

Women in Electrical, Computer and Energy Engineering Group: Spring 2011

Introduction I started a women's group for graduate and undergraduate students in Electrical, Computer and Energy Engineering (ECEE) in the spring of 2011. The group has several major goals including: creating a community atmosphere among ECEE students, providing students with role models, facilitating interaction between graduate and undergraduate students, and promoting professional and technical development of the students. The ultimate goal of the group is to increase the percentages of female undergraduate, graduate, and faculty members in the ECEE department. The group was sponsored by the ECEE department (Professor Michael Lightner) and the ISTEM program (Professor Noah Finkelstein).

Motivation The percentage of female undergraduates in ECEE is among the bottom compared with other engineering disciplines at the University of Colorado (CU). Data is shown in Figure 1. The percentage of female graduate students compared with other engineering disciplines also lags.

Figure 2 compares the percentage of women earning BS and Ph.D. engineering degrees at CU with national averages. CU is behind in the percentage of women earning BS degrees compared with national trends. On the Ph.D. level, CU performs approximately at the national average. The difference between the percentage of women earning undergraduate and graduate degrees is thought to come from the influx of foreign female graduate students.

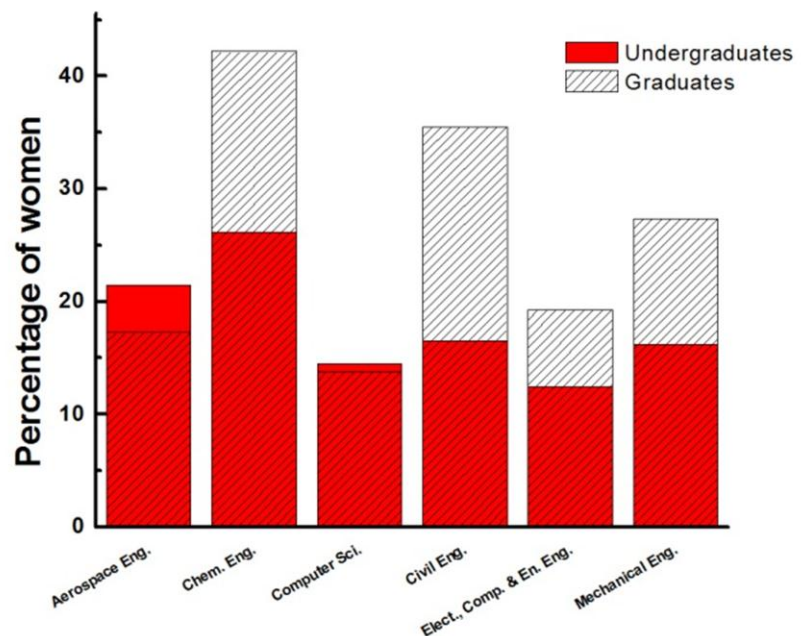


Figure 1. Percentages of female graduate and undergraduate students in engineering programs at the University of Colorado [2].

The percentage of female faculty in the CU ECEE department over the course of a decade is shown in Figure 3. The current number of female faculty in the department is above the national average of 10% women in engineering departments.

The statistics on female students and faculty in the CU ECEE department are surprising. One would expect the percentage of women awarded advanced degrees to be smaller than those who are awarded undergraduate degrees. As more education is required, the percentage of women in a discipline shrinks due to demands of family life. Instead, the statistics in the ECEE department defy this logic. However,

the percentages of female undergraduate and graduate students in a given class is still very low. The ultimate goal of the group is to increase the percentage of women at all levels (undergraduate, graduate, and faculty) in the CU ECEE program.

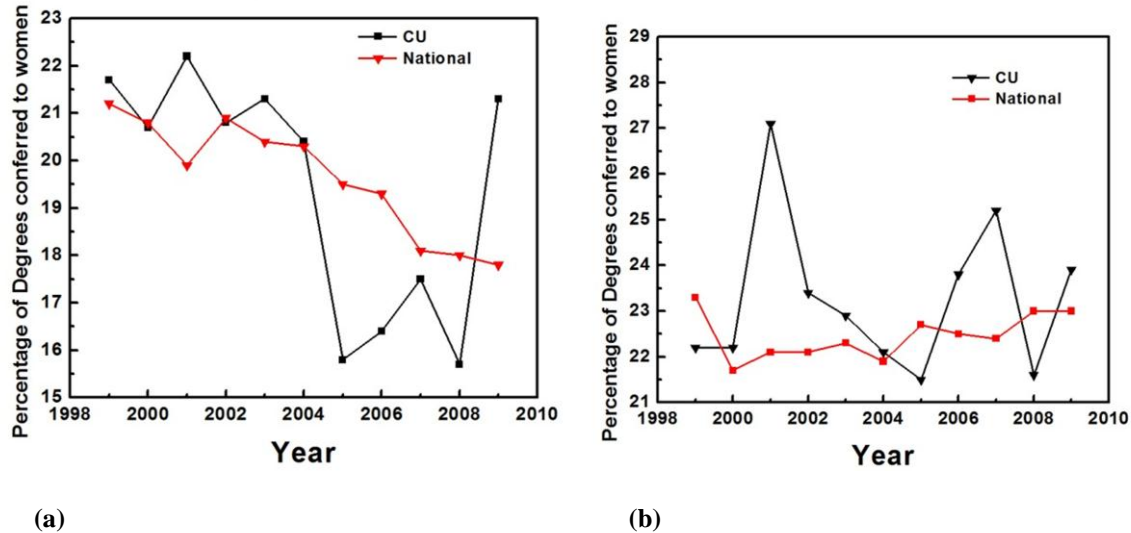


Figure 2. (a). Percentage of engineering BS degrees awarded to women at CU compared with the national averages. (b). Percentage of engineering Ph.D. degrees awarded to women at CU compared with the national averages [2-3].

Semester activities of Women in ECEE Six meetings were held during the spring semester. Each meeting followed approximately the same format: food and drink, a speaker, and some discussion. The group also has a facebook page [1] and used flyers to advertise. A summary of each meeting follows.

1. *January 18, 2011* I gave a brief introduction for the students on my motivation and purpose for starting the group. I talked about my years in industry (as the only women in 50 people), my goals for the group, and an overview of the professional development ideas captured in Robert Kelley's article, How to be a Star Engineer. The students played an icebreaker lead by Professor Beverly Louie, CU BOLD center. 19 students attended.
2. *February 10, 2011* Brianna Havlik (Hewlett Packard, CU ECEE BS and MS) and Tania Nowell (Western Digital, CU ECEE MS) gave an overview of their primary job responsibilities as verification engineers and program managers. They talked about successful professional development strategy (asking for promotions, retraining oneself etc.). The event was well attended, with more than 19 students. There were a lot of positive comments from both undergraduate and graduates. The event was requested by undergraduate students, who wanted to understand more of the working world.
3. *March 10, 2011* A panel of CU professors (six – including Profs. Liz Bradley, CS; Ruth Dameron, ECEE; Shannon Hughes, ECEE; Ute Hertzfeld; ECEE; myself and Carol Cogswell, ECEE) talked about questions generated by the students. Brief introductions were given, and then a set of questions generated by students before the meeting were discussed. 15 students attended. A photo of the meeting is shown in Figure 4.

4. *March 29, 2011* Yoriko Morita (Patent Agent, MBio; CU ECEE Ph.D.) gave a talk about her career in intellectual property, following a Ph.D. in optics at CU. The talk was intended to highlight a non-traditional career choice. Yoriko's resume is impressive, with a degree in music, seven years as the principal cellist in the Boulder Philharmonic, and two small children as well. The students who came enjoyed the meeting, but attendance was sparse (10 students). The timing of the meeting may have contributed, as it was just a few days after spring break.

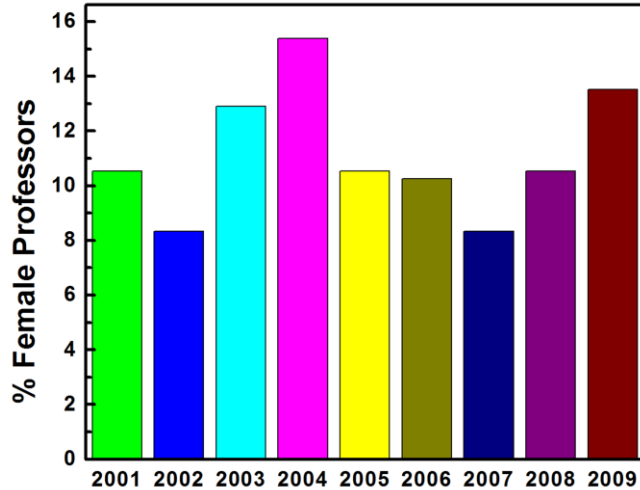


Figure 3. Percentage of female faculty in CU ECEE department over the last decade.

5. *April 11, 2011* Audrey Rowe, Senior Engineer (CU CS, BS) and Bhavna Chhabra, Director of Engineering (CU CS, BS) of Qualcomm gave a talk about the company's technical interests, their area of specialization, and some professional development tips. They included a list of courses that students should consider if they wanted to build an attractive resume for Qualcomm, as well as some interview tips. Bhavna had a very interesting career trajectory, which included a 2 year leave of absence to take care of her children, followed by a promotion. Again, the meeting was sparsely attended, probably due to the end of the semester (10 students).

6. *April 22, 2011* We had an end-of-semester breakfast with the Women in Computing group in the Discovery Learning Center. The breakfast went well, but again, suffered from female attendance issues (22 students). Figure 5 shows a photo from this event.



Figure 4. Photo from March 10 meeting.

Feedback The feedback from individual students was very positive. Several of the graduate students told me personally how much they appreciated the group. A comment on my FCQ's from a female graduate student stated that they enjoyed all the speakers I brought in!

Recommendations I would recommend having three meetings in the Fall semester, rather than the six we had in Spring 2011. Students get too busy during the last month of the semester and it

is hard to persuade them to make time for extra-curricular activities. While we did advertise to SWE, and Women in JILA, we have not engaged these groups properly. A more concerted effort to involve other women's groups across campus needs to be undertaken. While the format of the meetings came from both undergraduate and graduate suggestions, I did not have a



Figure 6. Photo from April 22 joint breakfast with Women in Computing.

formal steering committee. I would like to form a steering committee for the group in the fall, comprising both graduate and undergraduate students. Finally, panel formats need to be approached carefully, both limiting the number of participants and the length of their answers to questions.

References

- [1]. <http://www.facebook.com/home.php#!/pages/Women-in-Electrical-Computer-and-Energy-Engineering/186000068100306>
- [2]. American Society for Engineering Education, http://profiles.asee.org/profiles/4504/screen/15?iframe=true&school_name=University+of+Colorado+at+Boulder
- [3]. National Science Foundation, Division of Science Resources Statistics, 2008. Science and Engineering Doctorate Awards: 2006. Detailed Statistical Tables NSF 09-311. Arlington, VA. Available at <http://www.nsf.gov/statistics/nsf09311/>.