

College of Engineering & Computing
Blueprint for Academic Excellence

March 2014

Vision Statement

The College of Engineering & Computing will be, and recognized as being, pre-eminent in its teaching, research, and service to the State of South Carolina and the south east, and a leader in the nation.

Mission Statement

The mission of the College of Engineering and Computing is to attract the best undergraduate and graduate students, and by attracting the best faculty will provide the State of South Carolina and the nation with an effective resource for industry, government and academia in economic and workforce development. This will be achieved by strong research in all engineering disciplines thus maintaining the attractiveness and viability of our degree programs (undergraduate and graduate), furthering the capability of both supporting State and national industry and providing the means to attract industry (manufacturing and knowledge generation) to South Carolina.

Section I. Executive Summary

The College of Engineering and Computing has made steps in all the key performance parameters listed in the Provost's Guidelines for the 2015 Blueprint for Academic Excellence; Teaching Excellence, Research/Scholarship Reputation and Productivity, Service to State/Community/Profession and University, and Sustainability of our mission fiscally and through effective actions.

The first three parameters are, of course, included in all assessments of faculty performance and especially at promotion and review time. However, steps have been taken to enhance and encourage faculty to higher achievement levels:

Teaching Excellence: It is gratifying to see the importance given by faculty in promotion reviews to teaching excellence, but the College is now able to give greater prominence to teaching quality through the award of six Faculty Teaching Fellows to faculty nominated by their respective departments for their dedication to teaching quality and excellence – this has been made available through income from the AT&T BellSouth Teaching Chair. Fellows are appointed for a three year period, renewable for one further period of three year and a salary supplement is awarded.

Research/Scholarship Reputation and Productivity: A greater prominence is being given to collaborative projects that has led to a bigger number of large collaborative proposals that also include other colleges and other universities. Wherever possible, CEC faculty are being encouraged to assume leadership positions in such proposals. As to *reputation*, the College is pursuing the creation of a number of national and state-oriented workshops/conferences that will highlight our strengths in certain areas, e.g. Aerospace, Materials, Energy, and cyber security.

Service to State/Community/Profession and University: The College and its faculty are increasingly being asked to collaborate with the Office of Economic Engagement and several economic development agencies in the state in attracting industry to the area. The College hosted its first Open Day which was meant to raise the profile of the College within the state to both industry and commerce, and the legislature. The College has hosted dedicated events for both the Speaker of the SC House, and to Secretary Hitt from the Office of Commerce. The McNAIR

center is organizing and arranging the next SC Aerospace Event as a 1-2 day exhibition and conference instead of the previous evening dinner.

Sustainability of the Mission: Throughout the past year the College has worked extensively with the university and its officers to create and improve the processes for fiscal responsibility. In doing so, many undocumented issues came to light which were both positive and negative. We are confident that the college is better set to move forward fiscally than it was previously and can do so with confidence. In addition, the College is creating new revenue generation programs.

Section II. Academic Dashboard Measures

1. Total Undergraduate Enrollment

Our undergraduate enrollments increased by 50% from Fall 2008 to Fall 2013 – Freshmen enrollments increased by 30% in F2013 compared to F2012. We aggressively recruit undergraduate students. Three full-time staff are dedicated to outreach and recruitment, and administrators and faculty are also engaged. Outreach programs include Project Lead The Way, computer science and engineering summer camps, field study opportunities in College, and partnerships with other organizations. We participate in recruitment events at USC and in the primary regions served. We provide daily tours of the College and frequent “Big Fridays.” Accepted students receive a letter from the Dean, email from an Associate Dean, and a phone call from a CEC student. We will continue the outreach and recruitment efforts described above. We are actively looking at making our degree programs more attractive through better marketing and by making more tracks and concentrations available. Note also the creation of the Applied Computing minor.

Total UG Enrollment	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Number of Undergrads	1,454	1,584	1,698	1,849	1,971	2,188
Number of UG applicants		1,935	2,111	2,525	2,940	3,191

2. Average SAT Score

Our freshmen average SAT score is the highest it has been for at least the past 5 years, and remains the highest on campus. This past academic year has seen the CEC have the largest number of freshmen in the Honors College. Each year, hundreds of CEC students receive college scholarships...we have changed scholarship processes to ensure that all available funds are awarded. Increasing the number and amount of scholarship funds is a priority for our development office, which currently includes three full-time staff. We plan to improve our partnerships with the South Carolina Honors College and the Capstone Scholars Program to bring in more top-quality students. The average ACT score has been 27 or 28 since 2009. Improving SAT scores is also enabled by attracting a bigger pool of applicants.

Freshman Profile	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013	Fall 2014
Number admitted	1,327	1,493	1,687	1,958	2,275	
Freshmen Class Size	392	431	485	494	618	--
Average SAT	1237	1217	1226	1226	1254	--

3. Freshman-Sophomore Retention Rate

Our retention rates have been relatively flat, and remain the lowest on campus. Ongoing retention activities include a CEC living/learning community and a strong faculty advising system. The position of Associate Dean for Student Affairs was created in 2013 to better serve the academic needs of our students. An academic program manager position, whose responsibilities include retention, was hired in 2013. We have created space for the Student Success Center to add a satellite tutoring center in Swearingen. We will continue to improve these programs. We will also explore common advising of all freshmen. We are investigating differential (higher) admission standards for CEC undergraduate programs – this may mean creating pre-engineering & computing programs particularly for underprivileged students who nonetheless show academic potential.

See over...

Fresh-Soph Retention Rates	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
in the College	71.1%	69.2%	69.4%	65.6%	72.1%	--
at USC	82.3%	86.3%	84.0%	79.9%	84.8%	--

4. Six-year Graduation Rate

Our graduation rates have increased slightly, but generally remain the lowest on campus. Our faculty advising system has been our strongest tool to promoting timely graduation. Our Student Services Office also conducts degree audits for students at the ends of their sophomore and junior years (lower division and senior checks). Data indicates that poor performance in a student's first math class correlates with student attrition. This negatively affects overall GPA, and creates course sequencing problems. We will analyze student records to forecast course needs, and increase flexibility in course offerings when resources permit. Improved freshmen retention should also improve graduation rates.

Six-Year Graduation Rate	Fall 2004	Fall 2005	Fall 2006	Fall 2007
from the College	35.6%	41.1%	45.3%	49.5%
from USC	58.6%	61.5%	64.2%	66.2%

5. Student to faculty ratio

Student and faculty data for the previous five years are shown in the table below (Fall semester data). The UG student count excludes part-time students (typically less than 10% of the total), while the graduate student count shows both full-time and part-time students (Masters and PhD). The student-to-faculty ratios (a headcount ratio), however, include only full-time graduate students, not part-time. Note that student enrollments do not include the rather large service load of CSCE courses taught to non-majors.

Year	2009	2010	2011	2012	2013
TT Fac Count	94	102	106	114	112
UG enrollment, FT	1584	1698	1849	1971	2188
FT Grad enroll	283	325	327	322	350
PT Grad Enroll	90	103	122	125	166
UG Stu/TT Fac	16.9	16.6	17.4	17.3	18.3
Total FT stu/TT Fac	19.9	19.8	20.5	20.1	21.4

By comparison, for UT-Austin, student/faculty ratios were obtained from two sources: the ASEE on-line college profiles, and the UT-Austin statistical summary. For the former, we counted full-time students (BS, MS and PhD) divided by the reported number of faculty. For the latter, UT-Austin computes FTE students/FTE Faculty equivalents. The calculation based on FTEs is a more nuanced measure of how many student credit hours are being generated in the given program. For 2013, the ASEE/headcount calculation is 23.6 (considering only Biomedical, Chemical, Civil, Electrical, and Mechanical Engineering), while the FTE calculation is 16.49.

Thus, comparing USC-Columbia to a top 10 (or top 5) public university shows that our headcount ratio is a little less than UT-Austin. CEC could indeed teach more undergraduate students if we had access to larger classrooms. Increasing the graduate student enrollment depends on availability of laboratories for research, and funds to support graduate students.

However, CEC has a graduate student 'mix' that is heavily weighted towards Ph.D. students – the College is looking to greatly increase MS graduate students through the creation of new programs aimed at industry, primarily within the state, and which will also be available through distance learning. The College is also marketing the availability of the *Accelerated Masters* degree more aggressively to its own students.

6. Research expenditures

Data for FY 2013, provided by the University, are given in Appendix E. Appendix E shows only award data, not research expenditures. CEC performed its own analysis of research expenditures, presented here. Data compiled for the annual ASEE survey are shown below, for the past five years. These expenditures do not reflect SmartState activity, for the most part. ASEE data most closely represent the real operation of the college. The last column shows the approximate percentage of TT faculty in the college with funding. This column is not exact, because some research faculty have grants, but are not counted in the denominator (total number of TT faculty). The last column shows the percentage of CEC TT faculty who have active grants, and is based on data provided by the VPR.

Dept Research Expenditures, per ASEE Reports compiled and submitted by CEC								
<u>FY</u>	<u>ECHE</u>	<u>ECIV</u>	<u>CSCE</u>	<u>ELCT</u>	<u>EMCH</u>	<u>Total</u>	<u>\$/TT Fac</u>	<u>% TT Pls</u>
2009	\$6,145,949	\$1,842,248	\$1,336,086	\$5,116,797	\$4,224,200	\$18,665,280	\$198,564	59
2010	\$5,867,173	\$2,220,853	\$1,586,337	\$5,585,041	\$6,922,575	\$22,181,979	\$217,461	61
2011	\$6,971,268	\$2,001,181	\$1,948,763	\$5,932,043	\$11,266,895	\$28,120,150	\$265,283	75
2012	\$6,085,328	\$2,354,816	\$2,023,981	\$5,271,143	\$9,320,792	\$25,056,060	\$223,412	72
2013	\$5,057,885	\$2,520,411	\$2,097,241	\$4,727,947	\$7,081,486	\$21,484,970	\$194,764	77

Data from the annual NSF report on federal research expenditures are shown at right. Along with the expenditure data, we show how CEC total expenditures rank nationally against other colleges in the survey. These expenditures and rankings do not include expenditures in Computer Science. NSF expenditure data do not match ASEE data, because the categories of spending in the surveys are different. Nevertheless, the overall national ranking of the college should be relatively accurate.

NSF Reported Expenditures, CEC		
<u>Year</u>	<u>\$ k</u>	<u>Nat'l Rank</u>
2006	16,498	70
2007	16,453	71
2008	18,470	67
2009	20,501	65
2010	28,391	59
2011	23,448	76

7. Faculty productivity

Data are reported for calendar year 2013. Conferences, presentations, and proceedings are not reported for units where such activities are not traditionally viewed as high impact.

CEC Faculty Productivity					
Department	TT Faculty Count, F 2013	Refereed Articles	Articles per TT Faculty	Conferences, Presentations, Proceedings	Other
Chemical	23	55	2.4		
Civil & Environmental	18	73	4.1	34	1 book
Computer Science/Eng	22	95	4.3		
Electrical	18	56	3.1	61	
Mechanical	30	116	3.9		

The data recently supplied by Academic Analytics – see Appendix * - for all departments is interesting in being reasonably consistent in showing that the departments (with the exception of Mechanical Engineering) are lacking in *honorific* awards. The College, working with the departments, needs to look into this issue as it directly impacts others perceptions of the departments, College, and University. The AA data shows Electrical Engineering as being particularly below average in conference publications – however this may be due to the sources for data collection, but worthy of further study.

8. Doctoral degrees

Doctoral degrees are shown below; other degrees are shown also. We also report Master's productivity and certificates, in keeping with activities (APOGEE, planned Executive Masters, Cyber Security Certificate) that are specific to our college. Data are reported for the college by academic year.

CEC Degree Productivity				
AY	2009-2010	2010-2011	2011-2012	2012-2013
Baccalaureate	227	292	289	315
Masters	56	88	78	62
Doctorate	33	29	40	49
Certificates	0	1	1	0

Section III. Goals, Progress and Plans Relative to University's Key Performance Parameters

2014-2015 Academic Year Goals

AY Goal 1: Develop Distance Learning Masters Degrees

Performance Parameters: X___teaching X___research/scholarship ___service X___sustainability

1.i *How does the Goal contribute to the Performance Parameters* – These new programs and delivery options will enhance our Masters degree enrollments and increase our interactions with industry and commerce in the state. We anticipate that this will also lead to research opportunities with sponsoring companies. The programs are being 'priced' to provide profitability to support other operations of the college.

1.ii *Describe progress, if the goal continues from previous years* – Engineering Management was initially programmed via Academic Partners – it was not a good fit. We are now marketing internally.

1.iii *Describe plans for the upcoming year* – We will utilize the Low Country Graduate Center in Charleston for the delivery of our programs (initially Engineering Management, then System Design) and collaborate with The Citadel and the College of Charleston by using some of their faculty to present some of our classes. We hope for a cooperative arrangement in Charleston. We would hope to be able to have enrollments in other parts of the state and use DMSB facilities in Greenville and Charlotte.

AY Goal 2: Improve CEC Degree Offerings

Performance Parameters: X___teaching X___research/scholarship ___service X___sustainability

2.i *How does the Goal contribute to the Performance Parameters* – We need to make better and more efficient use of our capabilities. We have a large number of courses available at both undergraduate and graduate level that we can utilize in different ways and create programs that would be attractive to students and industry. We also need to market our strengths in a better way. We are considering undergraduate and graduate degrees in energy, materials, and aerospace. If successful it will attract more students to want to study engineering and computing at 4 year college level and, hopefully convert these applications into more students turning up at USC CEC. We also have opportunity to enhance the BioMedical Engineering undergraduate degree with links to Law, Pharmacy, Nursing, Public Health.

2.ii *Describe progress, if the goal continues from previous years* – We have created the Engineering Management and system Design masters degrees, and are creating new tracks/concentrations in the undergraduate areas whilst considering full undergraduate degrees in Aerospace Engineering and in Energy Systems.

2.iii *Describe plans for the upcoming year* – Marketing of existing programs to Industry, and market surveys for potential new degrees.

AY Goal 3: Continue Marketing of College as a Pre-Eminent Engineering & Computing Resource

Performance Parameters: X___teaching X___research/scholarship X___service X___sustainability

3.i *How does the Goal contribute to the Performance Parameters* – The problem of lack of perceived strength of USC's Engineering & Computing capability continues and needs addressing.

3.ii *Describe progress, if the goal continues from previous years* – The University can certainly help, but much can be done by the College. We are upgrading our brochures and web presence, but higher profile events need developing. The College held its first Open Day during this academic year with the aim of raising awareness with industry and legislators in the state – we intend to improve and continue with this in future years. Plans to hold workshops on both energy and composites this year were put on hold because of sequestration effects – we have received encouragement to hold them in the later half of this year (2014). With McNAIR as organizers there will be an expansion of the annual Aviation SC dinner into a 1-2 event with exhibits and speakers.

3.iii *Describe plans for the upcoming year* – As above.

AY Goal 4: Continue to Press for More Space/New Building

Performance Parameters: X___teaching X___research/scholarship ___service X___sustainability

4.i *How does the Goal contribute to the Performance Parameters* – More space will enable us to accommodate more students both at graduate level and undergraduate. We will be able to accommodate larger equipment becoming more prevalent in much research, and accommodate our larger faculty numbers. Larger classrooms are needed so as to limit the numbers of multiple sections of classes. Applied Computing degree is slated to attract even more students than currently and will need more classroom and lab space. Some CEC space is seriously deficient.

4.ii *Describe progress, if the goal continues from previous years* – Working with university on various options – Horizon II, BioMass Plant. Looking at financial options for totally new building. Have just received a promise of \$1M towards the building.

4.iii *Describe plans for the upcoming year* – As above.

5-Year Academic Year Goals

5Y Goal 1: Student Recruitment and Retention

Performance Parameters: X___teaching ___research/scholarship ___service X___sustainability

1.i *How does the Goal contribute to the Performance Parameters* – The College has the opportunity to grow its student numbers (undergraduate recruitment); in common with many engineering and computing programs we have a relatively low retention rate for admitted students. Recruitment is being addressed through increased and better marketing, PLTW, Edison Lecture Series, better use of existing scholarships, and creation of more 'interesting' programs. We need to be more pre-emptive with spotting 'at-risk' students and supporting them to get back on track; we can analyze freshman applicant

pool and historical data to predict needs in introductory courses – we already know that performance in freshman math classes is an indicator of future performance and dropout...we should consider placing some freshmen in MATH 115 instead of other classes...possible impact on sequencing of other classes. As we start to focus of recruiting from the Pee Dee this will become increasingly important. Need more scholarships.

1.ii *Describe progress, if the goal continues from previous years* – Marketing and outreach appear to have had ‘some’ impact with increasing numbers of applications and enrollments.

1.iii *Describe plans for the upcoming year* – begin data analysis of student performance as a measure of future problems. Look at implications of admitting students with certain backgrounds and possible implications for a ‘starter’ semester or year to bring up to speed. Continue development and marketing of new programs. Search for more scholarships.

5Y Goal 2: Collaboration Across Campus and other Universities/Colleges

Performance Parameters: X___teaching X___research/scholarship ___service X___sustainability

2.i *How does the Goal contribute to the Performance Parameters* – Through better utilization and exploitation of capabilities across campus for both teaching and research e.g. Engineering Management, Human Factors, System Design, Energy Leadership Institute.

2.ii *Describe progress, if the goal continues from previous years* – The creation of the Engineering Management program has been successful in bringing teaching material from across 4 colleges; Energy has 6 colleges and has already led to cross university large research proposals, including working with other universities – our subsequent perceived strength has enabled us to take on the role as PI which may not have been the case otherwise.

2.iii *Describe plans for the upcoming year* – as above.

5Y Goal 3: Increase Faculty Numbers

Performance Parameters: X___teaching X___research/scholarship ___service X___sustainability

3.i *How does the Goal contribute to the Performance Parameters* – This is joint goal with increasing student numbers at undergraduate and graduate levels. This would bring in more tuition and increase, hopefully, research and scholarship. Critical mass for a truly viable program is still an issue, especially with Electrical Engineering department.

3.ii *Describe progress, if the goal continues from previous years* – There has been a modest increase in faculty numbers, and a steadily growing number of students, particularly at undergraduate level. We have a goal to greatly increase graduate students, particularly at masters degree level, through executive and distance learning programs.

3.iii *Describe plans for the upcoming year* – as above.

5Y Goal 4: Greater Emphasis on Distance Learning

Performance Parameters: X____teaching X____research/scholarship X____service X____sustainability

5.i *How does the Goal contribute to the Performance Parameters* – There is a need for courses, and degrees, to be offered via distance learning technologies. The USC component institutions have asked us to provide some classes towards their two year programs (so that students might be better prepared if/when they transfer to USC Columbia campus), for executive masters degrees, but also for outreach programs to the community.

5.ii *Describe progress, if the goal continues from previous years* – APOGEE continues to provide a service, but needs expansion. Limited facilities are hindering the ability to expand, but recent appointment of AT&T BellSouth Teaching Fellows have a specific remit to identify technologies that can usefully be added to more classrooms to make this possible. Approximately \$200K is available in the short term to make this possible.

5.iii *Describe plans for the upcoming year* – as above.

5Y Goal 5: Increase Faculty Awards

Performance Parameters: X____teaching X____research/scholarship X____service ____sustainability

5.i *How does the Goal contribute to the Performance Parameters* – An interesting outcome of the Academic Analytics data for each department is that for each department in the College (with the exception of Mechanical Engineering) honorific awards to faculty are below average for their topic areas. A big part of what we need to do is to raise the perception of what we do at USC CEC is this is one obvious way to improve the situation.

5.ii *Describe progress, if the goal continues from previous years* – We need to for committee(s) to look at what should be done.

5.iii *Describe plans for the upcoming year* – as above.

Appendix A: Resources Needed

Goal 1:			
Type of Resource	Existing	Additional: state source	Strategy
10 TAs		\$200K	To support recitations sessions in 'difficult' classes – aim to increase success and retention
Goal 2:			
Type of Resource	Existing	Additional: state source	Strategy
! Staff Member		\$55K	To focus on retention by analyzing student trends primarily in freshman and sophomore levels.
Goal 3:			
Type of Resource	Existing	Additional: state source	Strategy
Goal 4:			
Type of Resource	Existing	Additional: state source	Strategy

Appendix B: Benchmarking information

Top 10 Public Colleges of Engineering

Cal-Berkeley; Illinois; Texas; Minnesota; U. Washington; Georgia Tech; Purdue; Michigan; UCLA; UC-San Diego.

Top five peer departments for CEC Departments and Programs

CSCE	ECHE	ECIV	ELCT	EMCH
Iowa	Florida	Florida	NC State	Kentucky
Tennessee	U Mass	Alabama	Clemson	Connecticut
Connecticut	Ohio State	Iowa State	UNC-Charlotte	Central Florida
Kansas	Oklahoma	Auburn	Arkansas	NC State
Washington State	Washington	Kentucky	Nebraska	Tennessee

Appendix C. Unit's Top Strengths and Important Accomplishments

1. Successful organization and running of first College Open Day.
2. Several top-level awards made to faculty this past year.
3. Increasing numbers of large collaborative research proposals being submitted (Energy, Aerospace, Materials).
4. Created Applied Computing minor undergraduate degree.
5. Biomedical Engineering undergraduate degree now second largest program in the College.
6. Freshman enrollments for Fall 2013 increased by 30% over previous year.
7. Approvals for masters degrees in Aerospace, Biomedical Engineering, Engineering Management, and System Design.
8. Engineering & Computing freshmen form largest group in Honors College.

Appendix D: Unit's Weaknesses and Plans for Addressing Weaknesses

1. Insufficient TA/Grader support: With low faculty numbers and increasing undergraduate student numbers the provision of adequate support by way of TAs and Graders is essential to reduce the overall load on research faculty. Some departments already have the requirement for all graduate students to give 5 hours per week in TA/Grader work. Funds are sought for further graduate student support. The College has expanded on the use of peer tutoring, i.e. undergraduates who have already taken key/core classes will help those that are taking that course.
2. Inefficient use of faculty teaching. Better coordination of teaching, especially core courses (e.g. statistics), can lead to efficiencies to reduce overall teaching load – would also need larger classrooms, see below.
3. Insufficient space for research and teaching: As the college expands with recent faculty hiring and increased student numbers it becomes self-evident that space has become extremely limited...and is now critical! The College has a new space committee to identify wasted space in Swearingen and 300 Main and is in the process of extracting such space for reallocation. The SCANA/Catawba building is in a bad state, but is also badly utilized. In the absence of new/additional space being allocated to the College, this building could usefully be refurbished to provide much needed lab space particularly with Biomedical Engineering in mind. Nevertheless, even with the space plans in place, the availability of space for the College of Engineering and Computing is woefully inadequate and planning for a new building must be initiated. The delays in Horizon (I and II) are a significant problem and may hamper future recruitment and retention.
4. Staff support is varied across the college. A study has been performed and a re-organization has been proposed and already underway.
5. Marketing has a key role to play in developing and exploiting the capabilities of the College. Although inroads have been made by expanding what the College already does, much more can be done provided adequate resources are made available, chiefly manpower.
6. Biomedical Engineering undergraduate degree needs more and better facilities – more faculty and research leadership. Dr. Melissa Moss has been appointed as Director on the advice of Dr. Bayoumi. The search for the SmartState chair has been postponed by 2 years.

Appendix E: Unit Statistical Profile

2014 Appendix E: Unit Statistical Profile (See draft following Appendix C)Blueprint Appendix E.1 Freshman class size and average SAT scores					
Freshman Profile	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Freshmen Class Size	392	431	485	494	618
Average SAT	1237	1217	1226	1226	1254

2014 Blueprint Appendix E.2 Freshman-Sophomore retention rate					
Fresh-Soph Retention Rates in the College at USC	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012
	71.1%	69.2%	69.4%	65.6%	72.1%
	82.3%	86.3%	84.0%	79.9%	84.8%

2014 Blueprint Appendix E.4 Number of Majors Enrolled (Fall semester count)					
Year	2009	2010	2011	2012	2013
TT Fac Count	94	102	106	114	112
UG enrollment, FT	1584	1698	1849	1971	2188
Masters	164	195	192	164	178
Doctoral	289	328	343	370	338
FT Grad enroll	283	325	327	322	350
PT Grad Enroll	90	103	122	125	166
UG Stu/TT Fac	16.9	16.6	17.4	17.3	18.3
Total FT stu/TT Fac	19.9	19.8	20.5	20.1	21.4

2014 Blueprint Appendix E.5 Number of entering first professional and graduate studies students
(Note: Nuclear and Biomedical Engineering students counted separately from Chemical and Mechanical students.)

	CHE	CEE	CSE	EE	ME	NE	AE	BME
Applications M+D	130	57	127	92	68	11	5	27
Acceptances M+D	20	39	77	19	12	6	3	12
Enrolled M+D	13	7	28	15	12	6	3	9
UG GPA – Masters number of applicants			3.82	3.4	3.43	3.05	3.42	3.49
			6	5	7	5	3	5
UG GPA - Doctoral number of applicants	3.6	3.36	3.28	3.21	3.64	3.13		3.36
	11	4	2	7	5	1		4
Verbal GRE - M			154.4	154	150	151	157	147.4
Verbal GRE - D	155	145	150	144	149			160
Quant GRE - M			160	155	154	158	160	154
Quant GRE - D	161	161	162.2	161	160			157
Anal Writing GRE - M			3.81	3.8	3.29	3.5	4.33	3.8
Anal Writing GRE - D	3.6	2.5	3.3	3.1	3.4			4.25

2014 Blueprint Appendix E.7. Degree Productivity

	AY	2009-2010	2010-2011	2011-2012	2012-2013
Baccalaureate		227	292	289	315
Masters		56	88	78	62
Doctorate		33	29	40	49
Certificates		0	1	1	0

2014 Blueprint Appendix E. 7. 6-Year Graduation Rates

Six-Year Graduation Rate from the College from USC	Fall 2004	Fall 2005	Fall 2006	Fall 2007
	35.6%	41.1%	45.3%	49.5%
	58.6%	61.5%	64.2%	66.2%

2014 Blueprint Appendix E.8. Total Credit Hours Generated					
	Fall 2011	Fall 2012	Spring 2013	Summ 2013	Fall 2013
Undergraduate	12,475	16,229	15,842	684	16,555
Masters	1,038	899	968	185	999
Doctoral	1,872	1,721	1,647	451	1,446
Total	15,385	18,849	18,457	1,320	19,000

2014 Blueprint Appendices E.9 and E. 10 . Percentage of UG Credit Hours Taught by faculty with a PhD (Highest terminal degree). Fall 2013 Semester					
Program	Total UG Cr Hours	UG Hrs Taught by Faculty with PhD	Percentage taught by PhD	UG Hrs Taught by FT CEC	Percentage taught by FT CEC
BMEN	1010	884	87.5%	734	72.7%
CSCE	5875	2365	40.3%	2365	40.3%
ECHE	1465	1449	98.9%	1311	89.5%
ECIV	2096	1859	88.7%	1532	73.1%
ELCT	1683	1656	98.4%	1656	98.4%
EMCH	4007	3518	87.8%	2312	57.7%
ENCP	678	678	100.0%	678	100.0%

Note for Appendices E.9 and E.10: All Assistant, Associate, and Full Professors, as well as Clinical and Adjunct faculty, hold the Ph.D. FT CEC faculty excluded adjunct faculty who may hold full-time appointments in other USC Colleges (particularly, the School of Medicine).

2014 Blueprint Appendix E.11 Faculty count by rank and department						
Source: ASEE On-line tables						
		Full	Assoc	Assist	FT Instr	PT Instr
Chemical	2010	12	4	4	0	1
	2011	12	4	6	0	1
	2012	13	4	7	2	0
	2013	12	4	7	0	2
Civil	2010	3	10	6	0	3
	2011	3	9	7	0	3
	2012	3	9	8	0	4
	2013	4	8	6	4	4
Computer	2010	5	11	5	1	2
	2011	4	12	5	1	2
	2012	5	12	6	0	0
	2013	6	13	3	1	3
Electrical	2010	4	8	3	1	1
	2011	6	8	2	1	1
	2012	6	7	4	1	0
	2013	7	6	4	0	0
Mechanical	2010	11	5	11	0	5
	2011	11	7	10	0	3
	2012	12	7	11	0	4
	2013	13	7	10	3	4

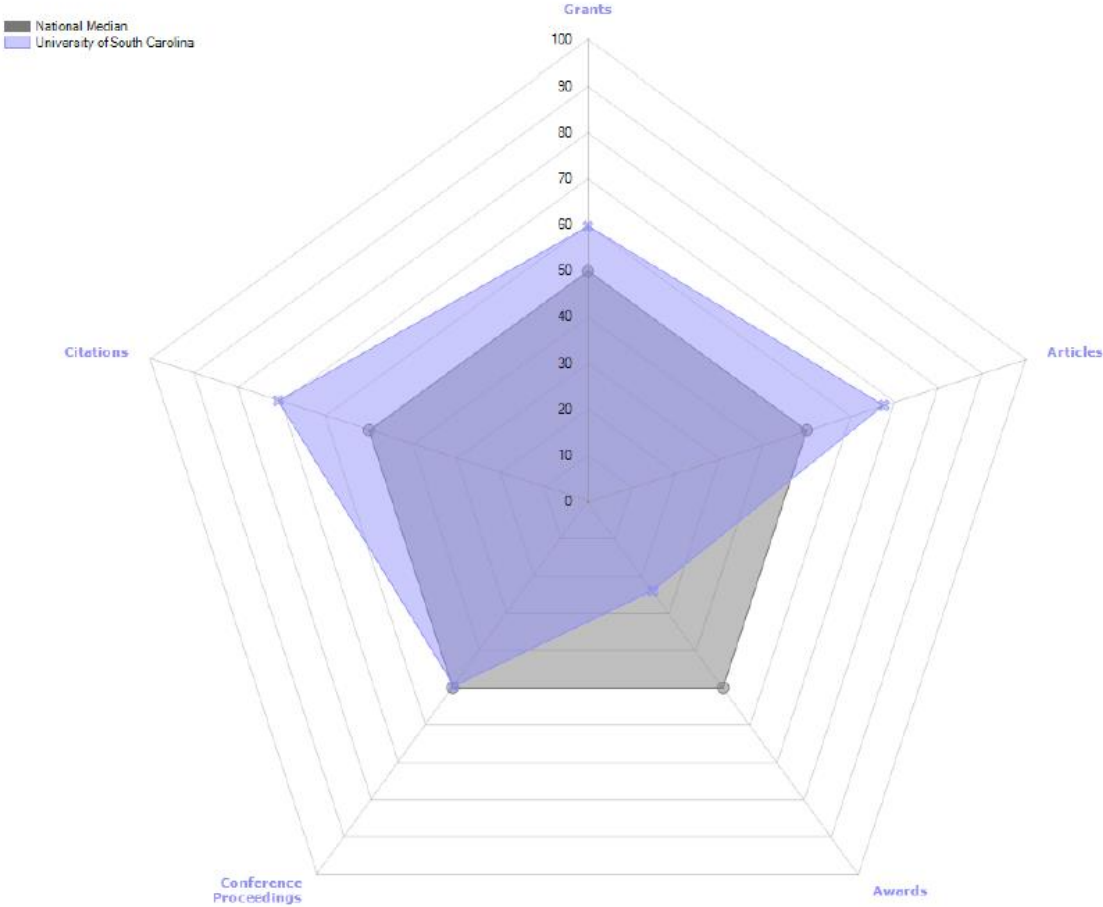
2014 Blueprint Appendix 12. Under-represented minority faculty members in CEC			
	Fall 2012	Fall 2013	Change
Hispanic	3	3	0
African-American	1	1	0
Native American	0	0	0
Pacific Islander	0	0	0

Appendix F – Faculty Productivity



Productivity Radar

Chemical Engineering, Department of | Chemical Engineering
Department Radar - All Variables Summary
University of South Carolina | Chemical Engineering, Department of



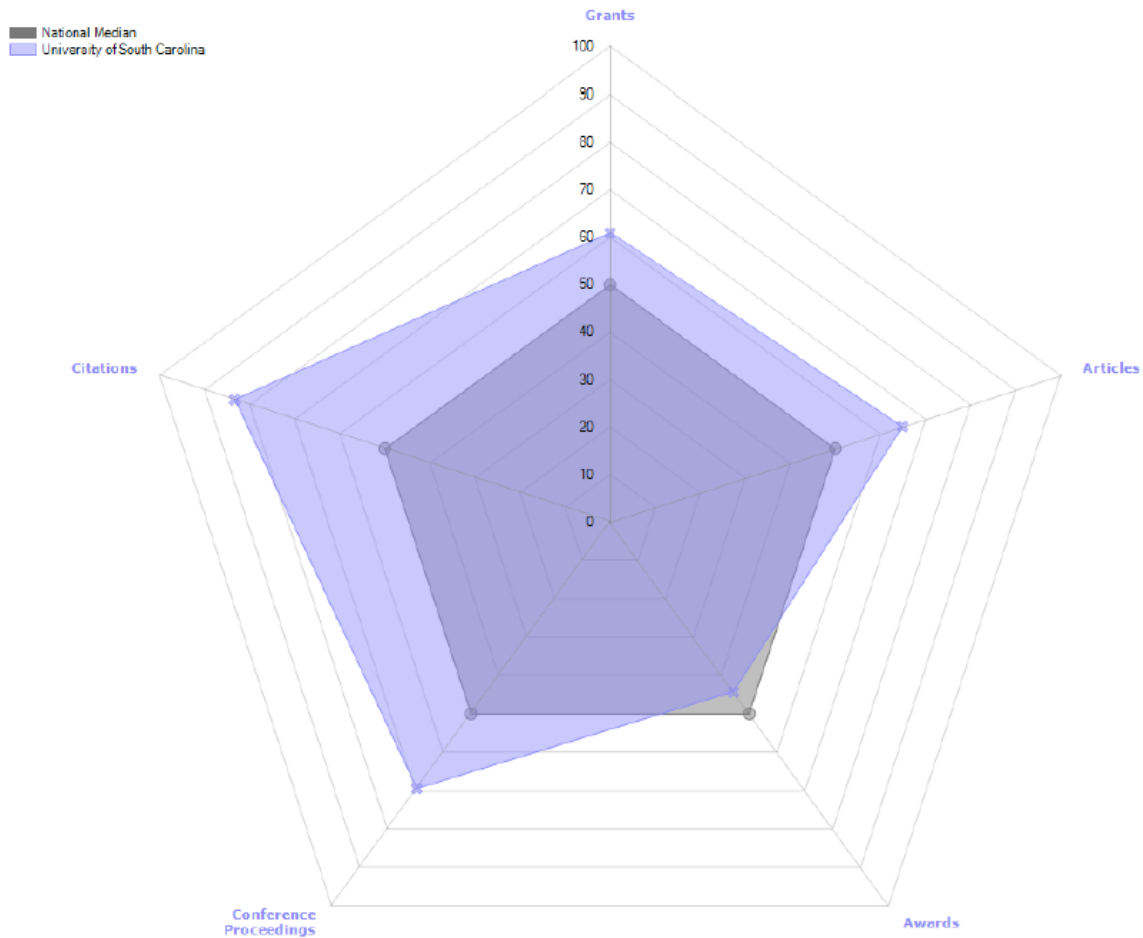


Productivity Radar

Civil and Environmental Engineering, Department of | Civil Engineering (145 Departments)

Department Radar - All Variables Summary

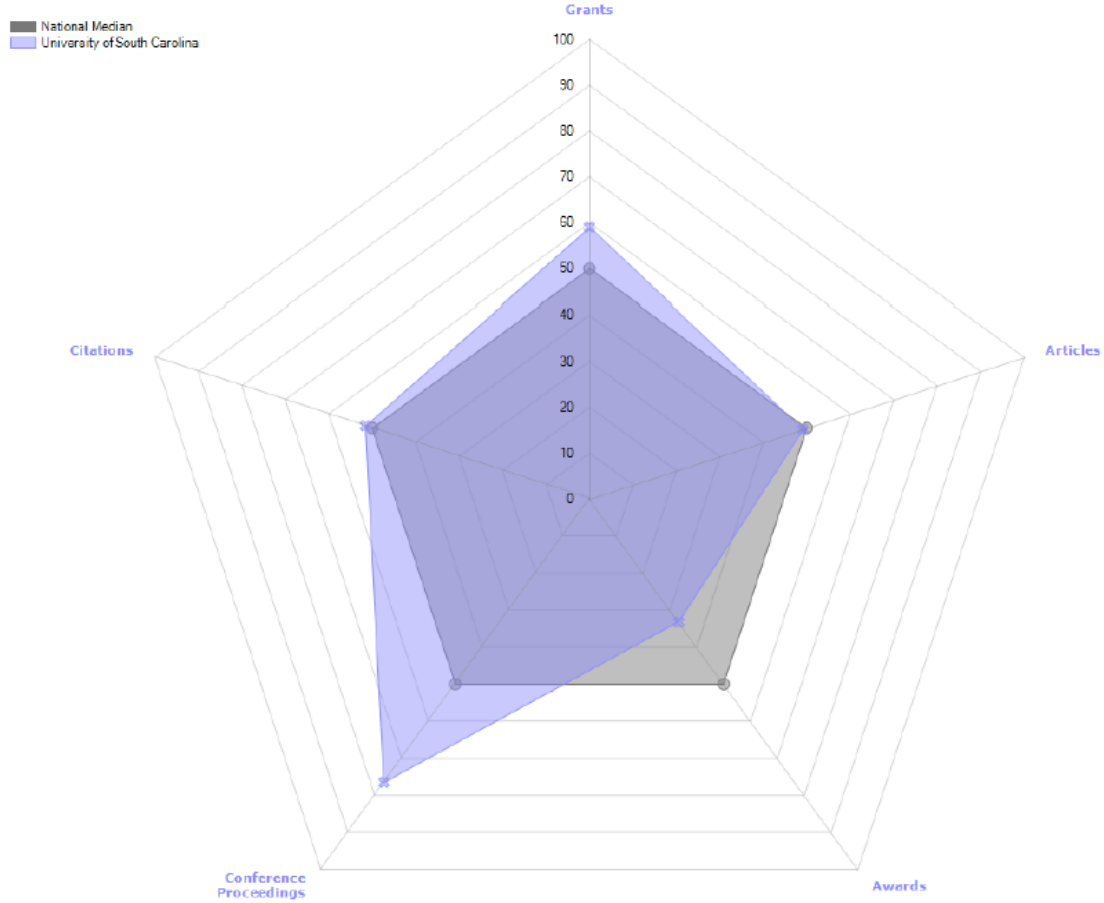
University of South Carolina | Civil and Environmental Engineering, Department of





Computer Science and Engineering, Department of | Computer Engineering (159 Departments)Department Radar - All Variables Summary

University of South Carolina | Computer Science and Engineering, Department of

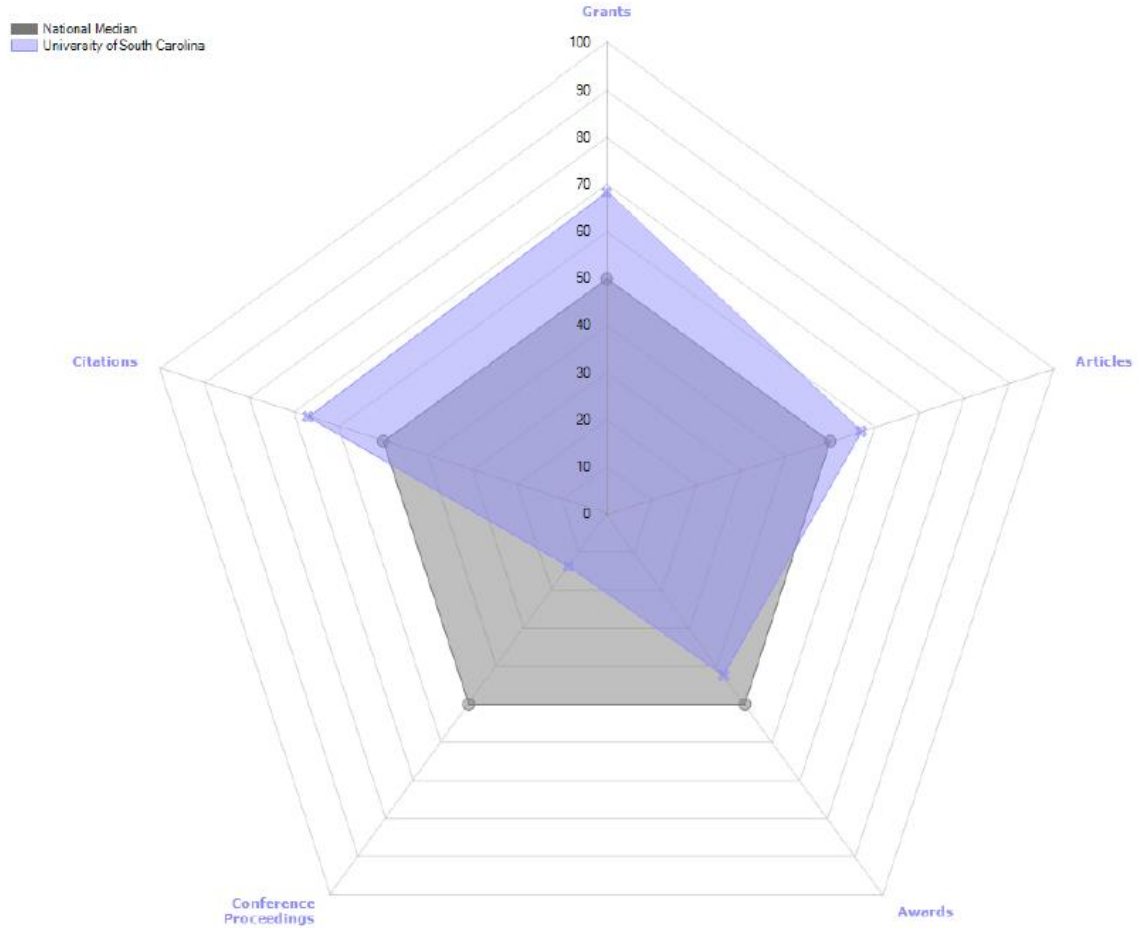




Productivity Radar

Electrical Engineering, Department of | Electrical Engineering Department Radar - All Variables Summary

University of South Carolina | Electrical Engineering, Department of

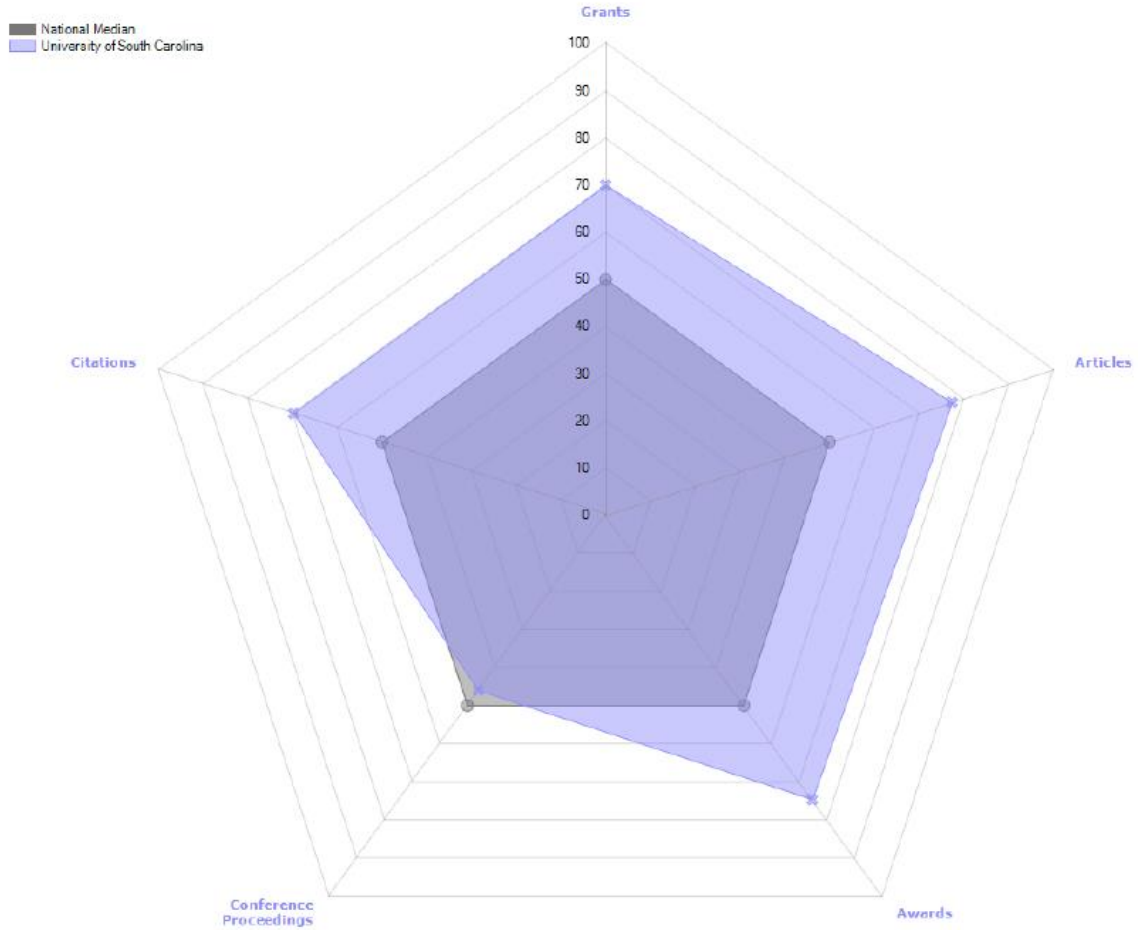




Productivity Radar

Mechanical Engineering, Department of | Mechanical Engineering Department Radar - All Variables Summary

University of South Carolina | Mechanical Engineering, Department of



College of Engineering & Computing

Externally Sponsored Proposals

#1 - Blueprint Data

Home Department	Total Amt - 1st Year	Total Count	Commercial - (C)	Federal - (FED)	Local Gov- (LC)	Other - (OTH)	Non-Profit	State - (STA)
Chemical Engineering	13,405,157	78	6	65	1	2	4	
Engineering	5,670,800	53	5	43		2	2	1
Engineering	4,536,558	34	3	30				1
Electrical Engineering	4,309,688	52	4	46			2	
Engineering & Computing, College of	402,779	2		2				
Mechanical Engineering	16,228,815	115	5	104		3	2	1

Total Requested 1st Year	44,553,797		1,238,455	42,624,055	25,000	236,802	372,616	56,869
Total Submissions		334	23	290	1	7	10	3

College of Engineering & Computing

Externally Sponsored Awards by Source and Rank

#2 - Blueprint Data

PI_HM_DE	PI_NA	Rank	Tenure / TT	Total Of TOT	Commercial - (CO)	Federal - (FED)	Local Gov. - (LO)	Other - (OTH)	Non-Profit - (PH)	State - (STA)
Chemical E	Amiridis, M	Professor	Tenured	490,454	-596,449	1,086,903				
Chemical E	Blanchette,	Asst. Professor		113,260		113,260				
Chemical E	Gonzalez, Francisco			19,180		19,180				
Chemical E	Hattrick-Sin	Asst. Professor		34,386	31,386	3,000				
Chemical E	Heyden, An	Asst. Professor		1,007,000		1,007,000				
Chemical E	Jabbari, Esn	Assoc. Professor	Tenured	40,000		40,000				
Chemical E	Jabbarzadeh	Asst. Professor		60,000		60,000				
Chemical E	Lauterbach,	Professor	Tenured	1,119,666	1,094,666				25,000	
Chemical E	Matthews,	Professor	Tenured	25,000					25,000	
Chemical E	Monnier, Jo	Research Professor		190,630	190,630					
Chemical E	Moss, Melis	Assoc. Professor	Tenured	211,819		211,819				
Chemical E	Padak, Biht	Asst. Professor		272,000		272,000				
Chemical E	Ploehn, Har	Professor	Tenured	30,400	0	30,400				
Chemical E	Popov, Brar	Professor	Tenured	280,000	30,000	250,000				
Chemical E	Regalbuto, J	Professor	Tenured	477,927		477,927				
Chemical E	Ritter, Jame	Professor	Tenured	1,360,000		1,335,000		25,000		
Chemical E	Shimpalee,	Research Assoc. Prof.		178,664		178,664				
Chemical E	Weidner, Jo	Professor	Tenured	409,026	0	409,026				
Chemical E	White, Ralp	Professor	Tenured	314,882		314,882				
Chemical E	Williams, Ch	Professor	Tenured	120,000		120,000				
Chemical E	Yu, Miao	Asst. Professor		240,000		240,000				

Chemical E	Zhou, Xiao-	Assoc. Professor		120,000		120,000				
Civil & Env	Caicedo, Juan	Assoc. Professor	Tenured	95,857		88,543			7,314	
Civil & Env	Chaudhry, N	Professor	Tenured	85,000						85,000
Civil & Env	Gassman, S	Assoc. Professor	Tenured	256,431	15,960	240,471				
Civil & Env	Goodall, Jon	Assoc. Professor		542,297		542,297				
Civil & Env	Huynh, Nat	Asst. Professor		479,770		429,770				50,000
Civil & Env	Imran, Jasir	Professor	Tenured	182,399	182,399					
Civil & Env	Matta, Fabio	Asst. Professor		236,834	93,696	143,138				
Civil & Env	Pierce, Char	Assoc. Professor	Tenured	16,129					16,129	
Civil & Env	Rizos, Dimit	Assoc. Professor	Tenured	6,572	6,572					
Civil & Env	Saleh, Navid	Asst. Professor		115,927		115,927				
Civil & Env	Song, Jeong	Asst. Professor		135,778		135,778				
Civil & Env	Viparelli, En	Asst. Professor		100,619		100,619				
Civil & Env	Yoon, Yeom	Assoc. Professor		150,000				150,000		
Civil & Env	Ziehl, Paul	Professor	Tenured	251,979		251,979				
Computer	Alekseyev, I	Asst. Professor		549,529		549,529				
Computer	Bakos, Jason	Assoc. Professor	Tenured	74,905		74,905				
Computer	Buell, Dunc	Professor	Tenured	26,457		26,457				
Computer	Huhns, Mich	Professor	Tenured	53,288	48,038	5,250				
Computer	Nelakuditi, S	Assoc. Professor	Tenured	16,000		16,000				
Computer	Tang, Jijun	Assoc. Professor	Tenured	444,303		444,303				
Computer	Tong, Yan	Asst. Professor		15,500		15,500				
Computer	Valafar, Hor	Assoc. Professor	Tenured	86,000		86,000				
Computer	Vidal, Jose	Assoc. Professor	Tenured	283,850		283,850				
Computer	Wang, Song	Assoc. Professor	Tenured	353,403		353,403				
Computer	Xu, Wenyua	Assoc. Professor	Tenured	110,765		110,765				
Electrical E	Ali, Moham	Professor	Tenured	565,512		565,512				
Electrical E	Brice, Charl	Assoc. Professor	Tenured	45,000	45,000					
Electrical E	Chandrashe	Asst. Professor		325,968		325,968				
Electrical E	Dougal, Rog	Professor	Tenured	1,790,005	32,556	1,757,449				

Electrical E	Ginn, Herbe	Assoc. Professor	Tenured	252,242	93,093	159,149				
Electrical E	Huray, Paul	Professor	Tenured	68,186	68,186					
Electrical E	Khan, Asif	Professor	Tenured	130,000		130,000				
Electrical E	Koley, Gout	Assoc. Professor	Tenured	196,488		196,488				
Electrical E	Mandal, Kri	Assoc. Professor		60,000		60,000				
Electrical E	Matolak, Da	Professor	Tenured	291,574		291,574				
Electrical E	Santi, Enric	Assoc. Professor	Tenured	117,972	20,204	97,768				
Electrical E	Shin, Yong-J	Visiting Professor		-66,334	642	-66,976				
Electrical E	Simin, Grig	Professor	Tenured	106,777		16,000			90,777	
Electrical E	Sudarshan,	Professor	Tenured	100,000		100,000				
Electrical E	Wang, Guoa	Asst. Professor		400,000		400,000				
Engineerin	Boccanfuso	Program Director		294,593		294,593				
Engineerin	Gurdal, Zafe	Professor	Tenured	10,000,000					10,000,000	
Mechanica	Bayoumi, Al	Professor	Tenured	570,382		570,382				
Mechanica	Cacuci, Dan			412,500		412,500				
Mechanica	Chen, Fangl	Assoc. Professor	Tenured	626,797		626,797				
Mechanica	Deng, Xiaon	Professor	Tenured	200,000		200,000				
Mechanica	Farouk, Tan	Asst. Professor		217,000		217,000				
Mechanica	Giurgiutiu, V	Professor	Tenured	476,771		470,250		6,521		
Mechanica	Huang, Kevi	Assoc. Professor		100,000		100,000				
Mechanica	Huang, Xiny	Asst. Professor		225,000	200,000				25,000	
Mechanica	Kaoumi, Dja	Asst. Professor		80,661		80,661				
Mechanica	Kidane, Add	Asst. Professor		34,000		34,000				
Mechanica	Knight, Trav	Assoc. Professor	Tenured	74,166	31,000	18,166			25,000	
Mechanica	Li, Chen	Asst. Professor		50,000		50,000				
Mechanica	Majumdar, A	Asst. Professor		238,190		238,190				
Mechanica	Reifsnider, I	Professor	Tenured	1,700,797		1,680,797				20,000
Mechanica	Reynolds, Al	Professor	Tenured	307,394	57,394	250,000				
Mechanica	Shazly, Tare	Asst. Professor		60,000		60,000				
Mechanica	Sutton, Mic	Professor	Tenured	150,000	100,000	50,000				

Mechanica	Tarbutton, J	Asst. Professor		84,007		84,007				
Mechanica	Wang, Guirong	Assoc. Professor	Tenured	130,816		30,825		99,991		
Mechanica	Xue, Xingjia	Asst. Professor		101,704		101,704				
Mechanica	Yang, Jinkyu			326,000		326,000				
Mechanica	Yu, Lingyu	Asst. Professor		66,976		66,976				

TOTALS				32,695,030	1,744,973	20,299,325	0	281,512	10,214,220	155,000
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College of Engineering & Computing

Externally Sponsored Awards by Source per Tenured /TT

#3 - Blueprint Data

PI_HM_DEPT_D ESC	PI_NA	Rank	Tenure / TT	Total Of TOT_SP	Commercial - (COM)	Federal - (FED)	Local Gov. - (LOC)	Other - (OTH)	Non-Profit - (PHI)	State - (STA)
Chemical Engineer	Amiridis, Michael	Professor	Tenured	490,454	596,449	1,086,903				
Chemical Engineer	Jabbari, Esmaiel	Professor	Tenured	40,000		40,000				
Chemical Engineer	Lauterbach, Jocelyn	Professor	Tenured	1,119,666	1,094,666				25,000	
Chemical Engineer	Matthews, Michael	Professor	Tenured	25,000					25,000	
Chemical Engineer	Moss, Melissa	Professor	Tenured	211,819		211,819				
Chemical Engineer	Ploehn, Harry	Professor	Tenured	30,400	0	30,400				
Chemical Engineer	Popov, Branko	Professor	Tenured	280,000	30,000	250,000				
Chemical Engineer	Regalbuto, John	Professor	Tenured	477,927		477,927				
Chemical Engineer	Ritter, James	Professor	Tenured	1,360,000		1,335,000		25,000		
Chemical Engineer	Weidner, John	Professor	Tenured	409,026	0	409,026				
Chemical Engineer	White, Ralph	Professor	Tenured	314,882		314,882				
Chemical Engineer	Williams, Christy	Professor	Tenured	120,000		120,000				
Civil & Environmental	Caicedo, Juan	Professor	Tenured	95,857		88,543			7,314	
Civil & Environmental	Chaudhry, M.	Professor	Tenured	85,000						85,000
Civil & Environmental	Gassman, Sarah	Professor	Tenured	256,431	15,960	240,471				
Civil & Environmental	Imran, Jasim	Professor	Tenured	182,399	182,399					
Civil & Environmental	Pierce, Charles	Professor	Tenured	16,129					16,129	
Civil & Environmental	Rizos, Dimitris	Professor	Tenured	6,572	6,572					
Civil & Environmental	Ziehl, Paul	Professor	Tenured	251,979		251,979				
Computer Science	Bakos, Jason	Professor	Tenured	74,905		74,905				
Computer Science	Buell, Duncan	Professor	Tenured	26,457		26,457				
Computer Science	Huhns, Michael	Professor	Tenured	53,288	48,038	5,250				

Computer Science	Nelakuditi, Srih	Professor	Tenured	16,000		16,000				
Computer Science	Tang, Jijun	Professor	Tenured	444,303		444,303				
Computer Science	Valafar, Homay	Professor	Tenured	86,000		86,000				
Computer Science	Vidal, Jose	Professor	Tenured	283,850		283,850				
Computer Science	Wang, Song	Professor	Tenured	353,403		353,403				
Computer Science	Xu, Wen yuan	Professor	Tenured	110,765		110,765				
Electrical Engineer	Ali, Mohammad	Professor	Tenured	565,512		565,512				
Electrical Engineer	Brice, Charles	Professor	Tenured	45,000	45,000					
Electrical Engineer	Dougal, Roger	Professor	Tenured	1,790,005	32,556	1,757,449				
Electrical Engineer	Ginn, Herbert	Professor	Tenured	252,242	93,093	159,149				
Electrical Engineer	Huray, Paul	Professor	Tenured	68,186	68,186					
Electrical Engineer	Khan, Asif	Professor	Tenured	130,000		130,000				
Electrical Engineer	Koley, Goutam	Professor	Tenured	196,488		196,488				
Electrical Engineer	Matolak, David	Professor	Tenured	291,574		291,574				
Electrical Engineer	Santi, Enrico	Professor	Tenured	117,972	20,204	97,768				
Electrical Engineer	Simin, Grigory	Professor	Tenured	106,777		16,000			90,777	
Electrical Engineer	Sudarshan, Tan	Professor	Tenured	100,000		100,000				
Engineering & Co	Gurdal, Zafer	Professor	Tenured	10,000,000					10,000,000	
Mechanical Engin	Bayoumi, Abdel	Professor	Tenured	570,382		570,382				
Mechanical Engin	Chen, Fanglin	Professor	Tenured	626,797		626,797				
Mechanical Engin	Deng, Xiaomin	Professor	Tenured	200,000		200,000				
Mechanical Engin	Giurgiutiu, Victo	Professor	Tenured	476,771		470,250		6,521		
Mechanical Engin	Knight, Travis	Professor	Tenured	74,166	31,000	18,166			25,000	
Mechanical Engin	Reifsnider, Ken	Professor	Tenured	1,700,797		1,680,797				20,000
Mechanical Engin	Reynolds, Anth	Professor	Tenured	307,394	57,394	250,000				
Mechanical Engin	Sutton, Michael	Professor	Tenured	150,000	100,000	50,000				
Mechanical Engin	Wang, Guiren	Professor	Tenured	130,816		30,825		99,991		

TOTALS				25,123,391	1,228,619	13,469,040	0	131,512	10,189,220	105,000
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College of Engineering & Computing

Technology Commercialization

#4 - Blueprint Data

College	Invention Disclosures	Provisional patent applications	Non-Provisional patent applications	Issued patents
Engineering & Computing	19	28	17	15
Breakdown	<i>Civil & Environmental 1</i> <i>Chem Eng 7</i> <i>Mech Eng 3</i> <i>EE 8</i> <i>SmartState :</i> <i>Solid Oxide Fuel Cells 3</i> <i>Renewable Fuels 2</i> <i>SAGE 3</i>	<i>Chem Eng 10</i> <i>Mech Eng 11</i> <i>EE 7</i> <i>SmartState :</i> <i>Solid Oxide Fuel Cells 9</i> <i>Renewable Fuels 3</i> <i>SAGE 1</i>	<i>Civil & Environmental 2</i> <i>Chem Eng 3</i> <i>Mech Eng 9</i> <i>EE 3</i> <i>Smart State:</i> <i>Solid oxide fuel cells 5</i> <i>SAGE 2</i>	<i>Chem Eng 4</i> <i>Mech Eng 4</i> <i>EE 7</i>

FY2013 - Licensing Agreements

1 – Electrical Engineering
1 – Mechanical Engineering