Executive Summary

Blueprint for Academic Excellence
College of Engineering & Computing
AY2017-2018

Introduction

CEC offers eight undergraduate degrees through its five departments, as well as seven PhD degrees, 18 Masters degrees, and two graduate certificates. The College enrolls 2,920 undergraduates (up from 1,122 in 2006), 575 graduates, and has 109 TT faculty members. CEC has the third highest number of students in the SC Honors College. CEC is investing significantly to modernize its laboratories and its curricula, and to add to its faculty. The College is also creating infrastructure for student success, and for enhanced productivity of its faculty. CEC is engaging in large and collaborative research with sister colleges, other academic institutions, government, and industry; and is also strengthening its relationship with employers.

Highlights

• John Monnier elected to National Academy of Engineering

• Ryan Geiser (biomed) received Goldwater Scholarship

• Very highly cited/ well-funded faculty members

• Junior faculty very research active

• Students compete well regionally/nationally

• In the midst of hiring 10 TT faculty members and 7 lecturers

• Participant on two NNMIs

• Strong relationship with industry

• Faculty active in generation of IP

• Increasing slate of industry sponsored capstone design projects

• Meaningful industry, academic, international collaborations

Hossein Haj-Hariri
USC Educational Foundation Distinguished Professor

UNIVERSITY OF
SOUTH CAROLINA
College of Engineering
and Computing

Blueprint for Academic Excellence
College of Engineering & Computing
AY2017-2018

Table of Contents

Foundation for Academic Excellence

Mission Statement
We create and disseminate knowledge that advances the practice of engineering and computing. We are committed to working on complex projects that are inherently inter- and multidisciplinary. We leverage the comprehensive nature of the state's largest university to graduate liberally educated engineers and computer scientists capable of teaching themselves new knowledge beyond the boundaries of their education.

Updated: 03/01/2017

Vision Statement
Teaching Excellence: Our College will be the premier destination of choice in the Southeastern U.S. for engineering and computing students, as well as the companies that hire them.

Research/Scholarship: Our research productivity will be internationally recognized based upon the reputation of our faculty scholarship and its impact upon society.

Service: We will lead the university and the state that supports us in the advancement and dissemination of knowledge in our fields of expertise.

Updated: 03/01/2017

Values
We value innovation, societal relevance, inclusivity, and collaboration.

Updated: 03/01/2017

Goals - Looking Back

Goals for the College of Engineering & Computing for the previous Academic Year.

Goal 1 - Sustainability of CEC Mission

Goal Statement	Place the College on sound financial and administrative footing to sustain the goals in teaching, research/scholarship, and service. The singular focus was on this one goal without which others would not have progressed far. NB: The new dean arrived mid-year.
Linkage to University Goal	Educating the Thinkers and Leaders of Tomorrow Assembling a World-Class Faculty of Scholars, Teachers, and Practitioners Spurring Knowledge and Creation Building Inclusive and Inspiring Communities Ensuring Institutional Strength, Longevity, and Excellence
Alignment with Mission, Vision, and Values	Enables the Mission, and the Vision.
Status	Completed with mixed results
Achievements	o Addition to the base, and streamlining of the fees o Investment in the undergraduate laboratories, preawards office personnel, professional advising and student services, TA support, lecturer support (moving toward elimination of TA-taught courses/sections) o Seeking and establishing partnerships o Return of 30% of the overhead to the department, and 1/3rd thereof to the faculty in further support of their research o Moving towards development of departmental budgets o Coordinating the IT practices across the College
Resources Utilized	Each year's goals will list the needed resources.

Goals - Real Time

Goals for the College of Engineering & Computing that are in progress for AY2017-2018.

Goal 1 - Teaching Excellence

Goal Statement	Enhance undergraduate education by decreasing the student-to-faculty ratio, enhancing instructional laboratories, and improving advising services.
Linkage to University Goal	Educating the Thinkers and Leaders of Tomorrow Assembling a World-Class Faculty of Scholars, Teachers, and Practitioners Spurring Knowledge and Creation Ensuring Institutional Strength, Longevity, and Excellence
Alignment with Mission, Vision, and Values	Enables the Mission, and the Vision
Goal Status	Progressing as expected (multi-year goal)
Achievements	o Hire 8+ faculty members this year (actually interviewing for 10, have completed 1 additional hire, and also 4+ lecturers) o Invest in engineering and computing laboratory upgrades ($500K/yr set aside for labs and curricula) o Hire Assistant Dean for Student Services o Implement First Year Advising o Hired/Hiring ~10 lecturers (must eliminate the practice of having TA's teach courses/sections) o Expand Student Success Center programs in Swearingen o Expand partnerships for the Engineering and Computing Community with linked MATH courses o Develop undergraduate Engineering and Computing Honors curricula tracks o Improve recruiting strategies that target underrepresented students o Continue to grow PLTW teacher training programs, adding high school computing and elementary school engineering courses o Update Engineering and Computing course prerequisites while eliminating upper division hurdle to facilitate On Your Time graduation sequencing o Upgrade distance education facilities and modes of delivery o Nurture current international collaborations and continuously seek to foster new ones.
Resources Utilized	
Continuation	

Action Plan for Achieving the Goal	o Hire 8+ faculty members this year (actually interviewing for 10, have completed 1 additional hire, and also 4+ lecturers). o Invest in engineering and computing laboratory upgrades ($500K/yr set aside for labs and curricula). o Hire Assistant Dean for Student Services. o Implement First Year Advising. o Hired/Hiring ~10 lecturers (must eliminate the practice of having TA's teach courses/sections). o Expand Student Success Center programs in Swearingen. o Expand partnerships for the Engineering and Computing Community with linked MATH courses. o Develop undergraduate Engineering and Computing Honors curricula tracks. o Improve recruiting strategies that target underrepresented students. o Continue to grow PLTW teacher training programs, adding high school computing and elementary school engineering courses. o Update Engineering and Computing course prerequisites while eliminating upper division hurdle to facilitate On Your Time graduation sequencing. o Upgrade distance education facilities and modes of delivery. o Nurture current international collaborations and continuously seek to foster new ones.

Upcoming Plans	o Complete the accreditation visit in the fall. o Continue hiring ~12 faculty members per year to bring down the student/faculty ratio o Continue investing in engineering and computing laboratory upgrades ($500K/yr set aside for labs and curricula) o Continue hiring lecturers and technicians as needed o Need more computer classrooms to accommodate the IIT department and the growing enrollment in CSE and other departments, as well as serve the vision to have USC as one of the first public universities to require programming from all its students. o Need a budget model for offering and expanding computer science courses as service courses (50% of the substantial investment in TA supports for CSE is for service courses for which there is not a clear budget model in place today) o Develop the plan for creating an experiential learning facility in the woodchip area of the Biomass building. o Offer 24 Honors specific sections in CEC majors. o A committee from all departments was formed to review and recommend actions. o BoT approved a 5-year collaboration with Caledonian College in Oman. CEC will help improve and develop new programs and monitor the quality. o Encourage the University to create more ~120 seat classrooms on the west side of the campus
Resource Needs	Between the University's existing commitments to CEC, and the hoped-for approval for the remaining two phases of the program fee, the budget for a-c is in place. Also the agreement with the Provost and the Honors College will cover 4 lecturers and the adjuncts who are needed to enable to offering of 24 Honors specific sections. Instructional space, wet labs, and computer labs are areas where central help is needed. Space in Sumwalt would be the natural choice for meeting our CEC need for computational classroom (1, accommodating 40 students). The upgrade of technology in classrooms will be implemented in stages, requiring about $20,000/room. The collaboration with Caledonian College will generate revenue of ~$2.5M over 5 years.

Goal 2 - Research/Scholarship

Goal Statement	Enhance research by focusing on prominence: we will not cover all fields, but what we do, we will do extremely well. We will attract strong research faculty (possibly jointly appointed), support and resource existing research active faculty, and create critical mass in areas of strength. We will incentivize collaborative and large projects having high societal impact. And we will invest in infrastructure and student support through research startups and return of some of the overhead.
Linkage to University Goal	Educating the Thinkers and Leaders of Tomorrow Assembling a World-Class Faculty of Scholars, Teachers, and Practitioners Spurring Knowledge and Creation Building Inclusive and Inspiring Communities Ensuring Institutional Strength, Longevity, and Excellence
Alignment with Mission, Vision, and Values	Fully aligned.
Goal Status	Extended to following Academic Year
Achievements	
Resources Utilized	
Continuation	
Action Plan for Achieving the Goal	o Hire new faculty in targeted areas that build upon existing research strengths, or create timely areas of research, that develop high-value multidisciplinary research opportunities. o Identify the areas to build upon o Create incentivize through return of indirect funds, allocation of CEC-supported graduate students, and creation of central pool of funds for maintenance of large and shared equipment o Identify equipment that could be placed in shared-use facilities o Increase international student participation in graduate programs through partnership with Shorelight
Upcoming Plans	
Resource Needs	o Between the University's existing commitments to CEC, and the pending approval for the remaining two phases of the program fee, the budget for hiring faculty and lecturers is in place. o CEC is counting on the continuation of FRIP and other similar incentives (such as return of overhead generated by the senior faculty recruit in the first X years) o Wet and specialized lab space is at a premium. As the nearly- 50 new faculty members will join CEC, they will need 100,000 square feet. Bert Storey Innovation Space provides some space, but we also need about 40,000 square feet of labs. CEC may need help in identifying space and resources to lease lab space. o Shorelight agreement will generate net new resources.

Goal 3 - Service

Goal Statement	Provide leadership for university and state organizations aimed at enhancing engineering and computing education, practice, and research.
Linkage to University Goal	Educating the Thinkers and Leaders of Tomorrow Spurring Knowledge and Creation Building Inclusive and Inspiring Communities
Alignment with Mission, Vision, and Values	Fully aligned.
Goal Status	Progressing as expected (multi-year goal)
Achievements	
Resources Utilized	
Continuation	
Action Plan for Achieving the Goal	o Continue to offer programming courses in CSE as service courses. Expand the offering to make computing be part of the general education of all USC students. o Explore in detail 2+2 programs for online degree completion. o Identify faculty from CEC and College of Education to work together and with the schools for STEM outreach. o Continue to participate in economic engagement activities. o Continue to engage with international partners for exchange programs
Upcoming Plans	o Attract resources to CEC to support offering the service courses by CSE. o Create engineering and computer science programs with the local middle schools; and also with partners outside of the state o Execute MOU's with SC State and Claflin on various joint/dual/accelerate degree options o Now that agreements are signed, roll out the partnership with Caledonian University of Oman, and also roll out the Shorelight partnership o Continue to strengthen the relationship with IBM and Boeing, and build partnership with Siemens, Michelin, GE, and Lockheed. o Continue to develop ideas and plans for a substantial maker and experiential space for USC and Columbia in the Biomass building.
Resource Needs	o Currently about 44% of the >$1.3M (=$570K) of TA support for CSE department goes to supporting the service courses. The College does not receive any support for this service. We request at least $570K, and preferably more, so that we can expand the offering of the courses to serve more of USC students. o Continued support from the Office of Economic Engagement o 1 joint FTE with College of Education.

Goal 4 - Sustainability of CEC Mission

Goal Statement	Resource and budget the College's commitment to its long-term goals by evaluating its programs and activities based on cost, revenue, and mission impact.
Linkage to University Goal	Educating the Thinkers and Leaders of Tomorrow Assembling a World-Class Faculty of Scholars, Teachers, and Practitioners Spurring Knowledge and Creation Building Inclusive and Inspiring Communities Ensuring Institutional Strength, Longevity, and Excellence
Alignment with Mission, Vision, and Values	Fully aligned
Goal Status	Progressing as expected (multi-year goal)
Achievements	
Resources Utilized	
Continuation	Present well-justified and reasonable plans to the University for programs that leverage the College and the University. College invests well over $1M in TA support in Computer Science and Engineering. More than half of that support is for service courses to non CEC students. Whereas there have been historic models that have resourced similar service loads in mathematics, physics, chemistry, and biology, no such model seems to be in place for the relatively new model (compared with the above) of computer science as a service course. The College is willing to pioneer the offering of programming or analytics courses to the whole student population of USC, eventually, starting with the Darla Moore School students. However, an upward adjustment of the budget of the College is needed in recognition of the significant resource intensity of this activity even today.
Action Plan for Achieving the Goal	o Present well-justified and reasonable plans to the University for programs that leverage the College and the University. o College invests well over $1M in TA support in Computer Science and Engineering. More than half of that support is for service courses to non CEC students. o Whereas there have been historic models that have resourced similar service loads in mathematics, physics, chemistry, and biology, no such model seems to be in place for the relatively new model (compared with the above) of computer science as a service course. The College is willing to pioneer the offering of programming or analytics courses to the whole student population of USC, eventually, starting with the Darla Moore School students. However, an upward adjustment of the budget of the College is needed in recognition of the significant resource intensity of this activity even today.
Upcoming Plans	Continue to develop the budget for the departments. Streamline post-award experience: CEC finally has the ability to provide monthly account reports to the faculty. The goal for this year is to develop an app that gives up to the minute information on every account, including encumbered personnel expenses.

Resource Needs	Addition to the base in support of the CSE service courses by the CEC: o $570,000 for TA support o $90,000 for lecturer support o The course fee pays for periodic update of computers, servers, furniture, etc. Furthermore, computer classroom space is needed in a central location on campus. Sumwalt is an ideal building based on location, and current underutilization.

Goals - Looking Ahead

Goals for the College of Engineering & Computing that are slated for the upcoming year.

Goal 1 - Goals are multi-year

Goal Statement	The college's goals are multi-year goals and will continue from last year as they were detailed in the previous sections.
Linkage to University Goal(s)	Educating the Thinkers and Leaders of Tomorrow Assembling a World-Class Faculty of Scholars, Teachers, and Practitioners Spurring Knowledge and Creation Building Inclusive and Inspiring Communities Ensuring Institutional Strength, Longevity, and Excellence
Alignment with Mission, Vision, and Values	Fully aligned
Goal Status	
Action Plan for Achieving the Goal	
Resources Needed	

Academic Programs

Program Rankings

Academic programs that were nationally ranked or received external recognition during the Academic Year.

The 2017 graduate rankings for the College are currently embargoed by US News. But they are given below for the engineering programs/departments. Computer science was ranked 101st in 2016. The highest-ranked programs in the College are chemical engineering (58th) and nuclear engineering (20th). We will also very soon have an aerospace degree
program that should be ranked favorably compared with our other programs. Strategic investments (and partnerships) are
envisioned to leverage the College in niche areas.

After the drop to 105 last year, we noted that some of our data was not reported correctly to US News. Correcting the data, as well as the improvements in some of the metrics (students per faculty, expenditures, etc.) would have lifted the rankings to 98-99. But unfortunately the GREQ average dropped by 4 points. We will address this shortfall in the coming year by putting in appropriate measures of quality centrally at the College level. Clemson University ranking too suffered a 10-place drop as a result of similar shortfall in the GREQ score. Mechanical, electrical, computer engineering and biomedical engineering are ranked where there are large year-over-year fluctuations. Last year computer engineering enjoyed a very nice jump, while the other three programs suffered significant slides. But the level of noise to signal is quite high in that neighborhood of the rankings.

Instructional Modalities

Innovations and changes to Instructional Modalities in unit's programmatic and course offerings that were implemented during the Academic Year.

Lecture-capture facilities are being incorporated into three classrooms. We will explore better ways to deliver online courses.
The fee structure for APOGEE remains a challenge, and makes the offerings essentially non-competitive outside of SC.

Program Launches

Academic Programs that were newly launched during the Academic Year; those that received required approvals but which had not yet enrolled students are not included.

o Graduate Certificate in Cyber Security Studies. (approved in 2016; currently 31 students).

o Railway Engineering, Graduate Certificate (approved in 2016, currently 3 students).

o Master of Health IT will move to CEC along with the department of Integrated Information Technology.

Program Terminations

Academic Programs that were newly terminated or discontinued during the Academic Year.

None.

Supplemental Info - Academic Programs

Any additional information on Academic Programs appears as Appendix 1. (bottom).

Academic Initiatives

Experiential Learning for Undergraduates

Initiatives, improvements, challenges, and progress with Experiential Learning at the Undergraduate level.

a. Modernizing and upgrading the undergraduate laboratories and curricula ($500K/year)

b. Envisioning a plan for the woodchip area of the Biomass building to convert it to 30,000 square feet of maker and experiential activities space with rapid prototyping, light machining, simulations and computing space, in addition to technicians and space for students and other groups. Once the plans are completed, then resourcing phase will begin.

c. Expanding on the existing required capstone-design experience of our students, by developing a college-wide capstone design experience which can address more complex and multi-disciplinary projects sponsored by companies. The teams will be drawn from multiple departments in CEC, or from other colleges as well.

d. Pathways for Graduation with Leadership Distinction in Research are well-established and include applicable CEC coursework. Identifying applicable coursework that we can offer that meets the expectations of other GLD pathways is a challenge to improvement.

e. Undergraduate Research. Many undergraduates participate in research but do not pursue GLD.

f. Co-ops and Internships. CEC provides space and collaboration with the university Career Center to house a satellite

office in Swearingen. This office focuses on engineering and computing students and the companies that hire them, and facilitates co-op and paid internship placements. An ongoing challenge is expanding the number and types of co-op and internship opportunities.

g. McNair Junior Fellows Program: This highly selective program brings about 40-50 undergraduates into McNair Center and engages them in research for 5-10 hours per week. The students get real-world experience in research; many publish papers or give presentations. And many also work closely with the sponsors of the research projects.

Experiential Learning For Graduate & Professional Students

Initiatives, improvements, challenges, and progress with Experiential Learning at the Graduate or Professional level.

A graduate degree in engineering or computing, unless it is purely-course-based, by definition has a significant experiential

learning component in the form of a thesis, dissertation, or project. As we continue to bring on board research active faculty who establish new research areas and new laboratories, we will continue to expand the options for our graduate students. Furthermore, we provide opportunities for collaborative research with international institutions.

Affordability

Assessment of affordability and efforts to address affordability.

At the graduate level, with the exception of self-paid masters students (not large in number), the rest of the students receive some level of stipend and tuition support. The packages are competitive so that we can attract them to USC.

Reputation Enhancement

Contributions and achievements that enhance the reputation of USC Columbia regionally and nationally.

o Hiring world-class faculty, and attracting great students

o Nominating the faculty and students for awards, and winning these

o Engaging and partnering with local and regional industry, schools, and the state government

o Engaging and partnering with other universities, and national labs

o Development of national and international collaborations with institutions all over the globe to enhance reputation

Challenges

Challenges and resource needs anticipated for the current and upcoming Academic Years, not noted elsewhere in this report and/or those which merit additional attention.

o Need lab space, and computer classroom space

o Need more large classrooms on the west side of the campus

o Resourcing the service element of computer science; it currently is a large commitment on the part of CEC

Supplemental Info - Academic Initiatives

Any additional information on Academic Initiatives appears as Appendix 2. (bottom)

Faculty Population

Faculty Employment Summary

Table 1. Faculty Employment by Track and Title.

	Fall 2016	Fall 2015	Fall 2014
Tenure-track Faculty			
Professor, with tenure	51	47	43
Associate Professor, with tenure	32	33	33
Professor	0	0	0
Associate Professor	2	1	3
Assistant Professor	24	30	30
Librarian, with tenure	0	0	0
Librarian	0	0	0
Assistant Librarian	0	0	0
Research Faculty			
Research Professor	2	2	0
Research Associate Professor	0	0	2
Research Assistant Professor	3	1	1
Clinical/instructional Faculty			
Clinical Professor	0	0	0
Clinical Associate Professor	0	0	0
Clinical Assistant Professor	0	0	0
Instructor/Lecturer	3	3	3
Adjunct Faculty	27	21	14

Faculty Diversity by Gender and Race/Ethnicity

Note: USC follows US Department of Education IPEDS/ National Center for Education Statistics guidance for collecting and reporting race and ethnicity. See https://nces.ed.gov/ipeds/Section/collecting_re

Table 2. Faculty Diversity by Gender and Race/Ethnicity, Fall 2016, Fall 2015, and Fall 2014.

	Fall 2016	Fall 2015	Fall 2014
Gender	144	138	129
Female	20	21	17
Male	124	117	112
Race/Ethnicity	144	138	129
American Indian/Alaska Native	0	0	0
Asian	44	41	40
Black or African American	2	1	1
Hispanic or Latino	3	3	3
Native Hawaiian or Other Pacific Islander	0	0	0
Nonresident Alien	4	6	5
Two or More Races	1	1	1
Unknown Race/Ethnicity	3	4	1
White	87	82	78

Illustrations 1 and 2 (below) portray this data visually.

Illustration 1. Faculty Diversity by Gender

2016 Faculty Gender   2015 Faculty Gender   2014 Faculty Gender

Male Female
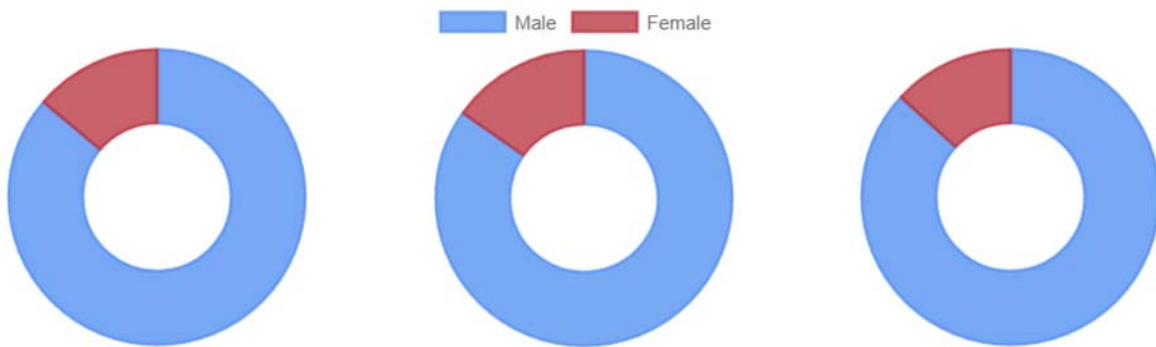
Illustration 2. Faculty Diversity by Race & Ethnicity

American Indian/Alaska Native Asian Black or African American

Hispanic or Latino Native Hawaiian or Other Pacific Islander

Nonresident Alien Two Or More Races Unknown Race/Ethnicity

White

2016

2015

2014

0 20 40 60 80 100 120 140 160
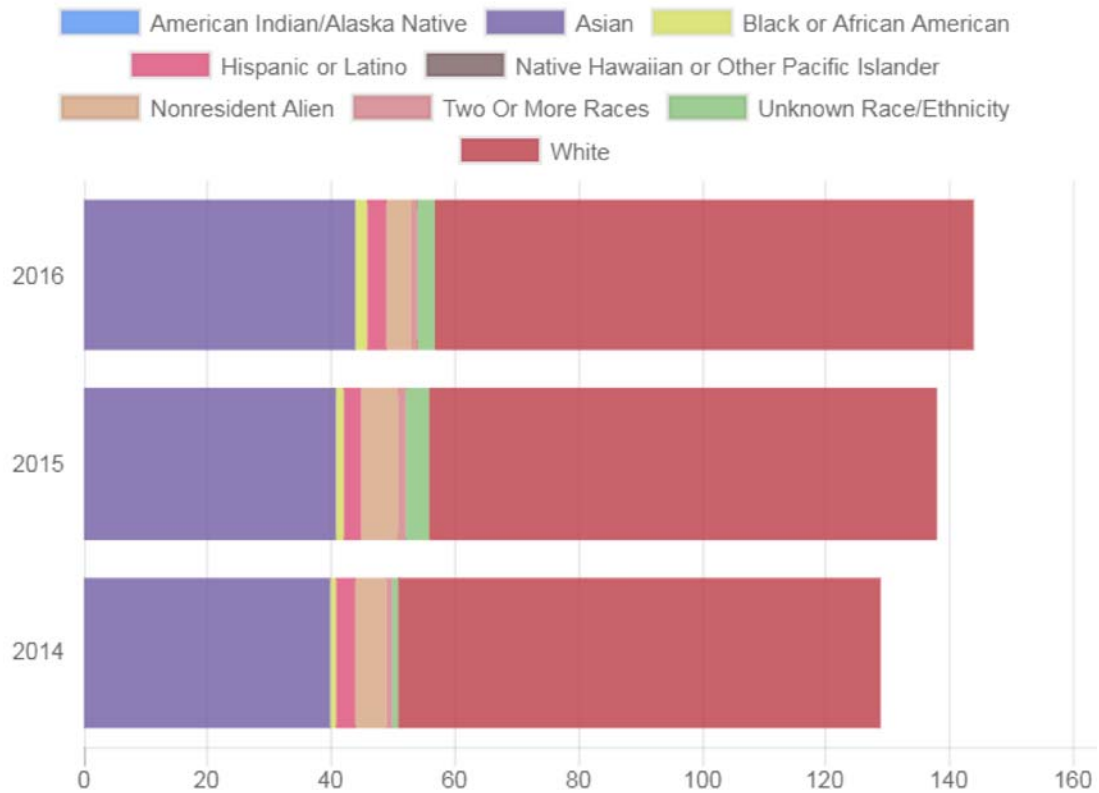
Faculty Information

Research and Scholarly Activity

Please refer to Appendix 3, which provides detailed information from the Office of the Vice President for Research, department of Information Technology and Data Management, including:
1) The total number and amount of externally sponsored research proposal submissions by funding source for the appropriate Fiscal Year.
2) Summary of externally sponsored research awards by funding source for the appropriate Fiscal Year. Total extramural funding processed through Sponsored Awards Management (SAM) in the Fiscal Year, and federal extramural funding processed through SAM in the Fiscal Year. (Available at: http://sam.research.sc.edu/awards.html) Amount of sponsored research funding per faculty member in FY YYYY (by rank, type of funding; e.g., federal, state, etc., and by department, if applicable).
3) Number of patents, disclosures, and licensing agreements for three most recent Fiscal Years.

Following discussions in Executive Committee in 2016, the following metrics from Academic Analytics were selected as being most relevant, in three categories as indicated. For certain departments, the conference proceedings are important but these are not available in the AA Database.

a. Total Departmental Impact and Competitiveness (scales strongly with faculty size)

Total Journal Publications

Total Citations

Total Grant Dollars

Total Awards/Honors

b. Productivity per Faculty Member

Journal Publications per Faculty Member

Citations per Faculty Member

Grant Dollars per Faculty Member

Awards/Honors per faculty member

c. Departmental Approach

Citations per Publication

Dollars per Grant

Number of Faculty with Grant

For the 2017 Blueprint, we have selected a subset of seven SEC schools as our peer comparators for the four purely "Engineering" departments. These areFlorida (from the Provost's Peer Aspirant group); Auburn, Missouri, and Tennessee (from the Provost's 2017 Peer Group); Alabama, Kentucky, and Arkansas (additional SEC schools that appear in our department's own choice of peer universities that were not already in the Provost's Peer and Peer Aspirant schools). We omitted Georgia from the Engineering departments. Although Georgia appears in the Provost's peer group, its engineering school is relatively small, limited in scope, and of recent vintage. For our Computer Science and Engineering Department, we included Georgia (which has Computer Science separately) and excluded Tennessee (which combines Electrical Engineering and Computer Science, and which is used as a peer for Electrical Engineering).

On the following pages, we present three radar charts (per the groupings a, b, and c above) for each of our five departments (Computer Science and Engineering, and Chemical, Electrical, Mechanical, and Civil & Environmental Engineering). These departments are the tenure homes of faculty who are also appointed in our programs: Biomedical, Nuclear, and Aerospace Engineering. The values on the radar charts are computed as follows:

Metric for USC department /Maximum metric in the category x 100%

Thus the charts on the following pages show how well a given CEC department compares to the category leader, for all 11 categories.

The metrics inform areas where each department, and College as a whole, needs to focus as they determine areas for building research strength.

For each department three charts are provided. The first chart shows the per-faculty productivity and scholarship. The second is a measure of size, and is merely for information purposes. The third chart captures the impact and activity of the department. In particular, it shows impact of the scholarly output (Cits/Pub), significance of the research awards ($/Grant), and the research activity of the faculty (Fac w grant).

Faculty Development

Efforts at Faculty Development, including investments, activities, incentives, objectives, and outcomes.

Optional

o PI Academy - CEC Research Office in conjunction of with other offices on campus offered a series of 17 workshops

designed to assist faculty with improving their research funding success and management of grants

o Investment in pre-awards to support the faculty in submission of proposals

o Investment in the position of assistant dean for research, to help faculty who wish to submit large and collaborative proposals

o Investment in grant-writing support services

o Formal and peer mentorship

o Return of overhead

o Investment in post-awards in order to provide timely and accurate budget and management information to the faculty for the research grants

Supplemental Info - Faculty

Any additional content on Faculty Information appears as Appendix 4. (bottom)

Supplemental Academic Analytics Report

Content from Academic Analytics appears as Appendix 5. (bottom)

Teaching

Faculty to Student Ratio

The formula used to compute the ratio uses data from Faculty Population by Track and Title and Student Enrollment by Time Basis, as follows:

$$\frac{(Total\ Full\text{-}time\ Students\ +\ 1/3\ Part\text{-}time\ Students)}{((Total\ Tenure\text{-}track\ Faculty\ +Total\ Research\ Faculty\ +\ Total\ Clinical/Instructional\ Faculty)\ +\ (1/3\ Adjunct\ Faculty))}$$

Table 4. Faculty-to-Student Ratio, Fall 2016, Fall 2015, and Fall 2014

Fall 2016	Fall 2015	Fall 2014
1: 26.0	1:24.97	1:23.18

Analysis of Ratio

Analysis of the ratio, agreement with the data, and plans for the future to impact this ratio.

As one notes, the number is trending up rapidly. This was the basis of the fee increase request submitted last year. If unchecked, at the end of the Dean's 5-year term, despite substantial investments by the University, the ratio would have been in the range of 28-30. Today however we are on track to trend down to 21-23. At these numbers, with effective teaching methods, CEC will deliver an excellent and world-class education.

Faculty Awards Received

During AY2017-2018 faculty of CEC were recognized for their professional accomplishments in the categories of Research, Service, and Teaching.

Research Awards

Recipient(s)	Award	Organization
Li, Chen	International Conference on Micro and Nano Channels Young Investigator Award	American Society of Mechanical Engineering
Hoque, Shamia	Science & Tech Award Level III	Environmental Protection Agency
Gower, Michael	Young Investigator Travel Award	National IDeA Symposium of Biomedical Research Excellence
White , Ralph	Vittorio de Nora Award	The Electrochemical Society
Ploehn, Harry	Fellow of the American Institute of Chemical Engineers	American Institute of Chemical Engineers
Regalbuto, John	Fellow of the American Institute of Chemical Engineers	American Institute of Chemical Engineers
Weidner, John	Energy Summit Education Leader Award	Charlotte Business Journal
Chaudhry, Hanif	Distinguished Member	American Society of Civil Engineers
White, Ralph	Leadership in Research	USC VPR Office
Wang, Guoan	Rising Star	USC VPR Office
Yu, Miao	Rising Star	USC VPR Office
Farouk, Tanvir	Rising Star	USC VPR Office
Uline, Mark	President Citation	Institute of Biological Engineers
Moss, Melissa	President Citation	Institute of Biological Engineers
Besmann, Ted	D.T. Rankin Award for Exemplary Service to Nuclear and Environmental Technology Division	American Ceramics Society
Kidane, Addis	ORR Early Career Award	American Society of Mechanical Engineers Materials Division
Giurgiutiu, Victor	NDE Lifetime Achievement Award	International Society for Optics and Photonics
Meadows, Michael	Fellow	American Society of Civil Engineers
Chaudhry, Hanif	Distinguished Member	American Society of Civil Engineers
Deng, Xiaomin	Fellow	American Society of Mechanical Engineers
Dougal, Roger	Leadership in Research	USC VPR Office
Weidner, John	Leadership	USC VPR Office
Giurgiutiu, Victor	Leadership in Research	USC VPR Office
Terejanu, Gabriel	Rising Star	USC VPR Office
Li, Chen	Rising Star	USC VPR Office
Monnier, John	Elected Member of National Academy of Engineering	National Academy of Engineering

Service Awards

Recipient(s)	Award	Organization

Teaching Awards

Recipient(s)	Award	Organization
Moss, Melissa	CUR-Goldwater Scholars Faculty Mentor Award	Council on Undergraduate Research
Gatzke, Ed	Garnet Apple Award	University of South Carolina
Moss, Melissa	Distinguished Undergraduate Research Mentor Award	University of South Carolina

Student Recruiting and Retention

Student Recruitment

Efforts, including specific actions, to recruit students into College/School programs.

Undergraduates:

o Director of Outreach and Recruitment. One full-time staff position dedicated to outreach and recruitment for the College. Position develops, implements and evaluates college activities that contribute to the successful recruitment of undergraduate students.

o Project Lead the Way. PLTW is a nationally-recognized program for implementing engineering, computing, and health sciences curricula in K-12 schools. USC is one of the leading providers of teacher training for PLTW. As such, teachers from across the country know that our college is a potential destination for their students. PLTW staff include a Director, Senior Consultant, Assistant Director, and dozens of Master Teachers and student workers, all supported by self-generated funding; the college provides the needed infrastructure.

o Enhanced Learning Experiences. Provided by department faculty and staff and coordinated ty Director of Outreach and Recruitment, ELEs are half-day hands-on engineering and computing experiences for classes of high school students. Scheduled upon request.

o Middle School Day. This outreach event in October was free of charge and open to any Middle School class of 20-25 students. Topics included Biomedical Engineering, Electrical Engineering, and Computer Science. Students engaged in various experiments and learning experiences with CEC faculty and students.

o E-Week Open House. National Engineers Week celebrates professionals in all fields of engineering and computing. CEC hosts an Open House geared toward kindergarten through 12th grade students. The free event features dozens of interactive exhibits that highlight our academic programs and research.

o Summer Camps for K-12 Students.   Coordinated by the Director of Outreach and Recruitment, camps this year include Partners for Minorities in Engineering and Computer Science, Adventures for Women in Engineering, Adventures in VEX Robotics, Adventures in Computer Gaming - Middle School, Adventures in Computer Gaming - High School, Adventures in Electrical Engineering, Adventures in Natural Hazards and Civil Engineering, and Adventures in Aerospace.

o USC Science and Engineering Fair. College faculty provides leadership and judges for the Engineering Division and the Computer Science Division.

o K-12 Classrooms, Career Fairs, FIRST Robotics Competitions. Director of Outreach and Recruitment presents to students at K-12 schools and regional robotics competitions.

o Website, Flyers, and Brochures. Director of Outreach and Recruitment designs and maintains college's "Apply" and "K-12 Outreach Programs" sections of college website, and the college and program-specific informational brochures for prospective students, to ensure timeliness and accuracy of information.

o College "Daily Tours" provided throughout the year. Daily tours are led by CEC student ambassadors that are trained and supervised by the Director of Outreach and Recruitment.

o Three "Big Fridays" each semester. Big Fridays include presentations by the Dean and the Director of Outreach and Recruitment, a student panel Q&A, and tours of the departments led by faculty.

o College-Specific Admitted Student Yield Efforts. These include:

o Signed postcards to all admitted students sent by CEC students.

o Hand-written postcards to all female admitted students sent by members of Women in Computing and the Society of Women Engineers student organizations.

o Email sent to all admitted students by Director of Outreach and Recruitment

o Letters to families of admitted students sent by Associate Dean.

o Dean's Letter to admitted students, crafted by the college's Associate Dean for Academic Affairs, Director of Outreach and Recruitment, with input from current students.

o Dean, Associate Deans, Department Chairs, and Faculty participate in Admissions Office events, including Fall Open House, Admitted Student Days, Scholar Socials, Carolina Scholars and Out of State Scholar Weekends.

o Scholarships. CEC provides hundreds of students with scholarships. Most target new freshmen.

o Articulation Agreements. Transfer student recruitment is facilitated through active articulation agreements with USC System campuses, SC Technical Colleges, and several 4-year regional institutions. Two more in the works with SC State University and Claflin University.

o Big Fridays (events for visiting students)

o Admitted students days

o Participation in Honors College recruiting activities

o Participation in the GSSM college fair

o Outreach to Richland and Lexington schools

Graduates:

o SEC Deans Fellows Program was instituted, bringing a minimum of 2 SEC alumni on board each year with add-on stipends of $5K, on top of a minimum $25K/year research stipend.

o The CEC Associate Dean for Research is the USC representative to the National GEM Consortium, which facilitates industrial internships and financial aid for under-represented minorities in STEM fields. USC Computer Science & Engineering has one graduate student who is a GEM Fellow. Two CSE undergraduates have won GEM Fellowships this year and will matriculate elsewhere.

o CEC participates in the ENGINE database effort; leading engineering schools share names of their undergraduates who are prospective graduate students and all engineering schools can recruit from this list.

o CEC centrally offers funds for individual departments to travel to recruiting events, or to develop campus visitation programs.

Student Retention

Efforts at retaining current students in College/School programs.

o Assistant Dean for Student Services. Duties of this position include coordinating college-level support for undergraduate retention efforts that involve academic issues, analyzing data to propose and develop interventions targeting specific courses and students, and maintaining partnerships with the Student Success Center and related offices.

o Carolina Pre-Calculus Review. Math-readiness of students has been identified as a challenge to retention for CEC's engineering and computer science degree programs. CEC collaborates with the Student Success Center to provide 6-day on-line pre-calculus intensive review courses during the summer before the freshman year. Content includes math concepts and college-level study strategies.

o New Student Orientation. The presentation by Associate Dean for Academic Affairs to all incoming students and families is data-driven and focuses on academic success strategies and student engagement recommendations.

o Hand-Off Advising Model. CEC uses First Year Advisors that have training, experience, and a disposition to help new students transition successfully to college. Faculty Advisors advise continuing students to help students connect with their fields of study and career opportunities.

o Tutoring. In collaboration with the Student Success Center, the college provides tutoring centers in Swearingen and in the Engineering and Computing Community. CEC currently has the only academic building with a satellite of the Student Success Center

o Engineering and Computing Community. In collaboration with Housing, a CEC Faculty Advisor and the Assistant Dean for Student Services provide linked courses and beyond-the-classroom activities for this themed living-learning community.

o Student Organizations. College provides meeting rooms, storage, advisors, administrative, and other support to over 35 CEC-oriented student organizations.

o Big Wednesday. The day before classes start, new students interact with representatives of over 30 CEC-orientated student organizations, with the intended outcome of improved student engagement.

o Events for Current Students. On-going student professional development and engagement events that are coordinated at the college-level include a Women in Engineering and Computing Panel, SCANA Design Competition, Dean's Leadership Conversation, and CEC Organizational Leaders Workshop.

o Professional first-year advising

Student Enrollment & Outcomes

The following data was provided by USC's Office of Institutional Research, Assessment, and Analytics. Please note that Fall 2016 and AY2016-2017 data, where presented, are preliminary and unofficial.

Note: Student enrollment and outcomes data are calculated by headcount on the basis of primary program of student only.

Student Enrollment by Level & Classification

Table 5. Student Enrollment by Level & Classification.

	Fall 2016-2017	Fall 2015-2016	Fall 2014-2015
Undergraduate Enrollment			
Freshman	595	630	606
Sophmore	650	613	590
Junior	626	618	516
Senior	1049	882	768
Sub Total	2920	2743	2480
Graduate Enrollment			
Masters	248	256	186
Doctoral	320	309	308
Graduate Certificate	7	3	3
Sub Total	575	568	497
Graduate Enrollment			
Medicine	0	0	0
Law	0	0	0
PharmD	0	0	0
Sub Total	0	0	0
Total Enrollment (All Levels)	**3495**	**3311**	**2977**

Illustration 3. Undergraduate Student Enrollment by Classification
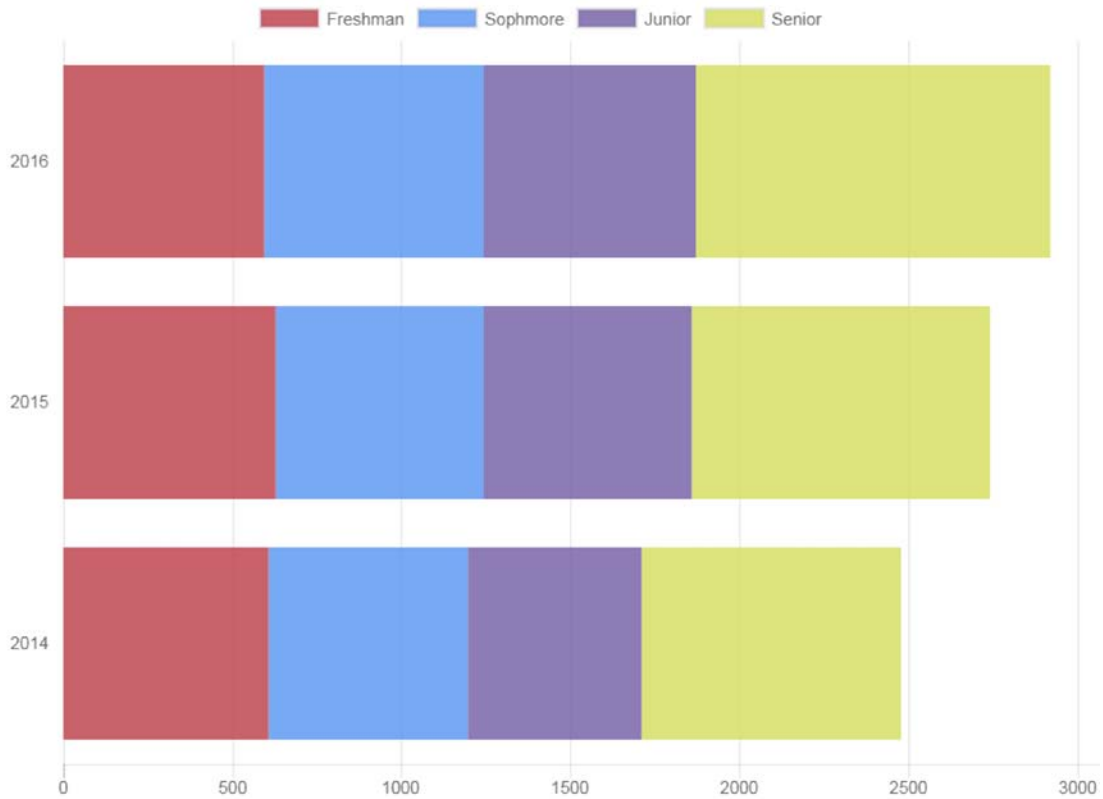
Illustration 4. Graduate/Professional Student Enrollment by Classification
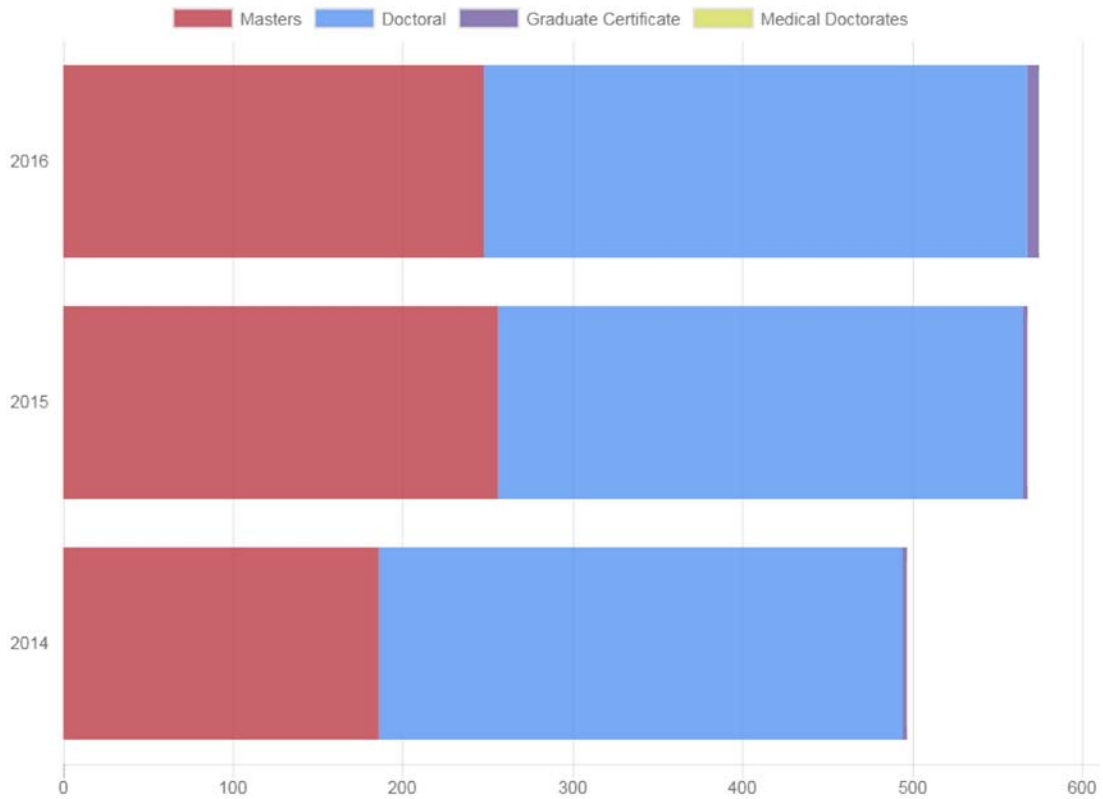
Illustration 5. Total Student Enrollment by Classification (All Levels)
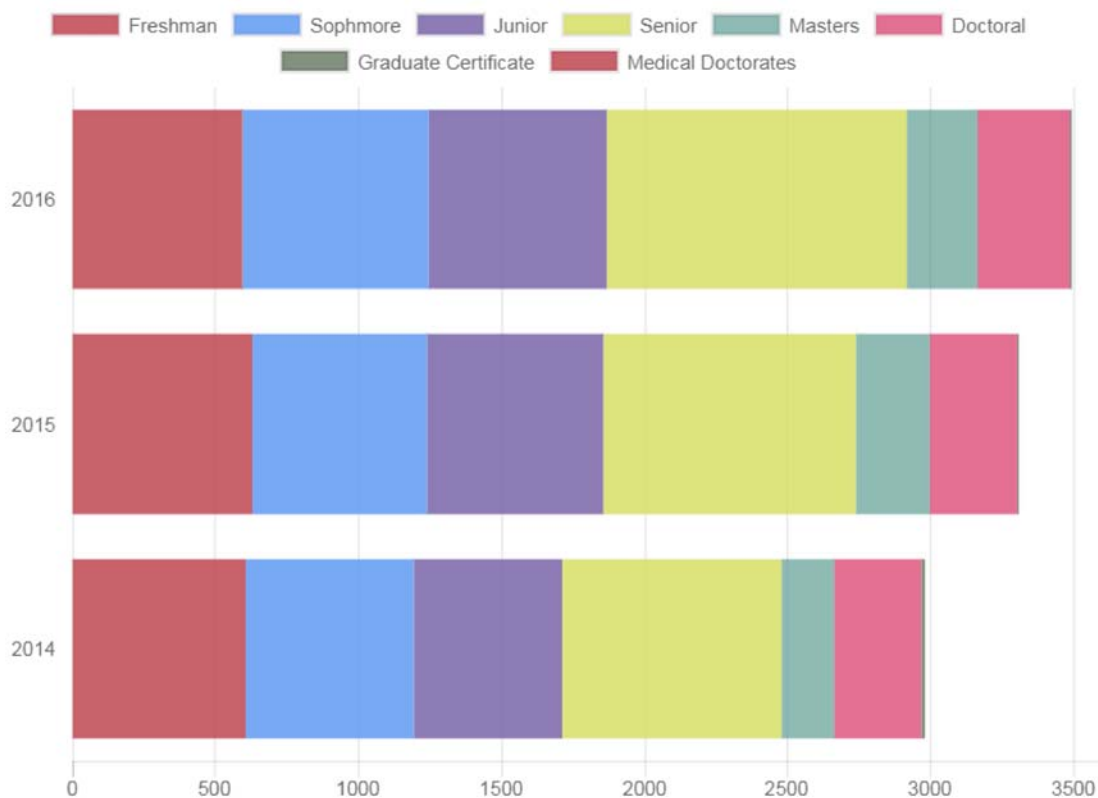
Enrollment by Time Status

Table 6. Student Enrollment by Level and Time Status.

	Fall 2016 (preliminary)	Fall 2015 (official)	Fall 2014 (official)
Undergraduate	**2920**	**2743**	**2480**
Full-Time	2728	2567	2325
Part-Time	192	176	155
Graduate/Professional	**575**	**568**	**497**
Full-Time	439	422	348
Part-Time	136	146	149
Total - All Levels	**3495**	**3311**	**2977**
Full-Time	3167	2989	2673
Part-Time	328	328	328

Student Diversity by Gender
Table 7. Student Enrollment by Gender.

	Fall 2016 (preliminary)	Fall 2015 (official)	Fall 2014 (official)
Undergraduate	**2920**	**2743**	**2480**
Female	579	539	469
Male	2341	2204	2011
Graduate/Professional	**575**	**568**	**497**
Female	132	125	104
Male	443	443	393

Illustration 6. Undergraduate Student Diversity by Gender

2016 Undergraduate Gender	2015 Undergraduate Gender	2014 Undergraduate Gender
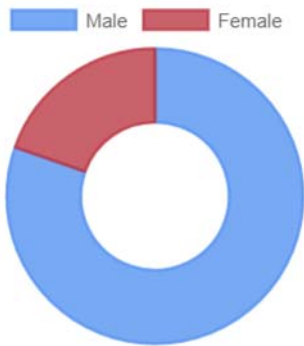
Male ☐ Female ☐

Illustration 7. Graduate/Professional Student Diversity by Gender

2016 Graduate Gender	2015 Graduate Gender	2014 Graduate Gender
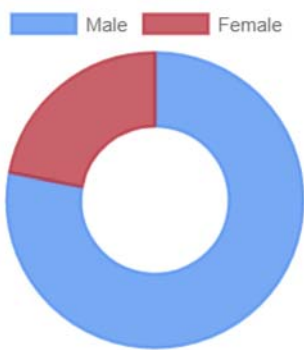
Male ☐ Female ☐

Student Diversity by Race/Ethnicity

Table 8. Student Enrollment by Race/Ethnicity.

	Fall 2016 (preliminary)	Fall 2015 (official)	Fall 2014 (official)
Undergraduate	**2920**	**2743**	**2480**
American Indian/Alaska Native	9	8	8
Asian	126	117	104
Black or African	228	225	179
Hispanic or Latino	145	142	127
Native Hawaiian or Other Pacific Islander	2	1	1
Nonresident Alien	148	111	78
Two or More Races	105	114	108
Unknown Race/Ethnicity	32	31	23
White	2125	1994	1852
Graduate/Professional	**575**	**568**	**497**
American Indian/Alaska Native	0	0	0
Asian	18	18	15
Black or African	20	21	13
Hispanic or Latino	15	12	11
Native Hawaiian or Other Pacific Islander	2	2	1
Nonresident Alien	330	321	267
Two or More Races	10	6	7
Unknown Race/Ethnicity	3	2	3
White	177	186	180

Illustration 8. Undergraduate Student Diversity by Race/Ethnicity
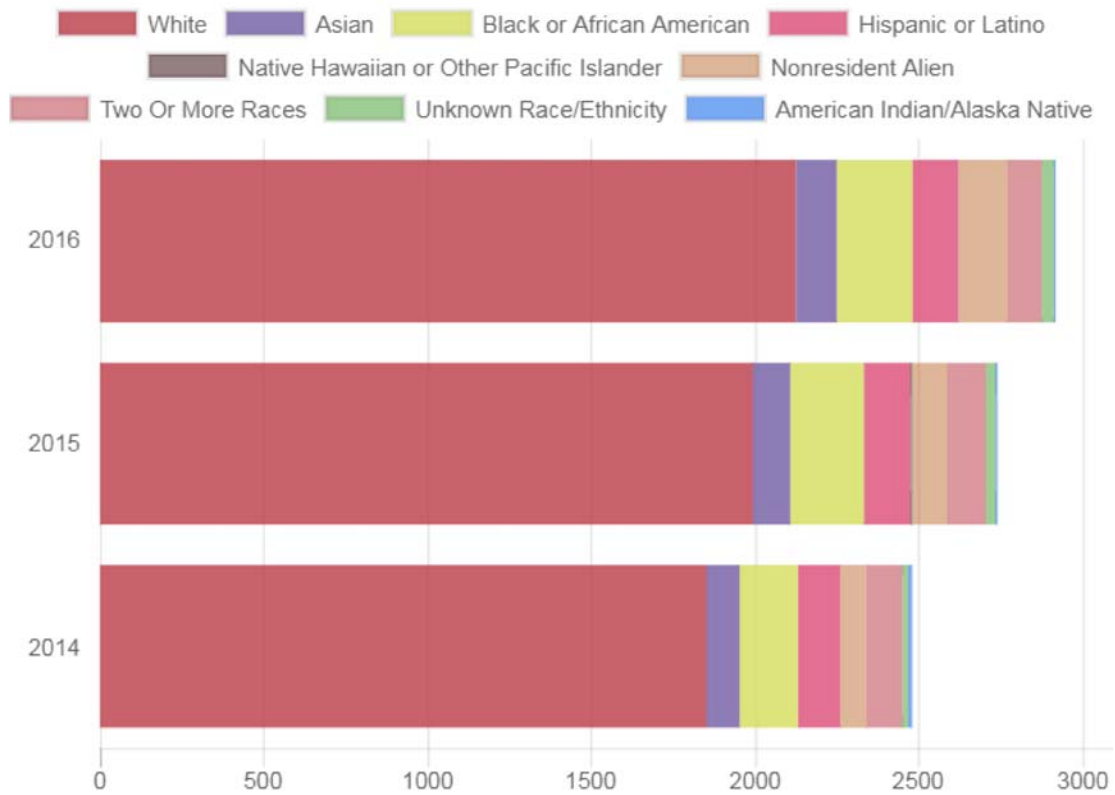
Illustration 9. Graduate/Professional Student Diversity by Race/Ethnicity
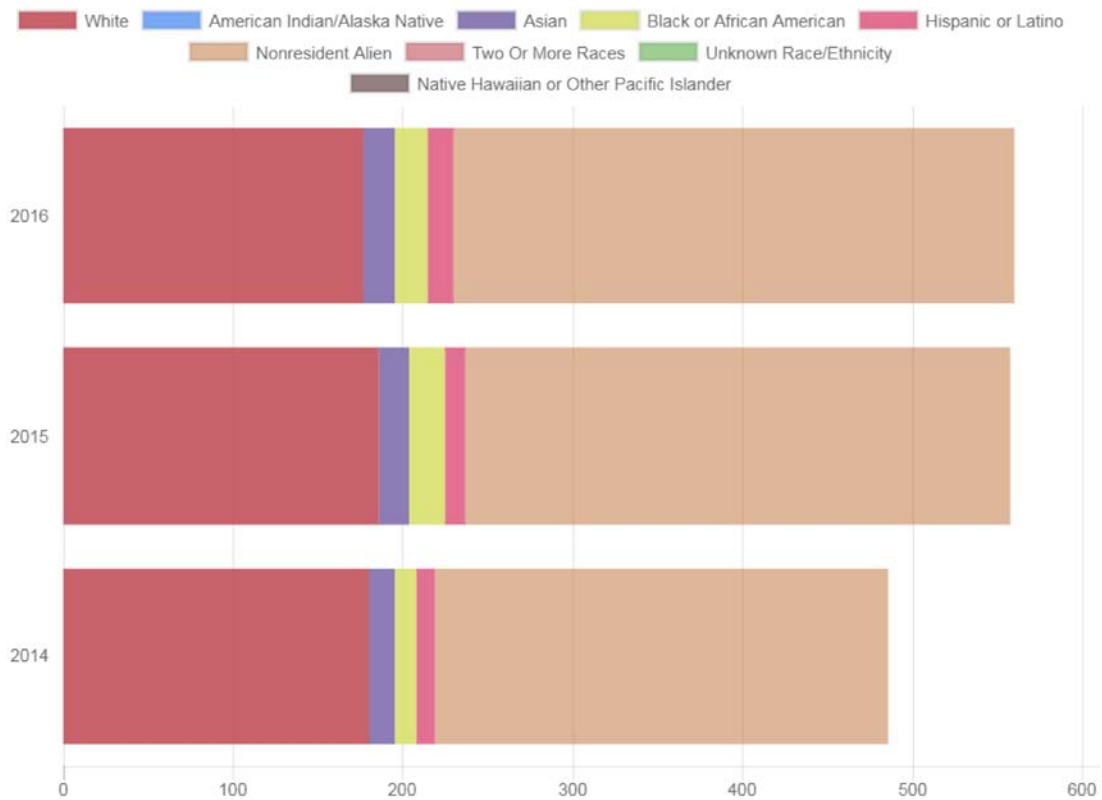
Undergraduate Retention
Table 9. Undergraduate Retention Rates for First-time Full-time Student Cohorts

	First Year	Second Year
Fall 2015 Cohort	87.8%	N/A
Fall 2014 Cohort	85.8%	78.7%
Fall 2013 Cohort	88.4%	80%
Fall 2012 Cohort	86.7%	78%

Illustration 10. Undergraduate Retention, First- and Second Year
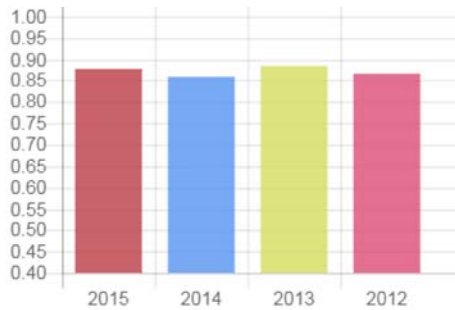
First Year   Second Year
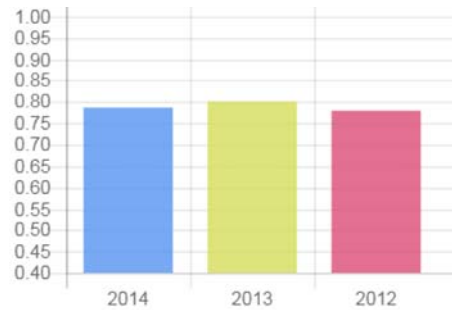
Student Completions

Graduation Rate - Undergraduate

Table 10. Undergraduate Graduation Rates for First-time Full-time Student Cohorts at 4-, 5-, and 6 Years.

	4-Year	5-Year	6-Year
Fall 2010 Cohort	36.2%	61.9%	65.2%
Fall 2009 Cohort	40.7%	62.4%	68.7%
Fall 2008 Cohort	38.6%	63.7%	67.7%

Degrees Awarded by Level

Table 11. Degrees Awarded by Level.

	AY2015-2016	AY2014-2015	AY2013-2014
Bachelors	410	395	295
Masters	79	69	75
Doctoral	46	56	66
Medical	0	0	0
Law	0	0	0
Pharmacy Doctorate	0	0	0
Graduate Certificate	0	1	0

Illustration 11. Degrees Awarded by Level
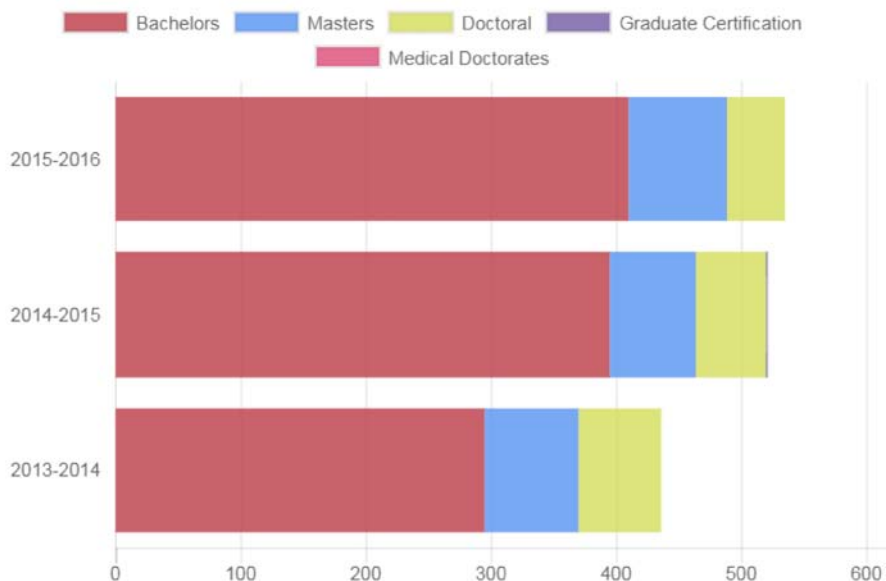
Alumni Engagement & Fundraising

Alumni
Substantial activities, engagements, and initiatives with alumni during AY2016-2017, focusing on relationships and activities with alumni.

The largest and most significant collective activity of which the College of Engineering and Computing engages is the Homecoming celebration, which on November 5, 2016, attracted 135 alumni as well as their families and guests. This event was a casual pre-game barbeque which recognized two alumni awards, Bill Fox '78 as Distinguished Alumnus and Jeremy Greenberger '14 as Outstanding Young Alumnus.

Other events of note:

o July grassroots luncheon in Aiken for eight alumni who work at the Savannah River site

o Early August saw lunch gathering in Kingsport, TN with CEC Development and seven alumni who work at Eastman Chemical

o In late August six CEC alumni gathered with CEC Development as a team to participate in the Charlotte Golf Outing

o Thus far, CEC Development has met and individually visited with 65 alumni this year

o Alumni giving has resulted in $1.8 million in funds from 360+ alumni donors.

Development, Fundraising and Gifts
Substantial development initiatives and outcomes during AY2016-2017, including Fundraising and Gifts.

o The most significant single gift has come from alumnus Bert Storey '51, whose $1.1 million contribution as part of the M. Bert Storey Engineering and Innovation Center has been dedicated to the CEC

o George Thomas '57 has made a $100,000 annuity gift to the Engineering/Computing & Law Program

o The children of Robert P. Williams have set up a $50,000 tribute endowment for undergraduate civil engineering students

o Savannah River National Labs is establishing twenty $4,000 senior capstone design scholarships from an $80,000 gift

o Billy Dickson '61 has made a gift of $200,000 to establish an endowment for graduate students in chemical engineering

o Dr. John Caughman '84 has established a tribute gift of $25,000 for his parents, George '51 and Anne Caughman for undergraduate chemical engineering

o In October of 2016, CEC sent out an Annual Giving Fall Appeal mailer, followed by an email blast, and call to donor prospects - 240 gifts have been made - The Spring 2017 appeal is scheduled for April

o To date, 470 gifts have been made to the CEC for a total of $3,118,821.60

Supplemental Info - Alumni Engagement & Fundraising

Any additional information on Alumni Engagement and Fundraising appears as Appendix 6. (bottom)

Community Engagement

Description

Community engagement and community based research, scholarship, outreach, service or volunteerism conducted during AY2016-2017, including activities at the local, state, regional national and international levels.

Outreach activities that are offered by CEC and are described above include:

o Project Lead the Way

o Enhanced Learning Experiences

o Middle School Day

o Summer Camps for K-12 Students

o Visits to K-12 Classrooms, Career Fairs, FIRST Robotics Competitions

o College "Daily Tours" and "Big Fridays"

o E-Week Open House

Community Perceptions
How unit assesses community perceptions of engagement, as well as impact of community engagement on students, faculty, community and the institution.

The Engineering and Computing Open House is a great community event that draws close to 1,000 visitors to the campus on a Saturday in February.

Incentivizing Faculty Engagement
Policies and practices for incentivizing and recognizing community engagement in teaching and learning, research, and creative activity.

There are many different ways that the faculty of CEC can engage with the community. As such we do not have a uniform policy to address all possible means of interaction and engagement. For engagements that are substantial and impactful, we will count it as a substantial element fo the service that each faculty members needs to do. For more significant levels of engagement, we can consider other incentives. We will address on a case by case basis.

Supplemental Info - Community Engagement

Any additional information on Community Engagement appears as Appendix 7. (bottom)

Collaborations

Internal Collaborations

o Student Success Center

o University Advising Center

o South Carolina Honors College

o Arts and Sciences (chemistry, physics, math, biology, environmental, statistics)

o College of Education

o College of Social Works

o School of Medicine (biomedical mainly)

o School of Business

o College of Public Health

o College of Nursing (forthcoming: joint hire with IIT)

o School of Law (forthcoming: Rule of Law, cybersecurity/autonomous transportation)

o Ocean Leadership Meeting - CEC and A&S

o Energy Frontier Research Center - CEC (BESMANN) AND A&S (ZUR LOYE)

o ARPA-E MicroAlgae proposal - CEC, A&S, PH

External Collaborations

o NNMI Rapid Institute on Process Intensification - led by AICHE from DOE for $140M with multiple universities and industrial partners from across the country

o NNMI ARM in Robotics - led by Carnegie Mellon University with multiple universities and industrial partners from across the country

o NASA Advance Composites Consortium - McNair Center joined the consortium and is expected to receive $2.8M in research funding.

o Boeing/USC Collaboration - Boeing and USC are working on several projects that total $2.5M in research funding with an additional $2M expected to come in the next year

o Georgia Tech

o Harvard

o McGill

o Virginia

o Delaware

o Universite Catholique de Louvain, Belgium

o Mississippi

o Instituto Superior Technico, Lisbon, Portugal

o Hydraulic Research Institute, Cairo, Egypt

o Irrigation Research Institute, Pakistan

o Caledonian College of Engineering, Sultanate of Oman

o Pacific Northwest National Lab

o NIST

o Sandia

o Oak Ridge

o Savannah River

o Army

o Army Research Lab

o IBM

o Michelin

o Siemens

o Fokker

o Siemens

o Governors School for Science and Math

o R2i2 Richland 2 Schools

o Greenville Technical College

o Midlands Technical College

o Orangeburg-Calhoun Technical College

o Piedmont Technical College

o Trident Technical College

o York Technical College

o Charleston Southern University

o Elon University

o Presbyterian College

Other Collaborations
Our most significant academic collaborations and multidisciplinary efforts that are not otherwise accounted for as Internal or External Collaborations.
CEC also works very closely with the Office of Economic Engagement.

Supplemental Info - Collaborations
Any additional information about Collaborations appears as Appendix 8. (bottom)

Campus Climate and Inclusion

Campus Climate & Inclusion
Activities unit conducted within AY2016-2017 that were designed to improve campus climate and inclusion.

1. Assess College of Engineering and Computing (CEC) diversity of faculty and students by:

a. Collecting and analyzing CEC data

b. Comparing data to national and peer institutes' statistics

c. Discussing diversity concerns with faculty, staff, and students

d. Generating report on current statistics and future outlook

2. Engage underrepresent and minority student chapters to

e. Discuss resources for scholarship, and development workshops

f. Promote undergraduate research experiments, such as SCAMP and Magellan

g. Elicit needs and initiatives to form strategic diversity plan

3. Provide travel support for student participation in national and regional conferences and workshops, such as Society of Hispanic Professional Engineers (SHPE), National Society of Black Engineers (NSBE), Black Women in Computing (BWiC)

4. Work with CEC faculty search committees to

a. Develop diversity-friendly search ads

b. Organize Equal Employment Opportunity (EEO) training

c. Identify and share resources and tools with search committees to evaluate hidden bias

d. Develop Diversity handout for potential candidates

5. Organize workshops and promote university-level resources addressing diversity issues, such as career for women in engineering and computing and workshops of the Center for Teaching Excellence

6. Participate in university-level diversity activities and promote resources for CEC students, staff, and faculty

7. Promote and participate in national diversity activities such as Graduate Education for Minorities (GEM) and National Center for Faculty Development and Diversity (NCFDD)

8. Supply data and provide support for university-wide and regional activities, such as applications for funding and donations and letters of commitment

9. Organize and support K-12 summer activities, such as Partners for Minorities and Engineering & Computer Science (PMECS), Adventures for Women in Engineering and Computing, initiate plans for sustainable K-12 recruitment to increase diversity

10. Form diversity alliances with other universities and organizations, such as HBCUs in SC, and soliciting

input from CEC and department-level Industrial Advisory Board members

11. Develop future plan and budget to support CEC diversity initiatives, such as

a. Form a diversity advisory board

b. Increase recruitment and retention of underrepresented and underserved minority and female students and faculty

c. Design diversity grant challenge program and elicit alumni support

d. Initiate brown-bag lunch discussions

e. Organize skill building program for underrepresented and underserved minority and female students and faculty for responding to discrimination and bias

Supplemental Info - Campus Climate & Inclusion
Any additional information about Campus Climate and Inclusion appears as Appendix 9. (bottom)

Concluding Remarks

Quantitative Outcomes

Explanation of any surprises with regard to data provided in the quantitative outcomes throughout this report.

No surprises, just some observations.

Diversity remains low; the new associate dean has been in place for less than 1 year. We will assess the progress soon.

The retention and graduation rates are low. Investments in student success and advising are being made this year. The results will be assessed as we go forward. Furthermore, the placement for students seems to be hovering in the low-80%'s (another source). A new Director of Career Services in CEC has been tasked with increasing this number towards 100% by contacting students every semester the student is in CEC.

Cool Stuff

Describe innovations, happy accidents, good news, etc. that occurred within your unit not noted elsewhere in your reporting.

Appendix 1. Academic Programs

Appendix 2. Academic Initiatives

Appendix 3. Research & Scholarly Activity

Office of Research
Information Technology & Data
Management

College Engineering & Computing

**Fiscal Year 2016
and prior**

UNIVERSITY OF
SOUTH CAROLINA

Faculty Information

RESEARCH AND SCHOLARLY ACTIVITY

The following refers to Appendix 1, 2 & 3 , which provides detailed information from the Office of the Vice President for Research, department of Information Technology and Data Management, including:

1) The total number and amount of externally sponsored research proposal submissions by funding source for the appropriate Fiscal Year.

2) Summary of externally sponsored research awards by funding source for the appropriate Fiscal Year. Total extramural funding processed through Sponsored Awards Management (SAM) in the Fiscal Year, and federal extramural funding processed through SAM in the Fiscal Year. (Available at: http://sam.research.sc.edu/awards.html) Amount of sponsored research funding per faculty member in FY YYYY (by rank, type of funding; e.g., federal, state, etc., and by department, if applicable).

3) Number of patents, disclosures, and licensing agreements for three most recent Fiscal Years.

Identified areas of challenge and opportunities with faculty research and scholarly activity, referencing Academic Analytics data (through 2015) and the report provided by the Office of Research's Information Technology and Data Management, including specific plans to meet these challenges or take advantage of the opportunities.

Summary of Extramural Proposal Submissions by Source

Appendix 1

PI Home Department	Amount First Year	Commercial	Federal	Other	Private, Non-Profit	State
Chemical Engineering	12,527,563	10	51	1	3	1
Civil & Environmental Engineering	6,606,037	1	21	4	5	5
Computer Science & Engineering	3,534,379	1	22			2
Electrical Engineering	5,007,045	3	38			
Engineering & Computing, College of	96,883	6	1		1	
Mechanical Engineering	29,936,944	14	67	1	2	
Total Count	**260**	**35**	**200**	**6**	**11**	**8**
Total Amount First Year	**57,708,851**	**2,296,200**	**53,833,144**	**222,451**	**467,642**	**889,414**

PI Home Department	Total Dept Funding	PI Name	Primary Job/Rank	Tenure Status	Total Funding	Commercial	Federal	Other	Private, Non-Profit	State
Chemical Engineering		Heyden, Andreas	ASSOC. PROFESSOR	TENURED	1,122,000		1,122,000			
Chemical Engineering		Jabbarzadeh, Ehsan	ASST PROFESSOR	TENURE-TRACK	411,350		411,350			
Chemical Engineering		Lauterbach, Jochen	PROFESSOR	TENURED	25,000		25,000			
Chemical Engineering		Monnier, John	PROFESSOR	TENURED	358,000	208,000	150,000			
Chemical Engineering		Moss, Melissa	ASSOC. PROFESSOR	TENURED	39,141		39,141			
Chemical Engineering		Padak, Bihter	ASST PROFESSOR	TENURE-TRACK	310,000		240,000		70,000	
Chemical Engineering		Popov, Branko	PROFESSOR	TENURED	100,000		100,000			
Chemical Engineering		Regalbuto, John	PROFESSOR	TENURED	480,000	-20,000	500,000			
Chemical Engineering		Ritter, James	PROFESSOR	TENURED	275,000	100,001	149,999	25,000		
Chemical Engineering		Shimpalee, Sirivatch	RESEARCH PROFESSOR		120,005		120,005			
Chemical Engineering		Uline, Mark	ASST PROFESSOR	TENURE-TRACK	73,250		73,250			
Chemical Engineering		Weidner, John	PROFESSOR	TENURED	98,420	98,420				
Chemical Engineering		Williams, Christopher	PROFESSOR	TENURED	398,172	50,000	348,172			
Chemical Engineering		Yu, Miao	ASST PROFESSOR	TENURE-TRACK	883,863		883,863			
Chemical Engineering		Zhou, Xiao-Dong	ASSOC. PROFESSOR	TENURED	300,000	100,000	200,000			
Total Chemical	**4,994,201**									
Civil & Environmental Engineering		Berge, Nicole	ASSOC. PROFESSOR	TENURED	407,319		407,319			
Civil & Environmental Engineering		Caicedo, Juan	PROFESSOR	TENURED	46,000		46,000			
Civil & Environmental Engineering		Chaudhry, M.	PROFESSOR	TENURED	110,254					110,254
Civil & Environmental Engineering		Flora, Joseph	ASSOC. PROFESSOR	TENURED	106,347		106,347			
Civil & Environmental Engineering		Huynh, Nathan	ASSOC. PROFESSOR	TENURED	180,686		180,686			
Civil & Environmental Engineering		Matta, Fabio	ASSOC. PROFESSOR	TENURED	407,524		407,524			
Civil & Environmental Engineering		SAMADI, SEYEDEHZAHRA			9,997					9,997
Civil & Environmental Engineering		Sasanakul, Inthuorn	ASST PROFESSOR	TENURE-TRACK	44,663	3,000				41,663
Civil & Environmental Engineering		Viparelli, Enrica	ASST PROFESSOR	TENURE-TRACK	49,924		49,924			
Civil & Environmental Engineering		Ziehl, Paul	PROFESSOR	TENURED	292,424		247,500		44,924	
Total Civil & Env.	**1,655,138**									
Computer Science & Engineering		Bakos, Jason	ASSOC. PROFESSOR	TENURED	77,000	61,000	16,000			
Computer Science & Engineering		Beer, Jenay	ASST PROFESSOR	TENURE-TRACK	77,354		77,354			
Computer Science & Engineering		Hu, Jianjun	ASSOC. PROFESSOR	TENURED	50,025					50,025
Computer Science & Engineering		O'Kane, Jason	ASSOC. PROFESSOR	TENURED	225,000		225,000			
Computer Science & Engineering		Rekleitis, Ioannis	ASST PROFESSOR	TENURE-TRACK	57,024	57,024				
Computer Science & Engineering		Terejanu, Gabriel	ASST PROFESSOR	TENURE-TRACK	594,252		594,252			
Computer Science & Engineering		Tong, Yan	ASST PROFESSOR	TENURE-TRACK	43,488		43,488			
Computer Science & Engineering		Valafar, Homayoun	PROFESSOR	TENURED	299,828		299,828			
Computer Science & Engineering		Xu, Wenyuan	ASSOC. PROFESSOR	TENURED	400,000		400,000			
Total Computer Science	**1,823,971**									
Electrical Engineering		Ali, Mohammod	PROFESSOR	TENURED	143,555		143,555			
Electrical Engineering		BAE, Seongtae	ASST PROFESSOR	TENURE-TRACK	100,000		100,000			
Electrical Engineering		Benigni, Andrea	ASST PROFESSOR	TENURE-TRACK	9,811	9,811				
Electrical Engineering		Dougal, Roger	PROFESSOR	TENURED	1,096,494	12,919	1,083,575			
Electrical Engineering		Ginn, Herbert	ASSOC. PROFESSOR	TENURED	18,683	18,683				
Electrical Engineering		Matolak, David	PROFESSOR	TENURED	145,835		145,835			
Electrical Engineering		Santi, Enrico	ASSOC. PROFESSOR	TENURED	43,587	43,587				
Electrical Engineering		Wang, Guoan	ASST PROFESSOR	TENURE-TRACK	64,627		64,627			
Electrical Engineering		Wang, Xiaofeng	ASST PROFESSOR	TENURE-TRACK	203,347		203,347			
Electrical Engineering		Zhang, Bin	ASST PROFESSOR	TENURE-TRACK	68,750		68,750			
Total Electrical	**1,894,689**									
Engineering & Computing, College of		Rhodes, Burton	PROJECT MANAGER		3,363	3,363				

Total Dean's Office	***3,363***								
Mechanical Engineering	Banerjee, Sourav	ASST PROFESSOR	TENURE-TRACK	805,782		805,782			
Mechanical Engineering	Bayoumi, Abdel	PROFESSOR	TENURED	109,529	109,529				
Mechanical Engineering	Besmann, Theodore	PROFESSOR	TENURED	190,625		190,625			
Mechanical Engineering	Cacuci, Dan	PROFESSOR	TENURED	328,745		328,745			
Mechanical Engineering	Chen, Fanglin	PROFESSOR	TENURED	35,000		35,000			
Mechanical Engineering	Farouk, Tanvir	ASST PROFESSOR	TENURE-TRACK	155,453		155,453			
Mechanical Engineering	Giurgiutiu, Victor	PROFESSOR	TENURED	637,962	250,000	387,962			
Mechanical Engineering	Gurdal, Zafer	PROFESSOR	TENURED	356,711	356,711				
Mechanical Engineering	Harik, Ramy	ASST PROFESSOR	TENURE-TRACK	30,000	30,000				
Mechanical Engineering	Huang, Kevin	PROFESSOR	TENURED	360,491	60,000	300,491			
Mechanical Engineering	Huang, Xinyu	ASSOC. PROFESSOR	TENURE-TRACK	200,173		200,173			
Mechanical Engineering	Kaoumi, Djamel	ASST PROFESSOR	TENURE-TRACK	519,559		519,559			
Mechanical Engineering	Khan, Jamil	PROFESSOR	TENURED	335,000		335,000			
Mechanical Engineering	Kidane, Addis	ASST PROFESSOR	TENURE-TRACK	170,551		170,551			
Mechanical Engineering	Knight, Travis	PROFESSOR		773,552		748,552	25,000		
Mechanical Engineering	Li, Chen	ASSOC. PROFESSOR	TENURED	925,041		835,041			90,000
Mechanical Engineering	Reifsnider, Kenneth	EMERITUS	TENURED	53,432		53,748			-316
Mechanical Engineering	Reynolds, Anthony	PROFESSOR	TENURED	263,921	70,000	193,921			
Mechanical Engineering	Scopatz, Anthony	ASST PROFESSOR	TENURE-TRACK	194,000		194,000			
Mechanical Engineering	Shazly, Tarek	ASST PROFESSOR	TENURE-TRACK	73,250		73,250			
Mechanical Engineering	Sutton, Michael	PROFESSOR	TENURED	30,749	30,749	30,749			
Mechanical Engineering	Tarbutton, Joshua	ASST PROFESSOR	TENURE-TRACK	30,000		30,000			
Mechanical Engineering	van Tooren, Michael	PROFESSOR	TENURED	262,500	262,500				
Mechanical Engineering	Yu, Lingyu	ASST PROFESSOR	TENURE-TRACK	889,223		889,223			
Total Mechanical	***7,731,249***								
Total Engineering				***18,102,611***	***1,915,297***	***15,720,767***	***25,000***	***139,924***	***301,623***

Patents, Disclosures, and Licensing Agreements
Fiscal Year 2014, 2015 and 2016
Appendix 3

FY2014 – FY2016 – COLLEGE OF ENGINEERING				
	Invention Disclosures	Provisional Patent Applications	Non-Provisional Patent Applications	Issued Patents
TOTALS:	85	72	42	51

Note: Nationalized-PCTs, divisionals, and continuations are not included in these numbers.

FY2016 - COLLEGE OF ENGINEERING & COMPUTING

	Invention Disclosures	Provisional Patent Applications	Non-Provisional Patent Applications	Issued Patents
TOTALS:	**33**	**22**	**15**	**19**

Department Breakdown

Aerospace Engineering	0	0	0	0
Biomedical Engineering	2	0	0	0
Chemical Engineering	6	4	5	6
Civil & Environmental	4	0	1	0
Computer Science & Engineering	1	0	0	0
Electrical Engineering	5	3	7	3
Integrated Information Technology	0	0	0	0
Mechanical Engineering	15	15	2	10
Nuclear Engineering	0	0	0	0

Note: Nationalized-PCTs, divisionals, and continuations are not included in these numbers.
Source: Office of Economic Engagement

FY2015 – COLLEGE OF ENGINEERING				
	Invention Disclosures	Provisional Patent Applications	Non-Provisional Patent Applications	Issued Patents
TOTALS:	20	19	14	19

Note: Nationalized-PCTs, divisionals, and continuations are not included in these numbers.
Source: Office of Economic Engagement

| FY2014 – COLLEGE OF ENGINEERING				
	Invention Disclosures	Provisional Patent Applications	Non-Provisional Patent Applications	Issued Patents
TOTALS:	32	31	13	13

Note: Nationalized-PCTs, divisionals, and continuations are not included in these numbers.
Source: Office of Economic Engagement

Appendix 4. Faculty Information

Appendix 5. Academic Analytics Report

Appendix 6. Alumni Engagement & Fundraising

Appendix 7. Community Engagement

Appendix 8. Collaborations

Appendix 9. Campus Climate & Inclusion