

S.W.E. Summer Engineering Exploration

For High School Sophomore and Junior Women

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Overview

Conducted by the University of Michigan student chapter of the Society of Women Engineers (SWE) since 1985, the Summer Engineering Exploration Program (SEE) gives high school sophomore and junior women perspective on a variety of fields and opportunities in Engineering. Each day is filled with group discussions with engineers from industry, plant tours, presentations about different Engineering disciplines, hands-on experience and recreational activities. This is a chance to learn first hand what Engineering is all about.

A parents seminar, held the last day of the program, provides an overview of the week's activities and information on women in Engineering. A discussion session is held with University of Michigan College of Engineering students and administration representatives and followed by a farewell luncheon honoring the participants and their parents.

Participants

The Summer Engineering Exploration is open to high school sophomore and junior women. Applicants are chosen based on academic record, extracurricular activities, and a completed application. One important response on the application is the answer given to the question, "Do you have a working definition of engineering?". If the student has no definition, they are readily accepted into the program. Application materials are mailed in February with a late March deadline to high schools in Michigan where a math teacher, science teacher or counselor has been identified. The cost of the program for students is minimal for a residential program, currently \$150.00 which essentially covers housing. The remainder of the budget is supplied by SWE general funds, the College of Engineering and many industry sponsors. With the help of local industry, most students who request financial assistance receive a full or partial scholarship.

Philosophy

The main goal of the SWE summer program is to educate young women about the realities of a career in engineering. Through a series of faculty presentations and tours of each disciplines facilities, the participants learn that engineering is not just building bridges or designing a car. They meet the real people who are doing exciting work on the forefront of technology. Role modeling is ever important at this stage of development so female faculty and graduate students are encouraged to actively participate in the presentations and tours of their departments.

A day trip to a local manufacturing plant provides the opportunity to see what "real" working engineers do everyday while the daily interaction with college students gives some understanding of what it is like to study engineering. By combining education and fun, these young women also learn that wanting to be an engineer does not rule out fun and recreation, engineers seem like normal people! Showing lots of examples of women who are successful in engineering gives permission to these young women to succeed in a challenging career.

Mechanics

The daily schedule (as outlined below) is filled with activities, structured and recreational. An important aspect of managing a residential program, especially for college students, is the risk and responsibility for the young women while they are on campus. For many participants, SEE is the first chance they have had to experience life away from home on a large university campus. By keeping the schedule busy, hopefully they will stay out of danger. One evening provides the chance to experience college life in a fairly controlled setting, at a local teen dance night. This is the chance for the counselors to allow the participants some freedom in an enclosed environment, to interact with local teens and have some fun dancing. One evening is also spent enjoying volleyball or an outdoor movie, providing the opportunity to "experience" Ann Arbor.

Sunday		Wednesday		Saturday
	8:00	8:00	8:00	
	Breakfast	Breakfast	Breakfast	8:30
	9:00	9:00	9:00	Breakfast
				9:30
	Departmental Presentations	Plant Tours	Departmental Presentations	Checkout
				10:30
	12:00		12:00	Parent Seminar
	Lunch		Lunch	
	1:00-3:30		1:00	Banquet
	1:00			2:00
Check-in Welcome	Tours		Tours	
	4:00		4:00	
Campus Tour	Free Time		Free Time	
	5:30	5:30	5:30	
Pizza Party	Dinner	Dinner	Dinner	
	7:00	7:00	7:00	7:00
	Speaker	Student Night	Speaker	Casino Night
	9:00	9:00	9:00	
	Design Project	Teen Dance Club	Movie volleyball	

Organizing

In order for the entire program to be successful, there must be a core of dedicated volunteer student organizers. The University of Michigan SWE student chapter has an officer structure which allows for an Outreach Director, who does most of the organizing, and several chairpeople including; activities and finance. A committee of interested SWE members is also formed to help out during the week of the program as live in leaders, daily chaperones, preparing lunches, sitting on student panels etc.

Design Project

An integral part of engineering today is group problem solving. To encourage cooperation and creativity, two evenings are spent creating a design project. The project should require very few materials, lots of imagination and about 4 hours to complete. Past projects have been to design and build a egg holder from a package of 3"X 5" cards and transparent tape that could be dropped from increasingly greater heights with out breaking the egg; a catapult created from cardboard, rubber bands and plastic utensils to propel a marshmallow to a target; or the ever famous bridge of toothpicks. Counselors supervise the design sessions, facilitating group cooperation without supplying any design advice. Principles of engineering should be considered in planning a design project such as aerodynamics, structural integrity, and functionality. On Thursday, a contest is set up in one of the engineering buildings with faculty and administration asked to judge. This is a good opportunity to get a picture of each group and provide some coverage for the College community and possibly the local community through newspaper stories.

Benefits

There are numerous benefits to a program such as the Summer Engineering Exploration. Getting a solid understanding of Engineering can only help the participants on their search for a career path. The involvement of SWE members reaps many rewards which are both personal such as improved self-esteem and a replenished enthusiasm for studies and those global to the participants by virtue of well-adjusted female role models in a male dominated field. What follows is the larger benefits to this type of program to the sponsoring institution.

University and College of Engineering Recruitment

- identifies a pool of women interested in math, science and engineering
- increases the pool by providing exposure and experiences to women who had not previously considered engineering (plus the trickle down effect)
- provides exposure to the University and College of Engineering facilities, faculty, students and staff
- the invitation and selection process affirms the individual student's desirability by the University
- clarifies the admissions process, and provides scholarship and financial aid information
- introduces resources and role models

- allows an opportunity to interact with and provide information to parents
- enhances public relations
- increases contacts and enhances relationships with secondary school teachers and counselors

Retention

- ∞ builds and reinforces personal aspirations
- ∞ provides an opportunity for bonding between women with common interests. (Establishes an atmosphere of acceptance and permission to succeed in the field).
- ∞ clarifies the field of engineering
- ∞ student panel presentations and peer counselors explain and model what is necessary to succeed in a college engineering curriculum

Follow Up

A follow-up survey is sent to the participants well into the school year. Since the main goal of the Summer Engineering Exploration is to encourage young women to study Engineering, that is one of the first questions asked. In order to see where they are applying to college, it is better to wait until the school year has begun and they are thinking about applications. It is important that there are also responses of "no" to the study of Engineering. If a participant makes this decision, it was an informed choice.

How to Start a Program

With the commitment of a Society of Women Engineers student chapter, this successful program can be implemented at any willing university. Currently under production is a "how-to" booklet authored by the 1990 Summer Engineering Exploration officers. This booklet details the mechanics of coordinating a student run pre-college residential program which provides participants with a unique view of the world of engineering in terms of academic and career opportunities. This booklet can be requested by writing to: SWE Outreach director, 1226 EECS, University of Michigan, Ann Arbor, MI 48109. Cost to cover mailing may be requested.

Conclusion

The success of the University of Michigan S.E.E. can be attributed to the cooperation and support of engineering departments, the Dean's Office, the consistent interest of industry and the enthusiasm and commitment of SWE volunteers. The learning occurs not only with the high school students but with the SWE volunteers as they exercise a new position of role model. All of these elements are essential in creating an educational and fun experience for all involved.