# **Annual Report**

January 2013

# Engineering Professional Practice







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.

R01-1304002-026-13 DOP: 2/13



### **Annual Report**

for

## THE UNIVERSITY of TENNESSEE

KNOXVILLE

### **ENGINEERING PROFESSIONAL PRACTICE**



January 2013

**Engineering Professional Practice** 

310 Perkins Hall

Web: <a href="www.coop.utk.edu">www.coop.utk.edu</a>
E-mail: <a href="mailto:coop@utk.edu">coop@utk.edu</a>
Phone: 865-974-5323



#### Introduction

The Office of Engineering Professional Practice is dedicated to helping **engineering students** find **educationally relevant** paid co-op or internship positions with one of our hundreds of employers. Our program has been in existence helping students add experience to their education since 1926 making it the second oldest program in the south and one of oldest cooperative education programs anywhere.

#### Key accomplishments for 2012

- Held the largest Fall Engineering Expo since Fall 2008.
- Held largest Spring Engineering Expo since Spring 2008.
- Held the inaugural Engineering Professional Practice Spring banquet in April 2012 with Mark Cox from Eastman Chemical as the guest keynote speaker.
- Hosted annual Southeastern Regional Cooperative Education Conference in Gatlinburg, TN in May.
- Held the largest attended Fall engineering cookout in recent memory with over 1200 students, staff and faculty participating.
- Saw a 10% increase in student placements in 2012 over 2011 after three years 1% year over year growth.
- 42% of engineering seniors who graduate have worked at least one co-op or internship assignment during their time at UT over the past four years of senior classes.

#### **Endorsement from Southern Company:**

"I wanted to thank you for your efforts on behalf of your students, myself and Southern Company. We have hired many students over the years from UT and the standard of their professionalism and performance continues to meet and exceed our expectations. UT students have a strong reputation amongst many of our hiring managers here and as such we continue to be committed to competing for your best and brightest. In my role I am often asked by other colleges about the effectiveness of their practices and how their students shape up against others. I typically refer to your program and students as a benchmark. As a program it is clear you have instilled in your students the important message that gaining experience is crucial to their career development. Similarly it is clear that you have taught them the important skills of marketing themselves effectively, they are among the most impressive students I speak with, and I speak with a lot of students. All of the students I speak with who have come from UT testify to the invaluable assistance you all provided them in preparing them for their career. All that to say I really appreciate all that you do in helping me to recruit high quality Engineers to Southern Company at UT. I look forward to recruiting many more!" Michael Armstrong, Campus Recruiter, Southern Company, Dec. 6, 2012.





## 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:

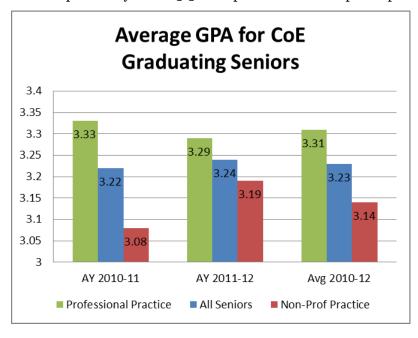
#### Co-op > Internship > no engineering work experience

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**

The average GPA for graduating engineering students participating in Engineering Professional Practice over the past two years is 3.31 compared to the non-participants GPA of 3.14. The educational benefit of



the experiential education is a significant component to consider.

This 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: class learning and experiential learning.

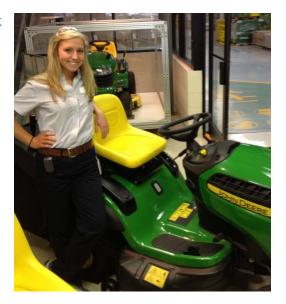


#### Engineering Students with Engineering Experience Accelerate Their Job Search

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

- 1) Engineering experience
- 2) Good grades
- 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
Year 1st	Fall School	Spring School	Summer School
1st	School	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 will enhance 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.

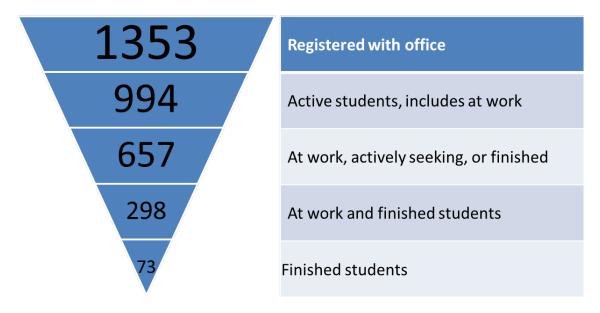
Students that start the co-op process in the summer before their sophomore year, and are able to make full use of the three summer semesters, can still graduate in the spring of their  $4^{th}$  year. A co-op student with a well

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.

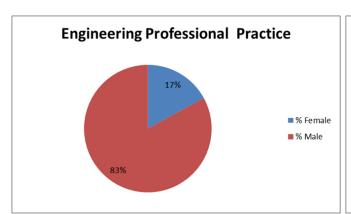


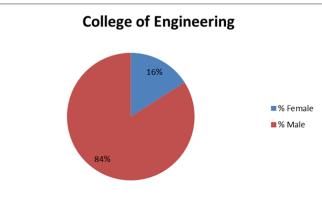
#### Students participating with the Office of Engineering Professional Practice - Fall 2012:

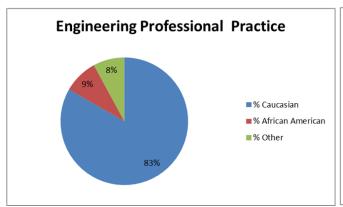
Our office continues to see strong interest and high participation levels from engineering students.

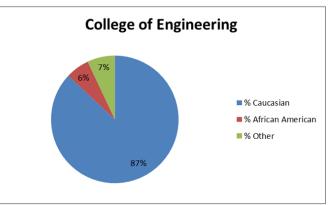


#### Average Demographics of Co-op and internship students since 2006:





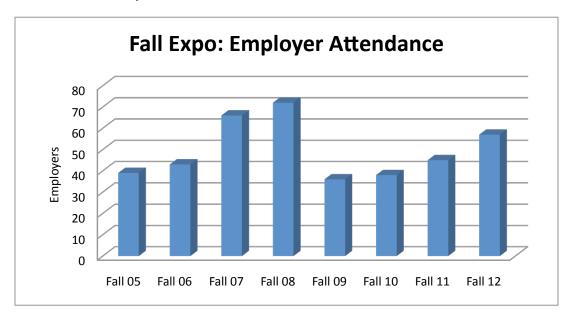


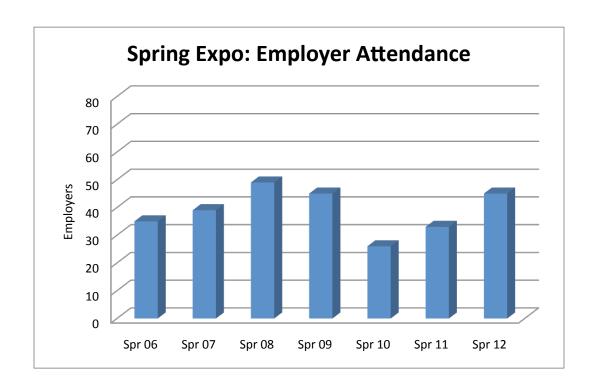




#### **Engineering Expo Employer Attendance is on the Rise**

Our program has experienced four consecutive years of growth in Engineering Expo **employer** attendance since AY 2008-09.

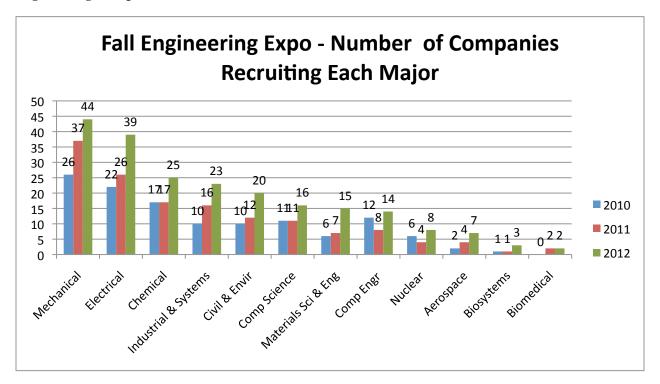




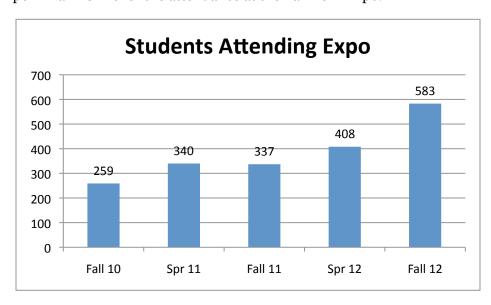


#### Engineering Majors Recruited by Employers Attending the Fall 2012 Expo Increased

Fall 2012 showed significant increases in number of companies and the majors that they are recruiting. The chart represents the number of instances that a specific major was being recruited for at the expo. To make sense of the data, please note that each attending company typically recruits 3-5 of UT's engineering disciplines.



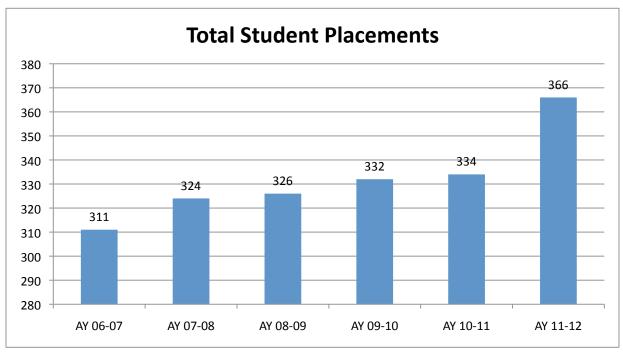
The Engineering Professional Practice program saw a 73% increase in number of students attending the Engineering Expo in Fall 2012 over the attendance at the Fall 2011 Expo.

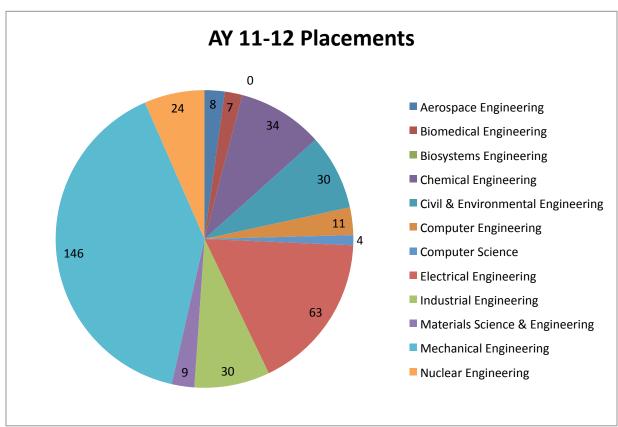




#### **Student Placements are Increasing**

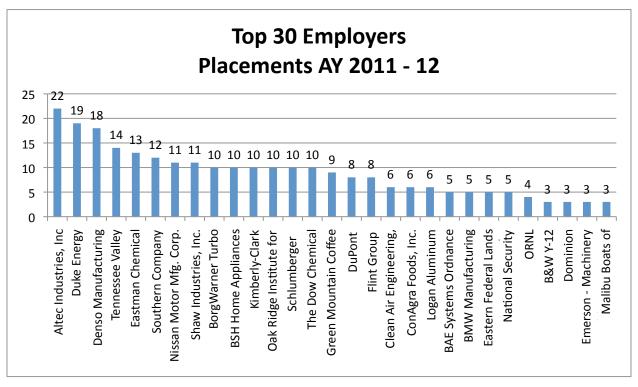
Our program experienced a 10% year over year growth student placements in AY 11-12 over AY 10-11 following four years of closer to 1% year over year growth.

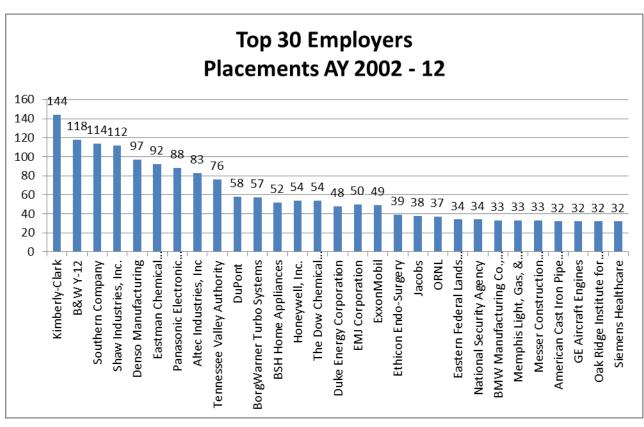






Top 30 Employers for 2011-2012 compared to the Top 30 Employers for past Ten Years

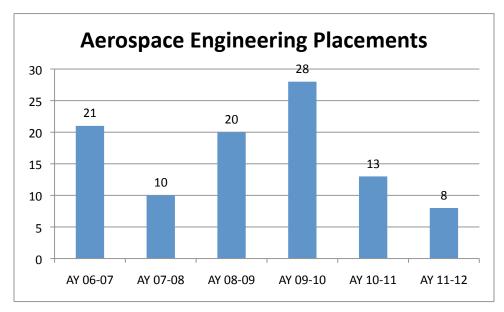


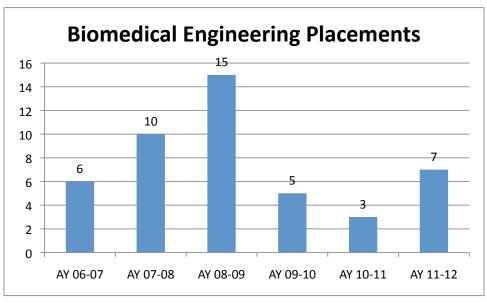




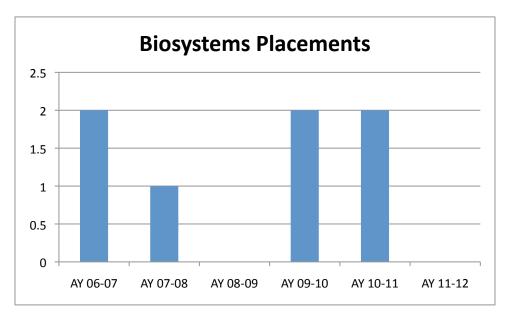
#### Placement of Engineering Majors by Discipline and by Year:

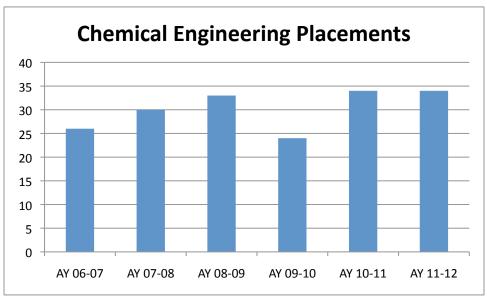
Year	Aero	Biomed	Biosys	Chem	Civil & Env	Comp Engr	Comp Sci	Elect	Ind & Sys	Mat Sci	Mech	Nucl	Total
AY 06-07	21	6	2	26	51	13	0	43	19	3	110	17	311
AY 07-08	10	10	1	30	55	12	2	54	15	4	111	20	324
AY 08-09	20	15	0	33	57	9	2	52	21	0	104	13	326
AY 09-10	28	5	2	24	49	13	7	51	38	3	95	17	332
AY 10-11	13	3	2	34	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



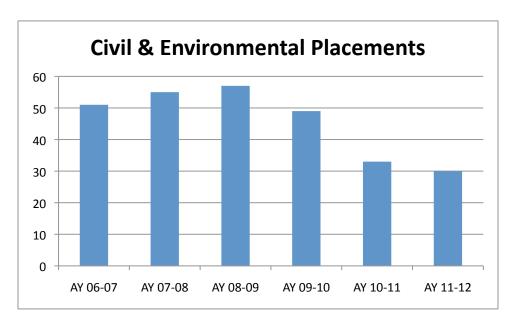


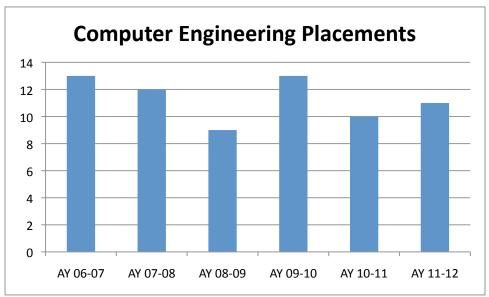




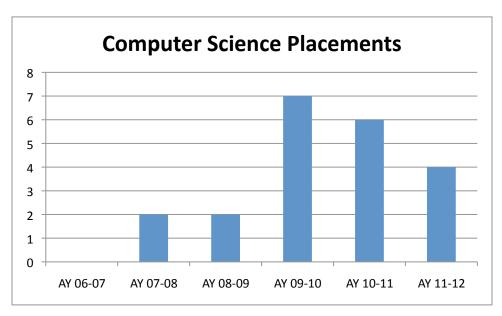


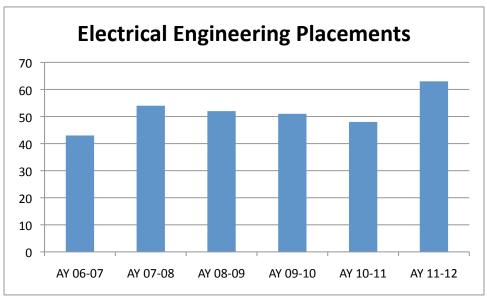




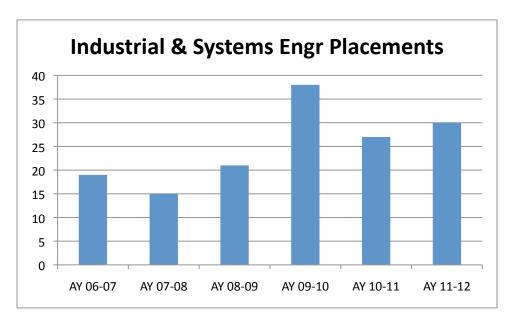


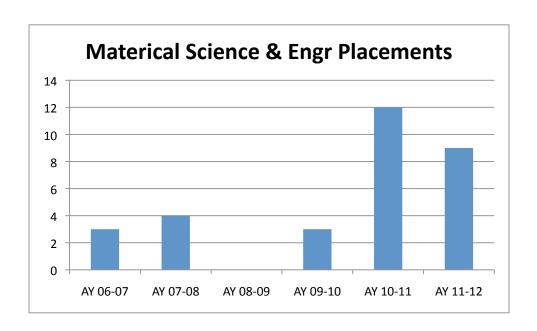




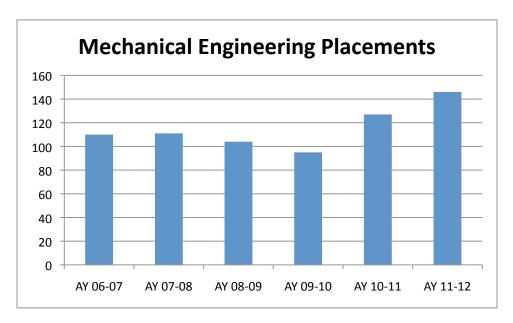


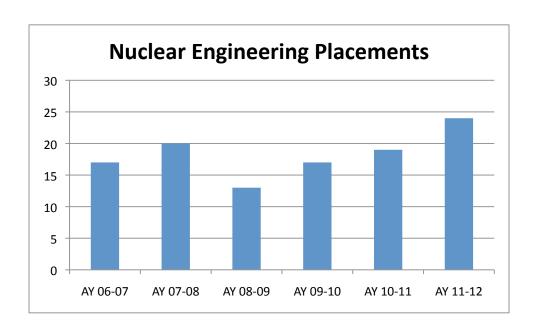








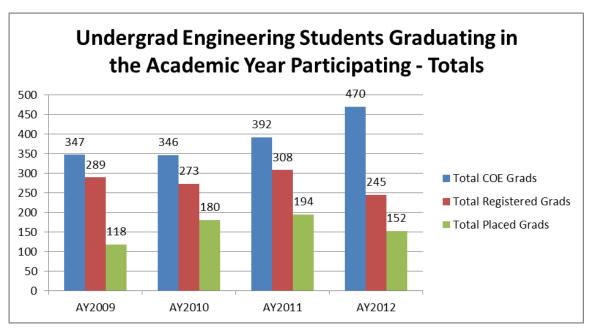


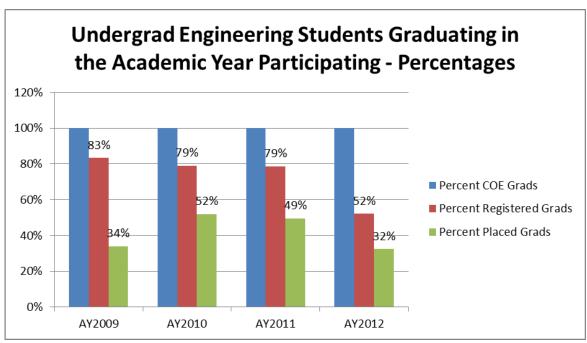




#### Students Graduating that Participated in the Engineering Professional Practice Program:

Total placed COE graduates participating in co-op and internships averaged 42% over the period AY2009 through AY2012. Also, since 2009 we have averaged 73% 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.

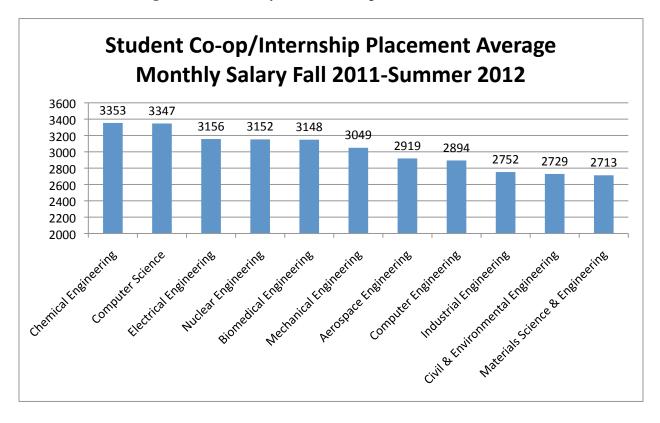






#### Student Co-op/Internship Placement Monthly Salary: Fall 2011-Summer 2012

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 **\$3.8 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.

### THE UNIVERSITY of TENNESSEE

#### KNOXVILLE

Engineering Professional Practice COLLEGE OF ENGINEERING

### 310 Perkins Hall

Web: www.coop.utk.edu

E-mail: coop@utk.edu Phone: 865-974-5323

