Program for Women in Science and Engineering

A look back on the 2008-09 academic year and a glimpse of what’s to come

www.pwse.iastate.edu
Main Office
218 Carver Hall
Iowa State University
Ames, Iowa 50011-2060
Phone: 515-294-0966
Fax: 515-294-6582
E-mail: pwse@iastate.edu
www.pwse.iastate.edu

2008-09 Staff
Karen Zunkel, Director
Lora Leigh Chrystal, On-Campus Coordinator
Carol Heaverlo, Outreach Coordinator
Mary Jordison, Secretary
Tricia England, First-year Programs Graduate Assistant
Emily Jensen, Second-year and Transfer Programs Graduate Assistant
Trina Landmesser, Outreach Graduate Assistant
Kellie Heiken, Undergraduate Office Assistant
Samantha Meyer, Career Conference Undergraduate Assistant
Nicole Vogl, Student Role Model Undergraduate Assistant

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Corporate Sponsors
Alcoa Foundation
Cargill Foundation
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Rockwell Collins

Services Provided
K-12 and Community College Outreach
Taking the Road Less Traveled career conferences
Student Role Models
GirlLinks e-mentoring
Scholarships
Special Transfer Visits

Transitional
WiSE Getaway—high school visit program
Individual and group visits with prospective students

Success/Retention
WiSE Learning Communities
Sophomore Success Seminar
Scholarships
Undergraduate summer research program
Support for student organizations
Academic support programs (help sessions, tutoring)
Leadership development programming

Resource to Others
Support for other STEM or gender issues on campus and statewide
Involvement with other programs/grants on campus: NSF Advance, Women’s Leadership Consortium, Learning Communities, etc.
Leadership within WEPAN national organization

The Program for Women in Science and Engineering (PWSE) will enrich science, technology, engineering and math (STEM) fields by engaging more women, creating the opportunity for a more competitive and diverse state, national, and global workforce.
A Word from the Director

Last year I commented about how we were just embarking on the new strategic plan. What a difference a year makes. Now I would say we are ‘in the thick of it’ and things are really starting to happen! At our staff retreat at the end of year, it was amazing how many of the strategic plan action items we could say ‘working on that one, things going well’. That’s not to say our work is done. But it is really nice to be able to reflect on everything that we have accomplished this past year.

It is also nice to know that our efforts are paying off. Fall 2008 Iowa State University saw the largest number of women majoring in STEM fields in the history of the institution (at least as far as we can track back!). Not only were the numbers up, but the representation of women percentage-wise in the STEM fields was also at its highest. This year we were able to gather some retention/success data with the assistance of the Office of the Registrar. Through their analysis, we know that our learning communities have a statistically significant impact on whether students are retained in STEM fields or not. Because of our success, demands for programs really expanded this year. Even with the Department of Residence squeezing in some extra spaces for us, the learning community spaces for Fall 2009 filled well before summer orientation. The increase in demand for our programs is definitely not limited to our undergraduate programs. Demand for our signature K-12 outreach programs continue to be extremely strong. The Taking the Road Less Traveled career conferences continue to overfill and the number of K-12 students reached by the Student Role Model program this year doubled from the previous year (from 3379 to 6903).

As you read through the report, you will get a sense of the progress we have made. It has been a busy and productive year. Below are a few of the more significant or new activities that are a result of our work on the strategic plan:

- PWSE has worked with RISE (Research Institute for Studies in Education) to conduct an extensive multi-phase needs assessment related to our K-12 outreach programs. This significant body of information will help guide us as we plan for the future of our K-12 programming.
- PWSE was involved in numerous initiatives that focused on community college and transfer students – a key target population and collaborative partnership opportunity.
- I served in a leadership role in the Women and Minorities in STEM report that was developed for the Iowa Legislature, at their request. This report includes data and recommendations from the three Regent universities in Iowa.
- We have started to refine the second-year programming efforts, as we work to develop a ‘second-year’ experience that meets the needs and interests of our students.
- We partnered to offer multiple role model visits and career conference participation to students in Marshalltown (a very diverse community with a large Hispanic population).
- Iowa State was a co-organizer of the first-ever Big 12 Women in Engineering meeting. This discussion-oriented meeting was developed to increase collaboration, networking and sharing of best practices with our peer institutions. It was also helpful in identifying potential issues/roadblocks we haven’t yet experienced, but that our peers have seen. So we can be better prepared and anticipate emerging issues.

As a small staff, many of these accomplishments would not be possible if it weren’t for the support of others committed to our mission. From engineers/scientists who present at our conferences, to faculty that mentor students, to colleagues at community colleges that share our passion, we have been fortunate to work with many fine individuals and companies this year. I would like to thank all of our partners, both within ISU and outside of ISU who provide us with the opportunity to pursue our vision to “enrich science, technology, engineering and math (STEM) fields by engaging more women, creating the opportunity for a more competitive and diverse state, national, and global workforce.”

Karen Zunkel, PhD
Director

2008–09 by the Numbers…. 

- 2967 registrants for Taking the Road Less Traveled Career Conferences for 6-12 grade girls, parents, educators
- 216 first-year students participated in the WiSE Learning Community
- 9,927 = total number of individuals reached by outreach programming during the year (an increase of 3,593 individuals from previous year)!!
- 22 students participated in the Sophomore Success Course (UST 201x) with 100 more participating in second-year activities, including job shadowing, etiquette training, and industry tours
- $29,200 in scholarships for women in science and engineering
- 38 undergraduates involved in summer research program
- 11 high school students and 14 undergraduates participated in the GirLinks on-line mentoring program that matches undergraduate students with high school students.
- 63 Learning Community students and peer mentors participated in the annual WISE Leadership Conference
- 6,903 K-12 students reached by Student Role Model program (an increase of 3,524 students over the previous year)
- 46 high school students from across the country attended the 2009 WiSE Getaway, and over 100 undergraduate students served as hosts and volunteers.
- 2893 students receiving weekly updates from PWSE
- Over 2971 women graduated with BS degrees in STEM over the past five years
- PWSE staff met with 205 prospective students (total of 500 visitors including family members) during the year. Over a 20% increase from previous year
- 32.6% of the undergraduates enrolled in STEM fields at ISU were women
Outreach Partnerships
PWSE continues to collaborate with programs across the state to offer experiential activities to stimulate the interest in STEM fields among Iowa youth. Examples of programs resulting from collaboration with others include:

- Partnering with Carla Espinoza (Associate Vice Provost for Human Resources) and Larry Genalo (Materials Science and Engineering Faculty Member and TRLT presenter) on a Women’s Enrichment Diversity Grant. The purpose of the grant is to engage ISU female, undergraduate engineering students (PWSE Student Role Models) in outreach and mentoring efforts with 7th and 8th grade minority students from Perry and Marshalltown.

- Serving on the Iowa Mathematics and Science Coalition to develop, plan, and coordinate the Iowa Student STEM Conference.

- Working with the Department of Education, Iowa AEA, and K-12 Science teachers on incorporating our Student Role Model activities with the Every Learner Inquires model.

- Partnering with ISU Extension and the Engineering Department on the Engineering Talent in Every County (E-TEC) project as part of the Student Enrollment and Engagement through Connections (SEEC) initiative between ISU and DMACC.

- Serve on the Board of Regents Title II Committee which is a government grant program funded by No Child Left Behind to Improve Teacher Quality.

- Partnering with the Iowa Commission on the Status of Women and The Iowa Department of Education on a statewide essay contest about historical woman in STEM.

- Collaborate with the Moingona Girl Scout Council to provide day-long experiences for Girl Scouts and Brownies (BEST and GEMS).

- Sponsoring awards for Outstanding Essay Entries related to Women in Science and Engineering for the National History Day in Iowa Event.

- NW Iowa Extension Technology Team – Robotix train the trainer program facilitated by our Student Role Models.

- WINGS Career Conference in NW Iowa.

Career Conferences
PWSE has been sponsoring Taking the Road Less Traveled career exploration conferences for girls in grades 6-12 each year since 1987. Six conferences were offered during FY09. The conference format includes a scientist or engineer offering a keynote demonstration, career exploration workshops led by women working in science, engineering, and other technical fields; tours of ISU labs and facilities; and special sessions for parents and educators. This year 2967 participants attended the conferences. This brings the total number of participants, since program inception, to 47,201. In response to addressing the overwhelming number of participants wanting to attend the conferences and our commitment to collaborating with community colleges, we applied and received an Iowa Math and Science Education Partnership (IMSEP) Grant to partner with Western Iowa Tech Community College (WIT) and host a Taking the Road Less Traveled Conference in Sioux City, Iowa at the Sioux City Convention Center on November 3rd.

Student Role Model Program
Created to encourage K-12 students’ interests in science and math fields, the Student Role Model program offers exciting challenges through hands-on activities facilitated by ISU undergraduate student role models. Through this program, undergraduate students majoring in science, technology, engineering, and math visit classrooms, community centers, and school fairs across the state. The role models visited 118 schools during the 2008-2009 year and reached 6,903 students (including 3437 female (50%) and 1026 (15%) minority students). There is no fee for the requesting a school visit, but the teachers are encouraged to complete a short evaluation of their experience with the ISU student role models. During the 2009-2010 academic year we will continue to incorporate the Inquiry Based Learning Model into the SRM training and school visits to correspond with the Every Learning Inquires and Statewide Core Curriculum initiatives.

GirLinks@iastate Mentoring
GirLinks is an online mentoring program that matches women who are high school or transfer students interested in science, technology, engineering, and math to ISU undergraduate students majoring in similar fields. Communicating via email or Facebook at least twice a month, pairs discuss classes, fields of study, student organizations, professors, and everything in between! The goal of GirLinks is to aid high school and transfer students in the transition to college, and monthly evaluations are required to monitor the success of the program. In 2008-2009, 12 students (5 high school, 1 transfer student and 6 undergraduate students) fully completed the requirements at the end of the year.

WiSE Getaway
Designed to introduce female high school seniors to the science, technology, engineering, and math fields, Getaway allowed 46 students from across the country to “try on campus.” During the 2009 event, students:

- spent two nights in the residence halls with a WiSE student host(s)
- ate in the dining halls
- attended actual classes
- participated in unique Iowa State activities like broomball and glass blowing

As in previous years, feedback from participants for the Getaway
program was very positive. The program gave students an opportunity to experience life as a female STEM student at Iowa State. The program was initially developed to assist students in the final college choice selection process and to recruit students for the WISE learning communities. The vast majority of the attendees at the 2009 program had already finalized their choice to attend Iowa State University (or a local community college) prior to attending the event and the WISE learning communities are filling beyond capacity prior to the housing deadlines. Therefore, as part of a prioritization of programming due to budget reductions, the Getaway program will not be offered in 2010.

Community College Initiatives
PWSE staff members were once again an integral part of year two of the National Science Foundation SEEC grant that has created a partnership between ISU Engineering and Des Moines Area Community College (DMACC). The purpose of the grant was to increase the number and diversity of students who transfer into the College of Engineering from the community college. The focus of the networking team this year was to compile available STEM resources, address the messaging of engineering to K12 and community college students, and offer up to 70 one-time $500 scholarships to be used by high school seniors and transfer students from across Iowa. This year 51 scholarships were awarded across the state and three of those recipients were community college transfer students.

The Program for Women in Science and Engineering also expanded its initiatives for prospective transfer students by providing informational lunches during APP visit days made possible by a Professional & Scientific grant. Over 15 transfer students participated in the visit days which provided lunch, resource packets and for those with a significant commute, overnight accommodations. In addition, PWSE was able to host two summer interns from Western Iowa Tech Community College the summer before they transitioned to Iowa State. The involvement of these students was a direct result of their participation in the visit days offered by PWSE. We are looking forward to continued success with our transfer students and assisting new APP students as they make the transition to Iowa State.

Included in our community college collaborations this year is the partnership between Western Iowa Tech Community College and PWSE to facilitate a Taking the Road Less Traveled Conference at the Sioux City Convention Center on November 3, 2009. PWSE and WIT were the recipients of an Iowa Math and Science Education Partnership (IMSEP) grant to take our conference on the road for the very first time to NW Iowa which is often a region of the state that has received limited programming.

Feedback from Educators on Taking the Road Less Traveled Career Conference Participants and Student Role Model Visits:

“Love the Road Less Traveled. It is one of the reasons I went into engineering.” (High School Teacher)

“Taking the Road Less Traveled” is a brilliant idea. The girls really enjoyed the hands on activities and fun presenters. The girls love to participate, laugh, and enjoy their sessions. Now, what about similar workshops for math careers?” (TAG Teacher)

“Thank you for your work – I hope to see more opportunities to work with ISU as we prepare the next generation of scientists and mathematicians.” (Science, Math, and TAG instructor)

“I support your efforts, but think the best way to reach kids and encourage them to pursue careers in STEM fields is to provide opportunities for personal interaction with role models. I had 2 Material Science students (women) who visited my Chem classes this year. They spoke about their experiences and about engineering, and engaged the students in an interesting lab. More of this sort of thing would be great.” (Science Teacher)
WiSE Learning Communities

The Women in Science and Engineering (WiSE) Learning Communities offer living and learning opportunities for women majoring in science, technology, engineering, and math (STEM). WiSE Learning Communities began in FY96 with 52 first-year students and has grown to 216 first-year students, with a large number of second-year students returning to their floors, as well as 5 transfer students living in Frederiksen Court apartments.

First-Year Learning Communities

Working in conjunction with the ISU Department of Residence, WiSE sponsors nine first-year residential learning communities in six residence halls across campus. Each learning community is comprised of twenty to twenty five women STEM majors. Each learning community is led by two peer mentors, who are upper division women STEM majors. Members of the learning communities have the opportunity to participate in a variety of social, academic, and leadership programs. In order to meet the high demand among students, the Department of Residence continues to increase the number of spaces allocated to WiSE first-year learning communities.

In the fall of 2008, WiSE sponsored seven “learning teams” for over 110 students within the overall WiSE Learning Community. The teams include:

- Two Calculus I/General Chemistry teams
- Two Calculus II and Chemistry teams
- One General Biology/General Chemistry team
- One Calculus/Chem for Engineering team
- One Biology/Math team for students in life sciences/pre-health

Transfer Learning Communities

Begun in the fall of 2005-06, the WiSE Learning Community expanded to include transfer students. In 2008-2009, there were 6 transfer students who participated in the University Studies 201x seminar course, attended WiSE events, and participated in the Job Shadow Program. PWSE was able to involve current transfer students as leaders for the APP student visits as prospective students made the transition to Iowa State.

Second-Year Success Learning Communities

With support from Alcoa, PWSE was able to offer a new learning community for our sophomore students. The Second-year Success Learning Community offered a series of workshops, a seminar course focusing on professional and leadership development, targeted tutoring, and a new Job Shadow Program in order to better meet the needs of second-year students. A total of 22 students participated in the course (UST 201x) and learning community. Over 100 students participated in a series of optional events exclusively for second-year students which included:

- a semester-long book discussion group offered both fall and spring semesters
- networking events with professional women in STEM
- attending cultural events and discussions
- film series and discussion
- workshops on leadership, setting priorities, and interviewing skills
- company visits and tours at the Great Ape Trust and the Mayo Medical School and Clinic
- Job Shadow Program at Rockwell Collins

Leadership Development

The WiSE Learning Community continued its fifth year of leadership development by integrating leadership principles into the daily activities of the learning community students. The WiSE Leadership Initiative enhanced current programming by:

- offering a variety of programs and workshop experiences focused on professional, academic, and collegiate leadership
- giving students the opportunity to develop and reflect upon their leadership skills through a service learning project

Sixty-five WiSE students and peer mentors were able to participate in a leadership retreat in February 2009. This retreat provided opportunities for participants to learn about different leadership styles and gain tools to assist them in future leadership positions.

In addition to attending programs, the WiSE first year students were encouraged to put what they learned into practice by becoming leaders…

“I was able to go to the leadership conference and learn a lot about ways to approach others and to discover myself.”

“It improved my leadership skills, my communication skills, and my interactive skills.”

“Yes, I was able to learn a lot especially from the leadership conference. I learned about emotional intelligence and being able to perceive someone’s emotions and react accordingly. I learned that as a leader, your role is to guide and direct, not to command or dominate.”

Programs for Undergraduates

Create, offer, and maintain innovative undergraduate and outreach programs that engage a diverse audience of women and girls in an experiential and supportive learning environment in STEM.
Summer Research Internships
The PWSE Summer Intern Program allows students to work on a variety of projects and gain hands-on research experience under the supervision of ISU faculty and staff. In addition, they attend seminars, write research reports and summarize their research in poster presentations. Funding to provide stipends to the interns comes primarily from ISU colleges and other administrative units and from faculty grants.

During summer 2009, 38 undergraduate students participated in the intern program. Interns worked for eight weeks and were paid a stipend of $3,500. The total number of students that have participated in the program now totals 1043 students.

Academic Support
PWSE organizes group study sessions for key introductory courses (such as calculus and chemistry). These sessions, which are typically facilitated by female graduate students, are open to all interested students. Attendance at the weekly sessions ranges from 5 to 25 students per course. In addition, WiSE Learning Community Students have the opportunity to receive additional small group or individual tutoring funded by WiSE. PWSE also coordinates the tutoring support provided by the College of Engineering for women undergraduates enrolled in that college.

Scholarships
During FY09, 29 scholarships totaling $29,200 were awarded to female undergraduate science or engineering students through funding provided by external gifts. This brings the total amount of scholarship money awarded by PWSE to $403,415 since program inception. Scholarships awarded this past year included:
- Endowed scholarships for Sylvia Stoesser, Laurel Ann Crowe, and Charlie Wright, Jr.
- Non-endowed scholarships awarded by PWSE to support first year and returning students in STEM fields

Retention Analysis
In partnership with the Office of the Registrar, PWSE did a statistical analysis of the retention of female students in the STEM fields at Iowa State University. The purpose of the analysis was to determine the impact of WISE learning community programming. In addition, the analysis identified where students who left STEM fields were going, so that PWSE can begin to identify programming/needs of students. The following are two highlights from the analysis:

**Highlight 1:** WISE learning community participants are twice as likely to stay in a STEM major than other females who start in STEM but don’t participate in a learning community.

**Highlight 2:** The top five majors for students who leave STEM but remain at Iowa State:

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Management Information Systems</td>
<td>1. Psychology</td>
</tr>
<tr>
<td>2. Pre-Business</td>
<td>2. Elementary Education</td>
</tr>
<tr>
<td>3. Finance</td>
<td>3. Marketing</td>
</tr>
<tr>
<td>5. Marketing</td>
<td>5. Management</td>
</tr>
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</table>
In 2009-10, the Program for Women in Science and Engineering will be half-way into our 2007-2012 strategic planning process. As evidenced by this report, we have made some great strides in our first two-years. Some of the major areas of emphasis associated with the strategic plan for this coming year will include:

Identifying opportunities to enhance, change, or expand our K-12 programming based on the comprehensive needs assessment work done during 2008-09. A lot of information has been gathered from students, teachers, parents, etc. as part of the needs assessment. This year we will be taking time to figure out how we can best use that information to further our mission.

- Continuing to develop our partnerships with community colleges through a variety of avenues:
  - Hosting the Taking the Road Less Traveled in Sioux City with Western Iowa Tech
  - Continuing to support the College of Engineering and DMACC on the NSF SEEC grant
  - Expanding the 'special visit' opportunity for potential transfer students from community college
  - Assisting the Iowa Department of Education on the NPE STEM Gender Equity grant that includes pilot work at three community colleges to impact their campuses. The grant also includes working with community college and/or high schools with Project Lead the Way.
  - Organizing meeting(s) with faculty/staff from targeted community colleges and/or additional campuses of colleges to which we are already connected.

- Establishing an overall framework for assessment of PWSE that will help us to measure impact and guide our future programming and planning efforts.

- Reviewing with faculty/colleges who have been involved with the Summer Intern Program the structure, purpose, and finances of the program. The program has many strengths; however the costs for the program are significant and given the financial times and growth of other research opportunities it is prudent to review the program this year.

- Continuing to build upon and enhance our successful programs (such as learning communities, second-year programming, Taking the Road Less Traveled career conferences, and the Student Role Model program)

Not surprisingly, another major focus of PWSE in 2009-10 will be to continually monitor the financial health and well-being of the program. This will involve us continually asking ‘can we achieve the same outcome by doing something in a less expensive way?’ and ‘can we partner/leverage resources to make our funds go further and make a bigger impact?’ In addition, we will be looking to expand our funding sources/partners to help us continue to achieve our mission.

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**Look to the Future**

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**Financial Summary**

**Revenues**

- PWSE General Fund Budget: $297,704
- Iowa State University Foundation (Gifts, Grants, Earnings): $121,073
- External Grants: $77,697
- Greater University Funds for Excellence: $60,000
- Participant Fees: $56,201
- Internal ISU Grants/Reallocations: $45,303
- Total Revenues: $657,978

**Expenditures**

- Salaries: $324,448
- On-Campus Programming: $197,855
- Summer Intern Program: $107,541
- Learning Communities: $77,697
- Scholarships: $60,000
- Leadership Initiatives: $56,201
- Second-Year Programming: $56,201
- Academic Support: $45,303
- Outreach Programming: $45,303
- Career Conferences: $32,134
- Student Role Models: $28,134
- Needs Assessment: $28,134
- WiSE Getaway: $28,134
- Outreach Initiatives: $28,134
- GirLinks: $28,134
- Community College Initiatives: $28,134

- Administration: $28,134
- Computers and Phones: $28,134
- General Administration: $28,134
- Supplies: $28,134
- Marketing: $28,134
- Staff Development/WEPAN: $28,134
- Total Expenditures: $657,641

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*We value people as individuals, integrity and accountability, inclusion, collaboration, leadership, and excellence in all we do.*
The best part of the WiSE Learning Communities was…

“Meeting my best friends.”

“All the girls on my floor, we all became really good friends. I had a blast with all those girls this year and look forward to more memories next year.”

“Knowing that I could ask people on my floor about homework because they were in the same classes.”

Thoughts from Second-Year Learning Community/Course

“This was a great way to continue the support from my freshman year.”

“The sophomore learning community has reassured me about my career choice.”

“I believe I really learned more about myself and what I want to accomplish.”
## WiSE Learning Communities

### First-Year Participants, 2008–09

<table>
<thead>
<tr>
<th>College of Agriculture and Life Science</th>
<th>Total</th>
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<tbody>
<tr>
<td>Animal Science</td>
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<td>Dairy Science</td>
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<tr>
<td>Entomology</td>
<td>1</td>
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<tr>
<td>Environmental Science (See also LAS)</td>
<td>1</td>
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<tr>
<td>Food Science (see also H Sci)</td>
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<tr>
<td>General Preveterinary Medicine</td>
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<tr>
<td>Genetics (See also LAS)</td>
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<td>Microbiology</td>
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<td>Aerospace Engineering</td>
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<td>Agricultural Engineering</td>
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<td>Chemical Engineering</td>
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<td>Civil Engineering</td>
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<td>Electrical Engineering</td>
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<td>Industrial Engineering</td>
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<td>Materials Engineering</td>
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<td>Mechanical Engineering</td>
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<td>Food Science (See also Ag LS)</td>
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<td>Kinesiology and Health</td>
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<td><strong>Total</strong></td>
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<td>Open Option - LAS</td>
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<td>Biochemistry</td>
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<td>Biology</td>
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<td><strong>Total</strong></td>
<td><strong>58</strong></td>
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| Overall Participation                   | 216   |

### Priorities:
- Expand partnerships with individuals and organizations to increase the impact of PWSE programs and initiatives.
- Serve as a knowledge resource.
- Increase awareness of PWSE and women in STEM issues.
- Broaden the participation in PWSE programs and initiatives.
- Improve quality and effectiveness of PWSE programs through continuous assessment.

[First-year learning community students celebrating the end of their first semester.]

[Leadership Development Seminar]
Praise for Peer Mentors

“My WiSE peer mentor gave me information and someone to look to if I needed help. It eased my transition to college even more than other college help units.”

“My mentor has been supportive and a good role model. She knows what I can expect in the future and helps to guide me.”

“I can trust my mentor and it is comforting to know that she is looking out for me here on campus.”

Twenty Years of Progress
Undergraduate Enrollment in STEM Fields at Iowa State

Number of Females

Percentage Female

First-year Peer Mentor Team
Program for Women in Science and Engineering

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