During the past year, the Women In Engineering Program has joined all of Purdue Engineering in implementing the college’s strategic plan to educate graduates who are effective in a global context, engage in research of global significance, empower our people and enrich our culture.

As we do this work, we continue to bear in mind the recommendations made by the National Academy of Engineering (NAE), whose Committee on the Public Understanding of Engineering advised that we “change the conversation” in order to attract more young people to engineering careers.

We weave this new conversation — one that emphasizes engineering as an inspiring link between ideas and possibilities rather than just a math-and-science-based method of solving problems — into all that we do.

We have used the NAE recommendations to conceive and develop our Innovation to Reality (I2R) program, which dramatizes for young people the ways that problems with food, water and energy are being fixed by creative, inspired, well-educated engineers who do research that improves people’s lives all over the world.

Our Imagination, Innovation, Discovery and Design (I2D2) after-school program speaks this new conversation boldly to kindergartners through fifth graders, exposing them to activities that foster their creativity and demonstrate the positive impacts that engineers make every day.

These are just two examples of how we are reaching young people in ways that truly resonate with them. I invite you to read about some other examples in this year’s annual report.

Thank you for all that you have done and continue to do to help us invite bright young women into this conversation, and into the thrilling, vital world of engineering that awaits them here at Purdue.

Beth M. Holloway
Director, Women in Engineering Program
MISSION

PURDUE’S WOMEN IN ENGINEERING PROGRAM IS DEDICATED TO ENRICHING THE ENGINEERING PROFESSION THROUGH THE FULL PARTICIPATION OF WOMEN. WE DEVELOP AND DIRECT ACTIVITIES THAT PROVIDE:

■ Encouragement for girls and young women to study engineering
■ Information about careers and companies
■ An environment conducive to the successful completion of studies

WE ALSO STRIVE TO MAINTAIN STRONG RELATIONSHIPS WITH ALUMNI AND EMPLOYERS WHO GENEROUSLY SUPPORT OUR PROGRAM.

OBJECTIVES

■ Provide career information and encouragement to precollege girls and young women to continue achievement in math and science and consider engineering as an appropriate career choice.
■ Encourage women to matriculate at Purdue University in the College of Engineering.
■ Ensure a climate in the College of Engineering that allows young women to reach their full potential.
■ Provide opportunities for female engineering students to develop leadership skills for their future.
■ Encourage women to consider graduate education and academia among their options upon graduation.
■ Maintain open communication with alumnae and their employers to encourage their continued participation in and support of the Women in Engineering Program.

ENROLLMENT OF WOMEN IN ENGINEERING: FALL 2009

<table>
<thead>
<tr>
<th>Major</th>
<th>Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeronautical and Astronautical</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>Agricultural and Biological</td>
<td>32%</td>
<td>25%</td>
</tr>
<tr>
<td>Biomedical</td>
<td>33%</td>
<td>35%</td>
</tr>
<tr>
<td>Chemical</td>
<td>33%</td>
<td>27%</td>
</tr>
<tr>
<td>Civil</td>
<td>22%</td>
<td>20%</td>
</tr>
<tr>
<td>Construction</td>
<td>15%</td>
<td>—</td>
</tr>
<tr>
<td>Electrical and Computer</td>
<td>10%</td>
<td>14%</td>
</tr>
<tr>
<td>First Year Engineering</td>
<td>18%</td>
<td>—</td>
</tr>
<tr>
<td>Engineering Education</td>
<td>—</td>
<td>59%</td>
</tr>
<tr>
<td>Industrial</td>
<td>28%</td>
<td>27%</td>
</tr>
<tr>
<td>Interdisciplinary</td>
<td>26%</td>
<td>21%</td>
</tr>
<tr>
<td>Materials</td>
<td>20%</td>
<td>38%</td>
</tr>
<tr>
<td>Mechanical</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>13%</td>
<td>16%</td>
</tr>
<tr>
<td>Total</td>
<td>19%</td>
<td>19%</td>
</tr>
</tbody>
</table>
WOMEN IN ENGINEERING PROACTIVE NETWORK (WEPAN) 7%
COMMUNICATIONS 7%
PROGRAM ADMINISTRATION 10%

UNIVERSITY FUNDS 46%
CORPORATE GIFTS 30%
ALUMS AND FRIENDS 17%
WEPAN REIMBURSEMENT 7%
For Your Imagination is a weeklong residential summer camp involving rising eighth- and ninth-grade students in hands-on engineering activities. The 2009 Camp, which focused on alternative energy, involved 31 girls from across the Midwest, plus a student each from Rhode Island and California. Students learned how engineers work to develop and maximize alternative energy sources, such as solar, wind and nuclear. Instructors put special emphasis on renewable energy and sustainability. The activities the girls enjoyed the most included designing and racing small solar cars; creating their own solar oven to bake brownies; visiting with the Purdue Solar Race Car Team; building their own miniature wind turbine and touring the Benton County wind farms.

Campers, parents and friends also attended the camp’s closing ceremony. The event showcased projects the girls built and included a team competition. Campers stacked as many styrofoam blocks as they could in a limited amount of time using T-Bots (manufactured by Pitsco), which they created in small teams earlier in the week. T-Bots are miniature robots powered by a hydraulic system. Their construction introduced the campers to engineering concepts of force, fluid movement, axes, levers and mechanics.

Participants and parents evaluated the program to assess its impact. All parents responded positively that their daughters had fun during the week and learned new things. This was confirmed by the participants’ survey. All parent respondents stated they would recommend the camp to other parents. (Sponsored by Boeing Co., Bechtel Group Foundation and ExxonMobil Chemical Co.)

“Now that I’ve seen all the different jobs engineers can do, I want to do a job in engineering.”

- FYI camp participant

Since 1969, Purdue’s Women in Engineering Program has been committed to increasing the recruitment, retention and graduation of female engineering students. Each year, we reach out to support and inform more than 3,500 girls and young women from elementary school through graduate school. The following is a brief review of our 2009-10 programs, with a spotlight on Engineering: For Your Imagination (FYI), the Women in Engineering Seminar (ENGR 194) and the Personal Connection Program (PCP).

IMAGINATION, INNOVATION, DISCOVERY AND DESIGN (I2D2)

I2D2 is an after-school program that runs throughout the academic year. It targets girls and boys from kindergarten through fifth grade in the three school systems closest to Purdue. Current engineering undergraduate and graduate students engaged participants in creative and innovative hands-on activities and discussions designed to show the creativity, teamwork and social relevance of an engineering career. The current engineering students functioned as both facilitators and role models. Twice a year, the program sponsors a Saturday open house at which young children can explore hands-on engineering concepts. (Sponsored this year by the Motorola Foundation.)

INNOVATION TO REALITY (I2R)

I2R is an after-school, on-campus program targeted at sixth to eighth graders. Two themed five-week sessions meet once a week and culminate in a team-based poster presentation to parents, faculty and staff. The spring 2010 themes were diabetes and water scarcity, which were chosen based on Purdue faculty research. (Sponsored this year by Motorola Foundation.)
OUTREACH ACTIVITIES

EXCITING DISCOVERIES FOR GIRLS IN ENGINEERING (EDGE)

EDGE camp is focused on students who have just completed their freshman or sophomore year in high school. It is designed to better acquaint the participants with opportunities in engineering and ways they can pursue their interests and talents in this exciting field. Last year, the attendees spent a week on campus learning about engineering by doing activities such as building and programming their own Guitar Hero guitar; designing, building and testing model roller coasters; and touring engineering laboratories. They also spent a day at the Indiana Beach amusement park experiencing the engineering and research behind roller coasters. Engineering was stressed as a profession that solves problems to help society. (Sponsored this year by Motorola Foundation, Eli Lilly & Co. Foundation and Bechtel Group Foundation.)

INTRODUCE A GIRL TO ENGINEERING DAY

Introduce a Girl to Engineering Day is a free, one-day event hosted by the WIEP and held in February each year in conjunction with National Engineers Week. The early high school-aged participants learn about engineering through hands-on activities and interactions with current female engineering students and faculty. This past February, undergraduate volunteers hosted two participants each for the day. They attended two “Purdue Engineering” sessions chosen by the participant, which involved hands-on engineering activities that were led by engineering students and faculty. They also enjoyed lunch in a Purdue dining court. Engineering was tied to the community with a tour of the Engineering Projects in Community Service (EPICS) laboratory. (Sponsored this year by Caterpillar Foundation.)

PERSONAL CONNECTION PROGRAM

We reach out to admitted students through our Personal Connection Program. The program’s goals are to create a personal connection between the admitted students and Purdue and encourage them to choose Purdue. Staff and current student volunteers call the students to answer questions and discuss opportunities and options at Purdue. Students also receive a note from WIEP congratulating them on their admission and a letter from Leah Jamieson, John A. Edwardson Dean of Engineering. They also receive a magnetic photo frame inviting them to “Picture Yourself in Purdue Engineering.”

The program is clearly working. Some 39 percent of the domestic admitted females were contacted through the program. The program had contacted 94 percent of the enrolled domestic females. The effect of PCP on the yield rates (the percentage of admitted students who enroll) is shown in the table below. Note the positive effect the program has on Indiana residents. This year’s program also began tracking whether parents were contacted when attempting to reach the student. Of the students whose parents were contacted, 29 percent enrolled, which is significantly greater than the general yield rate of students who were not contacted (22 percent). The results show that contacting parents can play a big part in encouraging students to attend Purdue. (Sponsored this year by John Deere Foundation)

<table>
<thead>
<tr>
<th>Effect of Program on Yield Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contacted</strong></td>
</tr>
<tr>
<td><strong>Indiana Residents</strong></td>
</tr>
<tr>
<td><strong>Domestic Non-Residents</strong></td>
</tr>
</tbody>
</table>

EXPLORING ENGINEERING AT PURDUE

High school juniors and seniors and their parents and teachers are invited to Purdue for a day each fall and spring. The prospective students learn about two types of engineering from engineering professors and graduate students, participate in a question-and-answer session with current female engineering students and hear from a panel of Purdue women engineering alumnae. Participants also tour campus, have lunch with a keynote speaker and attend sessions about residence halls and financial aid. The Purdue section of the Society of Women Engineers assists with planning the program. It takes approximately 75 student volunteers to make each daylong program successful. (Sponsored this year by Alcoa Inc., Caterpillar Foundation, Delphi Foundation Inc. and Eli Lilly & Co. Foundation.)

RECRUITING DINNERS

Young Indiana women admitted to the College of Engineering from targeted regions are invited to dinner in their area. Purdue WIEP personnel and engineering deans host the dinner, introduce themselves to the students, encourage the students to meet each other, promote Purdue and the College of Engineering and answer questions. Last year, the Indianapolis region was targeted and representatives from Marathon Oil Co. also attended. (Sponsored this year by Marathon Oil Co.)

Orthogonal Assistant
ENGR 194, Women in Engineering Seminar

First-year students can choose this one-credit course, in which dynamic alumnae inspire, motivate and affirm the students’ career choices. Students hear presentations from a variety of engineering alumnae who talk about their career choices, their daily routines on the job and their professional and personal challenges and successes. Speakers range from recent graduates to successful corporate executives.

Some speakers with professional degrees also describe how engineering can be used as a springboard to careers in law, medicine and business, among other avenues. Guest speakers act as energizing role models. Through a series of lunches, students are encouraged to learn networking skills. Grades are based on attendance and short papers (e.g., impact of course on career plans, interviews with upperclassmen). The seminar’s goals are:

- To provide knowledge about engineering
- To provide strategies and skills for success in engineering
- To stimulate interactions and networking potential
- To promote relationships and a sense of community.

Surveys are utilized during the course to assess if course objectives are being met. Results (see table) show that in fall 2009 there was improvement across all categories when comparing pre- and post-surveys, with the exception of Question No. 6. On average, the trends have been similar for the past five years. That data is available upon request.

Comparison of Pre- and Post-Surveys for Fall 2009

Students responded using scale between 1-5 where 5 is “completely agree” and 1 is “completely disagree.”

1. I feel I have a good understanding of the engineering profession.
2. I am aware of the various career options for engineering majors.
3. I am excited about the job opportunities available for engineers.
4. I am confident about choosing engineering as a major.
5. I feel confident that I have selected the best area of engineering for me.
6. I am looking forward to my classes in engineering.
7. I am confident that I can develop close relationships with other women engineering students.
8. I think I can be an engineer and do great things for society.

“...My expectations were very high and my expectations were passed. This was my most inspiring class and I learned a broader scope of information.”

- ENGR 194 Participant
UNDERGRADUATE AND GRADUATE RETENTION ACTIVITIES

M&M: MENTORS AND MENTEES
UNDERGRADUATE MENTORING PROGRAM

This program matches first- and second-year students with juniors and seniors, or groups first-year students with several upper-class students for formal and informal mutual mentoring activities. Eight monthly meetings help provide academic, personal development and professional success strategies. The program’s objectives are to enhance personal student support through contacts with female role models and mentors, to build students’ confidence through affirmation of their skills and values, to share effective strategies that lead to successful completion of their engineering education and to prepare them for future careers as engineers. (Sponsored this year by Eaton Corp., ExxonMobil Chemical Co., Kimberly-Clark, PPG Industries Foundation and United Technologies.)

Wiep-Wisp tutoring center

A free tutoring service for first-year classes, co-hosted by WIEP and the Women in Science Program (WISP), is offered on a walk-in basis. Women who are upper-class science and engineering majors are employed and trained as tutors. In addition to providing homework help, the tutors serve as mentors and role models. The tutoring service is located in the Earhart Hall conference room and adjoining computer lab for the convenience of the women who live on the engineering and science floors there, but it is open to all students, regardless of residence. In 2009-10, the center hosted 1,781 tutoring sessions, up 11 percent from the previous year.

WIEP RESIDENTIAL PROGRAM

First-year women majoring in engineering can choose to live on one of the designated engineering floors in Earhart Hall or Harrison Hall. The students that live on the engineering floors have informal access to female engineering mentors, who provide them with support and encouragement. Since engineering students share a common first-year curriculum, the women on the engineering floors are easily able to form study groups and social networks. Many of the resident assistants assigned to the engineering floors are engineering students themselves, and are able to relate to the residents academically as well as socially. In addition, the WIEP-WISP tutoring center is located in Earhart Hall for the convenience of the students who live there. Participants in the WIEP Residential Program can also join other Purdue Engineering learning communities if the residency requirement is co-located or optional, and many of them do so.

GRADUATE MENTORING PROGRAM

This program provides female engineering graduate students information to achieve success personally, academically and professionally. It also provides a means to form peer mentor groups, take breaks from intensive academic work and access professional role models. This is achieved within the framework of a networking/mentoring model and through consistent assessment of program objectives and results. The networking model for the program is implemented through monthly meetings and social events that allow participants to interact with each other and experience lively, informative speakers in a supportive environment. There were 131 participants in the program in 2009-10.
WOMEN IN ENGINEERING PROGRAM

annual report 2009-10 Purdue University

WIEP

WOMEN IN ENGINEERING PROGRAM

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