ENGINEERING PROFESSIONAL PRACTICE

Annual Report 2015

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Annual Report for

THE UNIVERSITY OF TENNESSEE KNOXVILLE

ENGINEERING PROFESSIONAL PRACTICE

2015

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ENGINEERING
PROFESSIONAL PRACTICE

Introduction

As we move past 2015 and head into 2016 we will celebrate the 90th anniversary of cooperative education here at the University of Tennessee. Our program has been in existence helping students add experience to their education since 1926 and this makes The Office of Engineering Professional Practice the second oldest program in the south and one of oldest cooperative education programs anywhere. We are dedicated to helping engineering students find educationally relevant paid cooperative education or internship education positions with one of our hundreds of employers.

Key recent accomplishments

- Fall 2014 Engineering Expo was our largest ever with 77 employers and 650 students
- The Spring 2014 Engineering Expo was our largest employer attended spring event in our history, with 59 employers.
- The Spring 2015 Engineering Expo was our largest student attended spring event in our history, with 427 students.
- Fall 2015 Engineering Expo was our second largest expo ever with 75 employers in attendance and 600 students.
- Held our largest attended Fall engineering cookout in 2015 with over 1200 students, staff and faculty participating.
- Held the fourth annual Engineering Professional Practice Spring banquet in April 2015 with special guest speaker Inky Johnson.
- After a modest 3% growth in student placements in AY 2012-13, we saw a dramatic 10% growth in placement in AY2013- 14 followed by a huge 22% year over year increase in AY2014-15.
- 39% of engineering seniors who graduate have worked at least one co-op or internship assignment during their time at UT over the past seven years of senior classes we expect this percentage to increase as the current group of students actively on assignments graduate.

Student Training – "Prep for Success"

Continuing our highly successful "Prep for Success" sessions each Fall and Spring semester, we provide content to aspiring co-op and internship students on key subjects like dressing for success, personal branding, interview preparation, interview strategies, and recommendations on how to succeed at the Engineering Expo and the Interview Day.

J. Michael Stone Engineering Professional Practice Leadership Development Program.

This key program began in 2014 due to the generosity of J. Michael Stone. This leadership development program is specifically for our engineering students that obtain co-op and internship assignment through our Engineering Professional Practice program. While on assignment, students are provided books on leadership development and communication skills and encouraged to read these books and apply the skills learned during their work assignments. This program also enables us to bring speakers to campus for additional leadership development. These leadership skills go hand in hand with the academic skills and really add to the experiential learning process.

Experiential Education in the form of Co-op and Internships is good for Engineering Students:

Any Experience is good, but Co-op is best

In light of many pressures engineering students find themselves in to graduate quickly and find a job, and with a plethora of opportunities to do undergraduate research, study abroad, etc. We often forget that historically the best option available for students is cooperative education. Cooperative education is a superior program to the internship program, but the internship program is superior to no work experience:

Co-op > Internship > no engineering work experience

The depth of the engineering work experience grows through three semesters such that the third semester of work typically results in 50-75% of the meaningful work experience that occurs over the three semesters.

Experiential Education Improves Academic Performance

Our data shows that students who participate in co-op and internships make, on average, higher grades than those who don't. One likely reason for this is the cycle of learning that takes place during the rotational periods. Students normally go on their first co-op assignment during their sophomore year before they have learned very much about engineering. They then get exposed to many real-world problems and challenges that they still haven't learned, or may never learn, in school. Once they return to school, they begin to see the engineering fundamentals behind these challenges they faced in the field and thus deeper learning occurs. Then as they progress in their engineering major, they begin to learn concepts that they see in the field which re-enforces the learning process. This is very similar to what takes place on a smaller scale during a chemistry class and chemistry lab or a physics class and a physics lab: classroom learning and experiential learning.

Employer benefits of hosting engineering co-op students:

- The opportunity to engage our most ambitious and enthusiastic students early in their academic timeline
- An infusion of new ideas and methods
- The opportunity to develop a young engineer in your particular methods and processes
- Greater visibility on the University of Tennessee campus
- Enhancing the engineering student's education because of the work experience offered early in the educational process
- Increased opportunities for technology transfer

Student benefits of engineering co-op assignments:

- Help bridge the gap between theoretical study and the professional world during the co-op assignments
- Find out exactly what engineers do in order to confirm their decision to study engineering
- Become professionals who can take their learning in the classroom and adapt it to the workplace
- Get a head start on classroom learning by working with engineering principles on the job
- Have co-op program participation noted on their transcripts
- Gain self-confidence and motivation and develop expertise in interacting with people
- Improve significantly the level of job and salary offers they get upon graduation
- Be able to offset educational expenses with their co-op earnings
- Develop professional behavior and social skills
- Receive one year's credit toward professional licenses in the state of Tennessee upon Program completion

Engineering Students with Experience Accelerate Their Future

The three most important things employers tell our office they look for when recruiting engineers for full time positions, in order, are:

1. Good grades
2. Engineering experience
3. Ability to communicate well

In reality, students who choose to participate in co-op and internships don't wait until their senior year to begin looking for a full time job, they actually accelerate the job search process by beginning their search in the freshman year. Surveys of our graduating engineering seniors show that, on average, 75% of co-op students receive a job offer from their co-op employers. Approximately 50% of these students take the offer, the rest presumably take better offers from other employers or proceed to graduate school.

Co-op Students Stay on Track for Graduation

Co-operative education at the University of Tennessee requires a student to work at least three semesters with the same company, typically alternating between work and school.

Year	Fall	Spring	Summer
1st	School	School	Work
2nd	School	Work	School
3rd	Work	School	School
4th	School	School	

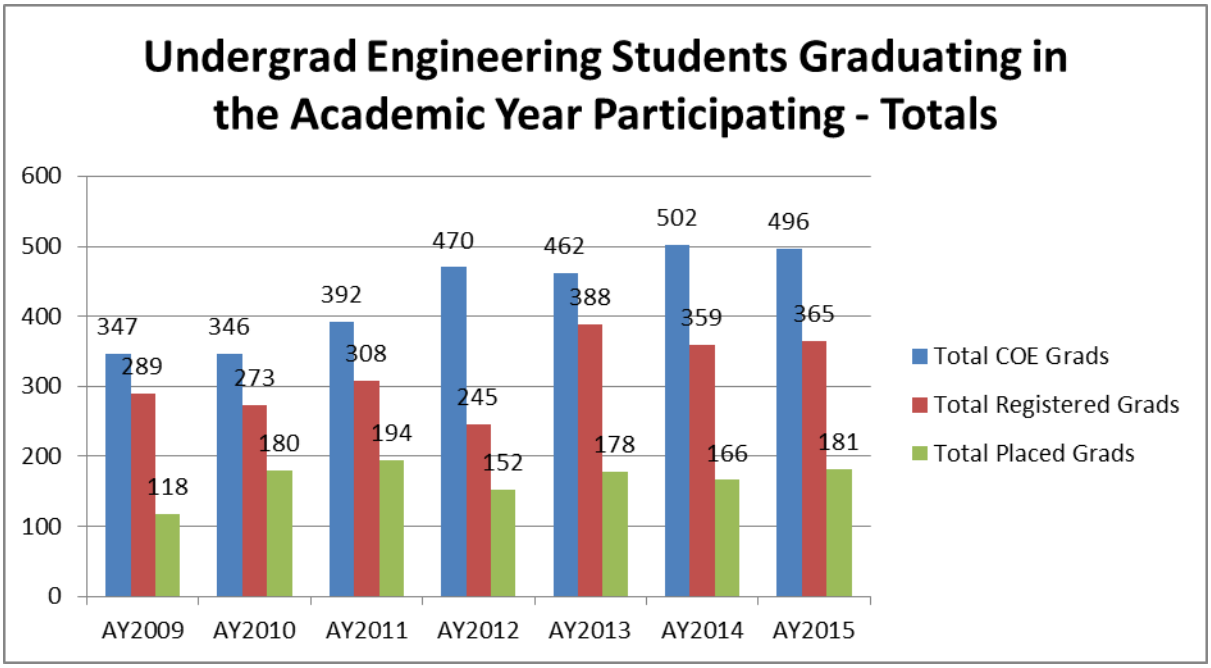
Year	Fall	Spring	Summer
1st	School	School	School
2nd	Work	School	Work
3rd	School	Work	School
4th	School	School	

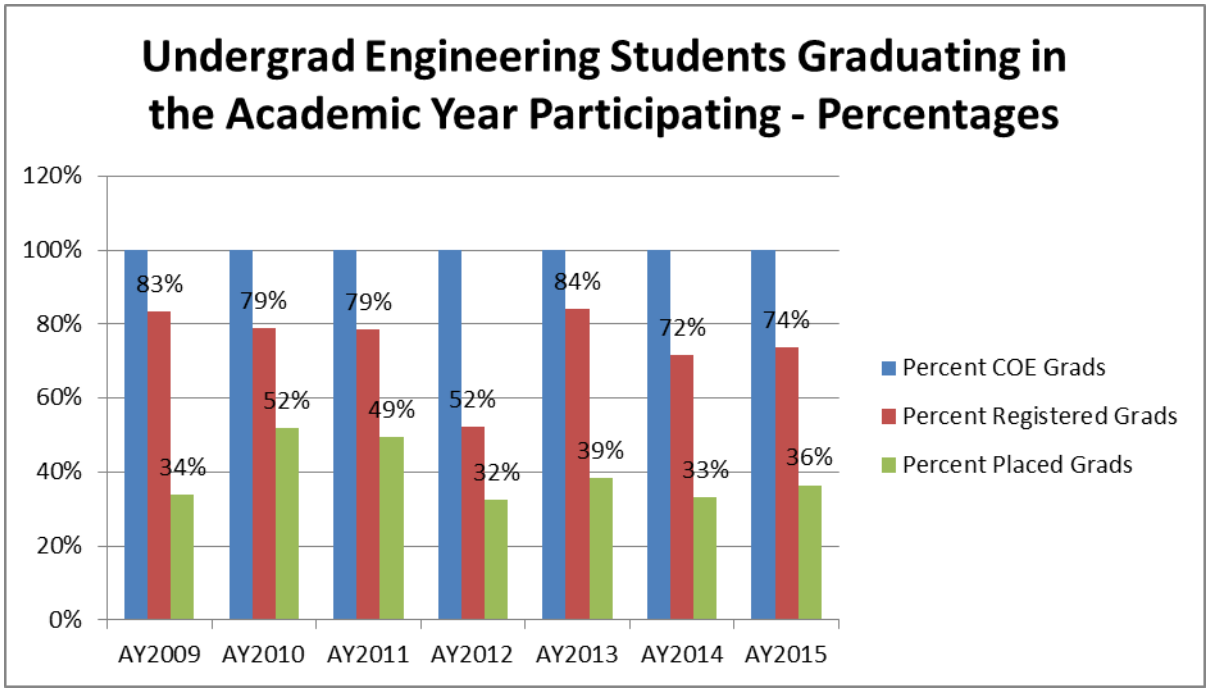
Engineering co-op students are very motivated to graduate as quickly as possible and the College of Engineering has structured its academic program to ensure a minimal impact to the engineering graduation rate. Improved opportunities to take courses during the summer semesters at the university level, beginning in 2013, enhanced UT engineering co-op students' ability to graduate more quickly relative to the past, when the summer terms did not have a robust enough set of course offerings to always ensure timely graduation rates.

Students that start the co-op process in the summer before their sophomore year, and are able to make full use of the three summer semesters, can still graduate in the spring of their 4th year. A co-op student with a well advised plan still only needs to take eight academic semesters to graduate unless they decide to add a minor or participate in additional academic activities such as study abroad.

Students Graduating that Participated in the Engineering Professional Practice Program:

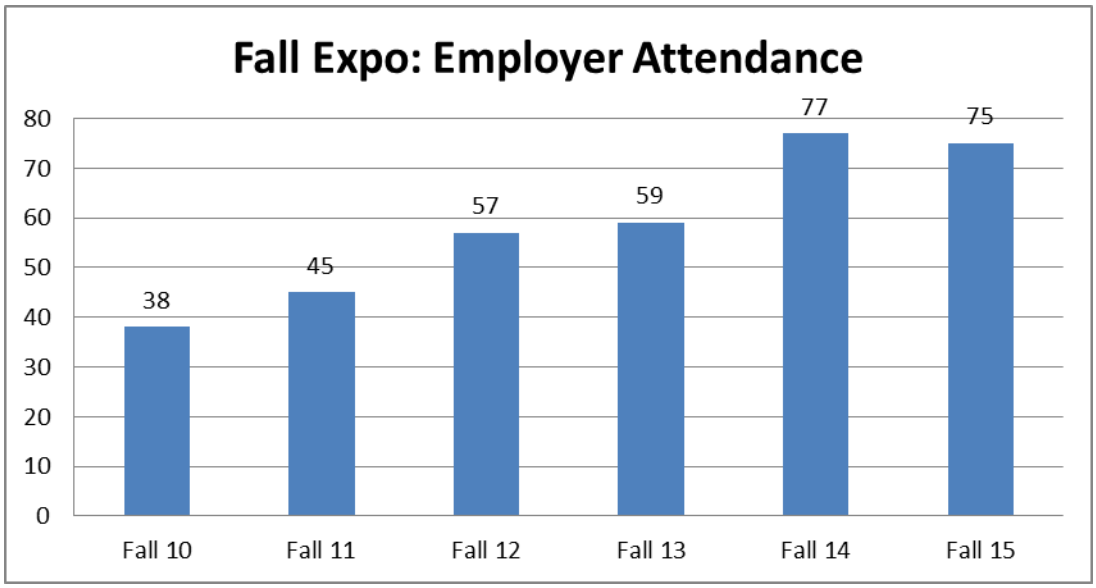
Our office continues to see strong interest and high participation levels from engineering students with total placed COE graduates participating in co-op and internships averaging 39% over the period AY2009 through AY2015. Also, since 2009 we have averaged 75% of graduating seniors having at least registered with our program. Total COE Grads = all graduating engineering students in the academic year; Total Registered Grads = all engineering students that at least registered with the Engineering Professional Practice office; Total Placed Grads = number of graduating engineering students that worked at least one assignment.

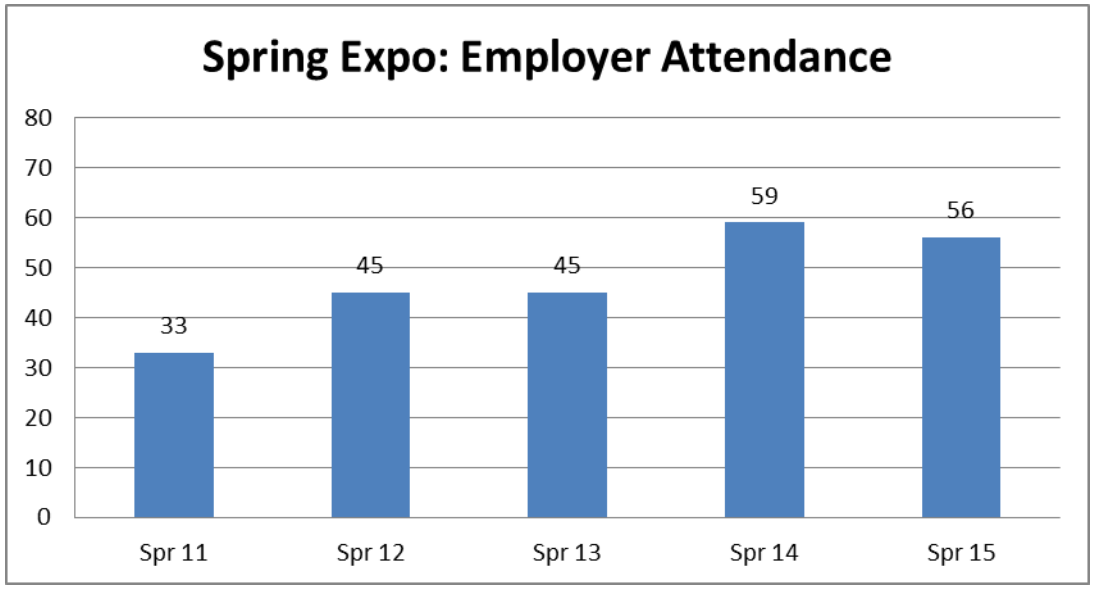




Engineering Expo Employer Attendance is on the Rise

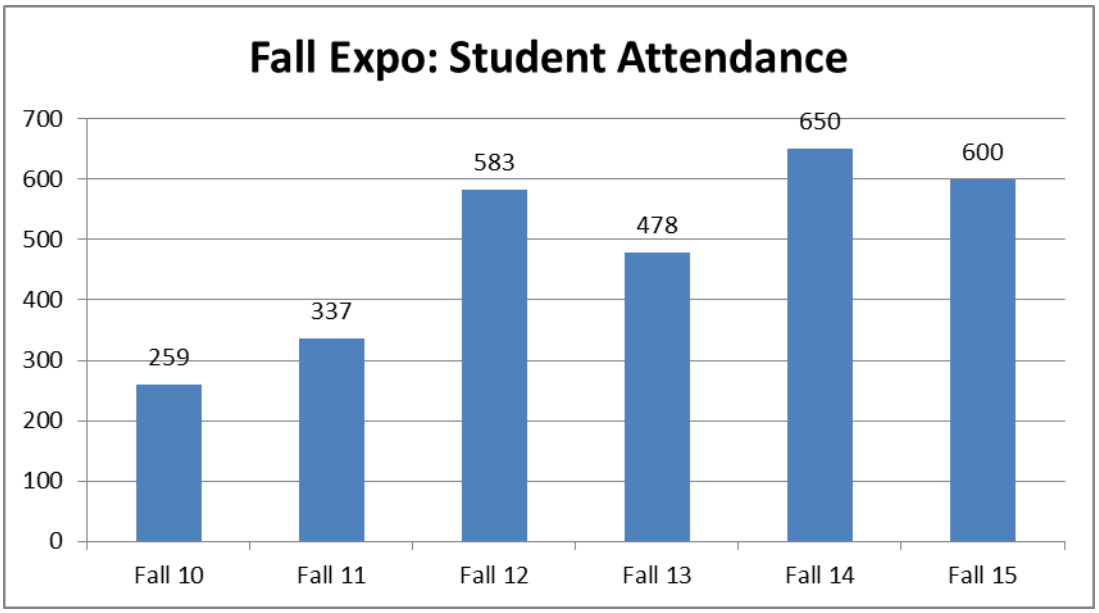
Our program has experienced consistent growth in Engineering Expo employer attendance since AY2010-11. After a record setting employer attendances in the Fall of 2014, and the Spring of 2015, our employer attendance in the Spring of 2015 and the Fall of 2015 were still extremely strong.



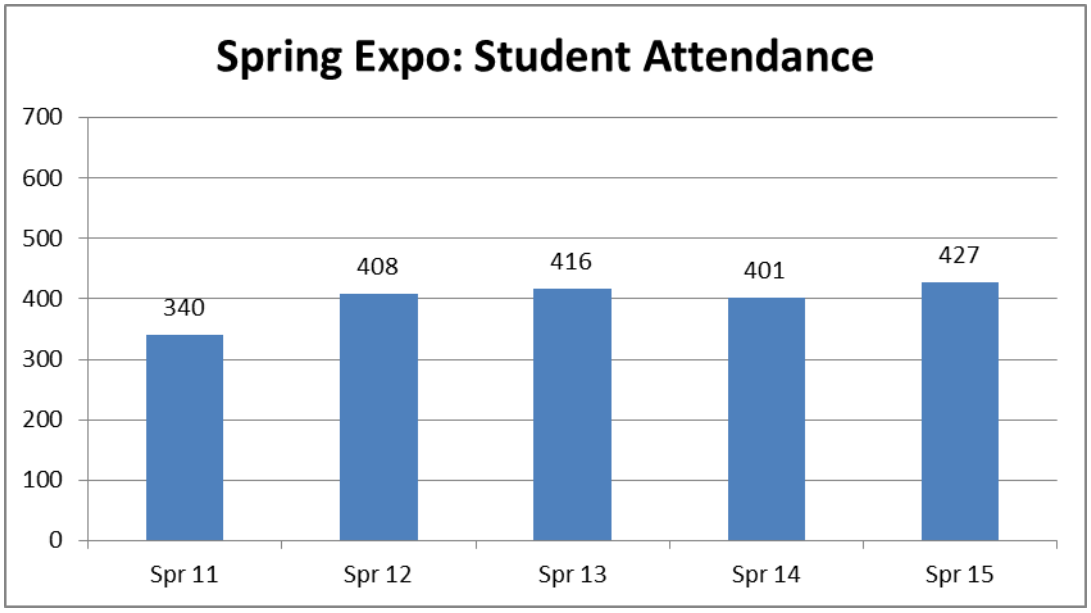


Engineering Expo Student Attendance is Strong

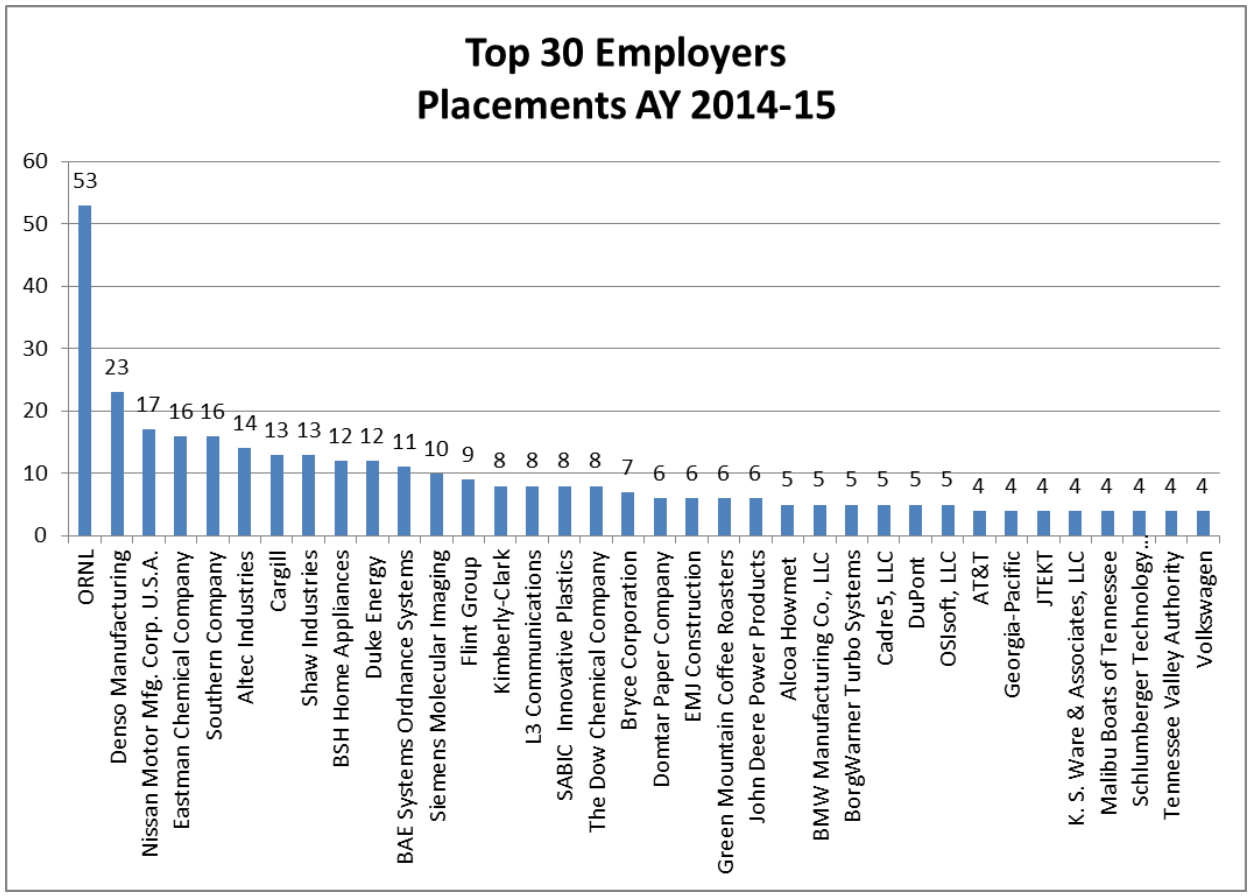
After a downturn in student attendance in the Fall of 2013, we saw a significant increase in student attendance to a record of 650 students in the Fall of 2014 followed by strong student attendance in the Fall of 2015 which was still larger student attendance than had occurred in the four years prior to the Fall of 2014.

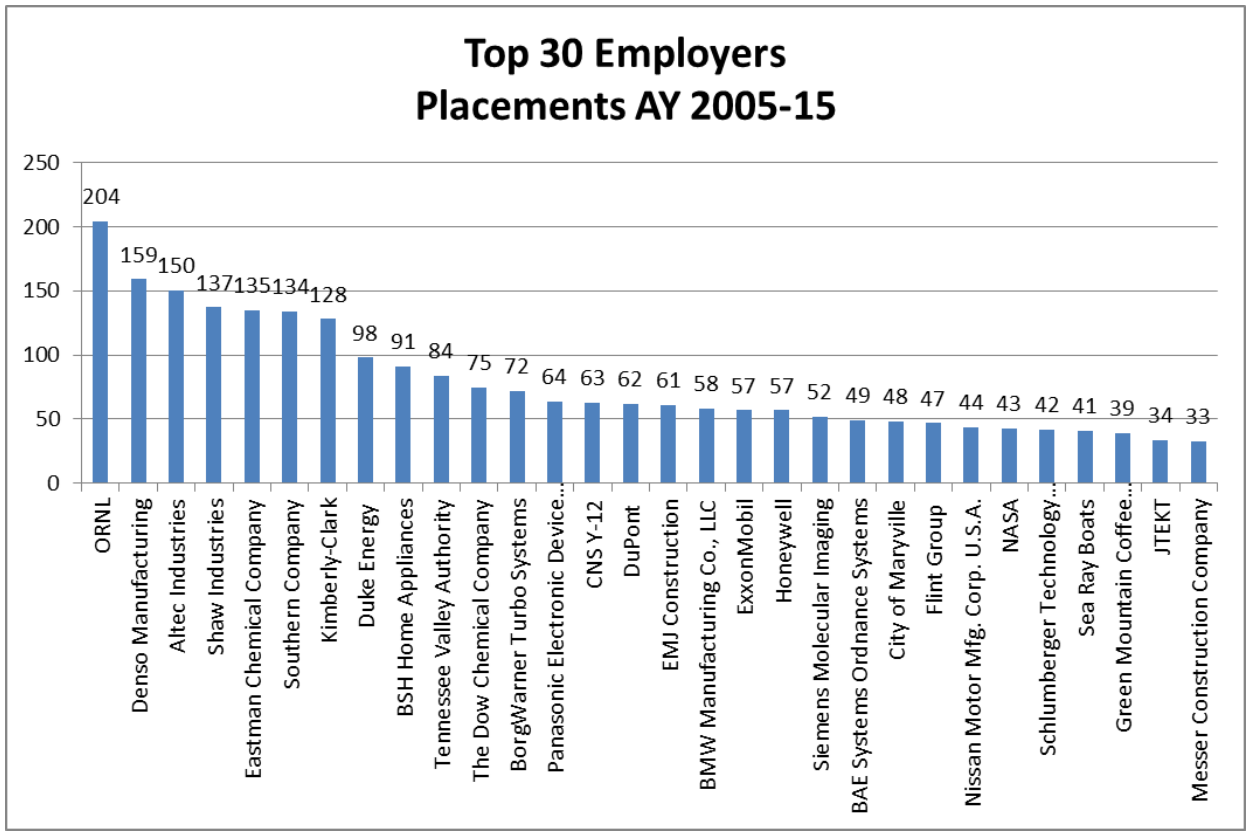


The Engineering Expo attendance for the spring event is holding steady, but has risen to its highest, record-setting level in the Spring of 2015.



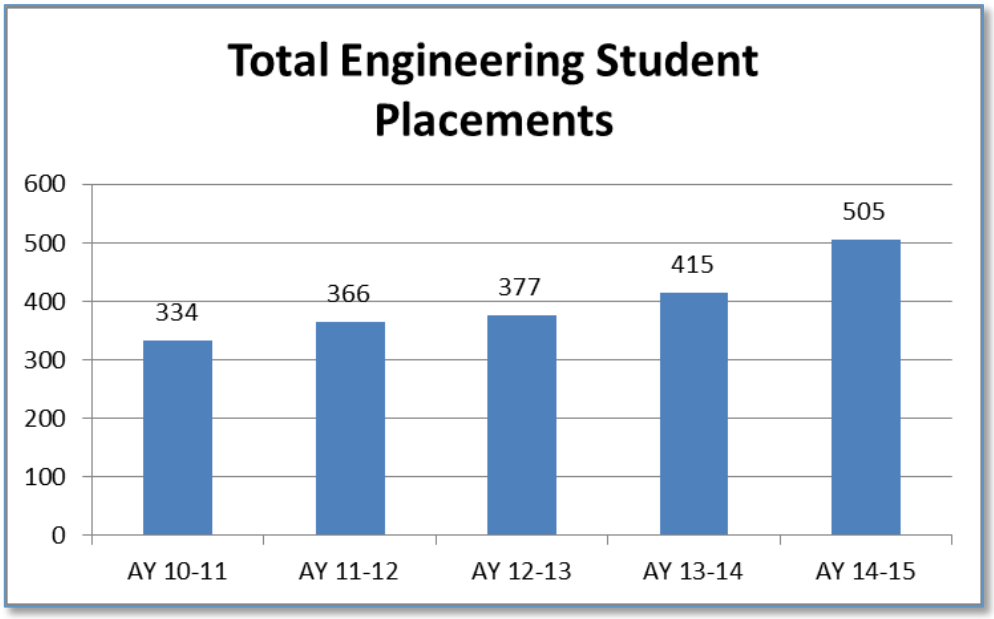
Top 30 Employers for 2014-2015 compared to the Top 30 Employers for past Ten Years

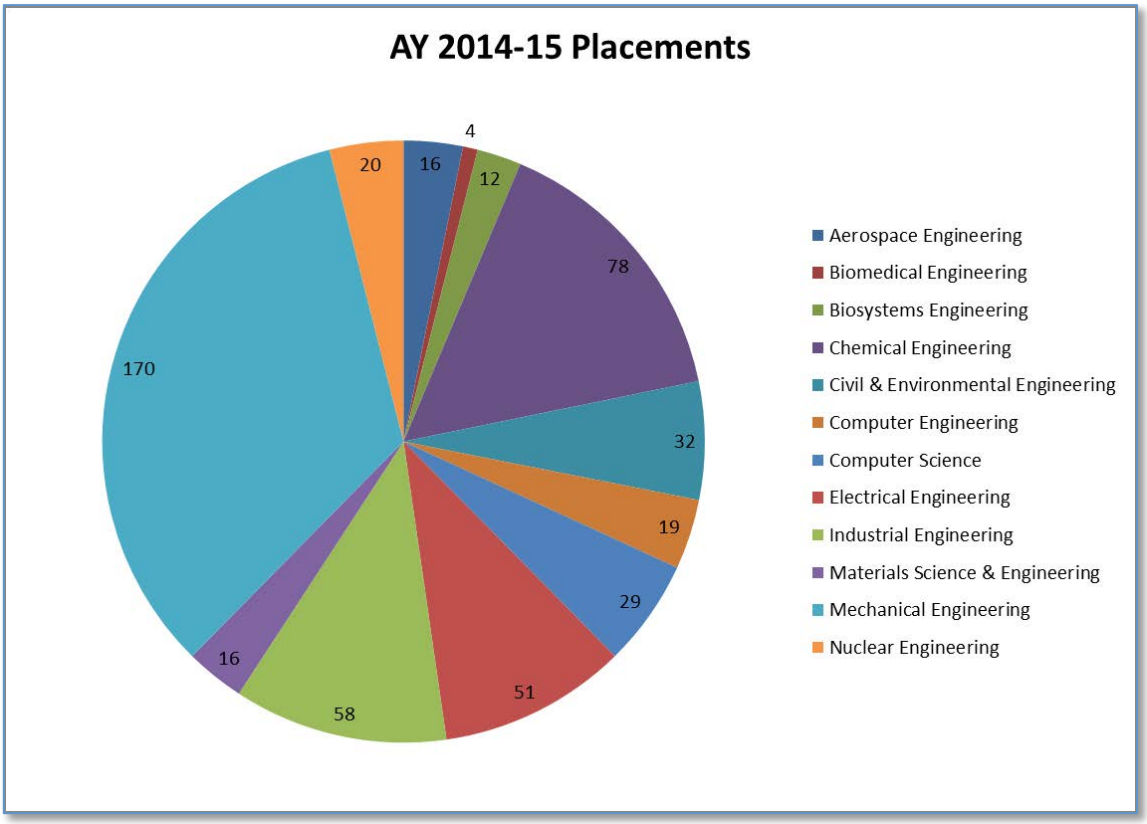




Student Placements are Continuing to Increase

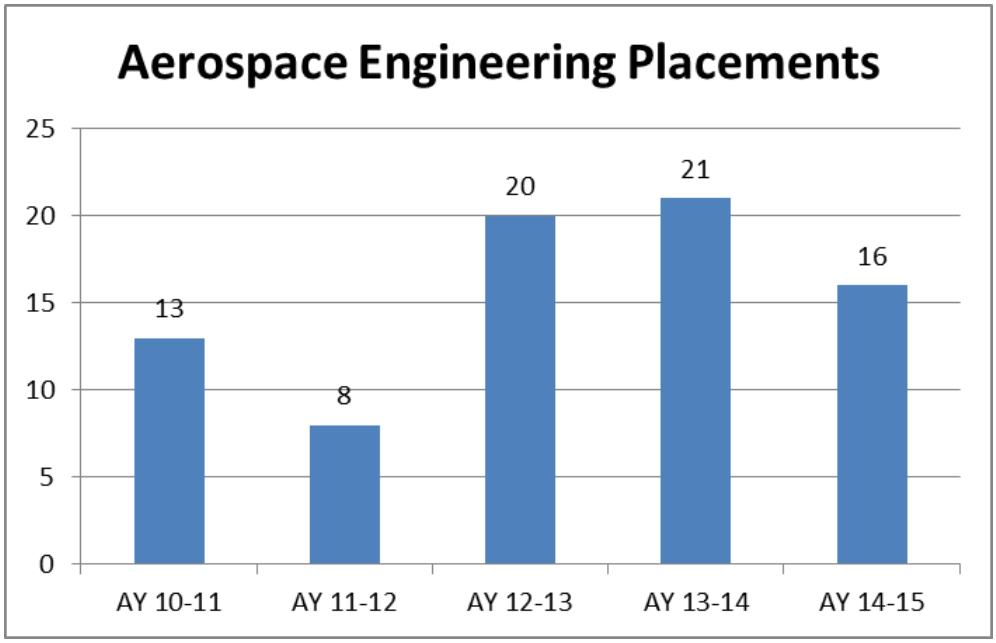
The program's student placements saw a dramatic 22% year over year growth in AY 14-15 which followed a significant 10% year over year grown the previous year. The total placement in AY 14-15 represent 51% growth over a five year period since the AY 10-11 year.

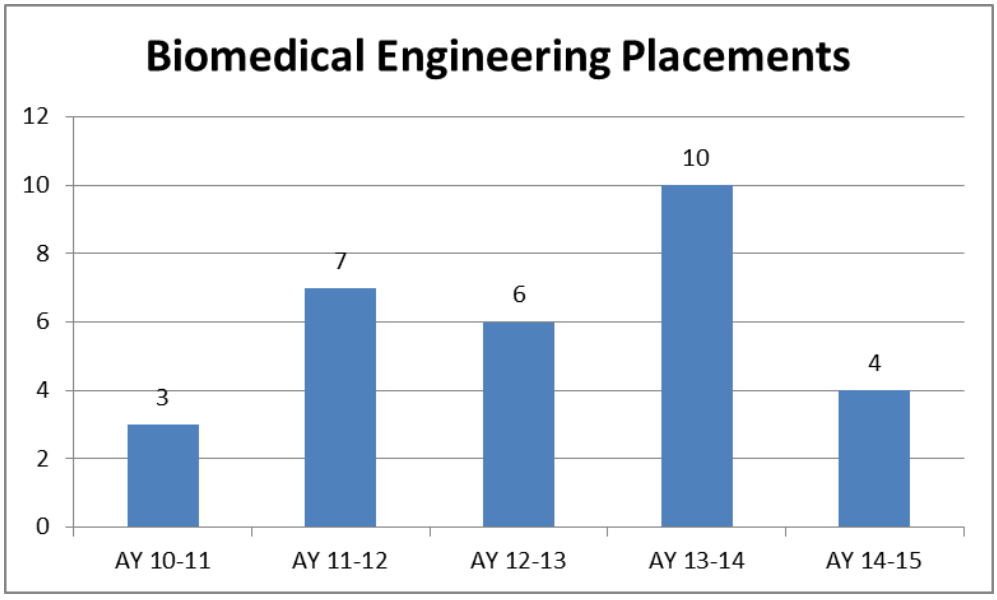


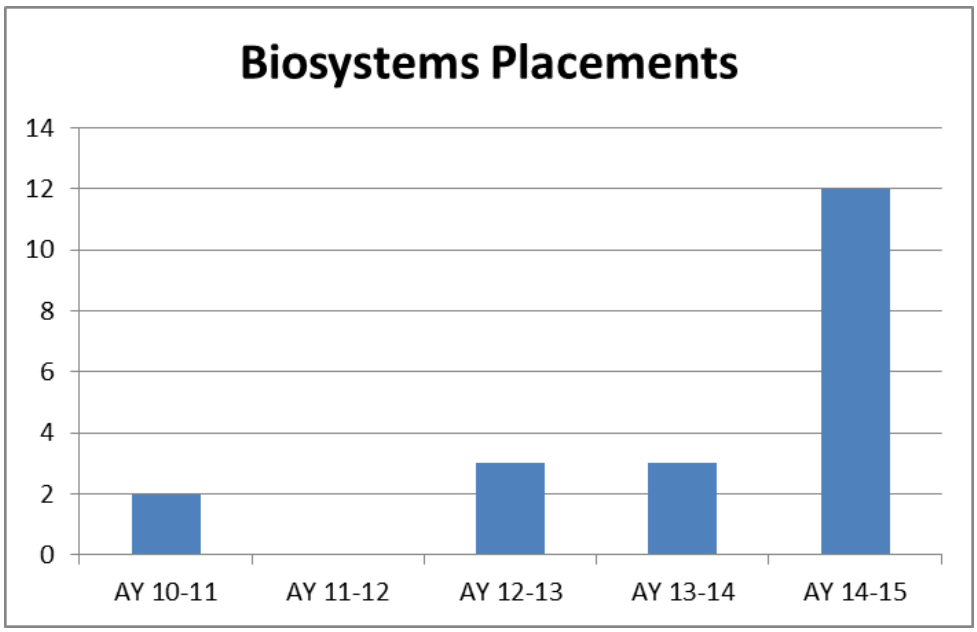


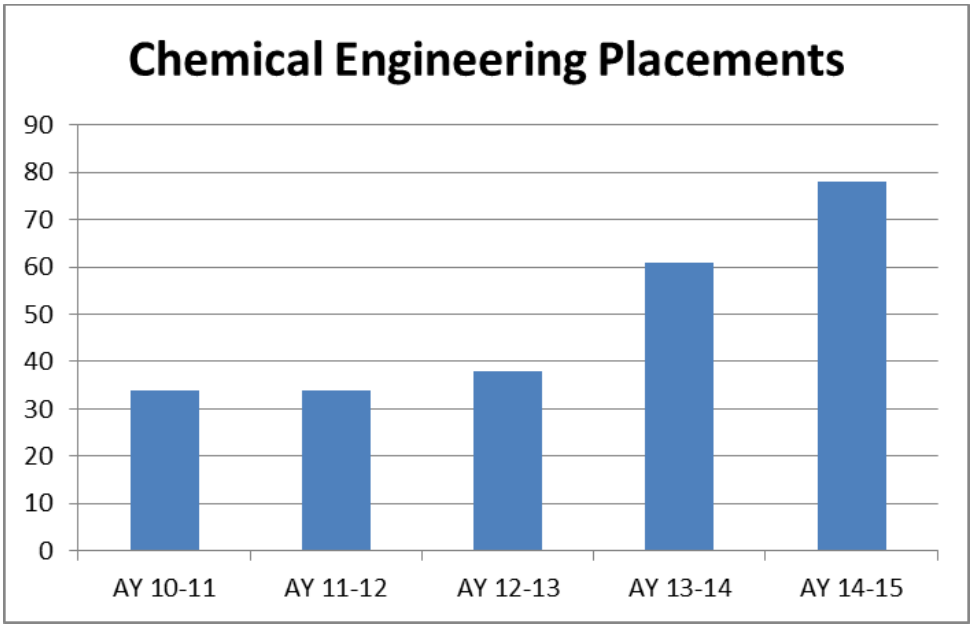
Placement of Engineering Majors by Discipline and by Year for the last Five Academic Years:

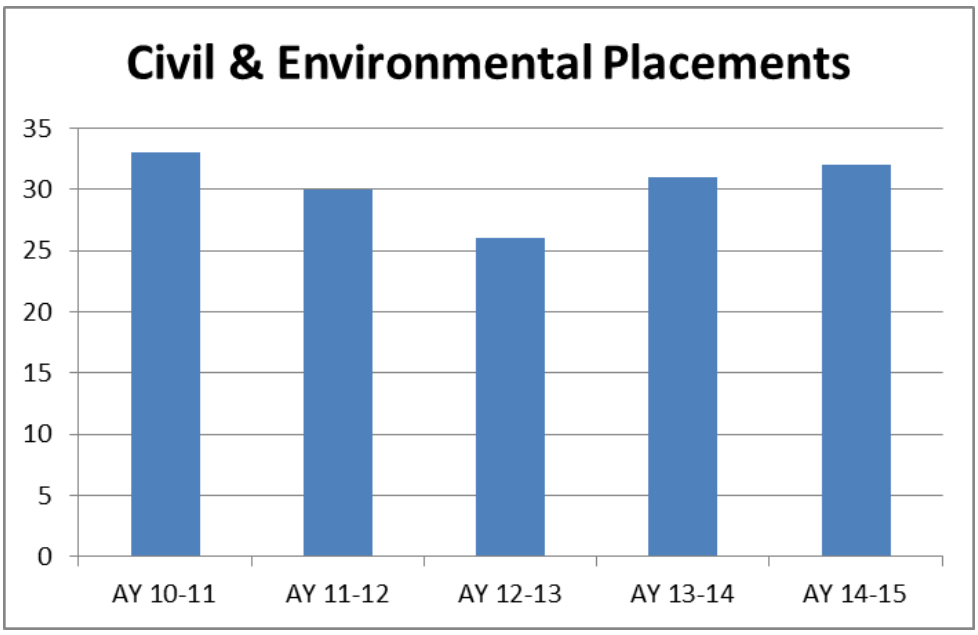
Year	Aero	Biomed	Biosys	Chem	Civil & Env	Comp Eng	Comp Sci	Elect	Ind & Sys	Mat Sci	Mech	Nuc	Total
AY 10-11	13	3	2	34	33	10	6	48	27	12	127	19	334
AY 11-12	8	7	0	34	30	11	4	63	30	9	146	24	366
AY 12-13	20	6	3	38	26	7	8	43	28	10	161	27	377
AY 13-14	21	10	3	61	31	12	13	44	31	12	153	24	415
AY 14-15	16	4	12	78	32	19	29	51	58	16	170	20	505

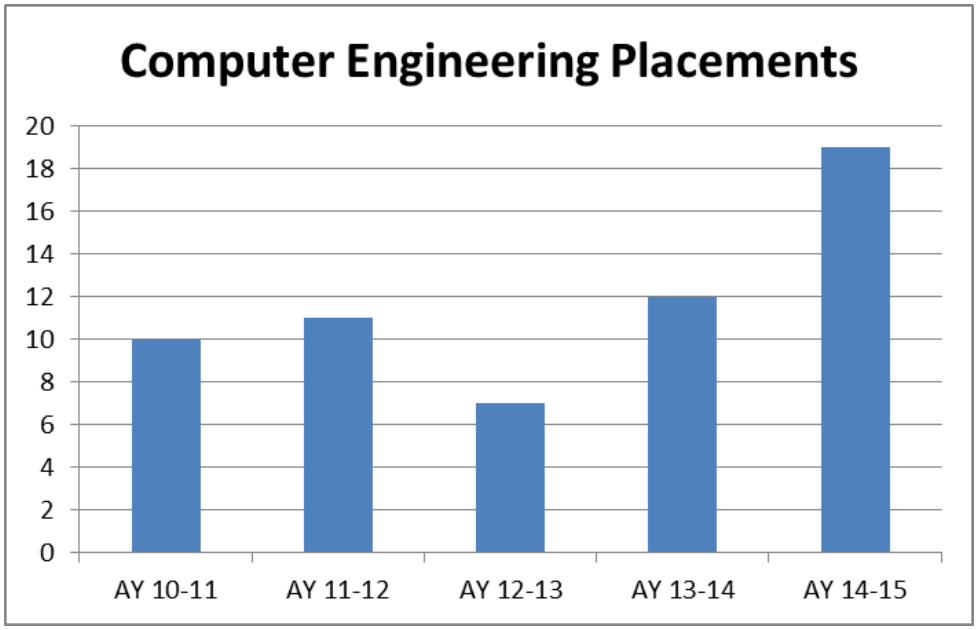


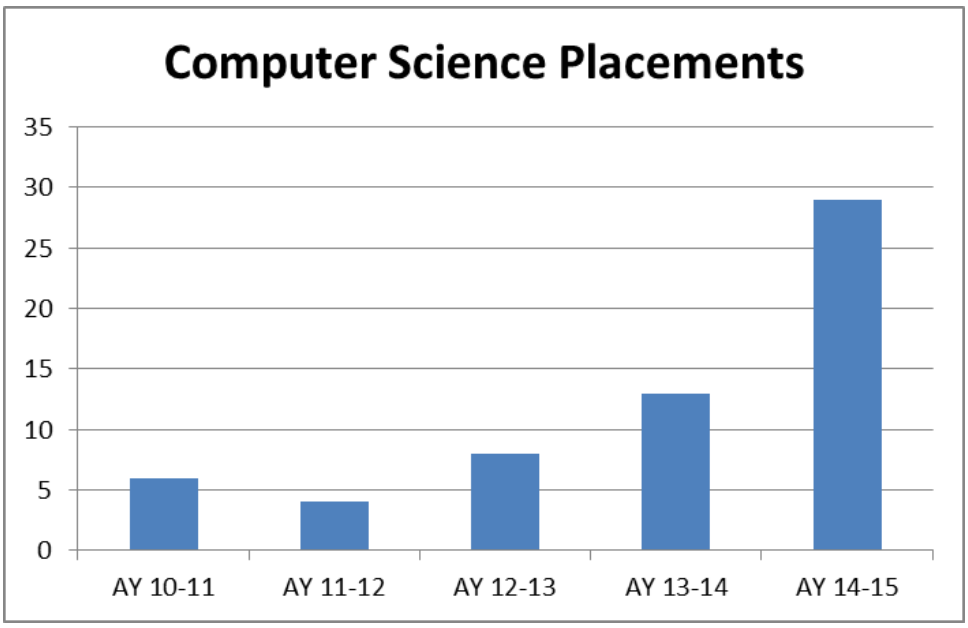


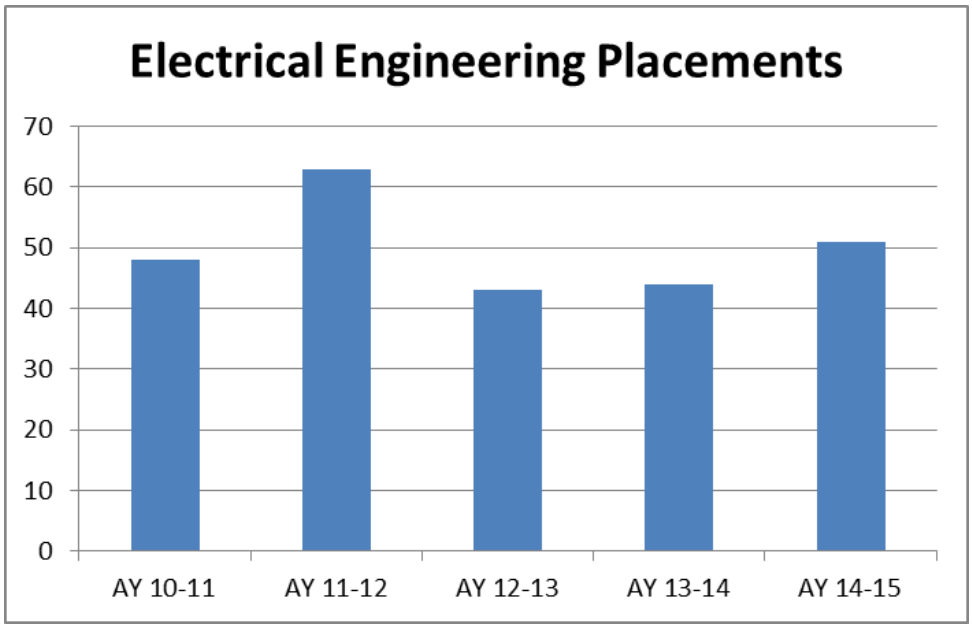

Biosystems Placements
14
12
10
8
6
4
2
0
AY 10-11
AY 11-12
AY 12-13
AY 13-14
AY 14-15

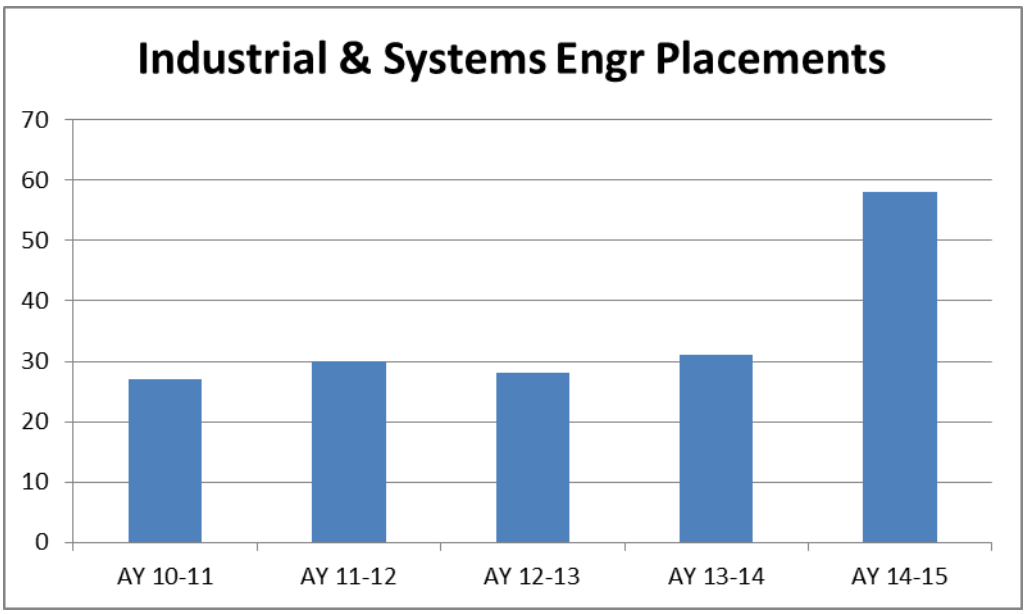

Chemical Engineering Placements
90
80
70
60
50
40
30
20
10
0
AY 10-11
AY 11-12
AY 12-13
AY 13-14
AY 14-15

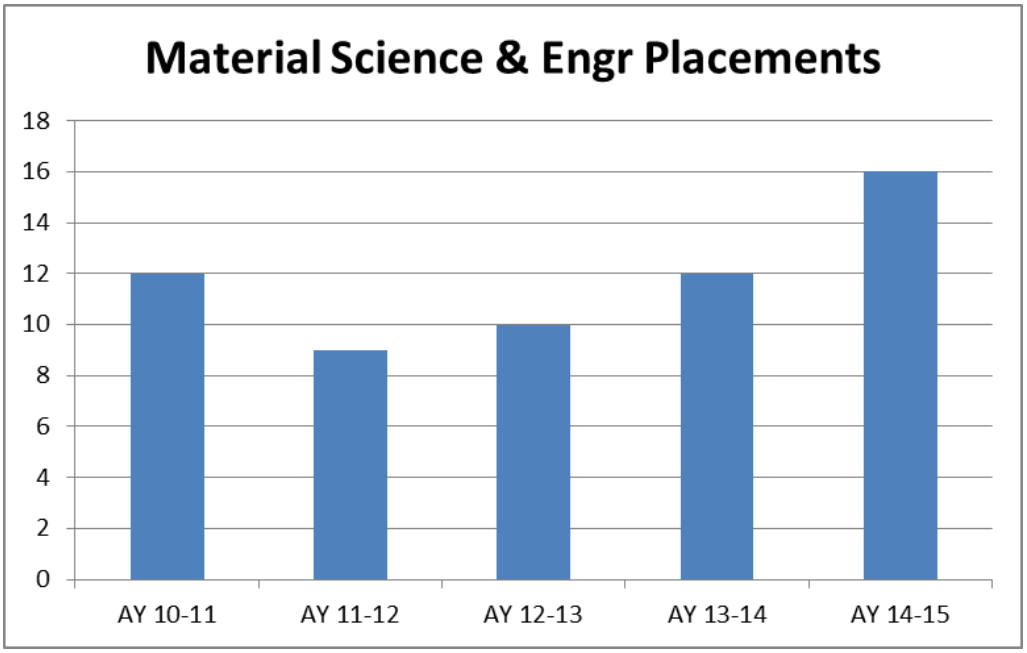

Civil & Environmental Placements
35
30
25
20
15
10
5
0
AY 10-11
AY 11-12
AY 12-13
AY 13-14
AY 14-15

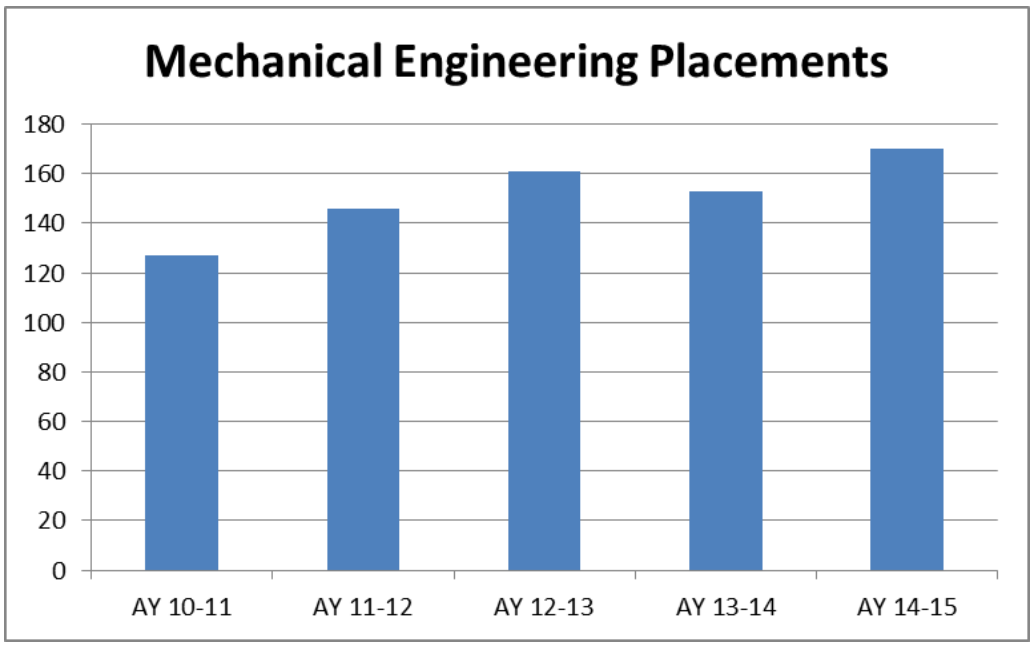

Computer Engineering Placements
20
18
16
14
12
10
8
6
4
2
0
AY 10-11
AY 11-12
AY 12-13
AY 13-14
AY 14-15

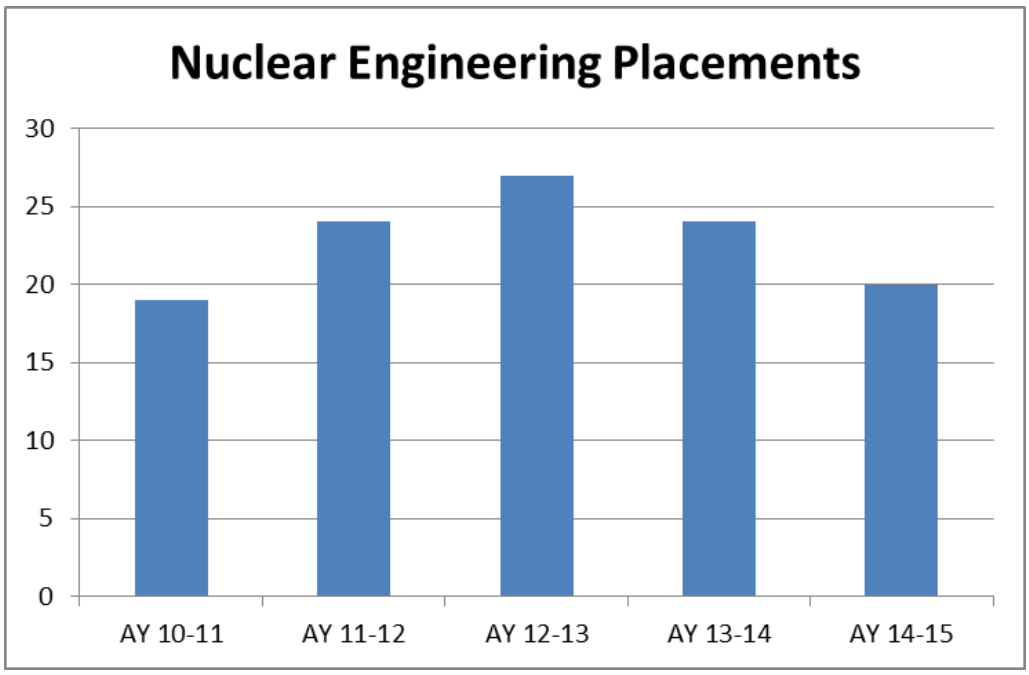

Computer Science Placements
35
30
25
20
15
10
5
0
AY 10-11
AY 11-12
AY 12-13
AY 13-14
AY 14-15


Electrical Engineering Placements
70
60
50
40
30
20
10
0
AY 10-11
AY 11-12
AY 12-13
AY 13-14
AY 14-15


Industrial & Systems Engr Placements
70
60
50
40
30
20
10
0
AY 10-11
AY 11-12
AY 12-13
AY 13-14
AY 14-15

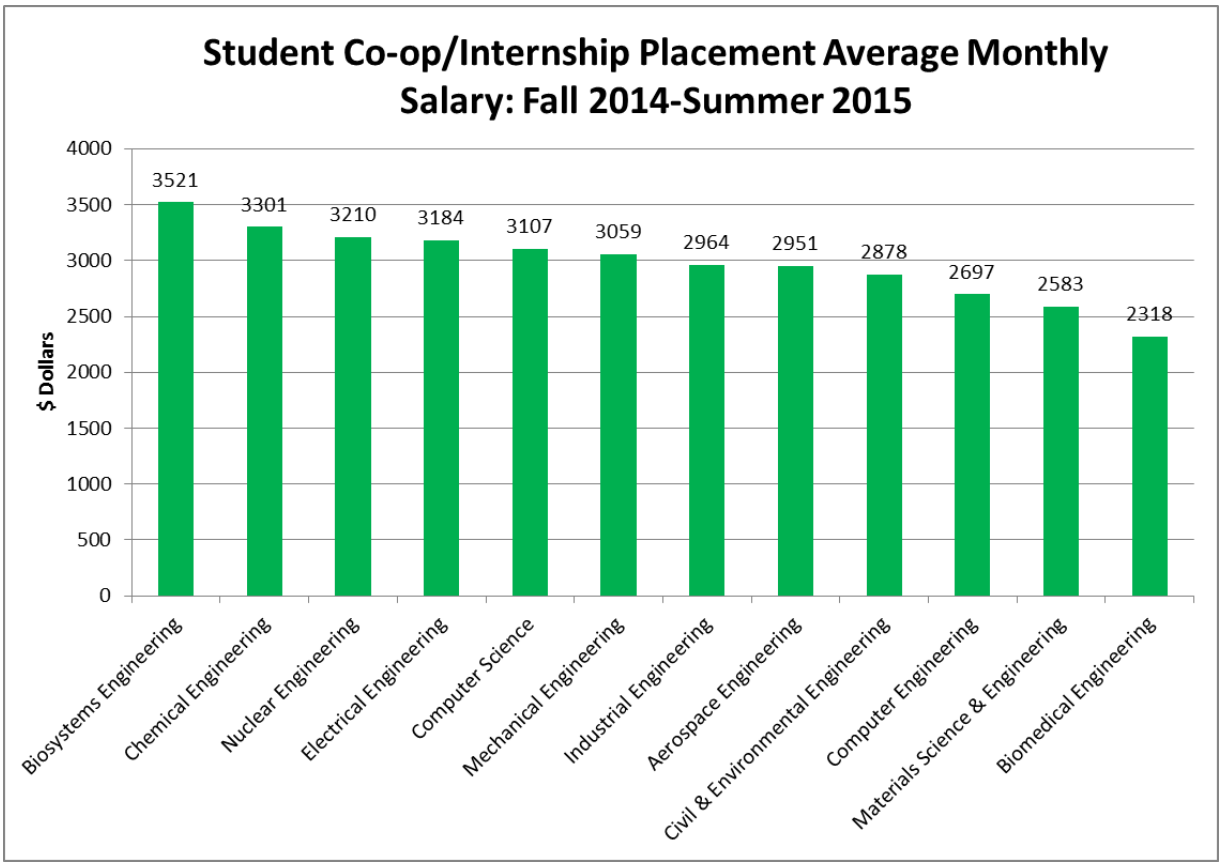

Material Science & Engr Placements
18
16
14
12
10
8
6
4
2
0
AY 10-11
AY 11-12
AY 12-13
AY 13-14
AY 14-15


Mechanical Engineering Placements
180
160
140
120
100
80
60
40
20
0
AY 10-11
AY 11-12
AY 12-13
AY 13-14
AY 14-15


Nuclear Engineering Placements
30
25
20
15
10
5
0
AY 10-11
AY 11-12
AY 12-13
AY 13-14
AY 14-15

Student Co-op/Internship Placement Monthly Salary: Fall 2014-Summer 2015

Engineering students continue to earn significant amounts of money during their engineering co-op and internship experiences. Students are then able to use some of this money to assist with housing, books, and tuition during the semester they return to campus.



In a typical year, engineering students collectively will earn over $6.0 million. This means that the Engineering Professional Practice program is not only educationally relevant to students, but also financially relevant to students. Students then bring a portion of this money back to campus and therefore it is financially relevant to the College of Engineering and The University of Tennessee.

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