.

3.9 Momentum in CUTR

Summer 2016 hire of Robert L. Bertini, Ph.D., P.E., as Director of the Center for Urban Transportation Research (CUTR) and tenured professor in the Department of Civil and Environmental Engineering.

New initiatives in Smart Cities with City of Tampa, new projects on automated vehicles with HART, THEA and Hillsborough County. New federally funded university transportation center projects and programs with Arizona State University, Cornell University and University of Texas at Arlington.
4 FACULTY AND RESEARCH EXCELLENCE

4.1 Significantly increase the number of federal research grant submissions over prior years

4.1.1 Chemical & Biomedical Engineering

ChBME federal grant submission data for the past 3 years and the current year-to-date are as follows:

<table>
<thead>
<tr>
<th># Federal Grant Submissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
</tr>
<tr>
<td>2015</td>
</tr>
<tr>
<td>2016</td>
</tr>
<tr>
<td>2017</td>
</tr>
</tbody>
</table>

![Figure 4.1. CHBME Federal Grants](image)

The recent trend of slightly declining submissions has been discussed in internal ChBME faculty meetings as a topic of concern and one that requires attention. In addition, the ChBME faculty annual reporting system has been modified to emphasize the importance of a number of faculty performance areas including grant proposal submissions and awards, with a particular emphasis on federal grant submissions and awards. Year-to-date 2017 numbers look promising in terms of reversing previous years’ trends in terms of declining proposal numbers, but ChBME will continue to monitor this issue.

4.1.2 Civil & Environmental Engineering

<table>
<thead>
<tr>
<th>Proposals Submitted</th>
<th>Requested Amounts</th>
<th>Proposals Awarded</th>
<th>Proposals Funded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>$6,758,105</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>$14,794,657</td>
<td>8</td>
<td>$3,487,080</td>
</tr>
<tr>
<td>2015</td>
<td>$5,418,158</td>
<td>4</td>
<td>$886,885</td>
</tr>
<tr>
<td>2014</td>
<td>$3,420,736</td>
<td>2</td>
<td>$99,897</td>
</tr>
<tr>
<td>2013</td>
<td>$4,881,864</td>
<td>1</td>
<td>$3,113,037</td>
</tr>
</tbody>
</table>

![Figure 4.2. CEE Federal Grants](image)
4.1.3 Computer Science & Engineering

<table>
<thead>
<tr>
<th></th>
<th>Proposals Submitted</th>
<th>Requested Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017 Federal</td>
<td>146</td>
<td>$73,894,599</td>
</tr>
<tr>
<td>2017 Non Federal</td>
<td>113</td>
<td>$135,997,925</td>
</tr>
<tr>
<td>2016 Federal</td>
<td>102</td>
<td>$49,883,334</td>
</tr>
<tr>
<td>2016 Non Federal</td>
<td>116</td>
<td>$12,560,546</td>
</tr>
</tbody>
</table>

*Figure 4.3. CHBME Federal Grants*

4.1.4 Electrical Engineering

In 2014-2015 the EE Department submitted 62 proposals (PI) for a total dollar amount of $28.6M. In 2015-2016 the EE Department submitted 71 proposals (PI) for a total dollar amount of $23.1M.

4.1.5 IMSE

Federal research grant submission at IMSE in 2016-17 increased by approximately 60% compared to 2015-16

4.1.6 Mechanical Engineering

Faculty members are assessed 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. Five year average (FY 2011-2016) of total proposals submitted by mechanical engineering faculty was $15.9 million as PIs and $16.7 as Co-PIs. The following table shows the number of proposals submitted as PIs and Co-PIs by the departmental faculty:

<table>
<thead>
<tr>
<th>Annual Year</th>
<th>Proposals Submitted-PI</th>
<th>Proposals Submitted- Co-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-16</td>
<td>34</td>
<td>48</td>
</tr>
<tr>
<td>2014-15</td>
<td>36</td>
<td>35</td>
</tr>
<tr>
<td>2013-14</td>
<td>26</td>
<td>26</td>
</tr>
</tbody>
</table>

*Figure 4.4. ME Federal Grants*

4.1.7 Center for Urban Transportation Research

CUTR submitted 67% more proposals, in terms of dollar value, to federal agencies in 2016 versus 2015 ($5.8M in 2015, and $9.7M in 2016).

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

4.2.1 Chemical & Biomedical Engineering

ChBME has implemented a new junior faculty mentoring plan effective spring 2017. In this new system, input is sought from the junior faculty member in terms of at least two
senior faculty members selected from a list of faculty who have volunteered to take on a new junior faculty mentee in a given year. The chair of the department then pairs the junior faculty member with a senior faculty mentor based on that input. The junior faculty member and senior faculty mentor make a commitment to meet at least once a month for discussions. Both the mentee and mentor are asked for a summary of their mentoring activities/outcomes each year in their annual reports to the department as one measure of the level of activity in the relationship. In addition, all junior faculty now meet with the department chair on a monthly basis for mentoring discussions. The goal is that the combination of mentoring from a senior faculty member, most likely with experience in areas related to the junior faculty member, combined with mentoring from the department chair, which helps represent departmental, college, and university expectations and resources, will provide and effective platform for successful cultivation of junior faculty.

At the mid-career level, ChBME is also currently discussing the creation of a more formal mid-career faculty mentoring program. The exact form of this program is still in discussions, but the goal is for the concept to be developed and implemented if agreed upon by the faculty by fall 2017.

4.2.2 Civil & Environmental Engineering

At present systematic and effective mentoring programs are available for Transportation and Environmental Engr. areas in conjunction with recent faculty hires. In both the above specialties, new hires have been mentored by and are collaborating well with in-house national leaders in the respective areas.

4.2.3 Computer Science & Engineering

CSE has a mentoring program for pre-tenure faculty in the department. Each assistant professor is assigned, with their consent, a senior faculty member who is their mentor. The 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 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.

4.2.4 Electrical Engineering

The EE Department has a junior faculty mentoring program. All junior faculty are assigned a senior faculty member (or two) as a mentor.

4.2.5 IMSE

IMSE has a mentoring program in place and will endeavor to have it written down in a faculty approved document by fall 2017.

4.2.6 Mechanical Engineering
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. Kaw has played a significant role as a mentor for teaching assignments.

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

4.3.1 Chemical & Biomedical Engineering

ChBME currently has a strong emphasis on undergraduate research and allows students to register for Independent Study – which counts for ChBME technical electives required for degree completion. They have advertised the existence of the USF Office of Undergraduate Research to students in the past two semesters at the time in which we have also advertised undergraduate research as an option for students to consider through departmental e-mails. The Associate Chair for Undergraduate Studies is currently exploring which programs and benefits ChBME students could access through engagement with the USF Office of Undergraduate Research and the department will take appropriate steps based on his findings. Internally, ChBME is also starting a new Undergraduate Research Symposium that will provide a venue for undergraduate research students to present their work and is also exploring the creation of an Undergraduate Thesis track in the department to better integrate and support undergraduate research, particularly for those students planning to attend graduate school.

4.3.2 Civil & Environmental Engineering

A number of undergraduates are employed by the faculty as REUs. Currently, nine faculty members are supporting 17 REU students. One faculty member has been communicating with the OUR (Office of Undergraduate Research). Engagement with OUR in terms of obtaining research guidance and attending of OUR workshops will be addressed and encouraged.

4.3.3 Computer Science & Engineering

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.

This year, the site is implementing a pilot program with NSF running the program in the University of Oviedo in Spain. The idea is 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.

4.3.4 Electrical Engineering

The EE Department participates in the REU program and the director of the COE REU Program is an EE faculty member. In 2015 the total support for EE UG students in the REU program was $19,095. In 2016 the total support for EE UG students in the REU program was $22,340. These students are in the pool that will participate in the USF Office of Undergraduate Research activities.

4.3.5 Mechanical Engineering

The ME Department has active research faculty with ongoing research projects. Undergraduate students work on some of these projects. In addition, the Department faculty participate in the REU student program.

4.3.6 Center for Urban Transportation Research

CUTR employs a large number of USF students and will continue to do so. At the end of 2015, we had 61 students. As of April 2017, we have 66. CUTR continues to increase undergraduate student employment.

5 REPUTATION AND PARTNERSHIPS

5.1 A comprehensive review of “like” colleges and public AAU institutions and utilize Academic Analytics, InCites and other available tools to compare the dept. program performance profile with like programs at public AAU institutions

5.1.1 Civil & Environmental Engineering

Peer Programs

Other civil engineering programs immediately above the 50th place (46th ranked cluster of equal rating).

1. Drexel University
2. University of Arizona
3. Colorado School of Mines
4. Oregon State University
5. University of Massachusetts Amherst

Other environmental engineering programs immediately above the 40th place:

1. Drexel University
2. University of Arizona
3. University of Cincinnati
4. Tufts University

With respect to publications and federal grant awards CEE compares well with peer institutions, being around the statistical median, nationally. CEE needs to slightly improve its GRE-Q Quantitative average for incoming graduate students. The Dept. is already taking steps to improve this to attract high caliber applicants and lower the acceptance rate.

5.1.2 Computer Science & Engineering

In the 2018 US News & World Report ranking Computer Engineering program was ranked 48 among public universities. Using Academic Analytics data, the USF Department of Computer Science and Engineering’s standing among public AAU universities is as depicted in the graphs below for some of the major indicators. Overall,

1. In journal publication and their impact (citations) we are in the 25th to 50th percentile of public AAU universities
2. In grants, we are in less than 25th percentile among public AAU universities. The part of the reason could be (i) lesser amounts per grant, i.e. we need to go after larger grants, (ii) less number of TT faculty compared to our aspirational peers - public AAU universities. We have 21 TT faculty members, while our aspirational peers with performance just better than us have more than 30 faculty members.
3. Compared to ALL CSE departments, our performance, including grants, is around the median. CSE excels in the honors and awards recognition.

The public AAU “peer” departments with at least 3 or the 5 indicators close to USF-CSE are at the following universities (number following the name is the number of indicators that are similar)

1. Iowa State University 5
2. University of California, Irvine 5
3. University of Missouri 4
4. University of Virginia 4
5. University of Washington 4
6. University of Arizona, The 4
7. University of Pittsburgh 3
8. University of Kansas, The 3
9. University of Iowa, The 3’

5.1.3 Mechanical Engineering

As shown in the table below, ME has been comparing its graduate degree and research expenditures with top 30 mechanical engineering departments and are comparable to the 25th percentile of the top 30 mechanical engineering departments in all categories and higher than median in MS degrees and headcount per faculty.
5.1.4 Nominate at least one honorary degree recipient (especially woman and those from underrepresented groups)

Dr. Patricia Flatley-Brennan, Director of the National Library of Medicine will be receiving an honorary degree at the spring 2017 Commencement. 

5.2 Consider the case for presenting new degree programs (including fully online delivery) for 2017 USF Work Plan

5.2.1 Academics

Spring 2017: Launch of the new BS in Biomedical Engineering Degree program, and subsequent Medical Engineering Department, which will also house the current BME graduate programs (Masters and PhD).

5.2.2 Chemical & Biomedical Engineering

ChBME currently has a committee formed to study the creation of a new Bioengineering Ph.D. program given the relocation of the existing Biomedical Engineering Ph.D. degree from ChBME to the new Medical Engineering department. ChBME is also in discussions with the other engineering departments about the possibility of such a Bioengineering Ph.D. degree being a cross-cutting degree accessible to ME, EE, and other traditional engineering department Ph.D. students. It was deemed important by ChBME core faculty who conduct research in biomolecular and bioengineering areas that their Ph.D. student have access to such a bio-themed Ph.D. degree.

5.2.3 Civil & Environmental Engineering

The Dept. has only three high enrollment courses that could generate widespread interest and
income: Statics, Dynamics and Introduction to Graphics. The latter course is a laboratory course that needs classroom instruction. The Dept. and COE considered the possibility of offering the first high enrollment course (Statics) online. However, discussions with the potential instructor revealed a number of practical problems in offering gate courses such as statics online. One major problem is the inability to closely monitor the student performance in the online scenario.

5.2.4 Computer Science & Engineering

The Department of Computer Science and Engineering (CSE) has a total of seven-degree programs and does not have the faculty bandwidth to offer any new ones. It offers BS, MS, and PhD degrees. The Department has three BS programs, they are Computer Science (CS), Computer Engineering (CpE), and Information Technology (IT), with the BSIT program focusing on applied aspects. The CS and CpE programs are ABET accredited, the IT program is 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 is fully 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.

5.2.5 IMSE

IMSE is looking at the feasibility of a ‘cost-recovery’ type model for an online/in class degree program in Master of Science in Engineering Analytics in 2018.

5.2.6 Mechanical Engineering

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

5.3 Conduct a deep and meaningful assessment of low productivity degree programs

5.3.1 College of Engineering Academic Affairs

It has been noted that low productivity programs housed in the College are due to them being new and without significant numbers of graduates as of yet. Those that are not newly developed or newly implemented have been retained for the interdisciplinary nature, while those that have not sustained enrollment have been successfully terminated such as MSES

5.3.2 Chemical & Biomedical Engineering

ChBME has conducted a review of low productivity degrees in the past two years. As a result, the
ME and MCHE degrees have been terminated. Also, the MSCH requirements have been modified to include both thesis and non-thesis tracks to make this degree option more appealing to a wider range of students.

5.3.3 Civil & Environmental Engineering
The existing ones like the Master of Engineering Science has been eliminated. The growth of the newly instituted PhD program in Environmental Engineering is being monitored.

5.3.4 Computer Science & Engineering
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.
- 13% of all undergraduate students in the College of Engineering were BSIT students and the Department has the 2nd highest undergraduate student-faculty ratio of 50 in the College
- The Department has the 2nd highest PhD load per faculty in the College.

![Figure 5.2. CSE Degrees Awarded](image)

From the above graph the number of BSIT graduates is growing rapidly. The expected growth in AY1617 is not an anomaly. CSE forecasts the following year to have a similar trend. This semester, all key core classes in the BSIT program have enrollments of about 140 – one class (CNT 4104 Computer Information Networks for IT) has an enrollment of 175, so the exponential trend is expected to continue.

5.3.5 Electrical Engineering
The EE Department has no low productivity degree programs.

5.3.6 IMSE
IMSE degree programs (BSIE, MSIE, MSEM, PhD) are highly subscribed and demanded. Plan for active participation in the 2016 USF Homecoming
5.4 Participation in USF Homecoming

College of Engineering held its fall 2016 Engineering Advisory Board meeting at the ROTC building located along parade route the same day. That evening we held a watch party, which was well attended by board members and their families. We have reserved the same location again for fall 2017.

CUTR participated in the 2016 Homecoming parade and intends to enter a transportation related float in the USF 2017 Homecoming parade.

6 STUDENT SUCCESS

6.1 Actively and directly participate in the recruitment of highly talented undergraduate and graduate students from Florida and beyond, and partner with the Office of Graduate Admission to enhance the recruitment and review of prospective students (including centralized decision-making for select programs).

6.1.1 Academics

**High Ability HS Student Recruitment Event October 2016:**

On October 25, 2016, 53 high ability high school seniors, along with their parents, were invited from within a 60 mile radius of the Tampa campus to attend a recruitment event. The event was sponsored by OCCAM at the CAMLS location downtown Tampa. Students were able to talk with current engineering students, visit department and laboratory booths.

Overall 200 students with math SAT scores of 600 and over and ACT math scores of 30 and over were targeted. The event was very successful in recruiting students to the College.

There is a plan to take this event on the road. The first recruitment event will be in Miami in September and sponsored by Nextra Energy. This provides the students with information about a top tier engineering school right in their own back yard.

**Roboticon FIRST Sponsorship**

We co-sponsored and hosted the Roboticon FIRST program in the SunDome. Roboticon attracted 850 middle and high school students including a team from China, the Red Hurricanes. Roboticon featured²

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- Full scale FIRST Stronghold off-season FIRST Robotics Competition event featuring 120 lb. student built robots playing a fast-paced castle defense game
- FIRST Tech Challenge scrimmage and build day for middle & high school teams
- FIRST LEGO League scrimmage and training for elementary & middle school teams
- FIRST LEGO League Jr. mini-Expo for early elementary teams
- Workshops for all programs, provided by teams, alumni, business and tech professionals, as well as public sessions
- Statewide STEAM Educators Conference & Workshops
- Young Women in STEM event
- ROBOTICON Challenge Awards
- Innovation Fair with college and career exhibits

The leadership of FIRST did an informal survey of current senior college interests at the Regional FIRST competition and there were a dozen or so students that had attended the Roboticon event at USF and indicated they wanted to attend USF. In the past, USF typically was not mentioned in these surveys as a desired destination. This event is an excellent recruiting program for the College of Engineering and for USF.

**Engineering EXPO:** The student-run EXPO has been reaching out to elementary, middle and high school students since 1973. Annually, more than 15,000 students attend the event held on the Tampa campus of USF in February during Engineering Week. The students, who come from all over the state of Florida, participate in experience that demonstrate STEM principals. In 45 years, more than 600,000 students have visited EXPO and the crowds grow every year. The EXPO also fulfills Sunshine State Standards and enables Boy Scouts to earn an engineering badge and Girl Scouts to earn both an engineering badge and a product design badge.

**Bulls-EYE Mentoring Program:** Under the guidance of Dr. Jonathan Gaines and initially funded through a Motorola Solutions Foundation Innovation Generation grant, Bulls-EYE Mentoring serves to bridge the gap between middle school and college for K-12 youth in the surrounding area of the University of South Florida. The program uses College of Engineering undergraduate students to mentor K-12 youth during five-week summer academies where participants complete interdisciplinary design projects. Since the program’s inception two years ago, it has hired over 30 undergraduate student mentors and invited approximately 70 K-12 youth to campus. While the program helps to inspire K-12 youth to continue their education in the field of engineering, it also serves as a leadership development opportunity for the engineering undergraduate mentors. The 21st Century Skills gained by being a Bulls-EYE Mentor makes its students more competitive in the job market and helps them contribute as productive and dynamic employees in their respective engineering disciplines.
Great American Teach In: This nationwide annual event gives engineering students and faculty the opportunity to reach out to students in middle and elementary schools. The “teachers” answer questions, describe their work and hold quizzes with prizes in the classroom. These annual encounters reach students who might not otherwise have the opportunity to ask questions about college or meet an engineer / researcher.

High School Counselor Events (bi-annual): High school teachers and counselors are often sources of information for students curious about programs and universities. By educating these trusted advisors on the benefits and opportunities USF offers, we can increase the likelihood of keeping these STEM-strong students in Florida. The most recent HS Guidance Counselor Event was on February 9, and was coordinated by Eva Fernandez, Assistant Director Engineering Student Services, and Michael Celestin, Senior Research Engineer.

Prospective Student Tours (weekly): The College of Engineering at University of South Florida holds regularly scheduled lab tours and engineering campus tours conducted by academic advisors and Engineering Ambassadors (TEAM).

Recruitment efforts and CoE reputation has increased % of high-achieving students interested in attending USF.

<table>
<thead>
<tr>
<th></th>
<th>2012 HSGPA</th>
<th>2013 HSGPA</th>
<th>2014 HSGPA</th>
<th>2015 HSGPA</th>
<th>2016 HSGPA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Below 3.4</strong></td>
<td>110</td>
<td>96</td>
<td>121</td>
<td>108</td>
<td>84</td>
</tr>
<tr>
<td><strong>3.4-3.59</strong></td>
<td>64</td>
<td>80</td>
<td>84</td>
<td>81</td>
<td>72</td>
</tr>
<tr>
<td><strong>3.6-3.79</strong></td>
<td>96</td>
<td>101</td>
<td>100</td>
<td>90</td>
<td>79</td>
</tr>
<tr>
<td><strong>3.8-3.99</strong></td>
<td>123</td>
<td>109</td>
<td>99</td>
<td>112</td>
<td>84</td>
</tr>
<tr>
<td><strong>4.00 &amp; above</strong></td>
<td>252</td>
<td>255</td>
<td>289</td>
<td>319</td>
<td>321</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>645</td>
<td>641</td>
<td>693</td>
<td>700</td>
<td>640</td>
</tr>
</tbody>
</table>

Figure 6.1. GPAs of HS Students Applying to COE

6.1.2 Chemical & Biomedical Engineering

ChBME is discussing approaches for actively recruiting more talented UG and GR students from Florida, nationally, and internationally. The goal for the department is to put new plans in place for student recruitment by fall 2017.

At the GR student level, ChBME has committed to running a graduate student recruiting booth at a series of major regional and national meetings in 2017-2018 including the 2017 AIChE Southern Regional meeting and the 2017 AIChE National Meeting. ChBME is currently evaluating what other such meeting venues would be opportunities for student recruiting that would be worthy of investment. In addition, ChBME has had a series of NSF-REU programs that have occurred over the past several years in which talented undergraduate students are brought to campus for a summer of research with our faculty. A new NSF-REU program led by Professor Bethanbolta is starting summer 2017 and will continue this tradition. Such REU programs provide excellent exposure for our department and can aid in recruitment of future Ph.D. students.

At the UG student level, the department has worked with its AIChE Undergraduate Student
Chapter on outreach activities to local area high schools and middle schools and through the Engineers Week activities to promote Chemical Engineering and USF ChBME. We are currently exploring other ways in which to attract talented undergraduates to the department and look forward to opportunities for such engagement that COE develops as well.

6.1.3 Civil & Environmental Engineering

The Dept. Chair, prominent faculty and outstanding students have taken part in recent drives for recruitment of undergraduate students to COE. The Chair has been encouraging faculty who teach senior elective courses to constantly promote the graduate program to exceptional senior students. Most faculty reach out to well-known universities in Asia and South America in order to recruit outstanding graduate students. These efforts have been in place over the past couple of decades and will continue.

6.1.4 Computer Science & Engineering

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.

6.1.5 Electrical Engineering

In 2016 the EE Department participated in the UG recruiting event organized by the COE and held at USF CAMLS. The EE Department also initiated renewed relations with the magnet programs at Middleton High School, and intends to replicate activities with other Tampa Bay area high schools in 2017-2018.

**Middleton High School STEM Magnet Programs**: Electrical Engineering has been actively developing a partnership with Middleton High School STEM Magnet Programs from 2012-2017. This involves creating two on-line courses (logic and computer methods) that their students can take as dual-enrollment courses. One of the goals of this engagement is to attract their high performing students to USF COE/EE; however, restrained resources have impacted the continuation of this project, though the Department of EE has a potential
proposal to continue the program in 2018.

6.1.6 Mechanical Engineering

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 is being hosted in Tampa, FL. The ME department and College of Engineering have 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. 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.

6.2 Actively engage in FUSE, the USF System’s carefully designed transfer-articulation program with regional state colleges

The 2+2 Program with USF-Sarasota/Manatee: 2+2 Pathway to Engineering was developed in 2015-16 to address local need in the Sarasota Manatee area for engineers (projected job growth in area = 21.1% between 2015-23 avg. salaries in $60,000s). Initial focus is on Mechanical Engineering with five students fall 2016 and six students in spring 2017. USFSM developed curriculum and hired an instructor.

USFSM benefits from this program in that we can expand access to engineering for students in our region, it contributes to our efforts to expand our STEM programs as we said we would do in our Strategic Plan, it allows us to be responsive to the community’s expressed need for more engineers in the workforce, and it allows us to leverage the resources of the larger USF System so that we can avoid duplication and reduce cost.

The College of Engineering benefits as they get access to a larger prospective student market, it provides a convenient and less expensive way for students to complete their lower level courses. It opens up opportunities for additional internship and job placements in the Sarasota-Manatee area and it increases regional awareness of the College of Engineering and the programs that are available.

Further, the USF System benefits as we have provided a model for future “Bridge Programs” that can take advantage of the resources of the System. It is an opportunity for us to showcase the power of the USF System and how the larger system can help the local communities we serve. It helps meet regional workforce needs, and it exemplifies BULLISH Collaboration.

Engineering Student Services is working closely with the Dean’s office and his faculty and staff to further develop the program and has begun to make visits to local high schools to discuss
the program and encourage students to remain in the community for their first two years.

6.3 Embrace and engage constructively in the review and revision of USF’s General Education program

Dr. Bhanja, Dr. Bishop, and Dr. Zayas-Castro have met with Bill Cummings regarding the review and revision of USF’s General Education program. The College has been supportive of the direction of these changes, and the discussions in the University’s ADC meetings have been communicated to our undergraduate coordinators.

6.4 Identify, understand and significantly improve performance in classes/sections recording a high percentage of WDF grades

6.4.1 Chemical & Biomedical Engineering

The only course ChBME offers that has had a very large fraction of WDF grades is ECH 3023 Material and Energy Balances. That course is historically the first substantial course in major for ChBME UG students and it is not uncommon for similar courses at other Chemical Engineering departments to also see high WDF grade fractions (e.g. at Georgia Tech the WDF % is normally >25%) and attrition in that first major course. However, in an effort to better prepare USF students for the ECH 3023 course and aid in their transition into major classes, ChBME has adjusted the content of and increased the rigor of its introductory course, ECH 3002 Intro to Chemical & Biomedical Engineering, which is also now a pre-requisite for ECH 3023. Because these changes were only made back in spring 2016, ChBME does not have much data yet on the outcomes, i.e. only one semester of feedback data. However, students taking ECH 3023 in fall 2016 that had the new modified ECH 3002 pre-req course had a pass rate of 66%, compared to a pass rate of 47% for those who did not. ChBME will continue to analyze the results of these changes and look to enhance these results with further changes and new programs. ChBME is currently working to initiate a formal UG mentoring/tutoring program for its UG program.

Discussions are underway with the AIChE Student Chapter to serve as a vehicle through which such a mentoring/tutoring program could be organized and supported by the student body itself.

6.4.2 Civil & Environmental Engineering

It has been identified that the main reason is the lack of preparation time students have for most of these gate courses due to high course loads carried with part-time or full-time employment. Help sessions have been offered in all the core courses with high percentage of WDF grade.

6.4.3 Computer Science & Engineering

The Department has had courses with high WDF 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 two things to reduce high DWF rates in upper-level courses.

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.

6.4.3 Electrical Engineering

In fall 2016 the Department had no UG sections with WDF rates >25%.

6.4.4 IMSE

Percentages of WDF in EIN and ESI classes are very small, less than 5% in each category.

6.4.5 Mechanical Engineering

The ME Department has one course with a record of high WDF. The Department Chair has met with the instructor to discuss this issue. The current WDF percentage rate for this course is steady or decreasing. The following table shows the WDF grades as totals and percentages of all grades during the last five years:

<table>
<thead>
<tr>
<th>Grade</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>77</td>
<td>3.11</td>
<td>59</td>
<td>2.74</td>
<td>28</td>
<td>1.58</td>
<td>33</td>
<td>2.12</td>
<td>41</td>
<td>3.04</td>
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<tr>
<td>D</td>
<td>108</td>
<td>4.35</td>
<td>107</td>
<td>4.97</td>
<td>61</td>
<td>3.44</td>
<td>61</td>
<td>3.92</td>
<td>65</td>
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<td>58</td>
<td>2.69</td>
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<td>2.09</td>
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<td>2.57</td>
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<td>1772</td>
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<td>1556</td>
<td></td>
<td>1350</td>
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</tbody>
</table>

Figure 6.2. ME WDFs

6.5 Invest as needed to improve the student-to-advisor ratio (of no greater than 35:1 in each college) in support of student success (and to improve retention and graduation rates and reduce excess hours)

Face to face advising meetings are a strong component of any retention program. The College’s advising contacts continue to increase resulting in increasing retention of students (Figure 2).

During the fall 2016 semester alone, there were over 8,198 advising contacts for pre-departmental engineering students compared to fall 2011 of just 3144 an increase of over 261%.
6.6 Re-evaluate your college’s class schedule (and 8 semester undergraduate degree plan) to better meet student needs and accelerate progress to degree completion

6.6.1 Chemical & Biomedical Engineering

The only significant recent change ChBME has made to its yearly class schedules is to offer two additional core courses each summer (ECH 4267 Transport Phenomena II and ECH 4418 Separations) to shorten students’ time to graduation by better aligning students on different initial timing schedules onto a common schedule for their last few semesters. This alignment of schedules also helps reduce the required number of courses taught at the senior level, which is an important factor given our large student to faculty ratio and shortage of teaching resources currently. ChBME is also currently evaluating offering the two early Chem Eng courses, ECH 3002 and ECH 3023 on a more frequent basis including summer since these two courses appear to be the bottleneck for transfer students currently. Finally, ChBME is in discussions to adjust some course pre-requisites to give students more flexibility in their course
scheduling and thus hopefully allow more students to reduce their time to degree completion.

6.6.2 Civil & Environmental Engineering
Over the years, the Dept.’s class schedules have been modified to expedite graduations. In fact, over the past six years, the Chair has worked with the Undergraduate Advisor and ASA to schedule classes toward the above target. One issue that is consistently observed by the Undergraduate Advisor is some students’ inability to register for all desired classes is their work schedules.

6.6.3 Computer Science & Engineering
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 three 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, or BS in Information Technology 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).
- 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).

6.6.4 Electrical Engineering
In 2016-2017 the EE Department completed planning for a significantly modernized BSEE curriculum. The new curriculum will go into effect in the fall 2017 semester. The primary goal of this new curriculum is to improve student success and their ability to compete for high quality job opportunities.
IMSEjop

BSIE program is designed (with a detailed flow chart that is used for advising) for 8-semester graduation with room for summer internships in sophomore and junior years, which most of our students participate in. We are currently working on removing some of the course prerequisites to make it easier for BSIEs to graduate on time.

6.6.5 Mechanical Engineering

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.

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

Dr. Bertini is working on the development of an abroad educational program for students. He is also hosting a visiting student from Munich, Germany. Kristine Williams was awarded a travel grant by South African members of the TRB Access Management Committee.

6.8 Consider employing more USF students as PT employees where appropriate

6.8.1 Chemical & Biomedical Engineering

Currently ChBME employs USF undergraduates in the ChBME main office as support staff. ChBME is currently undergoing a review of its staffing and may increase student employment as a result. In addition, ChBME is currently evaluating the prospect of utilizing undergraduate teaching assistants in some of its early undergraduate courses to better improve student access to help and support, and if this plan is adopted additional undergraduate students would be employed in these roles.

6.8.2 Civil & Environmental Engineering

During the past 8 years, CEE Dept. has employed 15 USF students as part-time employees.

6.8.3 Computer Science & Engineering

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 40 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.

6.8.4 Electrical Engineering
The EE Department does not have a budget for employing USF students except as teaching assistants.

6.8.5 IMSE

IMSE employs undergraduate students through work study program and graduate students for TA/GA/RA positions (total invested in hire TA/GA/RA is $375,000 for Fall and Spring of 2016-17)

6.8.6 Mechanical Engineering

<table>
<thead>
<tr>
<th>Annual Year</th>
<th>Headcount</th>
</tr>
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<tbody>
<tr>
<td>2016/17</td>
<td>91</td>
</tr>
<tr>
<td>2015/16</td>
<td>82</td>
</tr>
<tr>
<td>2014/15</td>
<td>84</td>
</tr>
</tbody>
</table>

Figure 6.5. Students employed by ME Dept.

6.8.7 Center for Urban Transportation Research

CUTR employs a large number of USF students and will continue to do so. At the end of 2015, we had 61 students. As of April 2017, we have 66.

6.9 Carefully evaluate and, as deemed appropriate, institute strategies to accelerate “time to degree” doctoral programs.

6.9.1 Academics

The College has a significant number of Professional Development activities with industry partners such as GE, JPP Morgan, Lockheed Martin, and Raytheon that are organized by our student clubs such as SHPE, which support retention efforts. Other activities that support the College’s potential and current recruiting and outreach efforts interface with companies such as Intel, Johnson Controls, and GE.

Due to the highly structured mentoring process, continuous professional development opportunities (mentioned in the previous paragraph) and the fact that graduating PhD students is a significant factor for faculty pursuing tenure and promotion, our time-to-degree for doctoral programs is better than the national average (Engineering Medial Time-To-Degree: 5.2 according to National Science Foundation, National Center for Science and Engineering Statistics. 2017. Women, Minorities and Persons with Disabilities in Science and Engineering: 2017. Special Report NSF 17-310. Arlington, VAS. Available at www.nsf.gov/statistics/wmpd/). Recent trends show that USF COE TTD is significantly better the national average: 4.39 (Summer and Fall 2016).
6.9.2 Chemical & Biomedical Engineering

The time for doctorate in ChBME in spring 2016 was a mean of 4.95 years (range 4.42-5.42). In comparison, fall 2016 was 4.29 years (range 3.58-5). So while these numbers are somewhat variable due to the relatively small number statistics, internally ChBME feels this amount of time to degree is appropriate and consistent with other peer Ph.D. programs. ChBME has however also taken the step to reduce the Ph.D. requirements to 60 credit hours for students coming in with a MS degree, which should be helpful in reducing the time to degree for those students.

6.9.3 Computer Science & Engineering

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.

6.9.3.1 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.

6.9.3.2 In fall 2016, new modifications were introduced (Graduate Council will consider them shortly) 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.

6.9.4 Electrical Engineering

The EE Department has recently reviewed its doctoral program with a particular emphasis on the Doctoral Qualifying Exam. They have instituted a new process that is more effective at getting students focused on their research early in the program and carrying greater momentum into the pre-candidacy period.

6.9.5 IMSE

During 2015 and 2016, of the eleven (11) IE PhD graduates, the average time to PhD degree was 4.9 years. Note that about half of these students came to the PhD program with a bachelor’s degree only. Three of these graduates joined the faculty ranks at other universities.

6.9.5 Mechanical Engineering

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>2015-16</td>
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<td>4.28</td>
<td>2.42</td>
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<td>2014-15</td>
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<td>2013-14</td>
<td>5</td>
<td>3.18</td>
<td>2.75</td>
<td>4.00</td>
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</table>

Figure 6.6. ME PhD Students Time to Degree

7 GROWING RESOURCES

7.1 Explore potential new revenue streams in collaboration with Innovative Education (cost recovery, continuing education, Wintersession, Maymester, and applied research projects with business and industry.

7.1.1 Chemical & Biomedical Engineering

ChBME has initiated two new study abroad courses for summer 2017, one on Sustainability and one on Engineering Thermodynamics, which will occur in Costa Rica. The effort has been coordinated by Professor Ryan Toomey. Registration for these courses opens this week.

7.1.2 Civil & Environmental Engineering

The potential for offering an Education Abroad summer course in Sustainable Multimodal Transportation has been pursued by Dr. Rob Bertini of CUTR in collaboration with the Dept. Such courses will be pursued in the future as well.

7.1.3 Computer Science & Engineering

Currently the revenue generated by the unit in just tuition dollars alone (aside from research grants) is significantly more than the total expenditures from all sources (E&G plus from other sources, such as INTO, Innovative Ed., etc.) of the department.

The Department of Industrial and Management System Engineering is discussing a joint MS degree in Engineering Analysis and are exploring with Innovative Education online options.

The department has several applied research projects with industry, some matched with Florida High Tech Corridor funds.

The college also has the BEST program that allows local industry to fund small educational projects for students such as in senior design classes or capstone courses.

The Department is beginning the process for Innovative Education to perform a quality audit of all BSIT courses (all are online courses). This about 40 courses. The review will improve the quality of the courses and this can lead to increased growth – and thus increased revenue – from the BSIT program. We see Innovative Education as a valuable partner in our continued improvement and growth of our BSIT program (and also of our MSIT program).
7.1.4 IMSE

Considering Master of Science in Engineering Analytics (MSEA) as a possible cost-recovery program. Currently working with Innovative Ed on this jointly with Computer Science.

7.1.5 Mechanical Engineering

Faculty members in the department are working on several industry funded projects. We have received 4 NSF IUCRC grants during the past 3 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.

7.1.6 Center for Urban Transportation Research

The CUTR Motorcycle Injury Prevention Institute (MIPI) was created in 2015 to conduct research and educational outreach to aid in the prevention of motor-vehicle injuries and deaths focused on motorcycles. In 2016, MIPI faculty made numerous appearances at the national level. Dr. Chanyoung Lee (team leader) was invited to speak at the National Traffic Safety Board (NTSB) and at the general session for the State Motorcycle Safety Administrators annual summit. Florida Department of Transportation motorcycle safety grants (a total of $1.5M per year) were renewed and MIPI received ($1.2M) of funding for the NHTSA/FDOT motorcycle helmet demonstration project.

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

7.2.1 Chemical & Biomedical Engineering

Internally, this idea has been discussed within ChBME and prior decisions have been that the department felt it was unwise to get into full on-line delivery at the undergraduate level.

Previous trials with on-line undergraduate courses were not overly successful in terms of enrollments or student survey feedback. ChBME has recently formed a new Undergraduate Student Advisory Board (USAB) and this topic is one of the items they are currently discussing and collecting feedback on for the department. At the graduate level, the department has discussed the possibility of on-line MS programs but the general feeling is that such programs would not be a good use of department resources at the current time.

7.2.2 Computer Science & Engineering
As discussed above the BSIT program is fully online 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 program in 2019. A consultant will come in fall 2017 to review the current program and suggest changes. In fall 2018, along with all other programs in the College of Engineering, there will be a mock ABET visit. Fall 2019, will have the formal ABET visit for the BSIT program and all other programs in the Department and College

7.2.3 Electrical Engineering

The EE Department is considering new fully on-line master’s degree programs with concentrations in wireless communications and controls. Several interactions with the University of Exeter have occurred over the past 12 months to co-develop and co-offer a master’s program on smart systems.

Work with Innovative Education to develop at least one new proposal for either (a) year-round (weekend), and/or (b) Summer pre-college program to support the strategic recruitment of high ability FTIC students to USF.

The EE Department has worked with Innovative Ed for 4-5 years on the biomedical summer workshop. This is one of their most successful programs starting at 2 days and now 4, capped at 24 students. The department is also developing (for launch this summer) a 4 week intensive course equivalent to full semester,2xxx level, Electric Mind and Body, that mixes bioelectric cellular and system concepts with critical thinking and bioelectric laboratory measurements.

7.2.4 IMSE

Proposing a statewide summer pre-college program for “Data Analytics” for high school juniors and seniors for COE to consider. We have participated in Dr. Pollenz’s efforts to recruit higher quality FTIC students.

7.2.5 Mechanical Engineering

Mechanical engineering faculty members have regular discussions on adding online 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.

7.3 Work with Innovative Education to develop at least one new proposal for either (a) year round (weekend), and/or (b) Summer pre-college program to support the strategic recruitment of high ability FTC students to USF.

7.3.1 Mechanical Engineering
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.