

An initiative by the University of Illinois at Urbana-Champaign Collegiate Section reaches across campus to raise awareness of gender inequalities in engineering.

# Diversity from the Ground Up

BY JESSICA WOOD, SWE, AND KALEV LEETARU, SWE

**F**rom its founding more than a half-century ago, the Society of Women Engineers has been dedicated to the promotion and support of women in the engineering disciplines.

Thankfully, many things have changed over those 58 years, with women enjoying opportunities today unheard of in previous generations. Yet, as we are all aware, there is still much that remains to be done.

Perhaps one of our greatest challenges is the promotion and encouragement of future generations — collegiate engineering students who all too often face reminders that

there are still those who believe women have no place in “their” field.

Contrary to popular belief, change doesn’t always have to come from the top; student sections can have impacts on their local campuses. This article documents the first six months of the gender diversity initiative launched by the University of Illinois at Urbana-Champaign (UIUC) Collegiate Section, including selected results from our diversity survey.

## Status of gender diversity at UIUC

How does a collegiate section launch a diversity initiative and grow it to the point of gaining the attention of college and campus leadership? UIUC SWE’s diversity initiative has humble roots, stemming from an offhand comment made during a meeting with College of Engineering administrators. The SWE officer recounted how she walked into a lecture hall on the first day of class, only to have the professor suggest she was in the wrong room because this was an “engineering class.” Faculty members were stunned that diversity issues of such magnitude persisted on their campus and asked SWE to survey its membership to learn the extent and severity of the situation.

Within a matter of days, the UIUC SWE section created an anonymous (to encourage submissions) online survey and distributed it to all female undergraduate and graduate students currently enrolled in the College of Engineering. To avoid biasing responses, UIUC SWE avoided such loaded terms as “discrimination” and instead used “treated differently” to encapsulate the entire range of actions that can constitute gender inequities. Questions on the survey attempted to ascertain the overall range of issues — whether

*Encourage women engineers to attain high levels of education and professional achievement*

(SWE Objectives, 1950)

*Stimulate women to achieve full potential in careers as engineers and leaders ... and demonstrate the value of diversity*

(SWE Mission, 1986)

*Establish engineering as a highly desirable career aspiration for women ... [and empower them] to succeed and advance in those aspirations*

(SWE Boilerplate, 2003)



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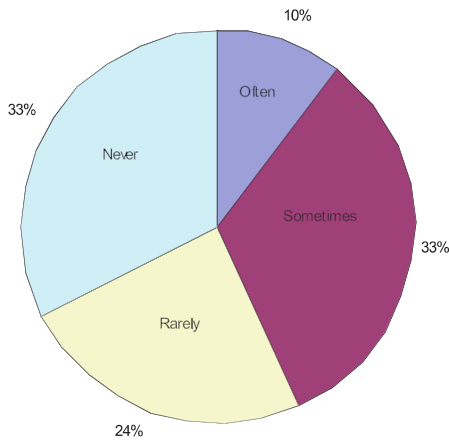


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### Survey responses by severity level



respondents reported being "treated differently" at some point in their careers on campus, with 10 percent reporting its being a frequent occurrence. The complete survey is available on our Web site (<http://webspaces.ncsa.uiuc.edu/swe/>) under the diversity initiative section.

Survey results also suggested a broad pattern of unequal behavior toward female students. Peers were the worst offenders, with 68 percent of students reporting peer issues. Even more disturbing, however, was that one-

quarter of students reported unequal treatment by faculty and teaching assistants. Anecdotal evidence suggested possible differences in the types of issues faced by students in each department, so the data were broken down by department for further analysis. Peer issues ranked the highest across the board, but there was significant stratification in the number of respondents reporting it, from slightly more than 50 percent in electrical and computer engineering to 100 percent in civil and environmental engineering.

Class issues and access to study groups also varied significantly across departments. Of course, given our small sample pool, we had no more than 20 respondents per department, with an average of about 10. The overall patterns in this graph, however, were largely supported by our later meetings with the departmental women's organizations.

The same survey was distributed to female undergraduate and graduate engineering students at Purdue University, which is nationally recognized for its programs to encourage and support women in engineering. Results there reflected a polar opposite of UIUC, with two-thirds of respondents reporting *never* having experienced being treated differently. We believe this stands as a testament to the strong positive effect that a comprehensive and properly executed diver-



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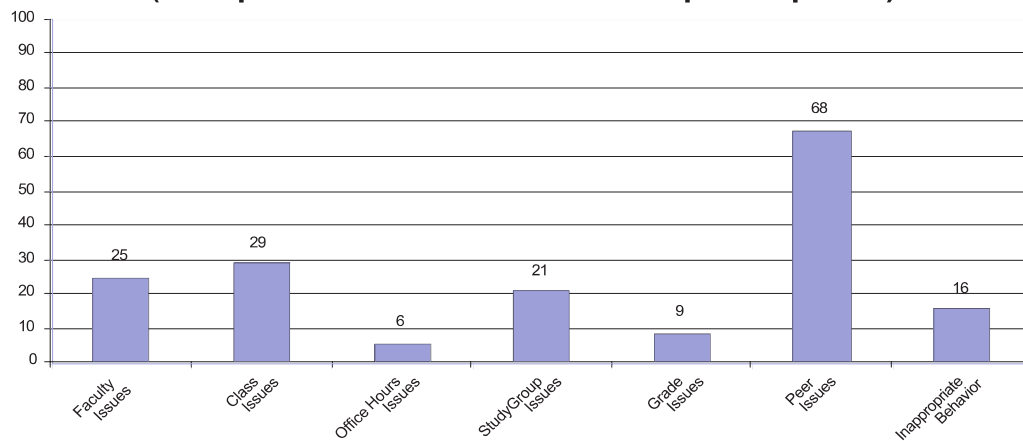
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**Percentage of responses by issue type  
(multiple issues could be selected per response)**



With survey results in hand, UIUC SWE wanted to determine whether these numbers were reflected in campus graduation rates.

sity initiative can have on the gender climate of an engineering college.

With survey results in hand, UIUC SWE wanted to determine whether these numbers were reflected in campus graduation rates. Women are considerably outnumbered by their male peers in the engineering disciplines, and the University of Illinois campus is no exception. In fall 2007, UIUC had a ratio of 5.33 males to each female student, and despite the College of Engineering's having the second-highest enrollment on campus (7,307), it had the second *lowest* number of

female students (1,154).

Using data from the campus Division of Management Information, we compiled a series of detailed graphs showing 10-year longitudinal trends along such dimensions as freshman retention and six-year graduation rates. Of particular concern, the data show a 5 percent overall decrease in female engineering graduates between 2001 and 2007 (from 63.5 to 58.3 percent), with a nearly 10 percent *increase* in females transferring out of the College of Engineering to non-engineering majors (from 19 to 27 percent).

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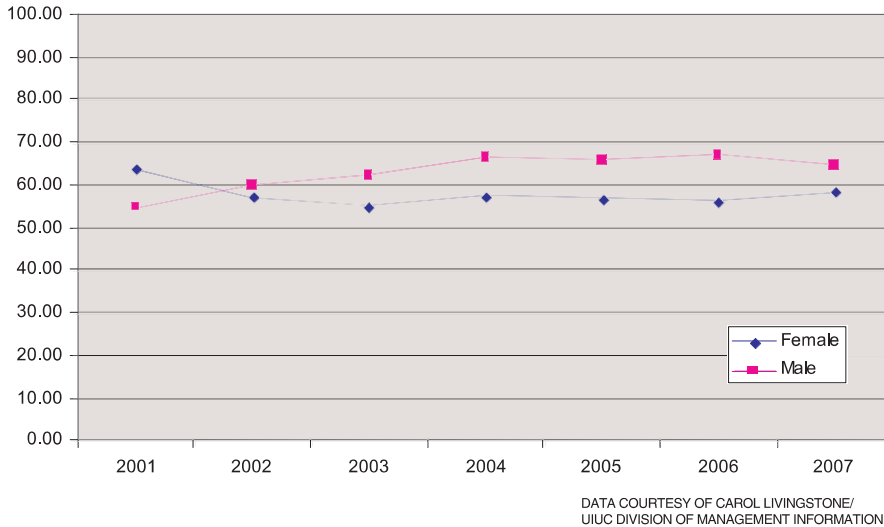
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## Female vs. male six-year graduation rates entering as engineering major and graduating with an engineering degree within six years



During the same period, men in engineering experienced an increase of 10 percent in retention, with male and female retention rates *effectively exchanging places during the last six years.*

### Building bridges

As the extent and severity of the gender diversity issue on our campus and its impact on our membership became apparent, we began to formulate a larger initiative to tackle the problem head-on. We took a dual-edged approach, working from both the top and bottom at once. We reached out to faculty and advocates within the college, while at the same time approaching campus-level diversity advocates, trying to connect with broader

campus diversity initiatives.

We met with faculty members whom SWE officers recommended, discussing our initiative with them and asking for their advice and recommendations of others with whom we should talk. Through the faculty, we discovered pockets of resources within the college as well as other supportive faculty who could help us.

Simultaneously, we reached out to campus diversity administrators, learning about campus-level initiatives and resources. Eventually, we met with the interim associate provost, who co-chairs the campus diversity committee. He was tremendously supportive of our initiative and promised to

work with us as we moved forward, lending his considerable experience and knowledge.

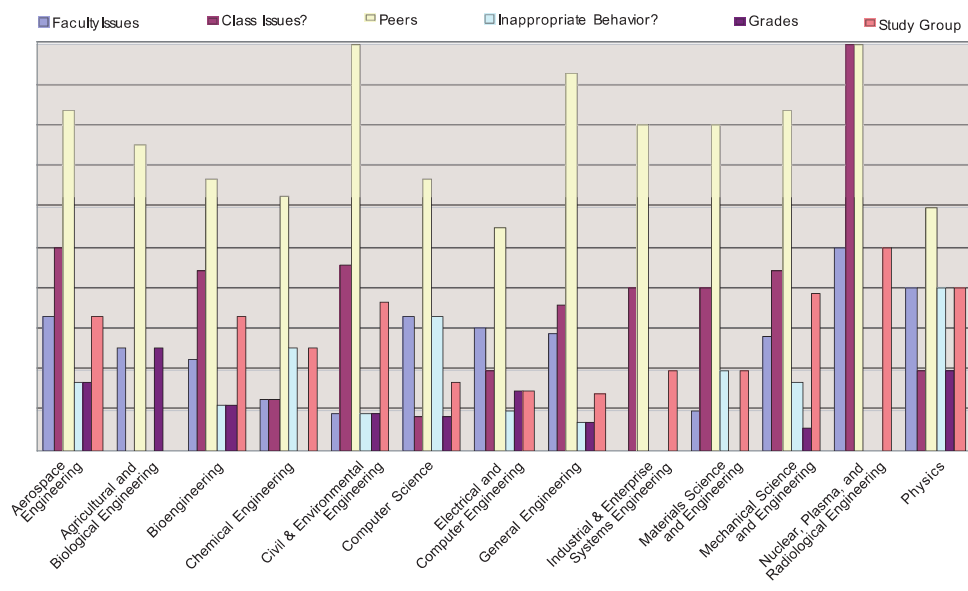
Shortly thereafter we met with the dean of the College of Engineering and his staff. They outlined a series of new initiatives they are undertaking, including creating a series of training workshops for faculty and staff and the prioritization of diversity-related efforts within the College. It is our hope that these efforts will have an impact on the diversity climate, together with our own continued work.

### A collective voice

The Society of Women Engineers is one of the best-known national organizations promoting women in the engineering disciplines, but it is not the only group to work

toward gender equity in the field. While not all collegiate societies are part of national organizations, the University of Illinois has five other student organizations devoted to women in specific disciplines, including aerospace, computer science, electrical and computer engineering, physics, and graduate women in mechanical science and engineering. Each one is an independent student group focusing on the needs of women in its department, with its own activities and resources. Some members are also members

## Issue densities by department





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While SWE officers hail from every department, we realized there was still tremendous potential in forging a closer bond with these departmental societies.

of SWE, but many choose to belong only to their departmental organizations. This means that while all of us work toward a common goal of promoting women in engineering, we operate along largely separate, but parallel, paths with little intercommunication.

Historically, SWE at UIUC has had no formal connections or engagement with its sister organizations. Therefore, one early component of the diversity initiative was to reach out to these other societies and learn more about issues specific to their departments. We met with the core officers of each, asking them questions about the most severe issues they face, general climate, and support infrastructure (such as office space, funding, mentorship, etc.) offered by their department.

While SWE officers hail from every department, we realized there was still tremendous potential in forging a closer bond with these departmental societies.

Toward this end, SWE UIUC has established a sort of ad-hoc advisory committee through which the other female engineering societies may have an officer attend SWE's officer board meetings to offer unique visibility into issues faced in that major, as well as to explore possibilities for joint events and other collaborations.

As the saying goes, "there is power in numbers," and the more voices SWE can unite, the more powerful we all become.

### Conclusions

We have made tremendous progress in the first six months of our diversity initiative, completing the preliminary data collection stage and reaching out across the campus to raise awareness of diversity issues. Most importantly, we have shown how powerful a student organization can be in bringing awareness to gender diversity issues on a university campus. In the coming months, we will be working closely with college leaders on a number of projects, and we hope to have continued success in this initiative so that we can fulfill our mission to create a welcoming environment for women in the engineering disciplines at UIUC. ■

*Jessica Wood currently serves as a Region H collegiate representative for SWE after a year and a half as the president of the University of Illinois at Urbana-Champaign Collegiate Section, where she helped lead its diversity and history initiatives.*

*Kalev Leetaru is coordinator of information technology and research at the University of Illinois Cline Center for Democracy and is staff advisor to the SWE University of Illinois Urbana-Champaign Collegiate Section.*

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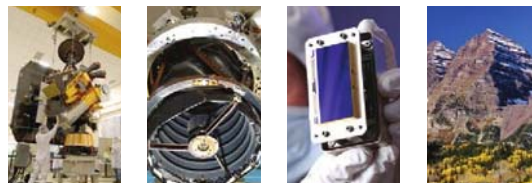
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