

2016 *annual report*



ENGINEERING
PROFESSIONAL PRACTICE



In 2016 we proudly celebrated our 90th anniversary of cooperative education here at the University of Tennessee.

As we move into 2017, we continue to see unprecedented growth in student participation, employer participation, and now the expansion of our program beyond traditional co-ops and internships into other areas of engineering student enrichment. Our program, which helps students add experience to their education, has been in existence since 1926. It's the second oldest program of its kind in the south and one of oldest cooperative education programs anywhere. We are dedicated to helping engineering students find educationally relevant paid co-op and internship positions with one of our hundreds of partnering employers.



Recent Key Accomplishments

- The fall 2016 Engineering Expo was our largest ever with 80 employers and 731 students attending.
- The spring 2016 Engineering Expo was our largest employer-attended spring event in our history, with 69 employers and 490 students attending.
- More than 1,250 students, faculty, and staff attended the fall 2015 Engineering Cookout, making it the largest ever.
- In March 2016 we held the fifth annual Engineering Professional Practice Spring Banquet.
- In AY16, 42 percent of graduating engineering seniors completed at least one co-op or internship assignment during their time at UT. Over the past eight years of senior classes, on average, 40 percent of those graduating have participated in at least one assignment.

Student Training: Prep for Success

We continue to hold our highly successful Prep for Success sessions each fall and spring semester, which provide tips and advice to aspiring co-op and internship students. Topics include dressing for success, personal branding, interview preparation, interview strategies, and recommendations on how to succeed at the Engineering Expo and Interview Day events.



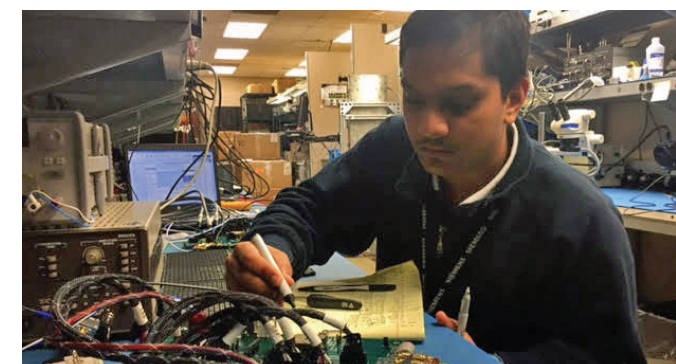
J. Michael Stone Engineering Professional Practice Leadership Development Program

This program is specifically for engineering students who obtain co-op and internship assignments through our program. While on assignment, students are provided books on leadership development and communication skills and are encouraged to apply the skills learned during their assignments. The program also enables us to bring speakers to campus for additional leadership development opportunities.

These leadership skills go hand in hand with the academic knowledge our students gain through their coursework and add to the experiential learning process, combining problem-solving and lifelong learning skills with critical reflection.

The program began in 2014 thanks to the generosity of alumnus J. Michael Stone ('63).

Benefits of Experiential Learning



Any Experience is Good, But Co-op Experience is Best

In light of the many pressures engineering students find themselves in to graduate quickly and find a job, and with a plethora of opportunities to conduct undergraduate research, study abroad, and more, 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 work experience

During a co-op, the depth of the student's understanding of engineering principles and work experience grows over the course of the three semesters such that the third semester of work typically results in 50-75 percent of the meaningful work experience gained.

Improved Academic Performance

Our data shows that students who participate in co-ops 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 much about engineering. While on assignment, they are exposed to real-world problems and challenges that they may not be exposed to or may never get the opportunity to learn in class.

Upon returning to school, they begin to see the engineering fundamentals behind the challenges they faced in the field, which leads to deeper learning. As they progress academically, they begin to learn concepts that they've already seen in the field which further re-enforces the learning process. This process of applied learning is very similar to what takes place on a smaller scale during a physics class and physics lab: classroom learning and experiential learning.





Employer Benefits of Hosting Co-op Students

- Engages our most ambitious and enthusiastic students early on in their academic timeline
- Infuses new ideas and methods
- Develops young engineers in your particular methods and processes
- Provides greater company visibility on the University of Tennessee campus
- Enhances the student's education through work experience offered early in the educational process
- Increases opportunities for technology transfer



Student Benefits of Co-op Assignments

- Helps bridge the gap between theoretical study and the professional world
- Provides greater understanding of exactly what engineers do in order to confirm their decision to study engineering
- Become professionals who take their learning in to the classroom and adapt it to the workplace
- Provides a head start on classroom learning by working with engineering principles on the job
- Receive co-op program participation on their academic transcripts
- Improves self-confidence, motivation, professional skills, and the ability to interact with people
- Significantly increases the level of job and salary offers upon graduation
- Ability to offset educational expenses with co-op earnings
- Receive one year's credit toward professional licenses in the state of Tennessee upon program completion



Students with Experience Accelerate Their Futures

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

- Good grades
- Professional engineering experience
- Ability to communicate well

In reality, students who choose to participate in co-ops 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 percent of co-op students receive a job offer from their co-op employer. Approximately 50 percent 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

Cooperative education at UT requires a student to work at least three semesters with the same company, typically alternating between work and school.

Year	Fall	Spring	Summer
First	School	School	Work
Second	School	Work	School
Third	Work	School	School
Fourth	School	School	

Co-op students are motivated to graduate as quickly as possible. To this end, the Tickle College of Engineering (TCE) has structured its academic program to ensure minimal impact to engineering graduation rates.

Since 2013, improved opportunities to take courses during summer semesters at the university level has enhanced our co-op students' ability to graduate more quickly. Previous summer semesters did not have a robust enough set of course offerings to always ensure timely graduation rates.

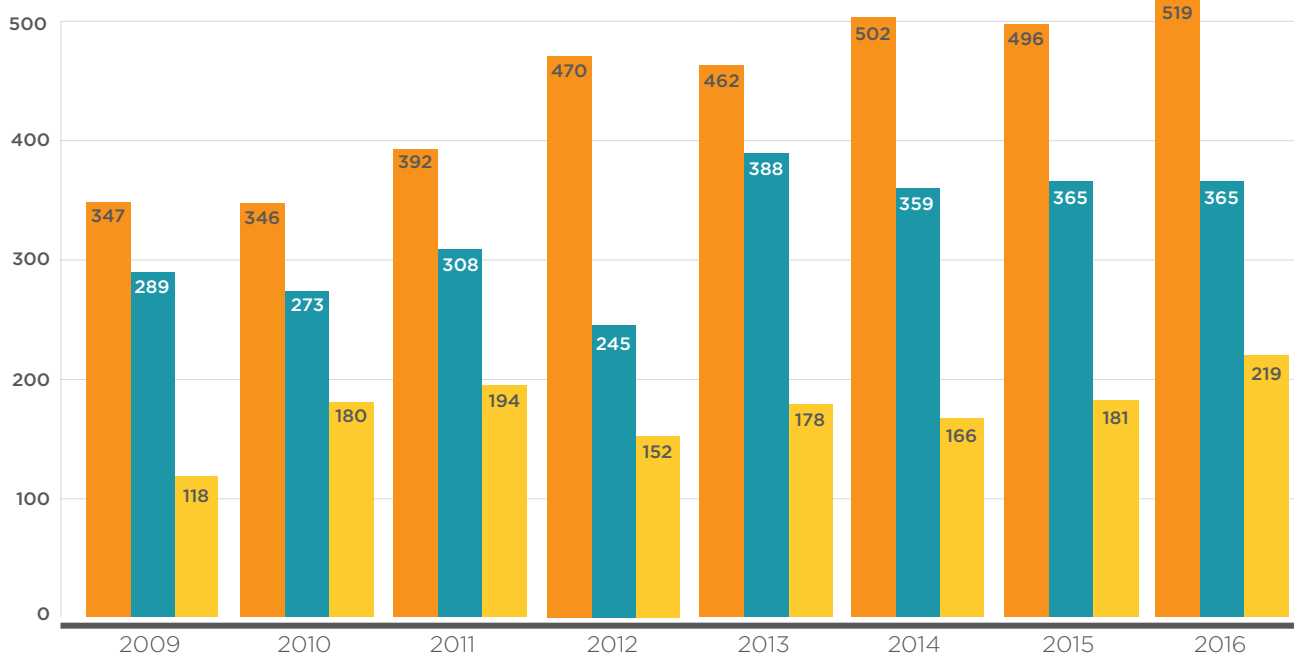
Year	Fall	Spring	Summer
First	School	School	School
Second	Work	School	Work
Third	School	Work	School
Fourth	School	School	

Students who start the co-op process the summer before their sophomore year and make full use of the three summer semesters can still graduate in the spring of their fourth 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.

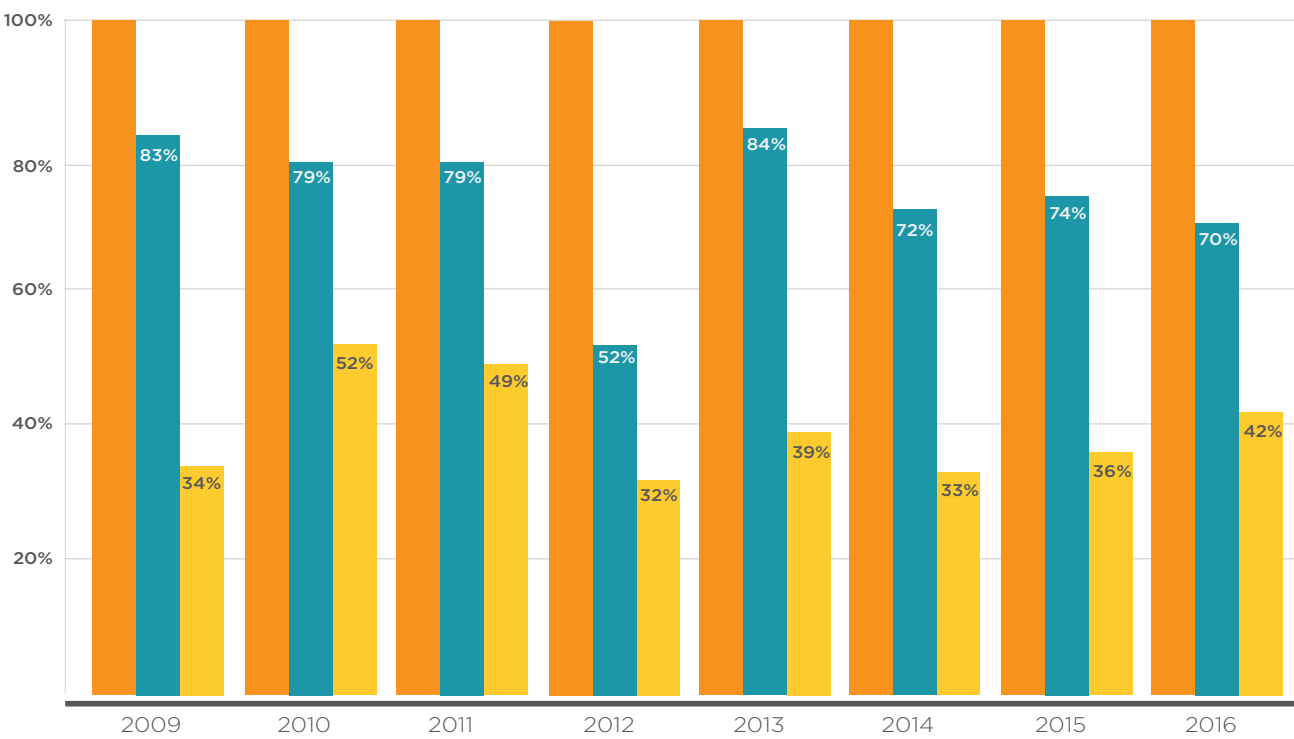
Graduating Students Who Participated in the Program

Our office continues to see strong interest and high participation levels from engineering students. In total, the number of placed TCE graduates participating in co-op and internships averaged 40 percent from AY2009 through AY2016. Additionally, since 2009 at least 75 percent of graduating seniors have, on average, at least registered with our program.

Undergraduate Engineering Students Graduating in the Academic Year Participating—Totals



Undergraduate Engineering Students Graduating in the Academic Year Participating—Percentages

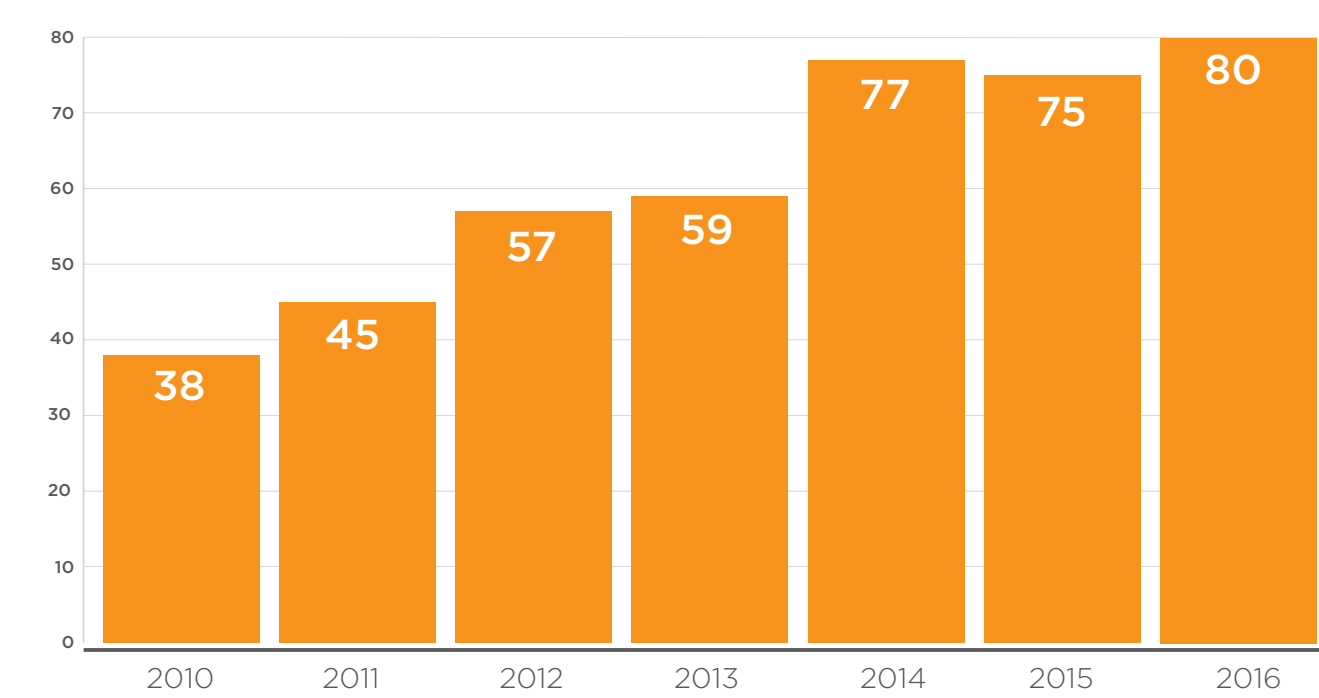


- Total TCE Grads = all graduating engineering students in the academic year
- Total Registered Grads = all engineering students that at least registered with the Office of Engineering Professional Practice
- Total Placed Grads = number of graduating engineering students that worked at least one assignment.

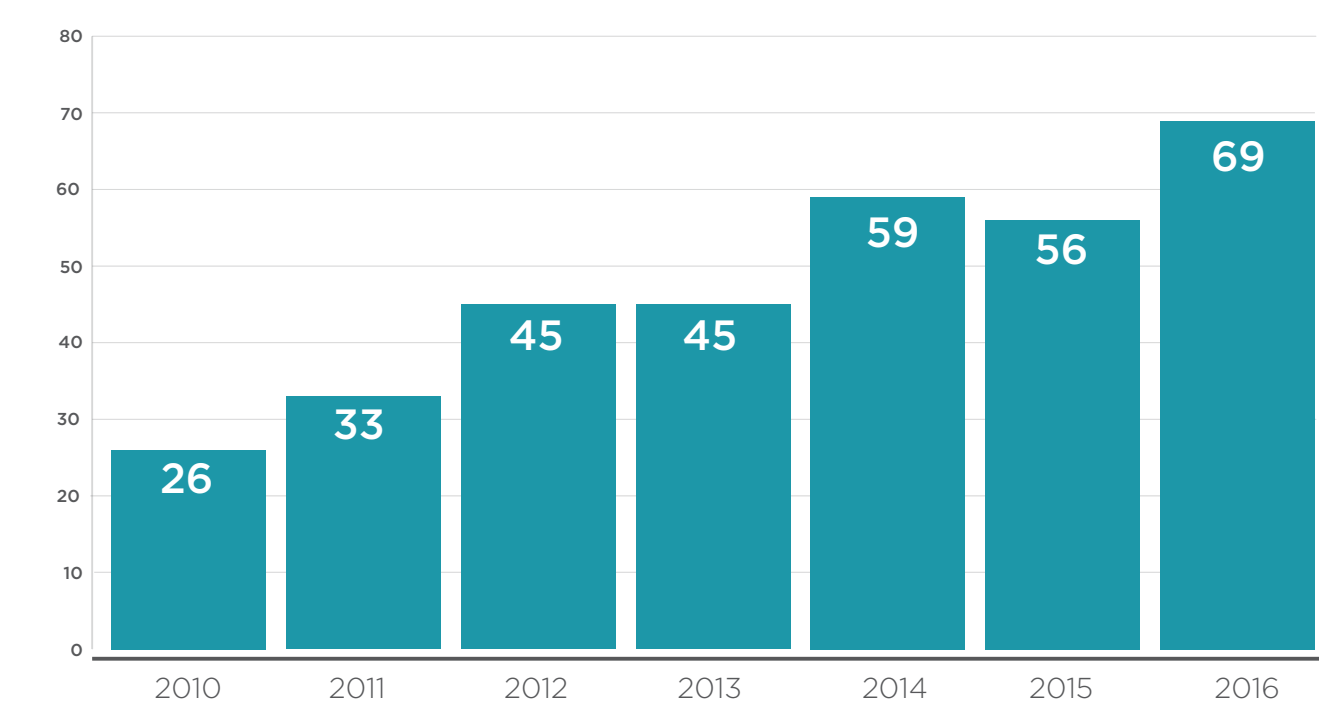
Engineering Expo Employer Attendance is on the Rise

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 2016 and the fall of 2016 were record setting once again.

Fall Expo: Employer Attendance



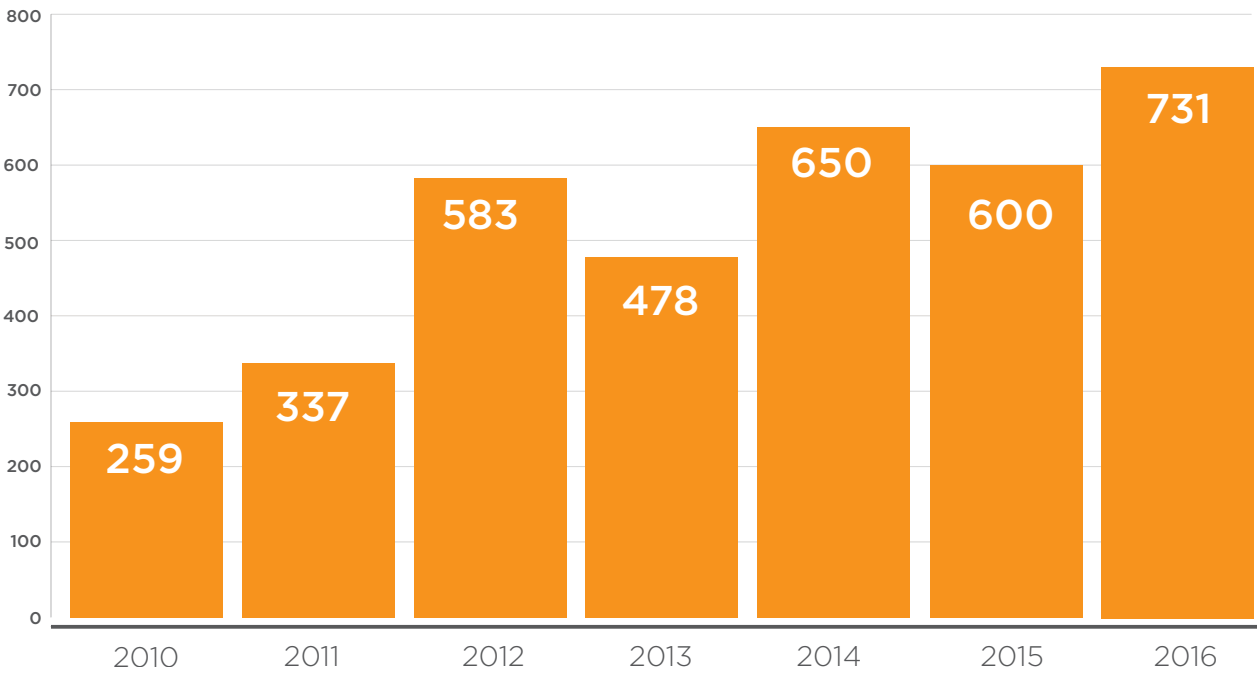
Spring Expo: Employer Attendance



Engineering Expo Student Attendance is Strong

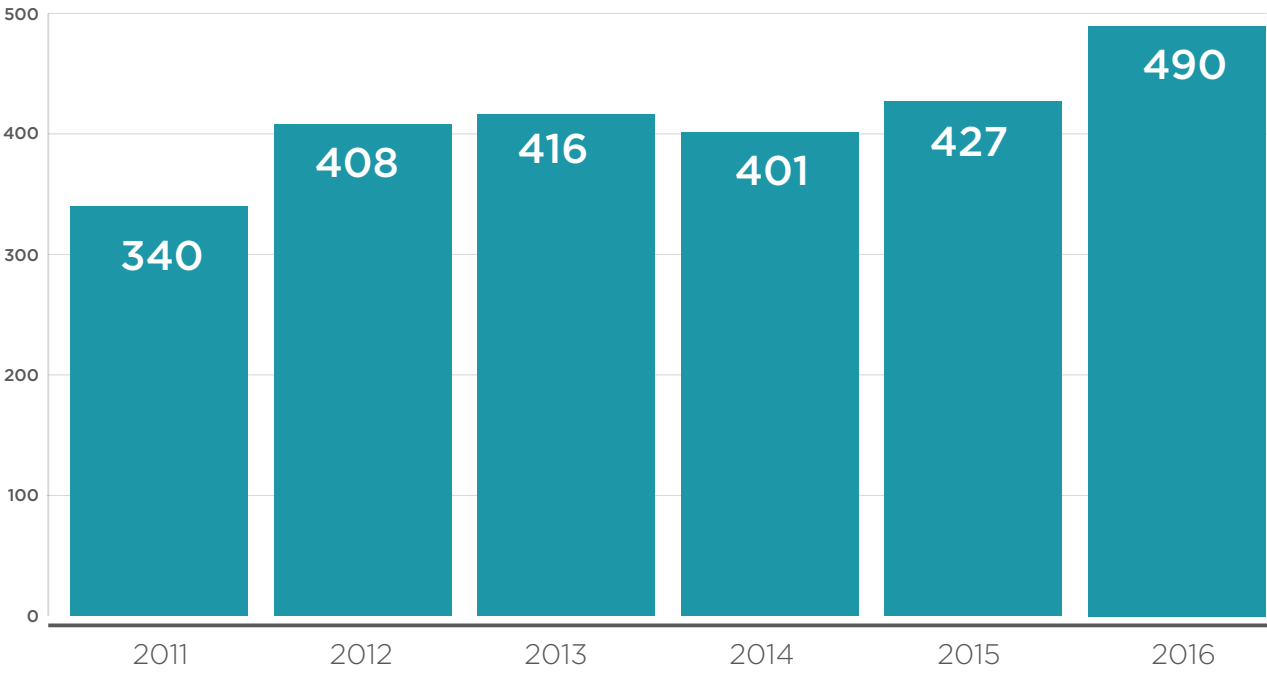
After a slight downturn in student attendance in the fall of 2015, we saw a significant increase in student attendance to a record of 731 students in the fall of 2016. This jump represents a 51 percent year-over-year increase and a **182 percent student attendance increase** over the fall of 2010.

Fall Expo: Student Attendance



Spring Engineering Expo attendance was holding steady, but rose to its highest record-setting level in spring 2016.

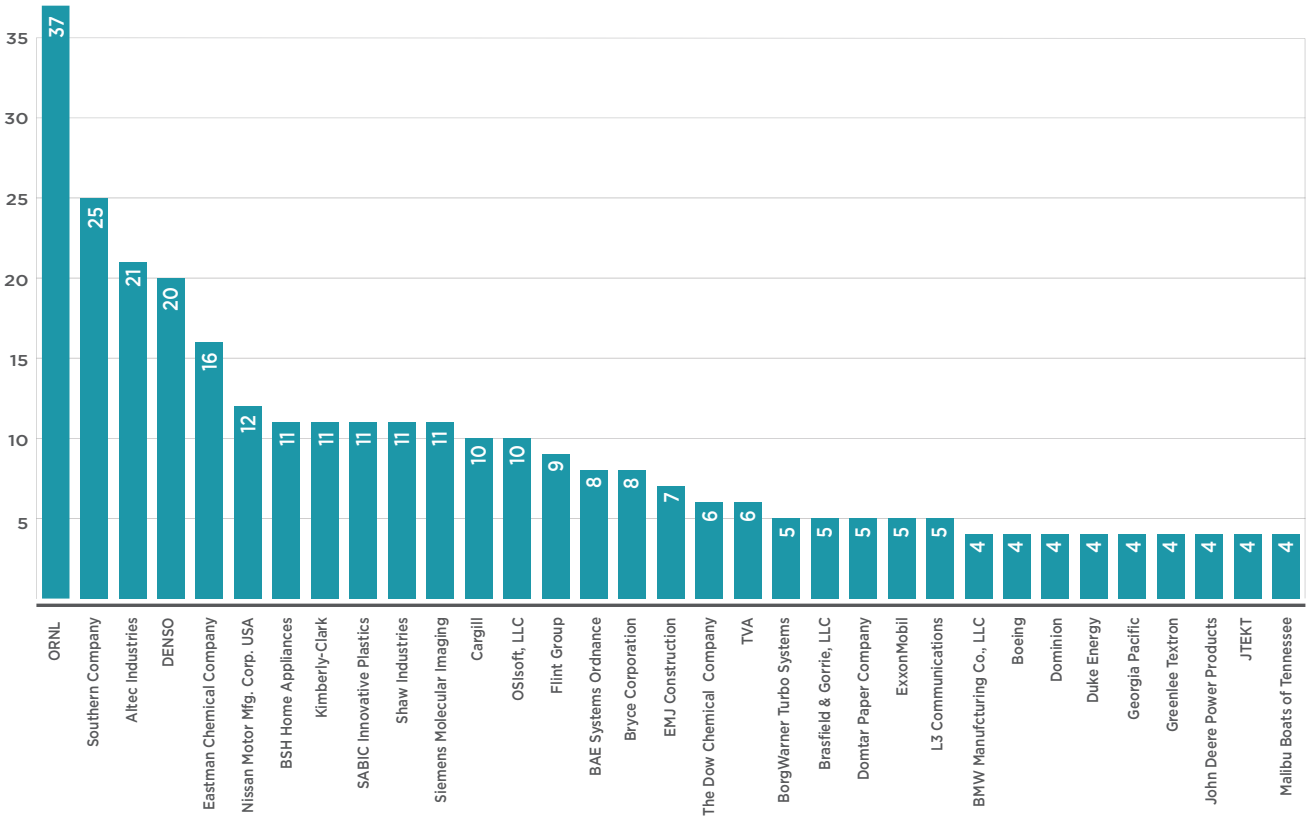
Spring Expo: Student Attendance



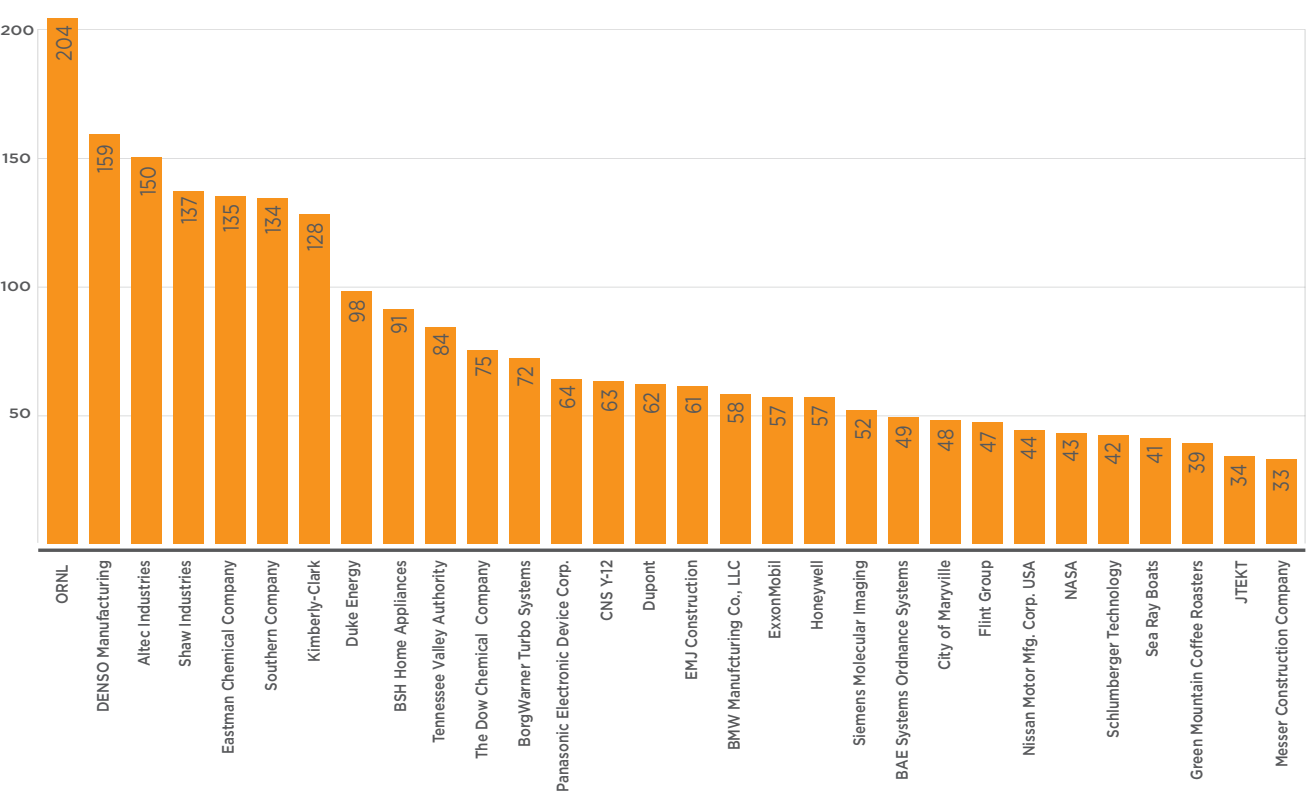
Top 30 Employers

ORNL continues to place the most co-op students, with DENSO, Altec, Southern Company, Eastman Chemical Company, and others consistently placing students year after year.

Top 30 Employers Placements: Academic Year 2015-2016



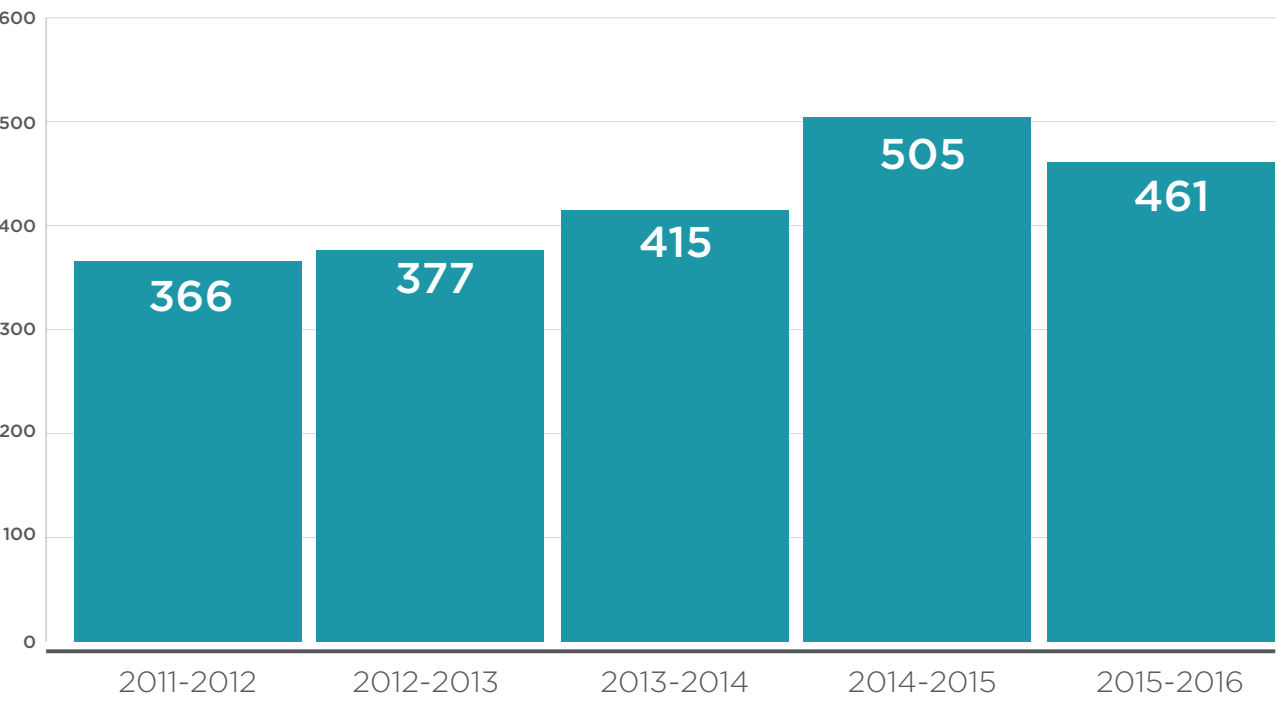
Top 30 Employers Placements: Academic Years 2006-2016



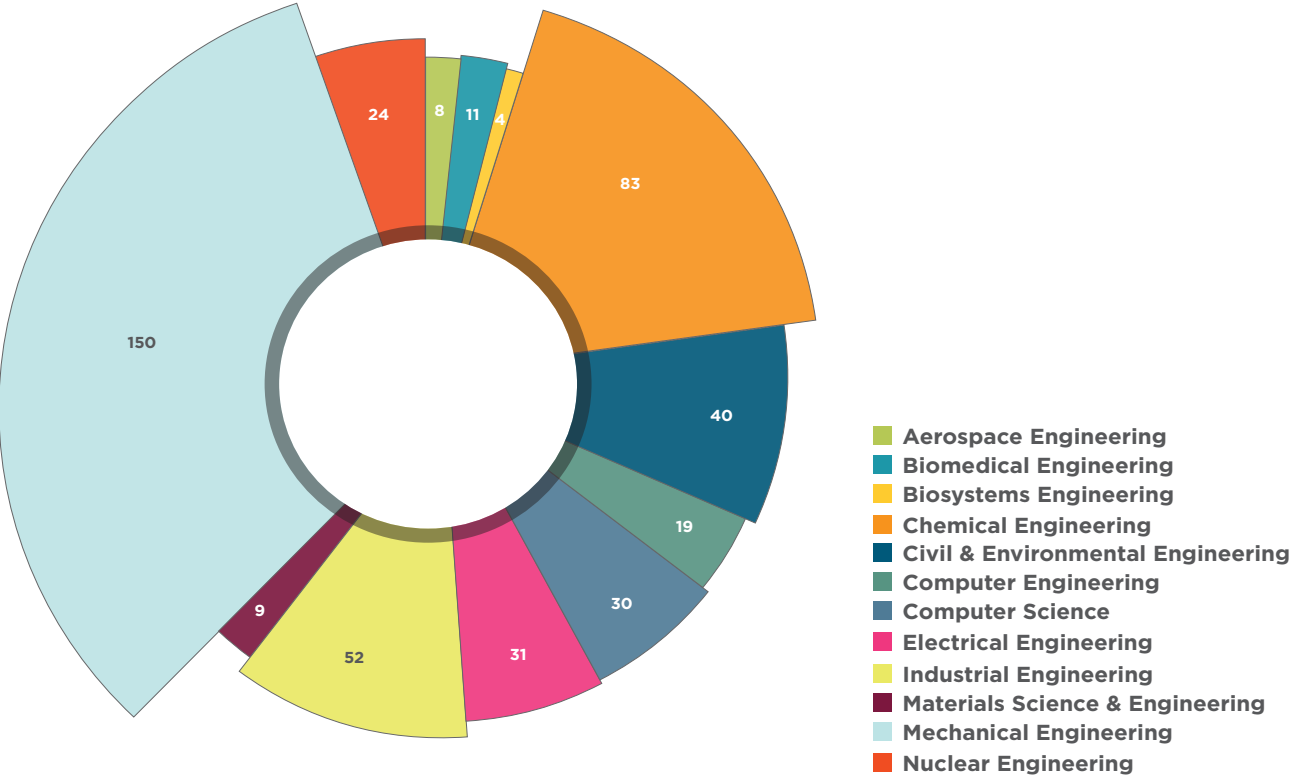
Student Placements Continue to Increase

The program’s student placements saw a slight 9 percent decrease in AY15-16, which is consistent with the decreased student attendance at the fall 2015 Engineering Expo and the year or so lag that occurs between the expo and the start of student placements. In our data, we do see placement numbers rising again in 2016-17.

Total Engineering Student Placements



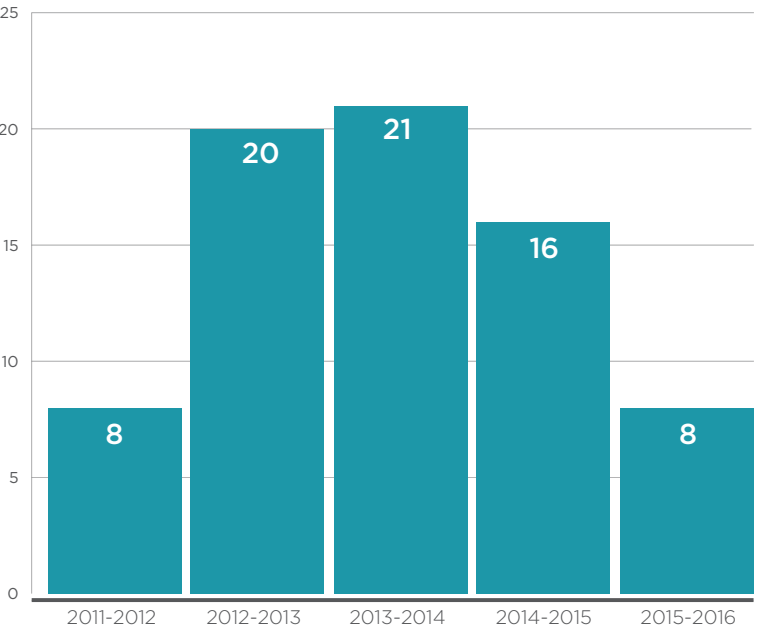
Academic Year 2015-2016 Placements



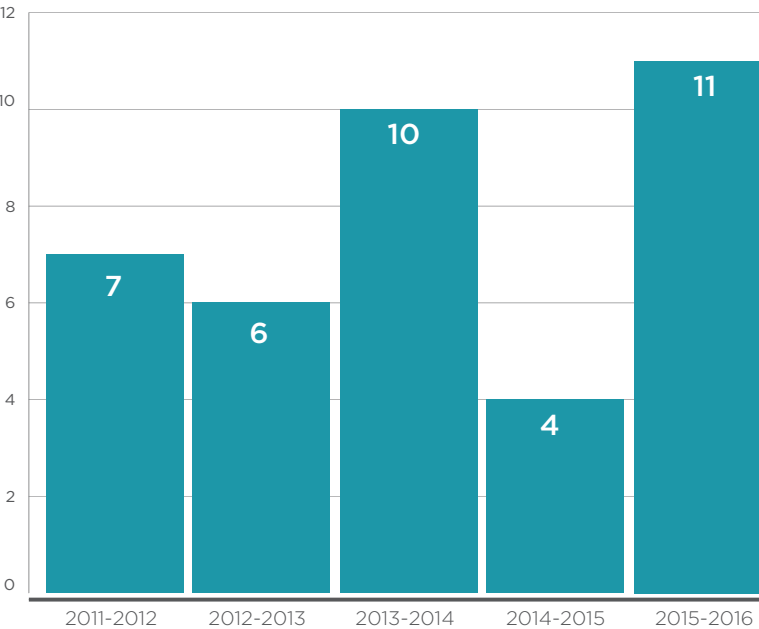
Placement of Engineering Majors by Discipline and Year for the Last Five Academic Years

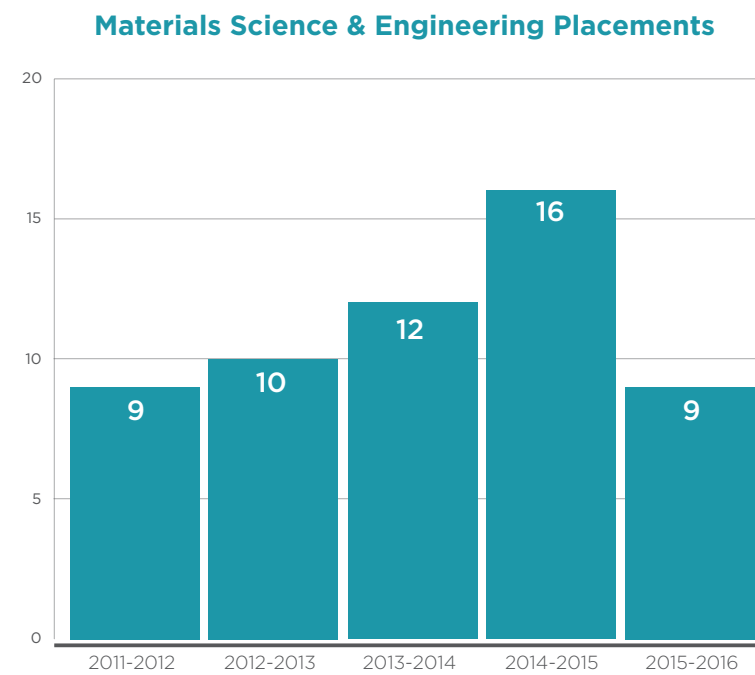
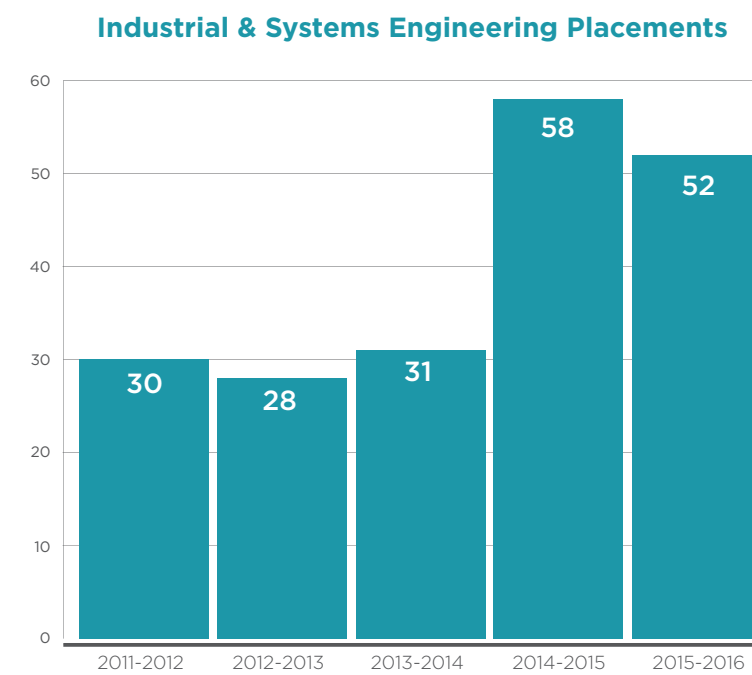
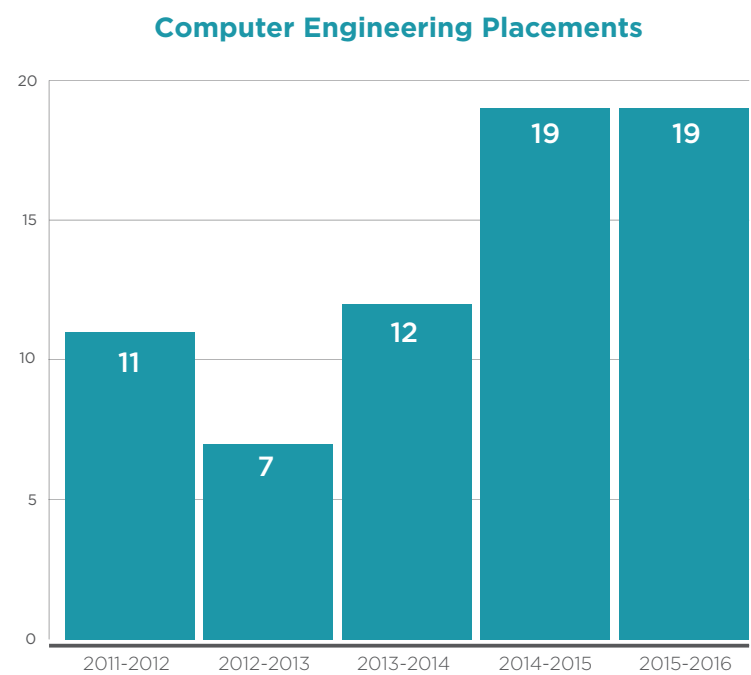
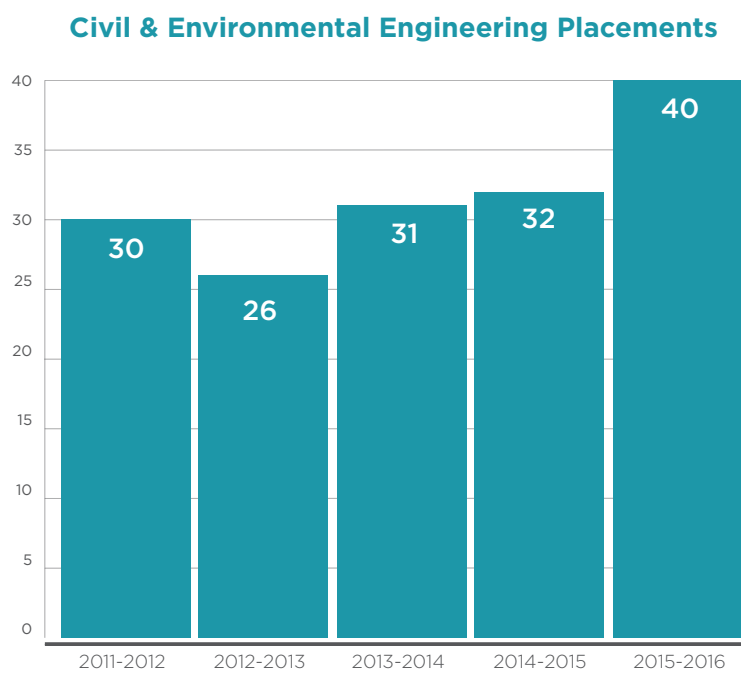
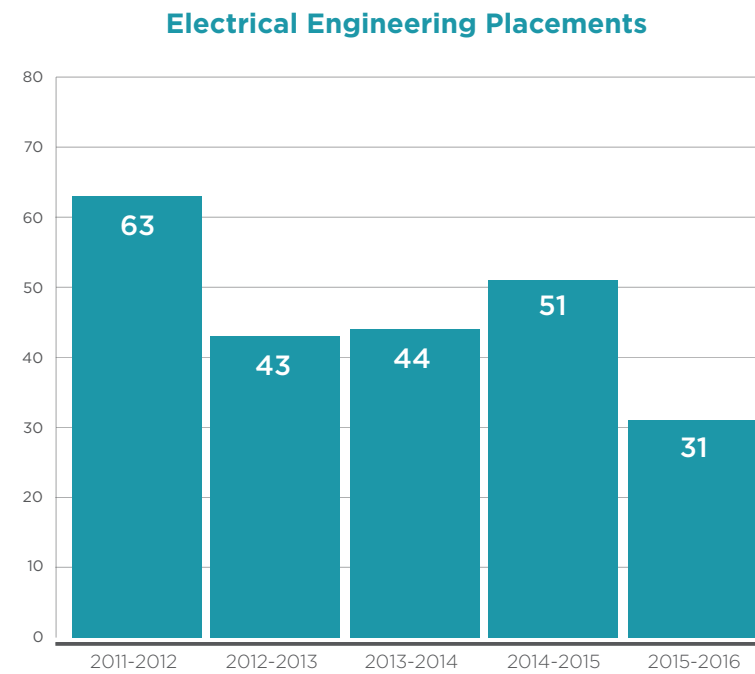
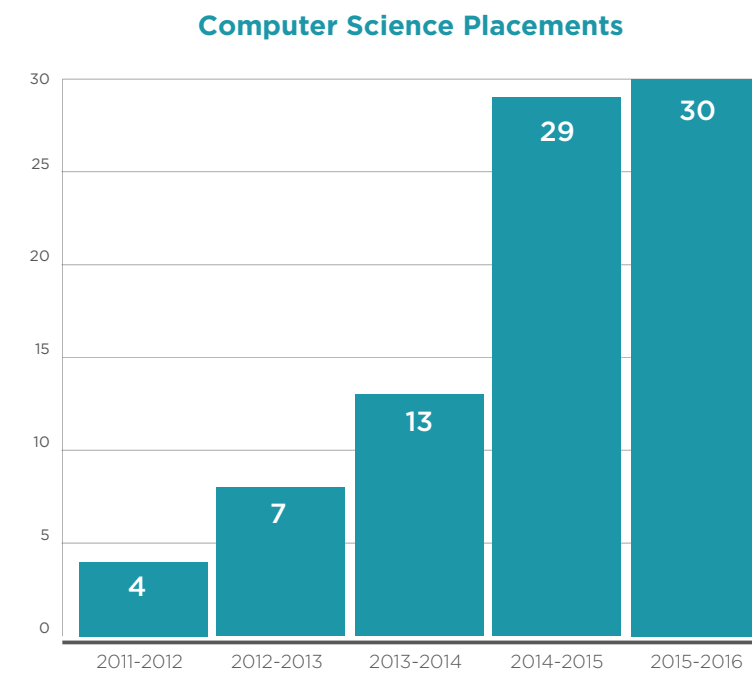
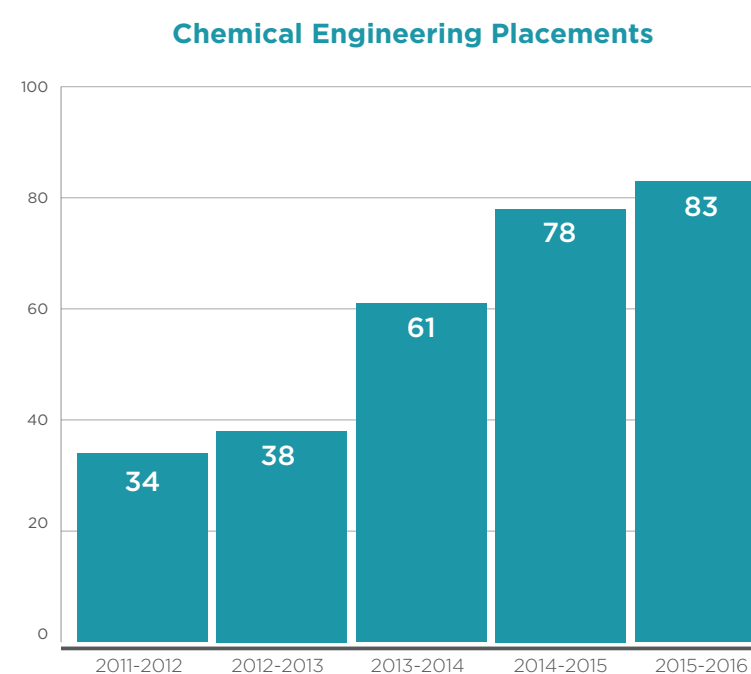
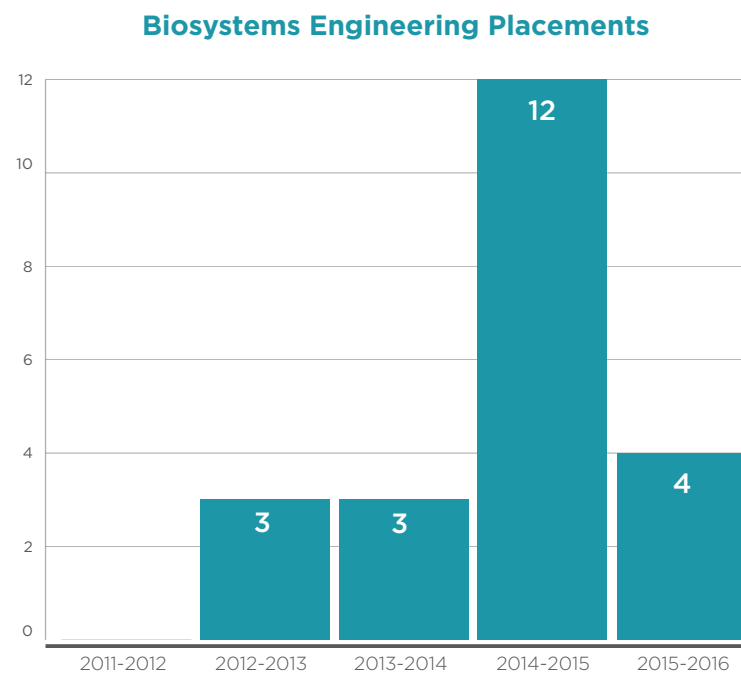
Major	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Aerospace Engineering	8	20	21	16	8
Biomedical Engineering	7	6	10	4	11
Biosystems Engineering	0	3	3	12	4
Chemical Engineering	34	38	61	78	83
Civil & Environmental Engineering	30	26	31	32	40
Computer Engineering	11	7	12	19	19
Computer Science	4	8	13	29	30
Electrical Engineering	63	43	44	51	31
Industrial & Systems Engineering	30	28	31	58	52
Materials Science & Engineering	9	10	12	16	9
Mechanical Engineering	146	161	153	170	150
Nuclear Engineering	24	27	24	20	24
Total	366	377	415	505	461

Aerospace Engineering Placements

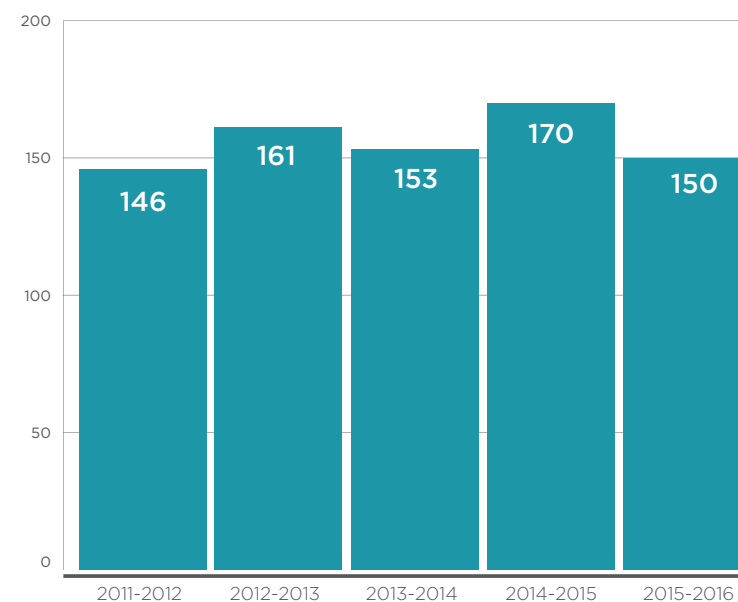


Biomedical Engineering Placements

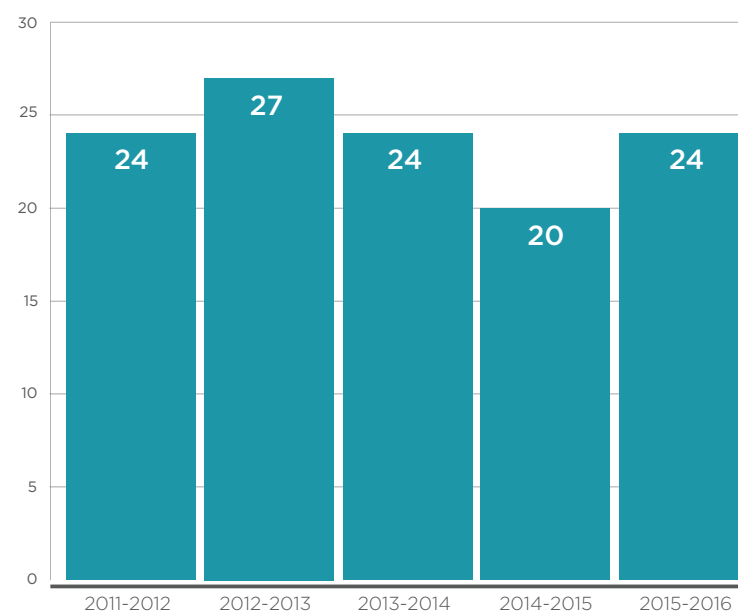




Mechanical Engineering Placements



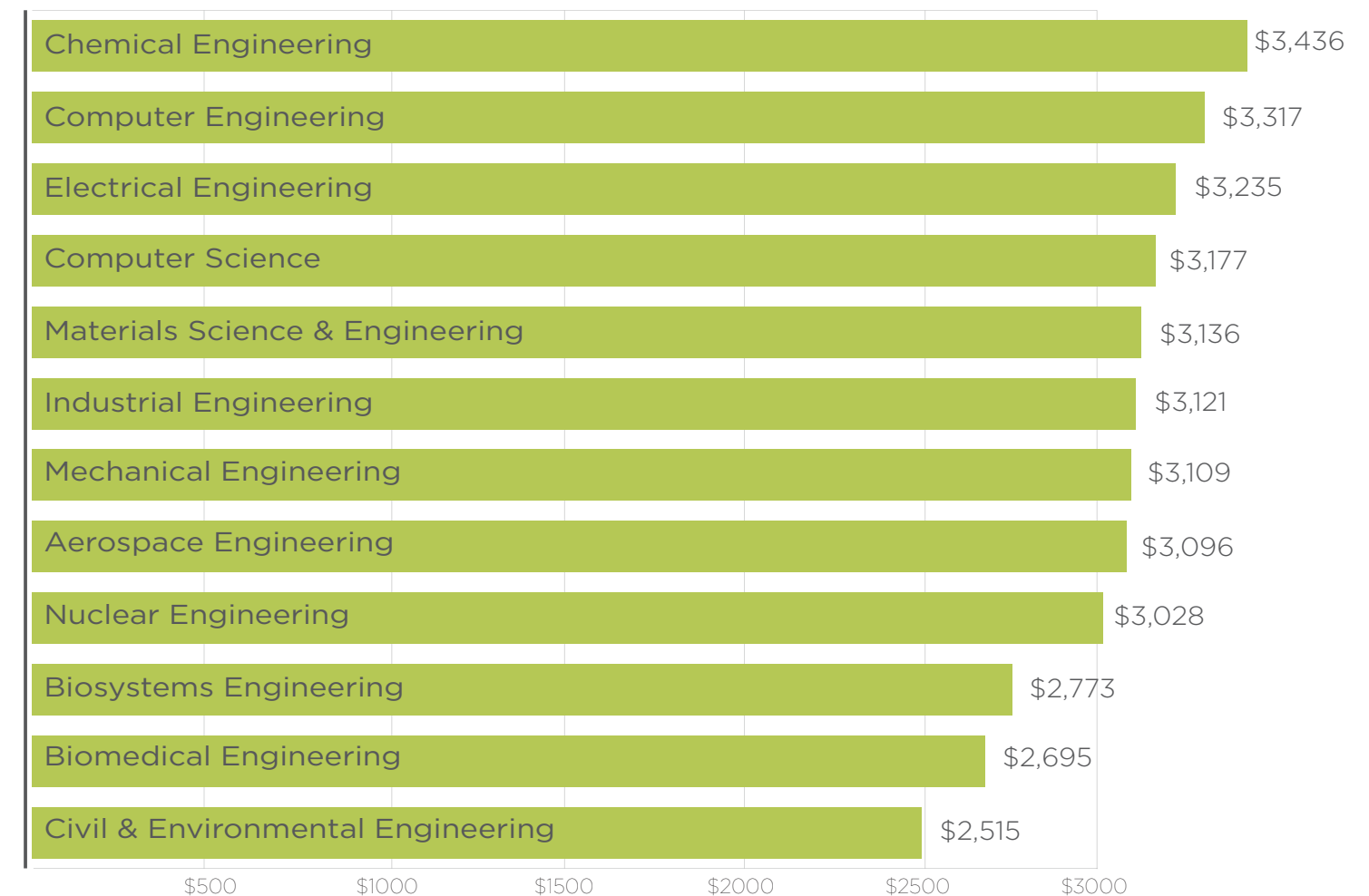
Nuclear Engineering Placements

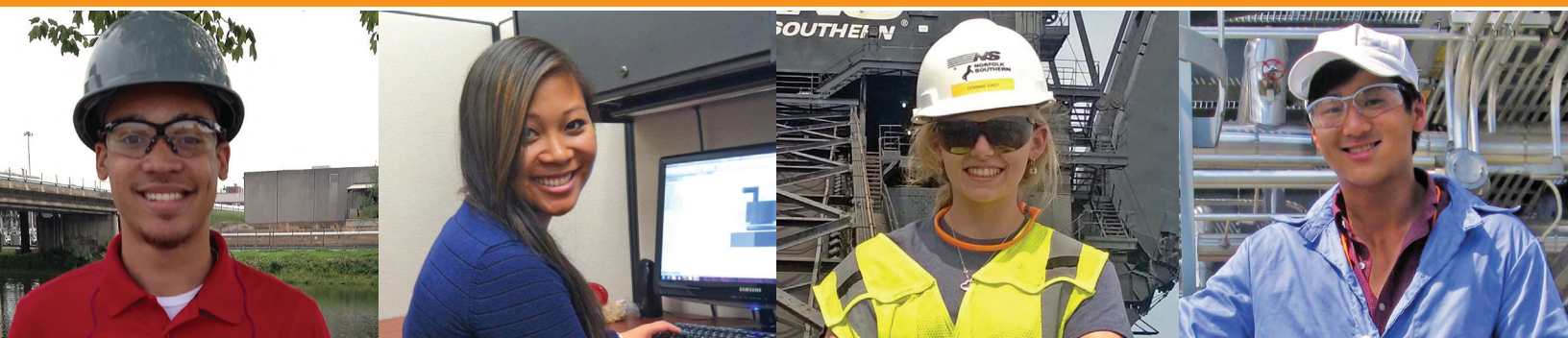


Student Co-op/Internship Placement Monthly Salary: Fall 2014–Summer 2015

Engineering students continue to earn significant amounts of money during their co-op and internship experiences. In a typical year, engineering students will collectively earn nearly **\$6 million**. This figure shows that the Engineering Professional Practice program is not only educationally relevant to students, but also financially relevant: Students are able to use a portion of their earnings to assist with housing, books, and tuition during the regular semester when they return to campus, making the program also financially relevant to both the college and the university.

Average Salary





ENGINEERING PROFESSIONAL PRACTICE

Engineering Professional Practice

110 Perkins Hall

P: 865-974-5323

E: coop@utk.edu

W: coop.utk.edu

The University of Tennessee is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its education and employment programs and services. All qualified applicants will receive equal consideration for employment without regard to race, color, national origin, religion, sex, pregnancy, marital status, sexual orientation, gender identity, age, physical or mental disability, or covered veteran status.

PAN: E01-1304-022-17 Job: 256301 DOP: 6/17