

WOMEN IN ENGINEERING PROGRAM





REFLECTIONS

FROM THE DIRECTOR



After 36 years in existence, is the Purdue University Women in Engineering Program still needed? I could point to statistics that show that only 18 percent of engineering undergraduates at Purdue are women, and only 19 percent of engineering graduate students are women. Or I could point to national statistics that show a steadily declining representation of women in the first year of engineering studies. It was 16.3 percent in 2004—the lowest percentage in 15 years. But instead I will point to the rationale presented by the College of Engineering's Diversity Action Committee.

Workforce Availability Rationale – The demographics of the U.S. population are shifting such that minority groups are making up larger and larger percentages of the total population. If engineering students continue to be as predominantly Caucasian and male as they are today, the United States will not produce enough engineers to fill available jobs. At the same time, countries such as Japan and China are now producing one and a half and four times more engineers than the United States, even though these two countries were at the same level as the United States in 1985.

Responsiveness Rationale – The groups conceptualizing, designing, producing, and marketing products need to understand the customer. Companies that would like to successfully market to women, minorities, and/or international customers need to have significant representation from those target groups. As the buying power of women increases, for example, it makes good business sense for companies to target the female consumer.

Innovation Rationale – If a job is routine, then a homogeneous group of workers is ideal. But if a job requires creativity and innovation, like engineering jobs do, then a team of people who approach problems differently, think differently, and were shaped by different experiences will deliver a better product. In other words, diversity is crucial to innovation.

Considering these rationale then, I would say, yes, the Purdue University Women in Engineering Program with its mission to enrich the profession of engineering through the full participation of women is absolutely necessary and critical to the future of engineering in the United States.

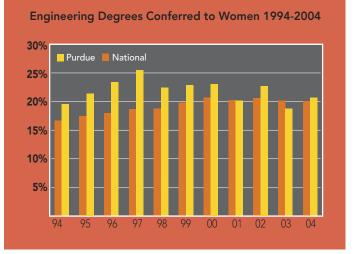
So, on behalf of the Women in Engineering Program, thank you for the support you provide to our future engineers.

Sincerely,

Beth M. Holloway

Beth Holloway Director, Women in Engineering Program

MISSION



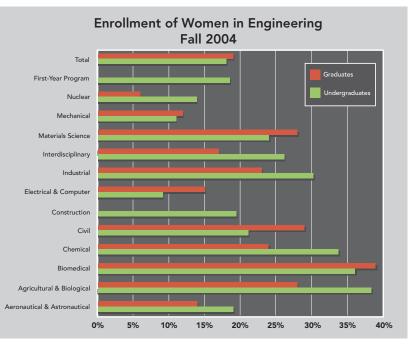
The Women in Engineering Program at Purdue University is dedicated to enriching the profession of engineering through the full participation of women. We develop and direct activities that provide:

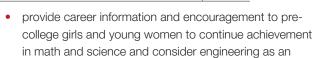
- encouragement for girls and young women to study engineering
- information about careers and companies
- an environment conducive to the successful completion of students' studies

OBJECTIVES

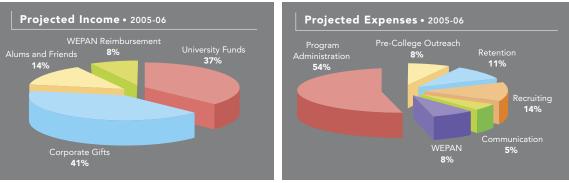
appropriate career choice

We also maintain strong relationships with alumnae and employers who generously support our program.





- 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 women engineering students to develop leadership skills that can be utilized in their future lives
- 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





UCCEPTEDUE UNIVERSITY



Since its inception in 1969, the Purdue Women in Engineering Program has been committed to increasing the number of women engineering graduates. Our programs are designed to increase the recruitment, retention, and graduation of women engineering students. Each year we reach out to support and inform more than 2,000 girls and young women—from elementary school through graduate school. Following is a description of our individual programs, with a spotlight on three of them: LEAP-II, the M&M: Mentors and Mentees Undergraduate Mentoring Program, and the WIEP-WISP Tutoring Service.



(LEAP-I): LEAP-I is a weeklong residential or day-only camp involving rising 7th and 8th graders in handson engineering activities. Participants break into teams to design and build a toy for young children. The campers also disassemble and reconstruct a computer, tour engineering facilities, attend workshops on leadership skills, receive computer training, and make electronic presentations about their experiences. (Sponsored this year by International Truck & Engine Corporation and Boeing Corporation.)

Love Engineering At Purdue II

(LEAP-II): LEAP-II is a weeklong residential or day-only camp involving rising 8th and 9th graders in handson engineering activities. Campers participate in a Lego RoboLab robotic team challenge. The participants also assemble electronic kits, tour engineering facilities, attend workshops on leadership skills, and make electronic presentations about their experiences. LEAP-II was launched in the summer of 2004 to meet the growing interest for an engineering summer camp. This camp allows a more personalized experience for the older student and for those campers who would like to come to camp again while in middle school. The LEAP-II camp is intentionally designed to be diverse-ethnically, geographically, and otherwise. Over the past two years, 40 percent of the campers have selfidentified as Caucasian, and 34 percent have self-identified as African American. In addition, while just over half of the participants reside in Indiana, 26 percent are from Ohio, and 11 percent are from Michigan. Students from as far away as Massachusetts have participated.

Comments from participants (in response to the question "What did you like best about LEAP-II?"):

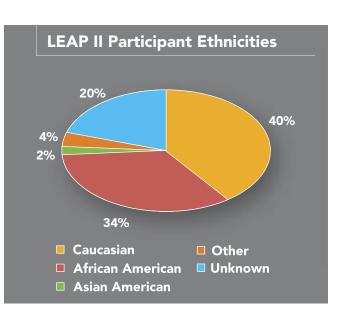
- I liked making and programming the robots.
- I liked the Boiler Challenge the best because it really made me stop and think and learn how to work better in a team.

- I liked meeting new girls and learning about engineering.
- I really liked the Industrial Engineering and Nanotechnology tours.
- I liked the opportunity to meet other girls with similar interests as myself.
- I liked the robot project, the ice cream production, the car crash derby, and the dorm time best.

(Sponsored this year by Caterpillar.)

Exciting Discoveries for Girls in Engineering (EDGE): This one-week residential camp for rising sophomores and juniors began in the summer of 2003. Campers assemble electronic kits, work on group projects, and participate in experiments during laboratory tours. They also participate in a First Lego League robotic team challenge. The event stresses engineering as a profession used to solve problems that help society. (Sponsored this year by Boeing Corporation and Delphi Corporation.)





WIEP Preview Days: Each fall and spring high-school juniors and seniors, their parents, and teachers are invited to Purdue for a day. Prospective students learn about two types of engineering from engineering professors and graduate students. They also participate in a question-and-answer session with current women engineering students and hear from a panel of Purdue women engineering alumnae. Campus tours, lunch with a keynote speaker, and sessions about residence halls and financial aid are also included. The Purdue University section of the Society of Women Engineers assists with the planning of Preview Days and provides the approximately 50 student volunteers needed to make each Preview Day successful. (Sponsored this year by Boeing Corporation, Fluor Corporation, and General Motors.)

Personal Connection Program:

Young women admitted to the College of Engineering are matched with undergraduate women students or alumnae from their home area. The Purdue students and alumnae answer questions about the university and engineering, and encourage the highschool students to enroll in engineering at Purdue. In addition to this contact, program staff and volunteers call students during the spring semester to answer any additional questions admitted students may have. (Sponsored this year by John Deere and General Motors.)

Merit Awards: One-time awards of \$1,000 are given to the top students admitted to the College of Engineering. Continuing student incentive awards, provided by corporate and alumnae donations, range from \$250 to \$2,500. These awards encourage outstanding academic achievement and student leadership. More than \$70,000 worth of awards is given annually.







Every year since 1994, undergraduate women majoring in engineering have been able to choose to live on one of three designated engineering floors in Earhart Hall. Students living on the engineering floors have access to female engineering mentors who provide support and encouragement. Since all engineering students share a common first-year curriculum, women on these floors can easily form study groups and social networks. In addition, the WIEP-WISP Tutoring Service is located in Earhart Hall for the convenience of the women who live on the engineering floors. (Sponsored this year by General Motors.)

M&M: Mentors & Mentees Undergraduate Mentoring Program:

One program matches first-year women with juniors, and the other matches sophomore women with seniors for formal and informal activities. In the context of mutual mentoring, students receive affirmation and strategies to succeed in engineering. The program is based upon eight monthly meetings that provide academic, personal development, and professional strategies. The objectives of the program are: • to enhance personal support of students through contacts with female role models and mentors on a monthly and weekly basis

- to build confidence in students through the affirmation of their skills and values
- to share effective strategies that lead to successful completion of their engineering education and prepare them for future careers as engineers

The program is facilitated by eight students from various engineering disciplines. This leadership team facilitates the monthly meetings, coordinates with the program speakers, conducts and analyzes surveys sent to participants, and writes an annual report of the M&M program. The leadership team also produces a monthly newsletter for participants and conducts a quality-control assessment of each pair's mentoring relationship.

Participants are surveyed after each meeting and at the end of every year. Those in the first- and third-year program rated it as follows (on a scale of 1 to 5 with 5 being the highest score): supportive (4.13), affirmative (4.09), and strategic (4.62). Similarly, the participants in the second- and fourth-year program rated it as supportive (3.94), affirmative (3.88), and strategic (4.68). The one-year retention rates for program participants over the past five years are close to 100 percent (see chart).

Comments from participants:

- The girls and the speakers have made me a lot more comfortable in engineering.
- This program is the only support I receive, and I love it!
- The speakers are really inspiring.
- Meeting with my mentor was both fun and supportive.
- I loved hearing past Purdue students who have made something special in their lives after college.
- It gives me confidence seeing my mentor being so successful in engineering.
- Being a part of this program has shown me that I'm not alone in my struggles. Thank you.

Students on the leadership team have also benefited by being part of this program. Their comments:

 It is very encouraging to know that we are a part of something that is making engineering a better environment for women to succeed in.

Undergraduate Mentoring Program (M&M) Retention Results (2000-2005)

| Year | Participants | # Retained or Graduated | % Retained or Graduated |
|---------|--------------|----------------------------|----------------------------|
| 2000-01 | 96 | 96 | 100% |
| 2001-02 | 96 | 93 | 97 % |
| 2002-03 | 96 | 90 | 94 % |
| 2003-04 | 96 | 91 | 95 % |
| 2004-05 | 96 | 94 | 98% |



 I have really enjoyed being on the team, and I feel that if I weren't, I may have dropped out of engineering.
(Sponsored this year by Abbott Laboratories, Applied Materials, Kimberly Clark Corporation, and Ford.)

ENGR 194, Women in Engineering Seminar:

First-year students may elect this onecredit course, which utilizes dynamic speakers to reinforce the student's educational and career choices. Students hear presentations from a variety of practicing engineers who talk about their engineering career choices, their daily routines on the job, and their challenges and successes in both their professions and their personal lives. Speakers range from well-established corporate executives to recent graduates. In addition, first-year students meet weekly in small groups for active sharing of information and support. Seminar speakers act as energizing role models, while the peer groups provide much of the community building emphasized in retention literature. (Sponsored this year by General Motors and Honeywell.)

WIEP-WISP Tutoring Service:

A free tutoring service for first-year classes, co-hosted by the Women in Science Program (WISP), is offered on a walk-in basis. Women who are upperclass science and engineering majors in their respective honor societies are employed and trained as tutors. In addition to providing homework help, the tutors are seen as mentors and role models. Tutoring takes place in Earhart Hall for the convenience of the women who live on the engineering and science floors.

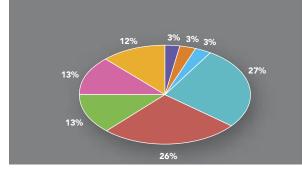
For the 2004-05 academic year, 115 students used the service 280 different times. A majority of these students lived in Earhart Hall, as shown in the pie chart. Chemistry was the most tutored subject, followed closely by calculus.

In addition to the tutoring service benefiting the students who visit, it also benefits those who provide the services. One tutor who has been with the program three years said the following about her experiences: "I've met a lot of great people and have had the opportunity to share my experience in engineering with incoming freshmen. I was able to help students with their classes and also reassure them in their pursuit of an engineering degree. Also, by helping students in math and physics, I personally have gained a better understanding of the concepts in both fields. It has helped me in my coursework as well." (Sponsored this year by General Motors.)

Graduate Mentoring Program:

This program provides information and strategies to assist women engineering graduate students toward achieving personal, academic, and professional success. 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 primarily through monthly meetings that allow participants to interact with each other and enjoy lively, informative speakers in a supportive environment. (Sponsored this year by the heads and deans of the College of Engineering.)

MentorNet: The national electronic industrial mentoring network for Women in Engineering and Science matches undergraduate and graduate students from colleges and universities with practicing engineers throughout the United States. Purdue's WIEP is one of MentorNet's original university partners. (Sponsored this year by the Dean of the College of Engineering.)



Tutoring Sessions by Subject

- Chemistry
- **First-Year Engineering**
- Biology

- Physics
- Computer Science
- Statistics
- Adv. Engr

WIEP Corporate Donations FY 2004-05

\$10,000 or above

ADC Telecommunications, Inc. Alcoa Inc. Applied Materials Boeing Company Caterpillar Incorporated Fluor Corporation General Motors Corporation

Under \$10,000

- Abbott Laboratories Air Products and Chemicals Inc. Chevron Corporation Corning Inc. Deere & Company Delphi Corporation E.I. Du Pont de Nemours & Co. Exxon Mobil Corporation
- Honeywell International Intel Corporation Kimberly-Clark Corporation Motorola Incorporated Munther & Janet Qubain Foundation PPG Industries Inc. United Technologies Whirlpool Corporation

WIEP Corporate Matching Donations FY 2004-05

\$1,000 or above

Altria Group Inc. Henry Luce Foundation, Inc. Hewlett-Packard Company Intel Corporation International Business Machines Motorola Incorporated

\$500-\$950

Boeing Company Delphi Corporation Procter & Gamble Company Raytheon Company

Under \$500

3M Corporation Air Products and Chemicals Inc. Alcoa Inc. Ameren Corporation American Electric Power Company Inc. Anheuser-Busch, Inc. Baxter International Inc. BP PLC ConocoPhillips Dana Corporation Eli Lilly and Company Exelon Fidelity Charitable Gift Fund Ford Motor Company General Mills Inc. General Motors Corporation Goldman Sachs and Company Guidant Corporation Hyperion Solutions Corporation Ingersoll-Rand Company Invensys PLC **ITT** Industries Johnson & Johnson JustGive Kimberly-Clark Corporation Lexmark International Inc.

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