Syracuse University WISE Program: History, Objectives and Structure

In 1997-1998 Syracuse University formed an interdisciplinary committee of concerned faculty, university deans, and professional staff to address the problem of women’s underrepresentation in the sciences and engineering (S&E). The outcome of several brainstorming meetings was the proposed Women in Science & Engineering Program (WISE) in 1999, led by Drs. Shobha Bhatia and Cathryn Newton, and designed to improve the academic climate for women in the S&E fields at Syracuse University.

The WISE initiative’s three-prong strategy included:

1. Actively recruiting women faculty into S&E to transform the “chilly climate” for diverse women in male dominated fields;
2. Establishing a prominent university-wide lecture series by prestigious women scientists and engineers to promote a “community in conversation” over women’s scholarly contributions to the technical fields;
3. Developing an undergraduate WISE focused on science and engineering research opportunities, a learning/living center, and a mentoring program, coordinated by faculty scientists and engineers, to improve the experiences for women coming through the pipeline.

Based on gender and education research and successful models at other universities, the WISE Program was begun in 1999-2000 and subsequently divided into three separate, but interlocking groups organized by participants’ academic career-course: (a.) Undergraduate WISE; (b.) Graduate WISE; and Faculty WISE. Each branch shares the same overall objectives, namely:

- Establish and recognize the dynamic presence of women in S&E at Syracuse University at all levels from undergraduate study to faculty scholarship;
- Promote new initiatives in research, learning, pedagogical, mentoring, and advising approaches in S&E to maximize the educational and career success for all SU students;
- Initiate change in the university climate to nurture both women and men’s participation in S&E fields.

This document discusses the first prong of the WISE initiative, the Undergraduate WISE Program, and its activities over the course of the last 8 years.
Overview: In any given semester, WISE undergraduate participants can expect to study and live together with other S&E majors and minors; access hands-on tutoring and academic advising; participate in research with faculty members at their labs; join discussion groups on gender and S&E; take part in career, internship, resume and cover-letter workshops; interact closely with female faculty members in a variety of informal venues like dinners and post-lecture discussions; take fieldtrips to sites of interest for S&E students; engage in confidence-building ropes courses; and reflect upon cutting-edge research in S&E by visiting women scholars.

In addition to these activities and to the WISE Program’s overall goals, the WISE Undergraduate Program is designed to bring women undergraduate S&E students together to provide opportunities for students to meet and interact with each other through these sponsored events. In this way, a woman undergraduate student in engineering, for instance, who may be the only woman in many of her classes, can get to know other women engineers and scientists and from these connections form a support system and social, academic, and professional network.

Several program elements are—or have been—a regular part of the WISE Undergraduate Program:

2. Prominent Women Speakers Series (2000-present)
3. The WISE Residential Living/Learning Community (2000-present)
4. Yearly dinners with students and their choice of faculty member at Shobha Bhatia’s home (2000-present)
5. Career-planning workshops: internships, graduate school, resume and cover-letter writing, dressing for success (2000-present)
6. Confidence-building ropes courses (2002-present)
7. Orientation (2003-present)
8. Field Trips (2002-present)
9. Formal Tutoring and Group Study-Sessions (2002-present)
10. WISE Networking with Student Organizations (SWE, AOE, etc.) (2004-present)
11. Norma Slepecky Memorial Lecture and Undergraduate Research Award
12. Outreach programs with local public schools (2000-present)

In the following pages, we describe some of these programs and their results in more detail.
In 2004, WISE conducted an assessment of WISE undergraduate student experiences in the various WISE-sponsored programs, including the WISE learning community (Shobha Bhatia, Amy Wilhite, and Corri Zoli, *Syracuse University Women in Science & Engineering Report*, 31 Aug 2004). The Report described the national problem of women’s underrepresentation in S&E higher education, results from the research literature indicating how to redress this problem, and many of the WISE Undergraduate Program activities to date—including student perspectives on them. As Brainard and Carlin’s (1998) longitudinal survey indicates, women undergraduates in S&E often feel some of the following barriers in the process of completing their S&E degrees: isolation, intimidation, financial challenges, and waning interest in their fields of study. WISE Programs have proved to be a helpful way to address these concerns.

**Results:** The Report noted several promising contributions by the WISE Undergraduate Program for participating members and to the Syracuse University community in general. These included:

- Help students ease the transition to university life by fostering a close-knit community of support for students to aid retention and to acquaint especially first-year students with university resources i.e., tutoring, social networks, professional staff, programs, and campus life;
- Encourage students to engage in academic skill-building and to develop a success-oriented peer network by participating in activities i.e., ropes courses, field trips, dinner at faculty homes, career building workshops, visiting lecturers etc.;
- Promote shared knowledge between and among students, faculty, and professional staff, so students begin to see themselves as members of a community of learners with faculty and professional staff as available resources and role models;
- Maximize academic and personal growth opportunities for students, including through community outreach
- Increase students’ confidence and self-efficacy
- Increase faculty interaction with students and commitment to the WISE Program as a helpful venue to engage with women S&E students
- Raise the visibility of women S&E scholars by bringing prominent speakers to campus
- Establish an interdisciplinary network of faculty and students across the S&E subfields

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The WISE Learning Community (WISE-LC) is a residential learning community that brings together undergraduate women from across the various S&E disciplines. The WISE-LC is designed to offer an environment that is both academically and socially supportive by providing helpful connections among students and between students and faculty and professional staff both in and beyond the classroom. Not only do participants share similar goals and academic interests, but in living together women enrolled in the same or related classes and programs interact socially and academically. Its three overall goals include:

1. Improving the academic climate for young women in the fields of S&E;
2. Strengthening the university experience for these women; and
3. Creating a close-knit network of support, mentorship, and guidance with peers, graduate students, faculty, and professional scientists and engineers.

The WISE-LC also promotes involvement with the city of Syracuse and with the broader university community.

**WISE-LC Mission:** The WISE-LC mission includes the following propositions:

- Learn about careers in engineering, science, and technology from experienced people
- Ease the transition into college and then into the workplace
- Advance student excitement and skills through internships and research opportunities
- Reach student potential in academics and in the world by providing supportive programs
- Network with other people in S&E at Syracuse University and in the field

**Easing the Transition:** Students living in the WISE-LC participate in a number of events throughout the academic year to help them succeed academically in their chosen S&E fields and become comfortable with college life at Syracuse University. WISE-LC events can be divided into three categories:

1. Social events, which allow WISE members to meet with other students, faculty, and members of professional organizations outside the university;
2. Community-building events, which bring together members of WISE, as well as members of other organizations and learning communities on campus; and
3. Academic events, aimed at providing students with support in their studies.
WISE-LC Events, 2007-2008: Some of the following events and activities were conducted by the WISE-LC over the course of the 2007-2008 academic year.

- The annual LC World Tour (7 Sept) orientation event introduced all new LC members to each other and to the LC programs in which they are involved, while enjoying fun activities: i.e., a banner-making contest in which WISE received 2nd place, lunch on the Quad, and viewing the authentic South Indian dance group syRAAScuse.

- Murder Mystery Dinner Theater (28 Sept): WISE and ECS learning communities attended the Bright Star ProductionZ’s performance of “Get A Clue” at the Birdie Manor Dinner Theater, where audience members dined and helped solve the murder.

- Pumpkin Carving for Local Children (28 Oct): this Halloween tradition donates WISE-LC members carved masterpieces to Blodgett Elementary School by special delivery—a visit from WISE members to the after school program. LC President Melody Miller said, “The children loved receiving a pumpkin, and candy too; it’s truly wonderful to see them happy from something seemingly trivial to us.”

- Field Trip to the Corning Museum of Glass: WISE members participated in three different glass workshops and a museum tour.

- Sonia Kovalevsky Festival (17 Nov): WISE students volunteered for the 9th annual Sonia Kovalevsky Festival, an event honoring the first woman to receive a Ph.D. in mathematics and designed to encourage local high school girls’ pursuit of math or science. WISE members helped with math and science workshops, games, and puzzles. As Regina Brown said: “My interaction with the high school girls was pretty informal. I didn’t want them to be forced to ask questions, but luckily they had a lot of questions. I had a lot of fun talking to them.”

WISE students have much to say about the value of their experiences in the WISE-LC and as members of the WISE Program in general. One student, for instance, noted that she felt “privileged” by her degree and her mentoring in WISE: “Without it, I would never have considered graduate school – it has opened up a lot of doors for me, and has given me a lot of contacts.” Another student found it “inspirational” to “meet so many intelligent, successful, talented women,” and said she “enjoyed helping underclassmen” since “it’s great to see my advice have an impact on someone else.” An additional student “loved the camaraderie of WISE,” felt “blessed to have met so many fabulous women doing such exemplary things in these fields,” and found the WISE experience “encouraging,” and “one of the many reasons that I fell in love with my major.”
WISE Mentoring Program—College of Engineering & Computer Science (ECS), 2000-2003:
As part of her Laura J. and L. Douglas Meredith Professor for Teaching Excellence Award in 2003, WISE faculty Co-Director Shobha Bhatia developed a professional mentoring program that paired undergraduates women in engineering with women professional engineers and scientists from such local companies as Bristol Meyers Squibb, Eastman Kodak, Lockheed Martin, Upstate Medical Center, and Blasland, Bouck & Lee. The rationale for this mentoring program was research that showed that one-on-one mentoring between woman professionals and undergraduate S&E majors and minors increased student persistence in these fields.

The Mentoring Program was designed so that students would make the first contact with a mentor from a pre-selected list of volunteers. Mentor and mentee would then engage in discussions formally, at WISE-sponsored events, including dinners, discussion-oriented lectures, and career advising workshops. Mentees would then arrange for follow up informal “coffee chats,” email correspondences, and other shared extra-curricular activities. This "quality time" included mentees asking about their mentor’s career trajectory, success strategies, and experiences. Additionally, the mentoring relationship was designed to build women’s self-confidence and to counteract some of the barriers that research shows that women undergraduate students in S&E face, including: gender stereotyping that identifies scientists and engineers as male; lack of role models and peer support; and learning environments that privilege male modes of learning, interacting and communicating.

WISE Mentoring events have included: home-cooked Indian meals at Shobha Bhatia’s house, IMAX movies followed by dinner in downtown Syracuse, fieldtrips to local cultural festivals, and resume writing and career fashion shows. Mentors have also gotten involved with other WISE Program events, appearing on panels in discussions of gender and communication, for instance, or advising students on job interviewing practices during mock interviews. Beyond getting inspiration and an “insider’s view” on S&E-related careers, students’ mentoring relationships opened up internships and future employment opportunities.

The WISE Lecturers Series was begun in 1999 and succeeded in introducing the Syracuse University and broader community to scholarly contributions by prominent and, in many cases, internationally-renowned women researchers in S&E. This university-wide WISE Lecture Series featured, for instance, senior female biologists, civil engineers, psychologists, and computer scientists, in addition to social scientists studying the issues facing women and underrepresented groups in S&E fields.

Each event in the WISE Lecture Series has purposeful components—a public lecture open to all members of the University and the community at large, specific classroom seminars with undergraduate S&E students, and follow-up dialogue-focused luncheons with participating WISE students and faculty members. Speakers often make presentations to WISE faculty classrooms, or to the public schools, thus, exposing as broad a range of participants as possible to research opportunities available to women in S&E.

Some featured scholars in the series include:

- Velma DeLeveaux, President of Allied Capital Research Associates, Inc. discussed the many transitions engineers face from graduate work, to private industry, to leading a large corporation (1999)
- Ruzena Bajcsy, former NSF Assistant Director of Computer and Information Science and Engineering and Adjunct Professor at University of Pennsylvania, discussed her research on women and technology and cooperative robotics (2000)
- Virginia Valian, Professor at Hunter College, discussed her research from her 1998 book Why So Slow? The Advancement of Women to address gender equity and leadership (2000)
- Lorna Gibson, MIT Matoula S. Salapatas Professor of Materials Science and Engineering, Professor of Mechanical Engineering, Professor of Civil and Environmental Engineering, and affiliated with Health Sciences and Technology, discusses “Natural Cellular Materials: Models for Biomimicking” (2001)
- Meave Leakey, world-renowned paleontologist and former head of the Division of Paleontology, the National Museums of Kenya, offered her insights as a leading expert in the study of human origins (2003)
- Caroline Baillie, DuPont Canada Chair in Engineering Education, Research, and Development, Queen’s College in Kingston, Ontario, Canada, discussed improving engineering education to take into consideration women, environmental sustainability, and social justice (2004)
- Sue Rosser, Dean of Ivan Allen College, Georgia Institute of Technology, addressed Leadership and Institutional Transformation (2004).

WISE undergraduates interact with visiting lecturers during the WISE Lecture Series and take part in discussions among a diverse audience of scholars, faculty, and community members on the impact of women in the S&E fields. These events extend the borders of SU, expose WISE undergraduates to the broader community, and provide tangible and attainable examples to young women of their possible future.
Each year, WISE invites a women scholar, distinguished in her field, to give the WISE Norma Slepecky Memorial Seminar. Norma Slepecky, Professor of Bioengineering and Neuroscience and member of the Institute for Sensory Research at Syracuse University, was a distinguished auditory neuroanatomist, advocate for undergraduate student research and mentoring, and a strong supporter of women in science and engineering. Part of this event is the presentation of a $750.00 award to a woman undergraduate for excellence in research. Typically, this award is reserved for upper-class students conducting research with faculty in the biological sciences, the natural sciences, and in engineering applications for biological problems. In 2007-08, for instance, a first prize and three supporting awards were presented to the following students:

- **Lindsay Avery**, Chemistry (advisor, Nancy Totah), “Using Functionalized Dihydopyrones to Control Diastereoselectivity in the Dihydopyrone Diels-Alder Reaction”
- **Jemella Raymore**, Biology (advisor, Melissa Pepling), “The Role of Estrogen Receptor Alpha in Early Mouse Oocyte Differentiation”

Along with the award, the Norma Slepecky event brings to campus a woman researcher who has made a significant contribution to scholarship in S&E and has advocated for women in these fields. In 2008, for instance, Valerie Davidson, NSERC and Hewlett Packard Canada awarded a Chair for Women in Science and Engineering, University of Guelph, Canada, lectured on her own career trajectory and her use of computational intelligence in improving food processing systems and developing a multifactorial risk analysis approach to food-borne pathogens. Likewise, in 2006, Deborah Pearce, CEO of LeaJames, Inc, a general management consulting firm, discussed how to succeed in the corporate S&E context, including how she managed developing technology and leadership initiatives at General Electric and other technology-oriented companies. The very differences between these speakers suggest the range of possibilities for future careers for young women scientists and engineers. In fact, the Norma Slepecky Memorial Seminar and Undergraduate Research Award in general encourages and recognizes women as budding researchers and professionals in the scientists and engineering.
In addition to regular events, such as Student-Faculty S&E Dinners at Shobha Bhatia’s home, the WISE Program has undertaken many outreach and collaborative initiatives in the process of improving women’s experiences in S&E on and off campus. The focus of these events have been reaching out to various communities beyond the SU campus to make a difference in the lives of members of the broader Central NY community, including public school students and collaborating with already-established groups on campus, such as student professional organizations, to create fun, social, academic and networking events. Additional priorities have included “connecting with faculty” through informal and formal events, attending lectures and follow-up discussions, and participating in academic and career-planning workshops, including internship information sessions.

Some events over the last few years have included:

- Informal “Pizza Parties” with student professional organizations such as the Society for Women Engineers (SWE) and Alpha Omega Epsilon National Engineering Sorority (AOE), Engineers Without Borders (EWB), National Society of Black Engineers (NSBE), American Society Of Civil Engineers (ASCE), among others.
- Orientation “Ice Cream Socials” for incoming WISE students
- “Ropes” and Confidence-building and Teamwork Courses at Cornell-Trust
- Faculty Dinners at Shobha Bhatia’s House where students select S&E faculty members to participate
- Field-trips to NYC with student professional organizations (SWE, AOE): these trips include visiting cultural sites such as museums (the MET), seeing Broadway performances (the musical Rent), exploring the City, and visiting engineering and science-relevant sites, such as Ground Zero.
- Various Academic Excellence and Career-Planning Workshops such as the “Time Management Workshop,” sponsored by the Office of Residence Life (24 Oct 2004)
- Formal and Informal Events with S&E Faculty, including the “Connecting with Faculty” Workshop (7 Nov 2004), Faculty & Residents “Hot Chocolate” Soiree, desserts with S&E faculty and WISE-LC residents in the Residence Hall Lounge (Apr 2004)

Additionally, WISE has sponsored a Writing Course section (WRT 105) and several important lectures:

- Lecture by Dr. Sue Rosser (Dean of Ivan Allen College at Georgia Tech) on Institutional Transformation and Women’s Leadership in S&E (9 Oct 2004)
- Lecture by Alumna Ms. Donna Francher, Expert in Oncology Pharmaceutical Research, on Science Creativity and Entrepreneurship (19 Apr 2005).
Since its inception, the WISE Undergraduate Program at Syracuse University has become an invaluable academic resource on campus in influencing the experiences that undergraduate women have in S&E—both academically and in preparing students for future careers in these fields. By providing role models, mentors, advising, informal relationships with S&E faculty members, campus programming and resources, and dynamic relationships with peers who are undergoing similar experiences, students in S&E are being prepared to excel in S&E and to take up places in future careers in these fields.