

THE PENNSYLVANIA STATE UNIVERSITY
COLLEGE OF ENGINEERING

2004-2009

College of Engineering Diversity Strategic Plan

CURRENT INITIATIVES, STATISTICS AND TRENDS,
AND PROPOSED STRATEGIES FOR ENHANCEMENT
OF DIVERSITY AND CLIMATE IN THE COLLEGE



February 16, 2004

INTRODUCTION

The College of Engineering has historically integrated diversity goals and initiatives into strategic planning and implementation. The College published its first formal Strategic Diversity Plan in January 1993 in which we formulated our diversity goal:

Our goal, with respect to diversity, is to be among the top 10 engineering programs at major research universities. This goal requires that we effectively be among the top three of the Big 10 universities in recruiting and retaining, through graduation, women and minority undergraduate and graduate students. We similarly need to recruit and develop women and minority faculty and staff to achieve senior positions within the College.

The College of Engineering has developed three strategic initiatives in its commitment to create a climate that is attractive, inclusive, and diverse. These initiatives are:

1. Increase the diversity component within the engineering curriculum and continue to develop faculty and staff awareness of climate issues.
2. Increase recruiting activities to create a more diverse student body, faculty, and staff in the College; and increase retention of women and minority students to equal majority retention levels.
3. Identify meaningful assessment indicators for measuring diversity within the College.

In 1994, as a part of the original plan, it established diversity committees in all departments, virtually all of which continue today.

The College of Engineering has also consistently integrated diversity strategic initiatives into its strategic planning processes and designed them to complement the University-wide initiatives outlined in [A Framework to Foster Diversity at Penn State: 1998-2003](#). This plan continues that tradition as it links reports of Continuing Activities Addressing the Framework for Diversity, initiatives and enhancements to the University's 2004-2009 plan.

Most recently, the College formulated "Progress and Strategic Initiatives in Fostering Diversity" (April 2, 2002), which was based on an in depth inventory of College activities, progress and needs. The plan was developed by a Task Force charged by the Dean to develop a response to the University's Framework for Diversity, and specifically "to identify issues and make recommendations which can improve our ability to build a more diverse and supportive College of Engineering." The thirteen-member Task Force, composed of faculty, administrative staff, and student representatives set about its assessment of progress and future prospects for diversity through meetings held every two weeks. From these exploratory efforts by the Task Force along with subsequent analysis and feedback from the Academic Council, a number of themes were developed that will provide an effective guide for continued progress. In retrospect, the College has developed a broad set of initiatives and processes, as well as a solid organizational structure and considerable institutional commitment and investment for its diversity efforts. These activities have been driven in large part by the particular challenges of an engineering community and, while successful, need to be filled in and integrated as a coherent package. The Task Force conducted a comprehensive inventory of the ongoing initiatives, as arrayed in the summary charts prepared for each of the challenges posed in the Framework. This document draws heavily on "Progress and Strategic Initiatives in Fostering Diversity", detailing current activities, progress and new or renewed action plans.

CAMPUS CLIMATE AND INTERGROUP RELATIONS

Challenge 1: Developing a Shared and Inclusive Understanding of Diversity

Challenge 2: Creating a Welcoming Campus Climate

Challenges 1 and 2 are closely linked, Challenge 1 providing the theory and Challenge 2 providing the data gathering and the practice. As a College, we view the integration of an awareness of diversity and implementing programs and activities with a goal to achieving diversity as essential to our stature as a world class educator of engineers; to be effective, an active appreciation of diversity and climate must be articulated, understood and incorporated in the workplace, classrooms, and laboratories throughout the College.

To develop and communicate clear and consistent descriptions of Penn State's diversity objectives and initiatives the College of Engineering integrated diversity into the vision and strategic goals of the college:

The vision of the College of Engineering is to have a partnership of faculty, students, staff, alumni, and government and corporate leaders working together to provide the highest quality education and to continue building one of the nation's best engineering institutions. The aim is to create a climate that attracts and supports a diverse group of students, faculty, and staff where effective learning, research, and service are accomplished by working together.

Strategic Goals

1. Attract and develop an outstanding and diverse faculty, student body, and staff.
2. Advance the quality of the undergraduate educational experience with increased active learning and faculty/student interaction, focusing on integration of design, communications, computation, and the contextual understanding of engineering.
3. Strengthen the quality of the graduate program.
4. Advance an active, externally funded research program and increase the number of quality awards to faculty.
5. Implement administrative and organizational actions to support strategic goals and increase effectiveness.

Further, the College's third strategic diversity initiative (listed in the introduction) addresses the challenge to "Identify meaningful assessment indicators for measuring diversity within the College." In addition to the current climate survey, the College has collected retention data through a cohort study since 1989.

Overarching recommended actions, as laid out in the 2002 Progress and Strategic Initiatives in Fostering Diversity plan, are:

- Foster an environment where everyone feels as though they can have a unique contribution to offer and differences to be celebrated, and in which effective learning, research and service are accomplished together.
- Show an appreciation for all individual differences and the value they bring to the creative enterprise; to the pursuit of knowledge, sustainable use of resources and betterment of the human condition.
- Keep the College's core, diversity-related values in the forefront and students, faculty and staff systematically informed, via E-News, First-Year Seminars and other available mechanisms or events on campus and other opportunities relating to diversity.

Activities to achieve a shared and inclusive understanding and implementation of diversity are detailed in Table I.

Table I: Developing a Shared and Inclusive Understanding of Diversity and Creating a Welcoming Campus Climate

Continuing Activities Addressing the Framework for Diversity

- Implementation and continued support for a network of Diversity/Climate Committees within almost all engineering departments with diverse memberships that include students, faculty, staff, administrators as well as gender and ethnic diversity. See Appendix I for a list of current committees and chairs.
- Implementation in December 2003, of an online climate survey disseminated to all members of the engineering community including faculty, technical and clerical staff, administrators and students. The survey is designed to assess the overall working and learning climate and respondents' individual experiences, with particular emphasis on the experience of underrepresented groups. See Appendix II for copies of the surveys.
- Continued support for two of the original, college-based diversity programs at Penn State—The Multicultural

Engineering Programs and the Women in Engineering Program. The activities of these programs are integrated into the college at all levels. The programs create and implement activities designed to recruit ethnic minority and women students into the College of Engineering and to develop and retain them once here. The programs are an important source of information on diversity in general for the College as a whole, offering workshops and information to departments and units and participating in regularly scheduled meetings with the Associate Deans for Undergraduate Studies and Graduate Studies, Research and Outreach and with faculty. The directors have direct access to the Dean and are members of the Academic Council, one of the two primary leadership bodies of the College. (See Appendix III for overviews of MEP and WEP activities.)

- Launching of a newly revised College Website provides prominent visibility for MEP and WEP.
- Creation of the Council of Senior Faculty Women, which reports to the Dean and is supported through the Women in Engineering Program. The Council offers workshops, acts as a climate liaison for faculty women, and undertakes diversity initiatives. In fall 2003, they took junior faculty women to Washington D.C. for meetings with NSF, NIH and other government funding agencies.
- Ensuring that diversity is a performance factor considered in annual performance reviews and encouraging supervisors to make comments in regard to this factor.
- Offering initiatives through the Office of Engineering Human Resources:
 - A College wide workshop on Sexual Harassment: What everyone needs to know
 - Encouraging college employees to attend a program “Communicating with People with Disabilities.”
- Creating access as an important aspect of fostering a welcoming environment. The College Facilities Office has overseen installation of an accessible ramp and first floor restroom in Old Botany and installation of an ADA ramp between Central and South wings of Sackett Building.

Planned Actions for 2004-2009

- Continue to support Departmental Climate Committees and be involved actively in implementation of the 2004-09 Engineering Diversity Strategic Plan.
- Use the results of the College survey to: 1) gauge the understanding of diversity issues and “buy-in” by members of the engineering community; 2) assess the quality of our climate; and 3) identify areas for action and improvement.
- Use the data and subsequent analysis and the existing Climate Committee network to create College- and Unit-wide approaches to identify and disseminate best practices as well as to identify and address climate issues.
- Continue to actively support for the MEP and WEP activities.
- Develop a web page as part of the College website that describes the College diversity position and activities, provides resources and the opportunity for Q&A, and posts this plan.
- Continue offerings of workshops related to diversity and the implementation of good diversity practices by HR.
- Develop a “Diversity Search Toolkit,” based on a successful University of Washington model, as an undertaking of the Council of Senior Faculty Women.
- Reinforce core values in the departments by developing student and faculty “pledges” or “contracts” along the lines of those developed in the Industrial and Manufacturing Engineering Department.
- Installation this summer of exterior enhancements to EE East that will include a new ADA entrance ramp.

REPRESENTATION (ACCESS AND SUCCESS)

Challenge 3: Recruiting and Retaining a Diverse Student Body

Challenge 4: Recruiting and Retaining a Diverse Workforce

Again, these challenges are inextricably linked: A diverse workforce is a crucial element in the development of a diverse student body. The College’s second strategic initiative recognizes this and directly addresses the issue of representation: Increase recruiting activities to create a more diverse student body, faculty, and staff in the College; and increase retention of women and minority students to equal majority retention levels.

A key factor in the success of recruitment and retention efforts is collaboration among all units of the College. This is achieved in a number of ways:

- Participation of the WEP and MEP directors on the College Academic Council that comprises the College leadership;
- Participation of the directors in all College Leadership retreats;
- Bi-monthly meetings of the Undergraduate Studies leadership group;
- Monthly meetings with the Graduate Studies leadership group;
- Cooperation between departments and MEP/WEP for recruiting and retention efforts.



The College is active in recruiting women and ethnic minority undergraduates through interactions at high schools and with Girl Scout groups and providing summer hands-on workshops for women and ethnic minority students. We also have recruiting activities with minority institutions such as North Carolina A&T, Morgan State, Tennessee State and University of Puerto Rico-Mayaguez to increase our pool of minority and women applicants at the graduate level. Departments are recruiting faculty with a commitment to hiring women and minority faculty to improve the climate within the College and to provide role models for current students. Also, mentoring activities and support groups enhance the learning environment within the college in an effort to increase retention of our women and students of color. A listing of recruiting and retention activities and action plans is given in Table II below. While enrollments of students of color have steadily risen from 1997 to 2002, we have seen some decline at the undergraduate level for women for the 2003-04 academic year that reflects an apparent national trend (Figure 1). Penn State continues to rank among the top 10 producers of women engineering graduates. The enrollment rate of students of color has held fairly steady over the period reported (Figure 2). In both cases, the decreased endowment income available for scholarships as a result of external economic conditions played a part in weak recruiting seasons. Note: College of Engineering data are drawn from the University data warehouse by Sarah Cohen, assistant to the Dean of Engineering, who maintains the College of Engineering performance indicators.

Figure 1: Engineering Undergraduate Women Enrollment

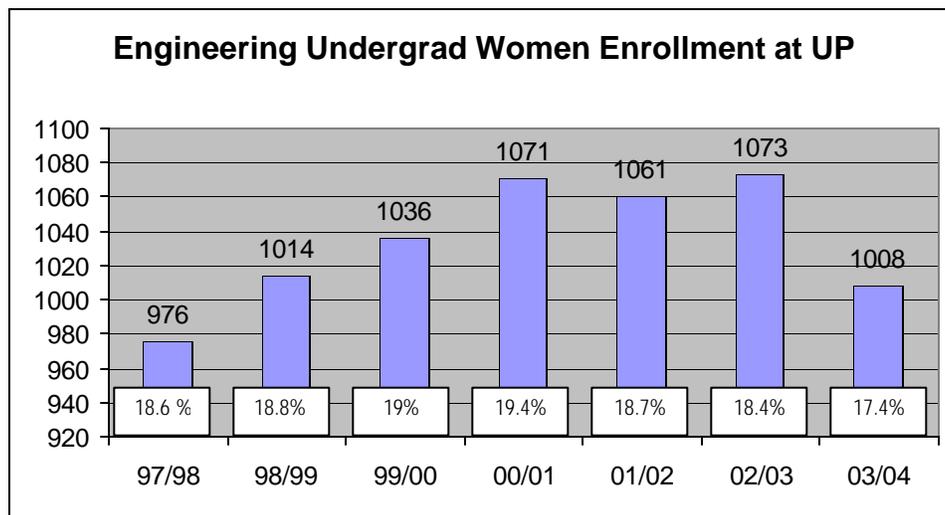
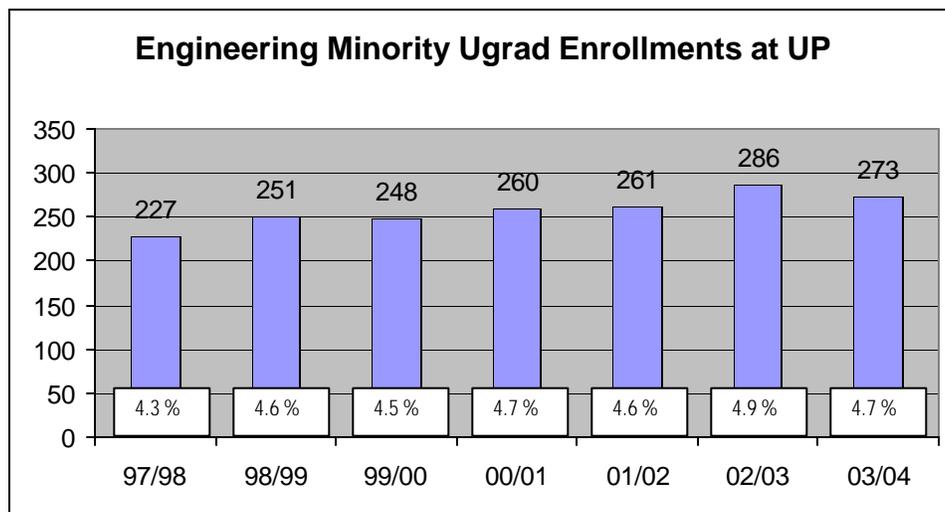


Figure 2: Engineering Undergraduate Minority Enrollment



Improvements in retention will depend largely on expansion of already successful programs to provide effective orientation and bridging programs, as well as strong incentives and support to encourage academic engagement and achievement. The preliminary retention data collected for the Women in Engineering Program Orientation and the recently introduced Multicultural Engineering Programs Academic Summer Enhancement for Campus College

students shows the powerful influence of this kind of community-building and skills-development initiative. As shown in the data for the WEPO 1997 and 1998 cohorts, the impact of the program appears to persist for the participants through subsequent years of study, as manifested by retention rates that exceed those for all women and men (Figures 3 and 4).

Figure 3

WEPO '97 Preliminary Retention Data

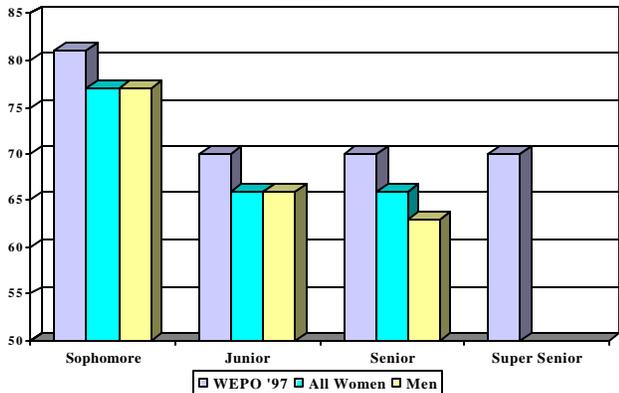
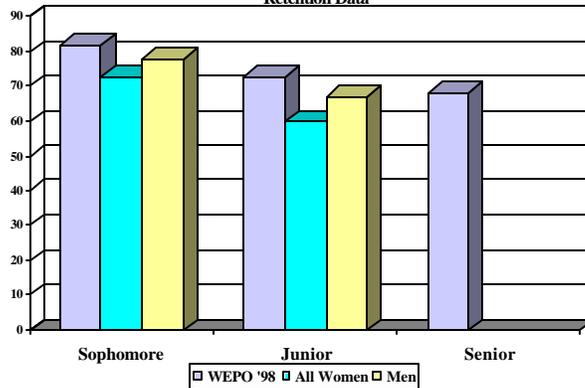


Figure 4

WEPO '98 Preliminary Retention Data



Early data for ASE are also encouraging. As seen in Figure 5, students who participated in 2003, the second offering of the activity, increased both in GPA and retention.

Figure 5: College Enrollment Data for ASE Students 2002-2003

Cohort Year	ASE Participation						PSU Enrollment Data, Fall 2003	
	Total Participants	Average Pre-GPA	Initial 1st-Year Enrollment		Average 1 st Fall Semester GPA		Current Enrollment	Dropped out
			Engineering	Other	Participants	Non-Participants		
2002	22	2.32	19	3	2.33	2.18	15	7
2003	20	2.41	19	1	2.79	2.23	19	1
TOTAL	42	2.36	38	4	2.56	2.20	34	8

Growth continues at the graduate student level (Figure 6), with particular success in turning around a declining enrollment among graduate minority students (Figure 7). In the 2003-04 cohort, 22 new minority graduate students were successfully recruited. The College will work to increase the number of endowed scholarships and fellowships to help attract women and minority students at all levels and is redoubling its recruiting efforts for the next recruiting year.

Figure 6: Engineering Graduate Women Enrollment

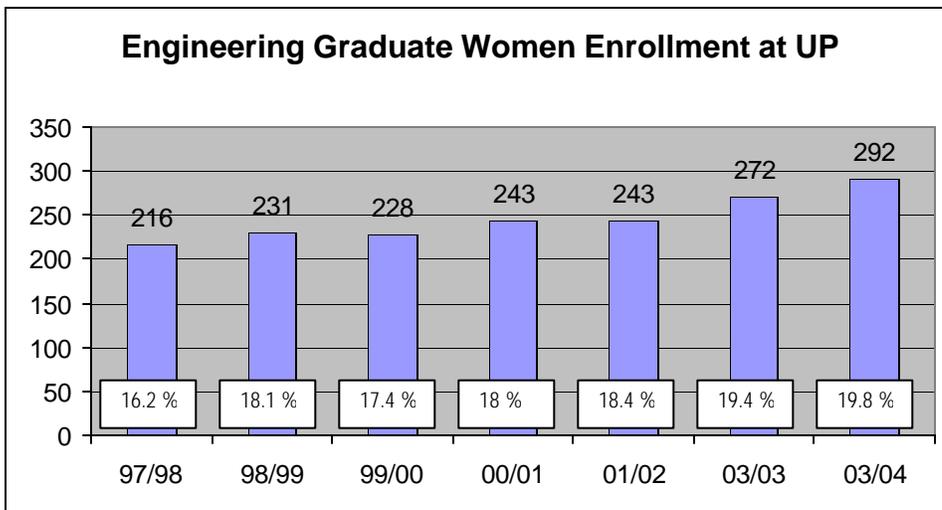
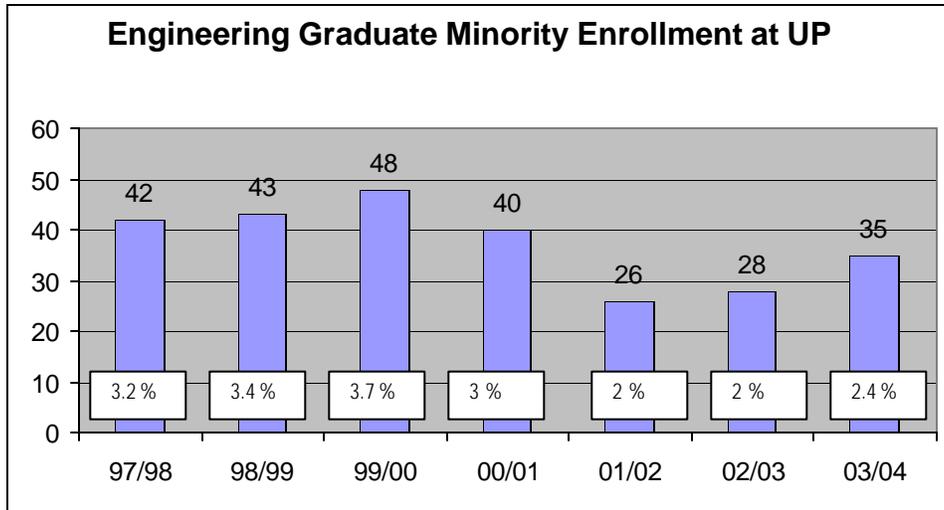


Figure 7: Engineering Graduate Minority Enrollment



Graduation rates of ethnic minorities and women have been fairly consistent over the past seven years, with increases at the undergraduate level. The number of undergraduate women receiving engineering degrees has risen steadily from 179 in 1997-98 to 244 in 2002-03 (Figure 8), while graduation rates for ethnic minorities have recovered from a drop in 2000-01 to 37 students to reach 54 students graduating in 2002-03 (Figure 9).

At the graduate level, women's degrees have hovered around 20 percent of all engineering degrees given at University Park for the past three years (Figure 10). The rate for graduate degrees granted to ethnic minority students fluctuates, not surprising given the small numbers enrolled (Figure 11). Last year did see a dip from 4.1 percent in 2001-02 to 2.4 percent in 2002-03, but it is anticipated that with the improved recruiting efforts and the larger enrollment of new ethnic minority graduate students in 2003, the degrees awarded will steadily increase.

Figure 8: Engineering Undergraduate Women Degrees at University Park

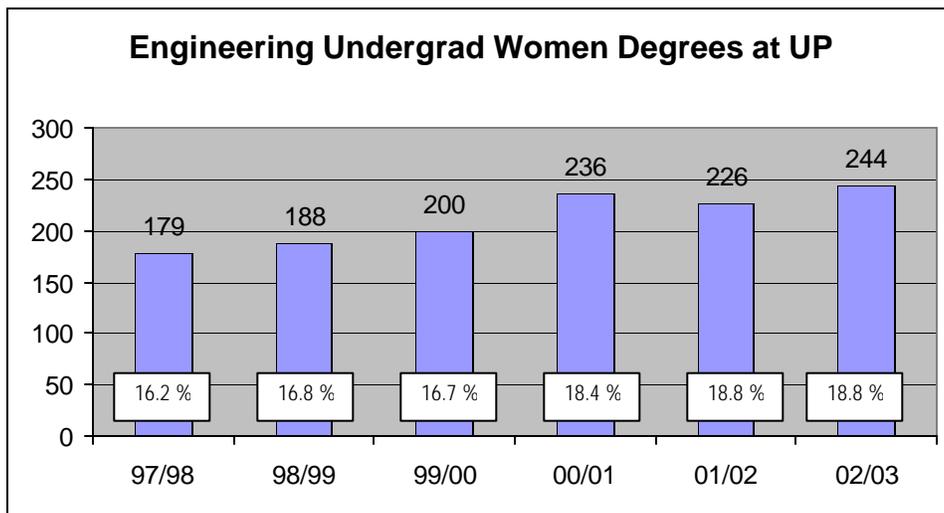


Figure 9: Engineering Undergraduate Minority Degrees at University Park

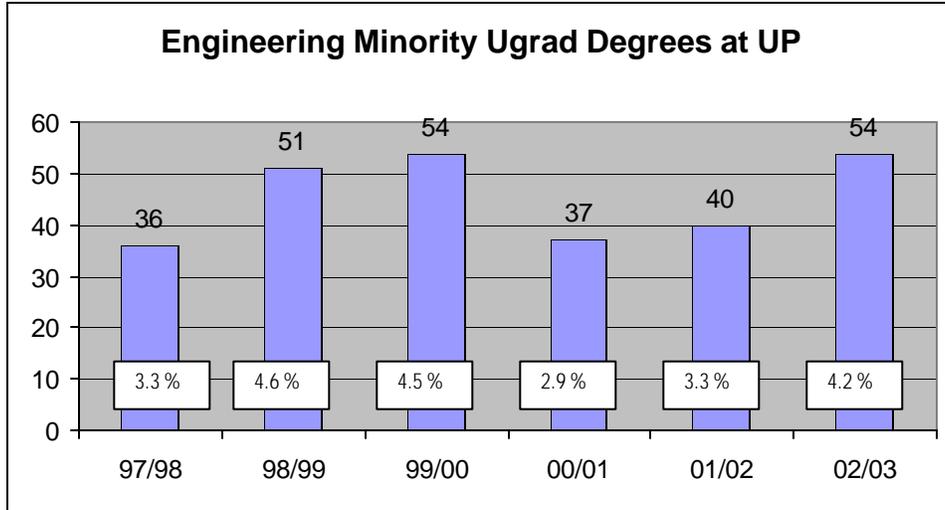


Figure 10: Engineering Graduate Women Degrees at University Park

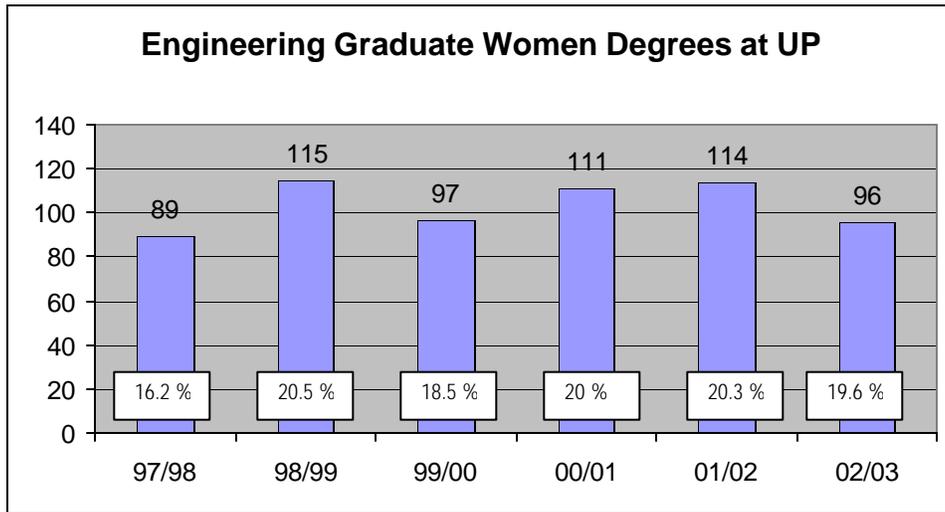


Figure 11: Engineering Graduate Minority Degrees at University Park

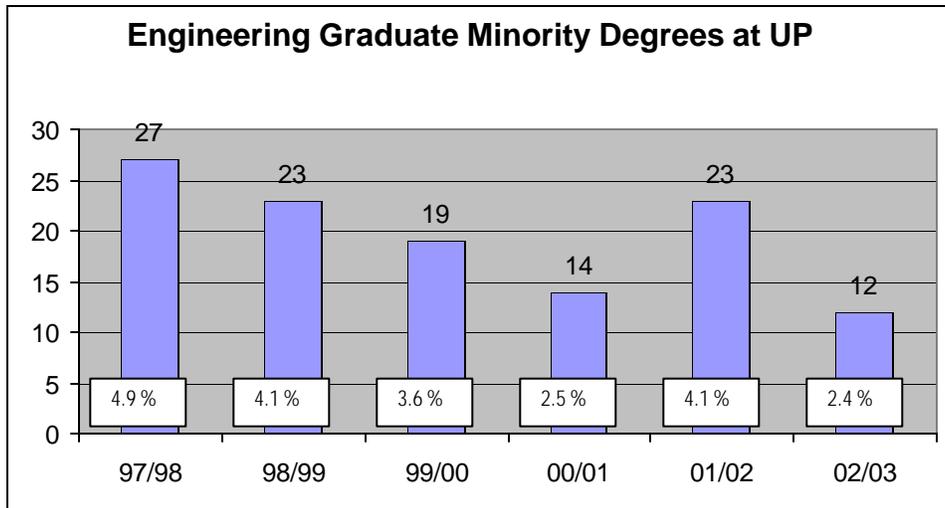


Figure 12 shows retention rates after two years for students who entered the College as first year students at University Park in 2001. Of the UP majority male and female students entering in 2001, 67% are retained after two years, partially reaching a college goal to have retention rates for women and under-represented minority students equal that of majority students. Fifty-five percent of the ethnic minority students were retained during the same time period. While the retention numbers for minority students continue on an upward curve, we still have work to do.

Figure 12: Retention rates after two years for students entering UP, 2001

YEAR OF ENTRY Comparison Cohort of Interest: Campus Gender & Ethnicity	2001		
	Men	Women	Minority
# Entering the College of Engineering	1002	219	49
# Enrolled in COE 1 Year Later 1 Year Retention Rate	836 83%	176 80%	39 80%
# Enrolled in COE 2 Years Later 2 Year Retention Rate	672 67%	147 67%	27 55%

The College will continue efforts to actively recruit underrepresented students at the undergraduate and graduate levels. Student recruitment and retention activities are driven by the Multicultural and Women in Engineering Programs and supported actively by the Office of the Associate Dean for Undergraduate Studies and the Office of the Associate Dean for Graduate Studies, Research and Outreach. Departments are active participants in a variety of ways including individual visits by high school students and graduate school prospects and participation in the annual Open House that targets all women and ethnic minorities who have been accepted to Penn State and high school sophomores and juniors who have been identified through College outreach activities and PSAT mailing lists. The OGSRO sponsors an all-College Graduate Open House that attracted 106 high achieving students, 49 of whom enrolled. The event stresses the recruitment of ethnic minority and women students and yielded 13 ethnic minority students and 69 women participants. Of those, 8 ethnic minority students and 32 women matriculated.

Quality Faculty

The internationally known Penn State College of Engineering faculty numbers 279 full-time tenured and tenure-track members at University Park and 29 full-time members at other Penn State locations. Engineering faculty have authored more than 275 textbooks and are recognized leaders in research, in their profession, and in the development of innovative curricula and courses.

The College has continued to emphasize the identification and hiring of diverse faculty candidates, with demonstrated success: we have one of the highest percentages of women faculty in the country (14.3%) and have increased the numbers and overall percentage of underrepresented ethnic minority faculty by more than a percentage point in the past year, from 10 to 13 faculty members or 4.7% (Figures 13 and 14). These hires have strengthened the faculty considerably, bringing key expertise. This is particularly noteworthy when one considers that engineering institutions nationally continue to struggle with low percentages of women and ethnic minority undergraduate and graduate enrollment and persistence and the strong competition by industry and among universities nationally for these candidates. The recruitment of a diverse faculty is a priority of the College Executive Council and has substantial buy-in from faculty in general. Search committees are provided information about how to increase recruitment of underrepresented groups through enlarged pools and sensitivity to cultural differences.

The College's administrative team includes women and minorities in positions as Chaired Department Head, Assistant Dean for Undergraduate Studies, Center Directors and Program Directors. The College will continue to actively recruit women and minority faculty members, and its search committees will also continue to include women and minorities.

Figure 13: Longitudinal View of Engineering Women Faculty Growth

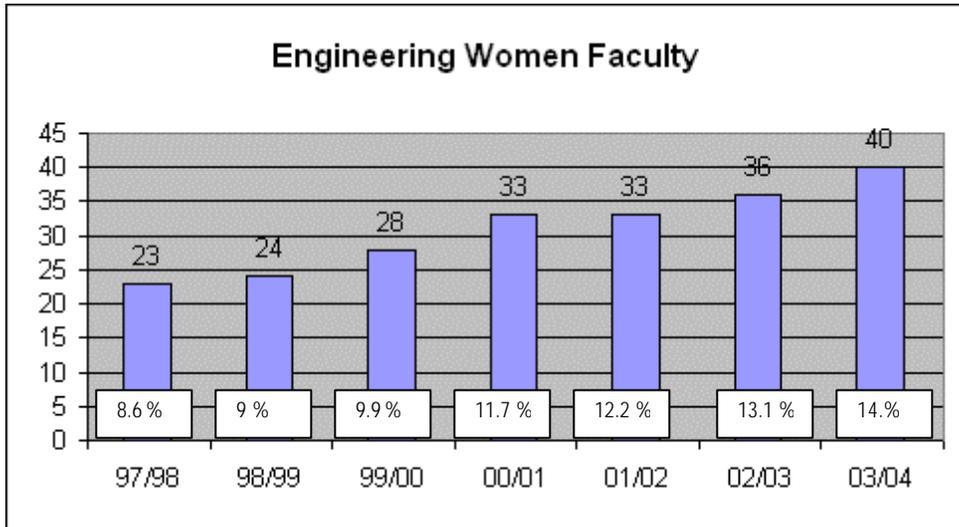


Figure 14: Longitudinal View of Engineering Minority Faculty Growth

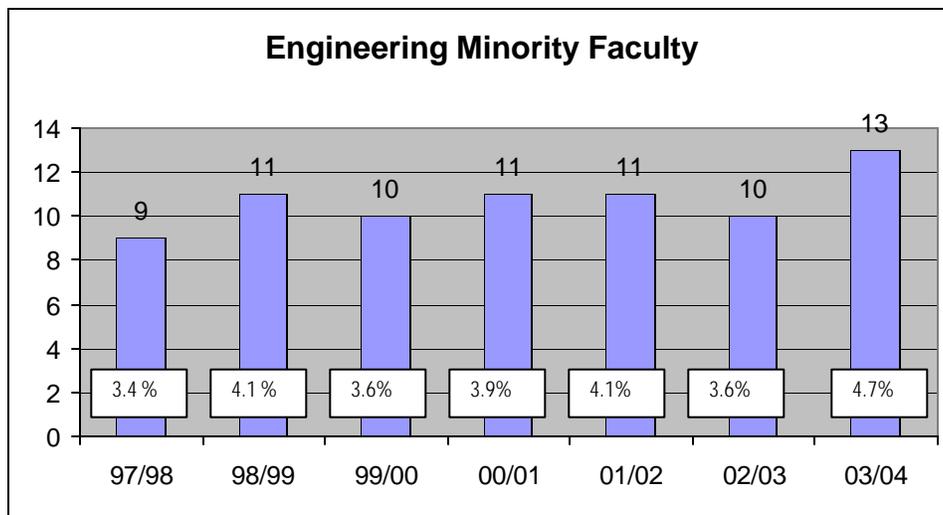


Table II: Continuing and Planned Recruiting and Retention Activities

Continuing Activities Addressing the Framework for Diversity: Recruiting

Faculty

- Aggressive pursuit of women and minority faculty candidates for faculty positions through identifying larger pools, creating recruitment networks, and ensuring informed search committees.
- Regular programming by Engineering Human Resources:
 - Offer a Promotion and Tenure Workshop that stresses diversity recruiting
 - Offer a workshop presented by the Affirmative Action Office that covers faculty affirmative action goals and strategies for recruiting diversity candidates
 - Make presentations to departmental search committees that points out affirmative action goals and diversity recruitment

Graduate Students

- Active recruitment of strong minority graduate students at Big Ten institutions and creation of partnerships with minority institutions such as North Carolina A&T, Morgan State, Tennessee State and University of Puerto Rico-Mayaguez
- Attend national career fairs to reach women and ethnic minority students for graduate school
- Offer annual visitation weekends for top candidates with an emphasis on women and ethnic minorities
- Exchange names of promising undergraduate women and students of color with other major universities to increase the graduate recruiting pool through the WEP Cross-Fertilization project
- Revamp and continue more aggressive recruitment packages targeting ethnic minority and women candidates developed by the Office of Graduate Studies, Research and Outreach

Undergraduate Students

- Visit high schools by departmental honor societies to seek minority undergraduates
- Conduct hands-on workshops to attract women and minority students:
 - MEP attends 10-12 conferences annually to nationally recruit undergraduate and graduate students.
 - WEP Take Your Daughters To Work Day MEP and WEP tutoring and presentations at local schools
 - WEP Spend an Engineering Day WEP Girl Scout Saturdays
- Conduct summer camps for middle and high school women and minority students:
 - MTM (Move the Mountain) camp for high school girls (1 week) which offers special sessions for African American girls from Harrisburg and Latinas from Philadelphia.
 - VIEW (Visit in Engineering Week), two 1-week programs for high schoolers and a 3-day program for middle school students (Figure 15).
- Early identification of girls and ethnic minority high school students through PSAT and outreach programs
- Contact with prospective students and insuring that prospective students meet women engineering students through the Alumnae Recruiting project and Envoy program
- Maintaining PSU4YOU recruiting listserv and website that presents stories from current students and information about student life to prospective students

Figure 15: Impact of VIEW Participation as Measured by Penn State Enrollment & Graduation 1993-2003

VIEW Participation							PSU Enrollment Data as of Fall 2003		
Cohort Year	TOTAL Participants	Applied to PSU /Still to graduate from HS	Initial First Year Enrollment		TOTAL PSU Enrollment -each year		Current PSU Enrollment -FA03	Dropped out	Degrees Awarded to Date
			ENGR	Other	Accepted	% of recruits for MEP			
1993	18	4	1	0	1	100%	0	0	1
1994	9	2	1	1	2	50%	0	1	1
1995	35	10	3	7	10	30%	0	5	5
1996	27	8	1	4	5	20%	1	1	3
1997	45	23	4	5	9	44%	0	3	6
1998	47	23	2	6	8	25%	6	2	0
1999	40	23	6	6	12	50%	7	5	0
2000	46	14	4	3	7	57%	6	1	0
2001	62	20/15	6	7	13	46%	11	2	0
2002	65	24/31	9	6	15	60%	15	0	0
2003	67								
TOTAL	384	151	37	45	82	45%	46	20	16

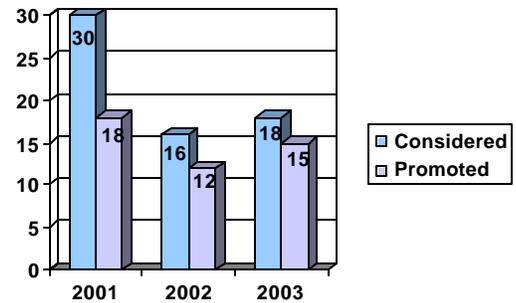
Continuing Activities Addressing the Framework for Diversity: Retention

Faculty

- The Council of Senior Faculty Women was established in 2003. Working with WEP, the council coordinated a trip to Washington D.C. in Fall 2003 to introduce faculty women to potential funders and plans a "Promotion to Full Workshop" in Spring 2004.
- WEP offers monthly Graduate/Faculty Networking & Professional Development lunches with speakers.
- The College has implemented clock stoppage for junior faculty members.

Staff

- Design and introduction in 2001 of The Peer Review of Exceptional Performance (PREP) to recognize, reward, and retain exceptional staff employees within the College by offering all employees the potential for two promotions within grade. (see right). In 2001, the PREP peer review committee considered 30 candidates for promotion. Eighteen, or 60%, were promoted. In 2002, the peer review committee considered 16 candidates for promotion. Twelve, or 75% were promoted. In 2003, the peer review committee considered 18 candidates for promotion. Fifteen, or 83% were promoted.
- Consider diversity as a performance factor in annual SRDP's. Supervisors are encouraged to make comments in regard to this factor.
- Development of a Staff Scholarship Award as part of the Grand Destiny Campaign.



Graduate

- Emphasize diversity and diversity recruiting in annual Office for Graduate Students, Research and Outreach (OGSRO) workshops (resulting in the enrollment of 22 new students in Fall 2003)
- Close collaboration among OGSRO, MEP and WEP in developing timely and attractive recruitment packages for ethnic minority students and women
- With sponsorship from OGSRO, offers monthly WEP Grad-Faculty Networking lunches with topics ranging from "Preparing for a Faculty Career" to "Writing a Corporate Resume" to "The Imposter Syndrome" with more than 200 participants per year
- Offer MEP graduate students a Brown Bag Lunch series for graduate students to get to know each other and develop a support community
- Build a pipeline of M.S. and Ph.D. candidates through undergraduate research experiences in state-of-the-art facilities through the Center for Undergraduate Research Opportunities (CURO) and College and WEP supported undergraduate research activities
- Provide a voice for graduate student concerns through the Engineering Graduate Student Council

Undergraduate

- Women in Engineering Orientation (WEPO) program, begins with an intensive, hands-on orientation to engineering and continues with year long individual, group, and email mentoring for first year women engineers with professional women and upper class women, with resulting increased retention of participants
- Pre First-Year Engineering & Science Program (PREF) - targets students who are prepared to enter their first-year at a Calculus math level. Students receive 6 credits and are housed on campus for six weeks to receive study skills instruction plus introductions to Physics, Chemistry, and Calculus.
- Mentoring activities including:
 - MEP: Peer Mentoring Program (PMP) matches upper level mentors with first-year students. PMP also hosts group activities and encourages students to interact with each other as they adjust to college life.
 - WEP: WEPO mentoring Teams of 6-8 students are led by upper level engineering women. The groups meet monthly. Campus College women are also matched with former CC student mentors who are now at UP via email (See Figures 3 & 4 above).
- Support for student chapters of the National Society of Black Engineers, the Society of Hispanic Professional Engineers, the American Indian Science and Engineering Society, the Society of Women Engineers and the Phi Sigma Rho Professional Sorority for engineering women
- Assistance to undergraduates and graduate students with resume development and submission for internships, co-op, and permanent employment opportunities through the Engineering Cooperative Education and Internship Office
- Collaboration between MEP and the Engineering Cooperative Education Office to offer a funded Internship Program for ethnic minority students with NASA-Kennedy Space Center that includes student recruitment, academic and professional development, a field trip to NASA-Kennedy Space Center, and internship assignments
- Promotion of academic excellence by providing tutoring, computer access, "survival" and professional skills courses, and career development materials through the MEP Academic Excellence Center and WEP Facilitated Study Groups
- MEP-sponsored Book Scholarship Fund as an incentive for students to improve academic performance. Funds are awarded based on the positive change in GPA to assist upper division students who earn GPAs between 2.0 and 3.0.

- Outreach programs to engineering students at Campus Colleges
 - MEP: (Academic Summer Enhancement (ASE) is a month-long summer orientation designed to familiarize CCC students with the University Park campus (where they will later attend) and provides an intensive review of Trigonometry and Pre-calculus. This review will help to ensure the students' success in math courses in the first semester at the campus college assigned (See Figure 5 above.)
 - WEP: The Women in Engineering at the Commonwealth Initiative (WESAC) includes a peer e-mentoring program, newsletter and listserv.
- Comprehensive dissemination of information through E-News, a weekly electronic newsletter distributed throughout to College of Engineering students and pre-majors systemwide. WEP and MEP both offer additional listservs to make sure that underrepresented students are well within the vital information loop.
- Creation of E-House, a new living option for engineering students which aims towards having a diverse population and emphasizing multicultural experiences, connections with engineering faculty, academic support and career development. It complements two existing options, FISE (the First Year in Science and Engineering Interest House) and EASI (Engineering and Applied Science Interest House).

Assessment

- Implementation of systemic assessment plans to measure activity effectiveness and long term tracking of participants
- Participation in NSF Assessing Women in Engineering Project to develop national assessment tools
- Continuation of longitudinal cohort retention study

Planned Actions for 2004-2009

Faculty

- Continue emphasis on recruiting diverse faculty candidates
- Develop and offer workshops for funding, promotion and other identified areas
- Provide career development workshops for faculty members (on promotion, management, leadership, and other ingredients for advancement) and take steps to ensure that underrepresented faculty members are not requested to serve on a disproportionate number of committees. (Current practices of directing requests to participate on committees through the department heads help prevent over-commitment of women and ethnic minority faculty should be reinforced.)
- Require enhanced level of training for all search committees on the topic of diversity as outlined in University policy
- Develop a guidebook for distribution to all search chairs and committee members and posting on the college website that includes outlets for advertising to reach underrepresented or nontraditional populations, objectives of the college diversity plan, and effective methods for running a search (In progress by Council of Senior Faculty Women.)
- Set up a training team that includes volunteers from the faculty and appropriate administrators who would be trained to meet with search committees throughout the college. (The participation of faculty as peers will help to institutionalize diversity values.)
- Proactively identify, recruit and hire qualified minority and women candidates, especially new Ph.D.'s and those in industry
- Encourage open searches
- Make advertisements for faculty positions as broad as possible to increase the potential pool of applicants. Advertisements and on-site interviews should provide information about the Penn State location (low cost of living, low crime rate, quality public schools, wide variety of outdoor recreational activities, active religious communities, etc.) and on assistance available for spousal employment support. Discourage the tendency during recruiting visits to be unintentionally critical or apologetic regarding the community (i.e., as isolated or lacking cultural outlets), even in jest, recognizing that many of us have, in fact, found the community and region to be a very pleasant place to live and work.

Faculty and Staff

- Identify and promote women and ethnic minority candidates for internal and national awards
- Continue and expand HR workshops and offerings on diversity and affirmative action
- Develop and implement strategies to improve the success of search processes in identifying and assessing the credentials of women and minority employee candidates for faculty and staff positions
- Develop a College orientation manual to acclimate new faculty and staff to the College's resources and services to reaffirm the College's diversity vision and mission
- Develop packets of information for minority candidates for all positions that detail availability of goods, services and social institutions available in the area

Staff

- Require that all faculty members and administrators make it possible for their staff to participate in some minimal number of career development activities per year
- Expand locus of recruiting to include urban areas and to cast opportunities and the local environment in their best light; advertisements should sell Happy Valley as a great and affordable place to live
- Provide reimbursements for moving expenses for underrepresented candidates who will have to relocate
- Offer orientation sessions for all new staff members

Graduate

- Explore new ways to recruit women and minority undergraduate and graduate students
- Continue to develop relationships with Colleges and Universities with high ethnic minority enrollment
- Attract ethnic minority and women graduate students through effective financial aid and fellowship packages
- Expand orientation and mentoring services for women and students of color
- Present recruitment and retention workshops for faculty at all departmental faculty meetings
- Develop a system for identifying and disseminating best practices for graduate recruitment, including aggressive networking, casting the Penn State community in its most favorable light, and involving current students as ambassadors

Undergraduate

- Develop strategies for recruitment and retention in majors with low diversity percentages
- Continue to identify prospective students early, particularly those who have the skills and talent for engineering but who have not identified engineering as a possible career, and create efficiencies by working with target schools, and math and science teachers
- Increase awareness of faculty on issues and challenges faced by underrepresented students
- Continue to expand the financial support for underrepresented students and concentrate undergraduate recruitment on PA-residents for whom providing a significant contribution to the cost of attendance is a more attainable proposition

EDUCATION AND SCHOLARSHIP**Challenge Five: Developing a Curriculum that Fosters Intercultural and International Competencies**

The College's first strategic initiative set a goal to: Increase the diversity component within the engineering curriculum and continue to develop faculty and staff awareness of climate issues.



As we prepare engineering students for an increasingly competitive and global workplace, an understanding of diverse cultures and attitudes becomes even more important from both a professional and personal point of view. It is the goal of the College to enhance the education and curriculum for our students to reflect a broad understanding of diversity. This includes emphasizing contemporary domestic diversity within national, international, and historical contexts. Curriculum enhancements have been initiated to develop our students into 'World Class Engineers' who embrace the important concepts of diversity along with professional and technical skills. Training for faculty and graduate students on issues of equity and integrating diverse teamwork in the classrooms are provided through workshops and video tapes. The number of courses with gender-balanced enrollments or

clustered for ethnic minority students is increasing within the College of Engineering, as are courses targeted towards retention and development for those populations. Actions undertaken by the College to increase diversity awareness are summarized in Table III.

Integrating diversity issues into technical research programs is challenging. The College encourages all engineering faculty to include diversity components for all research proposals and involvement of underrepresented groups in undergraduate research. The senior capstone design projects have also stressed development of socially relevant projects through EPICS projects (Engineering Projects in Community Service) and the Entrepreneurship minor. These design opportunities for students from mechanical, electrical and computer engineering come from local non-profit human service organizations, with the design effort typically focused on children or adults with physical or learning disabilities or for the economically disadvantaged. Students work directly with physical

therapists or experts from the agency, and see their design in use. Example projects include: Kids without Bounds - Disabled Child's Playground Rideabout; Child's Handgrip Device; Mobility Support Unit for Handicapped Child; Traveling Lights Toy; Multifunction Chair; and Electric Power Generation for Jamaica.

Table III: Continuing Curricular Enhancement Activities

Continuing Activities Addressing the Framework for Diversity	
<ul style="list-style-type: none"> • Course offerings that have specific diversity content and are designed to attract a diverse enrollment: <ul style="list-style-type: none"> • Senior Capstone Design Projects (described in the preceding paragraph.) • ED&G 497U: Global Approaches to Engineering design uses information technology and existing partners and contacts around the world to examine diverse approaches in engineering design. In collaboration with faculty and students in other countries, students study advanced topics, and engage in short studies and projects using the diverse views offered by their international partners. • ENGR 497: Career Strategies for Engineering Women is team taught and developed with the participation of practicing engineers. It introduces tools and methodologies and employs professional mentors to better prepare students for success in the work force. Students study gender communications and diversity as part of the course. • ENGR 297: Wellness Strategies for Engineering Women incorporates the development of effective lifelong wellness strategies, physical training, and stress management for engineering women and includes career development and gender components. • ENGR 588: Seminar for Engineering TAs offers instructional training for Engineering Teaching Assistants and includes material related to diversity and cultural issues that impact pedagogy. • Success 101: A Road Map for the Successful Student, is a two-credit course for first year students of color designed to reveal successful strategies and contributions of earlier pioneers, and offering experiences in the application of calculus, chemistry and physics to upper level courses. • ENGR 297: Lab and Shop Skills, a one-credit course designed to introduce women and ethnic minority students to key skills and showcase underrepresented students in leadership roles. • Gender-balanced course sections in Math 140, Math 141, and first year seminars that feature hands-on mechanical experience. • Cluster course sections for under-represented minority students in Math 140, Math 141, Chem 12, Physics 211, and ED&G 100. • An S T S 497V (International Orientation seminar) one-credit course to prepare students who are going overseas. Issues covered include engineering practices in other countries, cultural differences, and what it is like to be in a professional environment in other countries. • Introduction of minors and minor courses that attract a high number of women students and help to increase retention. These are Leadership Development and Entrepreneurship. A comparison of participation rates by gender reveals that females in the college population are more likely to take leadership courses than their male counterparts ($\chi^2=16.186$, $df=1$, $p<.0001$). This finding has been supported anecdotally by the course instructors for entrepreneurship as well. • Workshops for new faculty offered by the Instructional Services Office and The Leonhard Center with particular emphasis given to classroom climate, issues of cultural diversity, and diversity in managing and organizing teams in the classroom. • Supporting materials and documentation for facilitators and distribution of the video tape, "<u>In Their Own Words</u>", to partnering institutions for faculty training. • An active International Program that provides students with the skills and orientation to function effectively in multicultural workplaces and social environments. This activity allows students to pursue various international experiences that enhance their education and facilitate their development as world-class engineers. Options include studying engineering abroad and pursuing a professional work experience through an international internship or co-op. In 2002-2003, the Global Internship and Cooperative Education program engaged fourteen Penn State engineering students in study and work abroad and an equal number of international students came to Penn State. 	
Planned Actions for 2004-2009	
<ul style="list-style-type: none"> • Continue to expand diversity course offerings in College, including a course on Professional Issues that will integrate diversity issues and is in the planning stages. 	

- Integrate diversity into all First Year Seminar offerings.
- Integrate diversity more explicitly into definition of the World Class Engineer.
- Offer diversity training to all faculty who regularly teach first and second year students.
- Be cognizant of differences in learning styles, skill and confidence levels and certainty of the major choice (or even the decision to study engineering) held by different groups of students when devising or explaining class activities and assignments. This should include provisions to ensure that students with disabilities have the same opportunity for learning as students without disabilities, especially as the learning formats become more active.
- Insure that the advising system is proficient in helping students make course selections and utilize electives that will promote curricular coherency in their general education and major courses.
- Take advantage of opportunities to engage students actively in defining and agreeing on shared core values that will guide and enhance subsequent team-project and design efforts; establish an award program for senior projects that exhibit consideration of and sensitivity to cultural differences, to be given at the end-of-semester Design Showcase organized by The Learning Factory.
- Invite industrial representatives into the classroom and take advantage of the perspectives gained by co-op students to communicate the corporate processes for instilling commitment to and rewarding diversity.
- Offer faculty and TA workshops on the incorporation of non-intimidating approaches, such as role-playing, into the classroom experience to illustrate circumstances or dilemmas that call for policies and standards regarding ethics, diversity, flexible work arrangements and sexual harassment.
- Launch a searchable web database of engineering courses offered at study abroad locations, and increase the number of students participating in International Programs by developing an informational module for First Year Seminars.

INSTITUTIONAL VIABILITY AND VITALITY

Challenge 6: Diversifying University Leadership and Management

Challenge 7: Coordinating Organizational Change to Support Our Diversity Goals

The College has encouraged faculty and staff members to acquire leadership skills through participation in various professional development programs offered at the College and University levels. Although faculty are cautioned against too much volunteer service early in their careers, they will generally be advanced for faculty governance or administrative committee roles as time and due prudence permit. These activities are important to expanding the locus of experience from Department to College and University levels, and thus for faculty to be seen as viable candidates for academic leadership director positions.

As noted elsewhere in this report, the Academic Council, an expanded group composed of the Executive Committee and directors of key programs (such as the MEP, WEP, Student Services, and Graduate Studies) was created “to advance the College’s efforts in continuing to build a strong and supportive academic climate for a diverse group of students, staff and faculty.”

At the staff level, the College offers the Engineering Administrative Fellows Program, initiated in 1991. The program’s goal remains to provide staff members with an opportunity to serve fellowships with higher-level staff members in different areas of the College. Since the program’s inception, 26 people have participated in the program of which 23 were women and 1 minority. Twenty former fellows have been promoted to higher graded positions.

Table IV: Diversifying University Leadership and Management

Continuing Activities Addressing the Framework for Diversity
<ul style="list-style-type: none"> • Peer Review of Exceptional Performance (PREP) and promotion and tenure workshops • Provide opportunities for training through University workshops; encourage women and ethnic minorities to participate • Actively promote women and ethnic minorities for recognition inside and beyond the University
Planned Actions
Developing the leaders <ul style="list-style-type: none"> • Outline and encourage among faculty interested in leadership roles the ways to develop broader knowledge of college and university infrastructures and functions • Articulate approaches to balancing these developmental activities with successful advancement through the faculty ranks • Support faculty aspirations towards leadership and upper administration roles and eliminate impediments and disincentives

Diversifying the perspective

- Consider expanding the Executive Committee to include additional appointees to further diversify the leadership of the college and provide valuable experience and insights in deliberation and decision-making that are not currently available to the Committee. These appointments can be rotating so that the committee does not become too large. Steps have already been taken to invite heads of administrative units other than departments, such as institutes, research centers or distinguished or chaired professors, to selected meetings. Rotating appointments would not only serve as a way to introduce diversity into the committee, but would also provide retention and career development opportunities for other faculty.
- When searching for department heads or attempting to fill other leadership positions, invite applicants to submit a document that discusses their diversity and professional leadership philosophy.

As noted in the introduction, diversity is carefully integrated into the College strategic planning as demonstrated by our first strategic goal: “Attract and develop an outstanding and diverse faculty, student body, and staff.”

In order to better address our diversity goals, the College instituted the Academic Council in 2001. This body comprises the leadership of the College including the deans, department heads and the Directors of the Multicultural Engineering Programs, the Women in Engineering Program, the Leonhard Center and Graduate Studies. This group meets once a month and provides the basis for discussion and action on a variety of issues. It also serves as a platform for the dissemination of information related to diversity initiatives in the College, the University, and beyond. The group holds retreats annually, with a focus on integration of diversity issues into the life, practices and policies of the College.

The College Engineering also provided national leadership at the LEAP conference convened by the National Academy of Engineering. In addition to sharing best practices for diversity, the College team, which included the dean, a department head, a distinguished faculty member and the WEP director, developed an action plan that includes a survey, exploration of resources for a variety of support structures for faculty women including a specialized workshop and has resulted in the development of the Council of Senior Faculty Women. This group provides leadership within the college as well as devising initiatives for the support of a diverse faculty. (See Appendix IV.)

Finally, diversity is well integrated into the goals and practices of Engineering College Relations. The director and associate directors work closely with MEP and WEP to identify and cultivate prospects for involvement in their activities and for support. ECR developed specific donor pamphlets for MEP and WEP giving. ECR, which oversees college publications and the College of Engineering alumnae/i magazine, also prioritizes diversity representation in all publications.

Table V: Coordinating Organizational Change to Support Our Diversity Goals

Continuing Activities Addressing the Framework for Diversity
<ul style="list-style-type: none">• Institution of Academic Council (see above)• Taking leadership role in national for LEAP Conference sponsored by the National Academy of Engineering• Integration of diversity goals into publications and development activities• Integration of diversity goals and vision into overall College and departmental strategic planning
Planned Actions
<ul style="list-style-type: none">• Review of “A Framework to Foster Diversity at Penn State 2004-2009” to develop additional action items by the Academic Council• Integration of diversity questions and challenges into all IPAC meetings• Continued emphasis on diversity in unit strategic planning• Communicate diversity values and imperatives more effectively to all faculty, students, staff and administrators through workshops and web dissemination• Work with the College development staff to identify Academic Excellence endowment resources to institutionalize programs currently reliant on annual income sources, grants and gifts• Continue to expand departmental and faculty involvement and participation through appropriate incentive and recognition mechanisms

CONCLUSION

In summary, the College has made significant progress on diversity goals consistent with the above vision in areas such as increasing the representation of women on the faculty and narrowing the retention gap among male and female and ethnic minority students, while holding its own in other areas, such as maintaining its enrollment of women students at levels comparable to the national means. However, the College has not made substantial progress in attracting underrepresented minority students and faculty. Significant attention is given to fostering a welcoming climate in the College's departments, classrooms and laboratories, and a wide variety of initiatives have been developed to identify, communicate and address diversity issues. Although it is evident that diversity has been established and accepted as a core value and vital pursuit in the constituent units of the College, the translation of the College's diversity objectives into measurable outcomes still requires careful articulation and focused efforts. We remain committed to a strategy for achieving these outcomes that involves broad leadership and participation across, among and by all units and stakeholders—working together.

Specific goals for the future revolve around the recurring themes of:

- (1) Enhancing the communication of core values and diversity initiatives comprehensively and frequently using all available vehicles to keep students, faculty and staff informed and involved.
- (2) Interpreting broadly and flexibly the recruitment processes and opportunities for retention and advancement in the College.
- (3) Following up professional development and talent identification with real opportunities for promotion and leadership.
- (4) Actively engaging all students in thinking about and re-examining their perspectives of diversity and its linkage to their technical pursuits and studies, particularly through inclusion in the design component and preparation for professional life.
- (5) Devising means with which to assess progress, in terms of both measurable inputs (i.e., what we teach) and demonstrated outcomes (what is learned) in addressing the diversity objectives and climate in the College.

Looking forward, the College has outlined a course of action to build on its progress thus far, and to implement new, creative and aggressive initiatives to address its diversity goals. The recommendations are crafted from models that have proved to be successful elsewhere, approaches suggested by and adapted from our industry partners, good ideas for collaborative approaches developed in the College's departments, and the many contributions of individuals and groups throughout the College. As we strive for an inclusive understanding of diversity, so too is the College committed to diversity as a core value and collective enterprise.

Table of Appendices

Appendix I: List of College of Engineering Climate Committees