# AC 2011-592: ENHANCING THE INTEREST, PARTICIPATION, AND RETENTION OF UNDERREPRESENTED STUDENTS IN ENGINEERING THROUGH A SUMMER ENGINEERING INSTITUTE

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# Enhancing the Interest, Participation, and Retention of Underrepresented Students in Engineering through a Summer Engineering Institute

Abstract:

The summer engineering institute (SEI) in San Francisco State University is a two-week residential engineering program designed to attract, recruit and retain high school seniors and community college students to enter engineering programs. In 2008 Cañada College, a Hispanic-Serving community college in Redwood City, collaborated with San Francisco State University, a comprehensive urban university, to design and implement the summer engineering institute which is funded by the US Department of Education's Minority Science and Engineering Improvement Program (MSEIP) grant to increase the likelihood of success among underrepresented and educationally disadvantaged students interested in pursuing careers in STEM fields. Prior to its partnership with Cañada College, SFSU has many years of experience in offering an engineering residential program funded by the California Department of Transportation (Caltrans). With the newly funded grant from the DOE, the Summer Engineering Institute has been designed and taught by SFSU engineering faculty from Civil, Electrical, Mechanical and Computer engineering programs. The redesigned summer program involves projects that were specifically designed to motivate students' interest in hands-on research. The program also offers students the opportunity to gain insight into various engineering career options, and academic programs through a combination of lectures, field trips, and workshops. Preliminary results indicate SEI participants showed greater understanding of the engineering profession and increased interest in STEM fields. This paper aims to show how a summer engineering program can be designed to enhance interest in engineering among minority students, and how faculty can be actively involved in designing a program that has the potential to strengthen the engineering education pipeline.

## 1. Introduction

The Summer Engineering Institute (SEI) at San Francisco State University is a two-week residential program held on campus at SFSU. The SEI program is part of a Minority Science and Engineering Improvement Program (MSEIP) grant funded by the US Department of Education through collaboration with Cañada College, a Hispanic-Serving community college in Redwood City, California since 2008. The goals of the program are to introduce students to the engineering educational system and the engineering profession, to recruit students into an engineering field, increase student awareness of resources and skills needed for college success, and to increase student knowledge of specific engineering topics.

The SEI program is established based on the SFSU's previous experience in offering similar summer program that featured a mixture of faculty and engineers, reached out to many underrepresented high-school student groups.

## 2. Cañada College and San Francisco State University Cooperative Minority Science and Engineering Improvement Program (MSIEP)

Community colleges serve as the gateway to higher education for large numbers of students in the U.S., especially Hispanic and low-income students. Yet for many students, the community college gateway does not lead to success. Only one in four students wanting to transfer or earn a degree/certificate did so within six years, according to a recent study of California community colleges[1]. African American and Hispanic students have even lower rates of completion. According to the study, only 15% of African American students and 18% of Latino students completed a degree or certificate within six years, compared to 27% of white students, and 33% of Asian students.

For science and engineering fields, lower success and retention rates for minority students are observed at both community college and university levels resulting in underrepresentation of minority groups in these fields. For instance, while comprising almost 25% of the U.S. population, African Americans and Latinos make up less than 7% of the individuals with B.S. or higher-degree holders who work in the science and engineering fields[2].

Women are particularly underrepresented in engineering. In 2004, 57.6% of all Bachelor's degrees in all fields were awarded to women, yet only 20.5% of Bachelor's degrees in Engineering recipients were women[2,3]. This underrepresentation, however, has been attributed to lack of interest rather than lower success rates. In fact, recently, out of first time college students who expressed intentions to major in engineering, only 13.9% were women[2,3].

Among the factors that have been cited to contribute to this underrepresentation of minorities and women in science and engineering are:

- Lower interest in science and engineering for African American, Native American, and Latino students[4], as well as female students in general.
- Lower retention and success rate of minority students in these fields[2]
- Cultural values of community for minority students that may be at odds with perceived high levels individualism, and women's perceived competition in these fields[5]; and
- Disparities in "secondary education systemic factors, such as teacher quality, course taking, school funding, and expenditures on instructional resources[6]".

Though Cañada College is situated in one of the most affluent counties in the nation, there are large disparities in income distribution. For example, according to the U.S. Census, 4.7% of all families in San Mateo County live below the poverty level, while 32.9% of the Hispanic population in Redwood City does so. To place these economic differences in context, consider that the median price for a two-bedroom home in San Mateo County is over $700 K. Thus, the large gap between those who can afford to live comfortably in the Bay Area, and those who live in poverty, lends urgency to the situation many of our students face.

The areas that Cañada College serves also have high dropout rates and low educational attainment rates. In East Palo Alto, for instance, only 48.2% of the residents, age 25 and older, have a high school diploma, and only 10.6% of the residents have earned a Bachelor's degree (U.S. Census Bureau). Hispanic and other minority, low-income students from these areas face a range of complex conditions that pose serious problems to entering post-secondary education.

As of Fall 2007, 43% of Cañada's student are Hispanic. According to institutional research in the base year 2005-2006, most of these students qualify as high-risk students by the following standard measures: 35% of the students have an income below 150% of the poverty level; 81% speak English as a second language; and 88% are first-generation college students.

During the base year 2005-06, there were 173 total transfers. Of the 173 Cañada College students who transferred to any four year institution, only 55 were Hispanic students, or 31.7%; and only 9 Hispanics transferred to San Francisco State University, the closest and largest public four-year university available to them. Since Hispanics comprised 43.9% of Cañada College's student population that year, these transfer numbers are very low;. Clearly, much needs to be done at Cañada College to improve the persistence and transfer rates of Hispanic and other minority students.

San Francisco State University (SFSU), the collaborator in the project is a large, regional, comprehensive university, part of the California State University System. In fall 2007, 30,125 students enrolled at SFSU: 24,376 undergraduates and 5,749 graduate students. Students pursue 113 undergraduate majors, 96 master's degree programs, 27 credential programs, and 34 undergraduate and graduate certificate programs.

Like Cañada, SF State is quite multicultural. According to the fall 2007 Undergraduate Student Profile, although white students form the largest racial/ethnic group of undergraduates at 34.1%, 23.6% are Asian, 17.8% are Hispanic, 10.7% are Filipino, 6.7% are African American, 1.2% are Pacific Islander, and 5.3% are "other." 93.8% are Californians, and the largest group is from the three counties of the San Francisco Peninsula.

San Francisco State University's School of Engineering offers four undergraduate engineering degrees – Civil, Computer, Electrical and Mechanical – all of which are approved by the Accreditation Board for Engineering and Technology. As stated in its mission statement, the School's mission is: "[t]o educate students from a diverse and multicultural population to become productive members of the engineering profession and society at large." The School of Engineering combines excellence in teaching theoretical principles and engineering design concepts with practical hands-on experience and the development of technical proficiency and communications skills.
Average enrollment in the Engineering School is about 800 undergraduate students each semester. The student body is ethnically, culturally, academically and economically diverse. About 20% of the School's students are women and 55% are minority. Many students are the first in their families to attend college and most are economically or socially disadvantaged and must work to support themselves financially while in college. Most of these students persist in their studies, complete their engineering degrees and ultimately reap the benefits of significantly enhanced employment opportunities. The School also offers a graduate degree of Master of Science in Engineering with two areas of concentration, Structural/Earthquake Engineering and Electrical/Computer Engineering.

The faculty in the School of Engineering is highly regarded for its excellent academic qualifications and strong practical engineering experience. The orientation and specializations of the faculty are eclectic and wide-ranging, offering expertise in both basic research and

design/applied research. In addition, the School is active in research and has been awarded nearly $3 million over the last five years in grants and contracts from sources including the US Department of Energy, National Science Foundation, Air Force Research Laboratory, National Aeronautics and Space Administration, Pacific Gas & Electric, Agilent Technologies and Sun Microsystems. The school also maintains strong ties with the local industry. The San Francisco Bay Area, home of many innovative engineering and technology companies, provides an excellent regional setting and an abundant pool of desirable employment opportunities for our students.

Given the challenges outlined under Identification of Need, the following goals were set for the funded proposal.

Goal 1: Increase students level of academic preparation of Hispanics, African, American, Native American and women for college-level course work in STEM fields.

Goal 2: Increase awareness of and interest in Engineering as a future career for the underrepresented groups.

Goal 3: Increase the number and expand the participation - in Science and Engineering education and career pathways - of undergraduate students from historically underrepresented populations, including Hispanics, African Americans, Native Americans, and women.

Goal 4: Improve the retention of students from underrepresented populations in STEM disciplines.

Goal 5: Increase the number of underrepresented students transferring in STEM fields.

Goal 6: Facilitate the timely transfer of Hispanic, African American and Native American students.

## 3. Summer Engineering Institute at SFSU

Summer bridge programs is proven effective in increasing the retention and success of minority students[7,8]. The Summer Engineering Institute is a two-week residential summer camp at San Francisco State University, and will offer underrepresented engineering students the opportunity to gain insight into the engineering academic program by participating in engineering projects with engineering professionals and undergraduate students.

The SEI features regular classroom instruction, group, and individual study on the nature of engineering education. Informal meetings, social events, and company tours (California Department of Transportation, Google, and Lawrence Hall of Science) with faculty, engineers and undergraduate students will also be offered. Appendix 1 shows a summary of the schedule of the 2010 Summer Engineering Institute that was held from July 11$^{th}$ to July 23$^{rd}$. Mornings were generally devoted to lecture sessions, with group activities and hands-on workshops in the afternoon to reinforce concepts learned from the lectures. Most evenings were devoted to working on group projects.

Upon completion of this program students have gained personal knowledge about their academic strengths and weaknesses and sufficient knowledge about the engineering profession to determine whether engineering is indeed for them.

Program participants engage in studies of mathematics, surveying, drafting, and basic fundamentals of engineering. They are divided into groups and each group is responsible for completing an engineering project. At completion of the group project, participants present the final engineering projects in written and oral form to an Evaluation Committee.

Activities, laboratory modules, and group projects to be used for the Summer Engineering Institute include a combination of materials and resources currently being used at Cañada College and SFSU with additional resources are developed by engineering faculty at Cañada College and SFSU. In addition to Cañada College and SFSU faculty and students, the Institute will also have volunteer Engineering Professionals providing guidance and assistance.

Profile of SEI Students

Twenty six students were jointly recruited by Cañada College and San Francisco State University for the 2010 SEI program. Table 1 is a summary of the demographics of the 26 participants. Twelve of the students were female. Hispanics constitute the largest ethnic group at 76%.

Table 1. Demographics of 2009 Summer Engineering Institute.

| **Demographics** | **N** | **%** |
|---|---|---|
| Gender | | |
| Female | 12 | 46.2% |
| Male | 14 | 53.8% |
| *Total* | 26 | |
| Ethnicity | | |
| African American | 1 | 3.9% |
| Asian American or Pacific Islander | 4 | 15.4% |
| Caucasian | 5 | 19.2% |
| Hispanic | 20 | 76.9% |
| Other | 1 | 3.9% |
| *Total* | 31 | |
| First in Family to Attend College? | | |
| Yes | 14 | 53.8% |
| No | 12 | 46.2% |
| *Total* | 26 | |

To evaluate the success of SEI in achieving its goal of recruiting students to major in an engineering field, a pre- and post-survey of students' intended major in college was done. Table 2 summarizes the results of this survey. At the beginning of the program, 17 out of the 25

students (or 68%) indicated one of the fields of engineering as their intended major, with Engineering (General) as the most popular choice. The remaining 8 out of the 25 students (or 32%) were undecided. After the program, students intended major remained the same except for one student who switched from Civil Engineering to Landscape Architecture. Clearly, the program failed to recruit additional students to major into any of the engineering fields.

Table 2. SEI Student Survey: Intended Major in College.

| **Major** | **Pre-SEI** | | **Post-SEI** | |
|---|---|---|---|---|
| | **N** | **%** | **N** | **%** |
| Aerospace Engineering | 3 | 11.5% | 3 | 11.5% |
| Biomedical Engineering | 1 | 3.9% | 0 | 0.0% |
| Civil Engineering | 3 | 11.5% | 2 | 7.7% |
| Computer Engineering | 8 | 30.8% | 7 | 26.9% |
| Electrical Engineering | 2 | 7.7% | 2 | 7.7% |
| Engineering (Undecided) | 2 | 7.7% | 0 | 0.0% |
| Mechanical | 3 | 11.5% | 5 | 19.2% |
| Other (Non-engineering) | 2 | 7.7% | 5 | 19.2% |
| Undecided (Non-engineering) | 2 | 7.7% | 2 | 7.7% |
| *Total* | 26 | | 26 | |

The failure of the SEI program to achieve its primary goal of recruiting students into engineering is also reflected in Table 3. Although student enthusiasm for the program increased significantly, there was a statistically significant decrease in student confidence that the Institute will help them select an appropriate engineering major. The slight increase in student level of confidence that they have the necessary skills and preparation for college success is not statistically significant.

Table 3. SEI Student Survey: Attitudes.

| **Attitudes**<br>Response Scale: 5 – Strongly Agree, 4 – Agree, 3 – Neutral, 2 – Disagree, 1 – Strongly Disagree. | **Pre-Program** | **Post-Program** | **Difference** (Post - Pre) |
|---|---|---|---|
| I feel excited about participating in Summer Engineering Institute. | 4.35 | 4.23 | -0.12 |
| I am confident that I have the skills and academic preparation to be a successful college student. | 4.00 | 4.12 | 0.12 |
| I am confident that SEI will help me in selecting an appropriate Engineering major. | 4.19 | 3.81 | -0.38 |

* The difference is statistically significant ( $p < 0.050$ ).

With regards to SEI's goal of increasing students' awareness of knowledge and skills that are important for college success, the results of pre- and post-SEI student surveys are summarized in Table 4. All the gains that were measured after the program were statistically significant except in the area of using a calculator for engineering calculations. Pre- and post-SEI average student responses were all between "Quite a Bit" and "A Lot" in all areas except for "How to transfer and explore majors." This is again an indication that the program was not successful in helping students explore career options, or select an appropriate major.

Table 4. SEI Student Survey: Knowledge and Skills important for College Success.

| **Knowledge and Skills for College Success**<br>Response Scale: 4 – A Lot, 3 – Quite a Bit,<br>2 – Some, 1 – A little, 0 – Nothing. | **Pre-Program** | **Post-Program** | **Difference** (Post - Pre) |
|---|---|---|---|
| Time management | 3.62 | 3.96 | 0.34 |
| Education planning | 3.46 | 3.88 | 0.42 |
| Your learning style | 3.69 | 3.92 | 0.23 |
| Your personal strengths | 3.88 | 3.81 | -0.07 |
| Financial Aid | 3.08 | 3.62 | 0.54 |
| Self Confidence | 3.81 | 3.73 | -0.08 |
| Essay writing | 3.65 | 3.92 | 0.27 |
| How to transfer and explore majors | 2.50 | 3.31 | 0.81 |
| Using a calculator for Engineering Calculations | 3.65 | 3.08 | -0.57 |

* The difference is statistically significant ( $p < 0.050$ ).

With regards to its goal of increasing student knowledge of college resources and support services, results of the student surveys are shown in Table 5. There is no statistically significant change in student responses in any of the areas after the completion of SEI.

Table 5. SEI Student Survey: Knowledge of College Resources and Support Services.

| **Knowledge of Resources and Support Services**<br>Response Scale: 4 – A Lot, 3 – Quite a Bit,<br>2 – Some, 1 – A little, 0 – Nothing. | **Pre-Program** | **Post-Program** | **Difference** (Post - Pre) |
|---|---|---|---|
| Library | 3.19 | 3.69 | 0.50 |
| Undergraduate Advising | 2.77 | 3.42 | 0.65 |
| Learning center | 2.81 | 3.65 | 0.84 |
| Health center | 2.38 | 3.35 | 0.97 |
| Tutorial services | 2.50 | 3.69 | 1.19 |

| | | | |
|---|---|---|---|
| Financial aid office | 2.69 | 3.69 | 1.00 |
| Transfer center | 2.35 | 3.08 | 0.73 |
| Disabled student services | 1.77 | 2.58 | 0.81 |
| MESA | 2.27 | 3.62 | 1.35 |

Table 6. SEI Student Survey: Knowledge of Specific Engineering Topics.

| **Knowledge of Specific Engineering Topics**<br>Response Scale: 4 – A Lot, 3 – Quite a Bit, 2 – Some, 1 – A little, 0 – Nothing. | **Pre-Program** | **Post-Program** | **Difference** (Post - Pre) |
|---|---|---|---|
| Computer-Aided Design (CAD) | 1.73 | 2.77 | 1.04 |
| Laboratory Experimental Procedures | 2.00 | 3.15 | 1.15 |
| Data Analysis | 2.04 | 3.23 | 1.19 |
| Engineering Design Process | 1.85 | 3.54 | 1.69 |
| Civil Engineering | 1.69 | 3.77 | 2.08 |
| Computer Engineering | 1.96 | 3.96 | 2.00 |
| Electrical Engineering | 1.77 | 3.54 | 1.77 |
| Mechanical Engineering | 2.00 | 4.00 | 2.00 |
| Robotics | 1.69 | 3.77 | 2.08 |
| Renewable Energy | 1.92 | 3.65 | 1.73 |
| Computer Programming | 1.81 | 3.77 | 1.96 |
| Bridge Design | 1.50 | 3.46 | 1.96 |
| Thermodynamics | 1.62 | 3.62 | 2.00 |
| Electronics | 2.08 | 3.54 | 1.46 |

* The difference is statistically significant ( $p < 0.050$ ).

** The difference is statistically significant ( $p < 0.010$ ).

* **The difference is statistically significant ( $p < 0.001$ ).

| **Projects** | **Average Rating** | **%** |
|---|---|---|
| Bridge design (Dr.Chen) | 4.00 | |
| Designing a Timer (Dr. Mahmoodi) | 4.27 | |
| iPhone project(Dr. Jiang) | 4.10 | |
| Sterling Engine kit (Dr.Cheng) | 4.26 | |

| **Projects** | **Average Rating** | **%** |
|---|---|---|
| Designing a Timer (Dr. Mahmoodi) | 4.27 | |

| | |
|---|---|
| Sterling Engine kit (Dr.Cheng) | 4.26 |
| iPhone project(Dr. Jiang) | 4.10 |
| Bridge design (Dr.Chen) | 4.00 |

| **Lectures** | **%** |
|---|---|
| Lecture on Electrical Engineering(Dr. Jiang) | 3.23 |
| Lecture on Computer Engineering (Dr. Mahmoodi) | 3.69 |
| Lecture on Civil Engineering(Dr. Chen) | 3.65 |
| Lecture on Mechanical Engineering(Dr. Cheng) | 3.69 |
| Overview of Engineering Curriculum and Profession (Dr. Shahnasser) | 3.46 |
| Top 10 Things Engineering Students Need to Know (Dr. Enriquez) | 4.35 |
| Wheel Chair Lab presentation | 3.88 |
| Guest Speaker (Robert Levenson) | 3.73 |
| Student Panel | 3.58 |

| **Lectures** | **%** |
|---|---|
| Top 10 Things Engineering Students Need to Know (Dr. Enriquez) | 4.35 |
| Wheel Chair Lab presentation | 3.88 |
| Guest Speaker (Robert Levenson) | 3.73 |
| Lecture on Computer Engineering (Dr. Mahmoodi) | 3.69 |
| Lecture on Mechanical Engineering (Dr. Cheng) | 3.69 |
| Lecture on Civil Engineering (Dr. Chen) | 3.65 |
| Student Panel | 3.58 |
| Overview of Engineering Curriculum and Profession (Dr. Shahnasser) | 3.46 |
| Lecture on Electrical Engineering (Dr. Jiang) | 3.23 |

| **Workshops** | **%** |
|---|---|
| Guaranteed 4.0 workshop (Mr. TomNguyen) | 3.96 |
| Civil EngineeringPresentation/Hands-onWorkshop (Prof. MutluOzer) | 3.77 |
| Egg Drop (Mr.Fernando Novoa) | 4.12 |

| | |
|---|---|
| Secret Codes with Tic Tacs (Dr. Enriquez) | 4.12 |
| Solar Project (Dr.Nilgun Ozer) | 2.54 |
| Robotics Workshop(Mr. Nick Langhoff) | 4.08 |
| Math Review using MyMathTest (Dr. Enriquez) | 4.15 |
| Resume Workshop (Dr.Ozer) | 3.46 |
| Vision Board (Dr.Enriquez) | 4.00 |
| Robotics Challenge(Wall Follower) | 4.19 |
| Field Trip: Shipyard | 3.96 |
| Field Trip:Exploratorium | 4.31 |
| Field Trip: Bay Bridge | 3.91 |

| **Workshops** | **%** |
|---|---|
| Field Trip: Exploratorium | 4.31 |
| Robotics Challenge(Wall Follower) | 4.19 |
| Math Review using MyMathTest (Dr. Enriquez) | 4.15 |
| Egg Drop (Mr. Fernando Novoa) | 4.12 |
| Secret Codes with Tic Tacs (Dr. Enriquez) | 4.12 |
| Robotics Workshop(Mr. Nick Langhoff) | 4.08 |
| Vision Board (Dr. Enriquez) | 4.00 |
| Guaranteed 4.0 workshop (Mr. Tom Nguyen) | 3.96 |
| Field Trip: Shipyard | 3.96 |
| Field Trip: Bay Bridge | 3.91 |
| Civil Engineering Presentation/Hands-on Workshop (Prof. Mutlu Ozer) | 3.77 |
| Resume Workshop (Dr. Ozer) | 3.46 |
| Solar Project (Dr. Nilgun Ozer) | 2.54 |

| **Facilities** | **%** |
|---|---|
| Dorm Rooms | 4.00 |
| SFSU Bookstore | 4.00 |
| Evening Snacks | 3.73 |
| Computer Labs | 3.62 |
| Workshop Labs | 3.58 |
| Classrooms | 3.50 |
| Laboratory Equipment/ Instruments | 3.46 |
| Sports and Gym Facilities | 3.04 |
| Food-Breakfast/Lunch /Dinner | 2.69 |

## 4. Summary and Conclusions

The Summer Engineering Institute was successful in increasing student knowledge and understanding of specific engineering topics and of the engineering profession. Among students who solidified their choice of an engineering career and decided to major in one of the engineering fields, the program has provided context to their study of engineering – a strategy that has been proven to increase student motivation and persistence[5] – especially as they struggle through the first two years of the engineering curriculum. The program, however, did not achieve its goal of recruiting additional students to major in engineering. Results of pre- and post-program surveys asking students to rate their confidence that "the Summer Engineering Institute will help in selecting an appropriate Engineering major" show that student confidence level dropped significantly after the program. One possible contributing factor could be the overemphasis given to Civil Engineering and other related fields brought about by the partnership with Caltrans whose personnel have expertise mostly in these fields. The SEI team hopes to provide a more balanced treatment of all the major fields of engineering at next summer's program. However, an investigation on research and literature on career selection, especially those in the STEM fields, indicates that the underlying reason might be beyond the SEI curriculum.

Many researchers believe that career interests and career plans start developing in middle schools, and recommend that career explorations and career planning begin before high school, when students have already made major career decisions in the form of curriculum choices[9,10,11,12,13,14,15]. Many of these middle school and high school students passively eliminate technical career options by not choosing courses that are not needed for these STEM fields[9]. In many cases, students who pursue STEM courses have made these career decisions before they finish high school so that STEM career exploration summer programs before their senior year, or before they start college may be too late. With this consideration, the SEI team is planning to develop a curriculum that will be implemented in an engineering institute for middle school students.

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## Appendix 1

### 2010 Summer Engineering Institute Schedule: Week 1

| | July 11 | July 12 | July 13 | July 14 | July 15 | July 16 | July 17 |
|---|---|---|---|---|---|---|---|
| Time | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
| 7:30AM | | Breakfast | Breakfast | Breakfast | Breakfast | Breakfast | |
| 8:30AM | | Campus Tour | Project Advisors Project Selection | Civil Engineering | Engineering Curriculum | Mechanical Engineering | Breakfast |
| 9:30AM | | Electrical Engineering | | | | | Field Trip 10 AM to 3 PM (bag lunches) Exploratorium |
| 10:30AM | | | | | | | |
| 12:00 PM | | Lunch | Lunch | Lunch | Lunch | Lunch | |
| 1:30PM | | Guaranteed 4.0 Workshop | Computer Engineering | Field Trip : Coast Guard Ship Yard - Alemada | International Wheelchair Lab Tour | Guest Speaker | |
| 2:30PM | Registration / Room Check-In | | | | | | |
| 3:00PM | | | | | Communications | Solar Project | Personal Time /Laundry |
| 4:00PM | Welcome Ceremony | | | | | | |
| 4:30PM | | Team Building | Hands-on Workshop (CE) | | | | |
| 6:00PM | Dinner | Dinner | Dinner | Dinner | Dinner | Dinner | Dinner |
| 7:30PM | Ice Breaker | Homework Time | Project Time | Project Time | Project Time | Project Time | Activity / Movie Night (SC 256) |
| 9:00PM | Personal Time | Personal Time | Personal Time | Personal Time | Personal Time | Personal Time | |
| 10:00PM | In Rooms | In Rooms | In Rooms | In Rooms | In Rooms | In Rooms | |
| 10:30 M | Lights Out | Lights Out | Lights Out | Lights Out | Lights Out | Lights Out | In Rooms |

## 2010 Summer Engineering Institute Schedule: Week 2

<table>
<tr><td></td><td>July 18</td><td>July 19</td><td>July 20</td><td>July 21</td><td>July 22</td><td>July 23</td></tr>
<tr><td>Time</td><td>Sunday</td><td>Monday</td><td>Tuesday</td><td>Wednesday</td><td>Thursday</td><td>Friday</td></tr>
<tr><td>7:30AM</td><td></td><td>Breakfast</td><td>Breakfast</td><td>Breakfast</td><td>Breakfast</td><td>Breakfast</td></tr>
<tr><td>8:30AM</td><td>Breakfast</td><td rowspan="3">Math</td><td rowspan="3">Computer Applications: CAD</td><td rowspan="3">Robotics Challenge</td><td rowspan="4">Project Time</td><td rowspan="3">Presentation (SCI-101)</td></tr>
<tr><td>9:30AM</td><td>Personal Time</td></tr>
<tr><td>11:00AM</td><td rowspan="3">BBQ<br>&<br>Fun Games<br>(Softball Field)</td></tr>
<tr><td>12:00PM</td><td>Lunch</td><td>Lunch</td><td>Lunch</td><td>Lunch</td><td rowspan="2">Awards Buffet Luncheon</td></tr>
<tr><td>1:30PM</td><td rowspan="2">Student Panel</td><td rowspan="2">Guest Speaker (Financial Aid)</td><td rowspan="4">Field Trip Bay Bridge</td><td rowspan="3">Mock Presentations Post-Program Survey</td></tr>
<tr><td>2:00PM</td><td>Checkout time</td></tr>
<tr><td>3:00PM</td><td rowspan="3">Project Time</td><td>Planetarium</td><td rowspan="3">Workshop: Robotics</td><td rowspan="6"></td></tr>
<tr><td>4:00PM</td><td rowspan="2">Project Progress Report - Meeting with Project Advisers</td></tr>
<tr><td>5:00PM</td><td>Personal Time</td></tr>
<tr><td>6:00PM</td><td>Dinner</td><td>Dinner</td><td>Dinner</td><td>Dinner</td><td>Dinner</td></tr>
<tr><td>7:30PM</td><td rowspan="2">Personal Time</td><td>Project Time</td><td>Project Time</td><td>Project Time</td><td rowspan="3">Talent Show</td></tr>
<tr><td>9:00PM</td><td>Personal Time</td><td>Personal Time</td><td>Personal Time</td></tr>
<tr><td>10:00PM</td><td>In Rooms</td><td>In Rooms</td><td>In Rooms</td><td>In Rooms</td></tr>
<tr><td>10:30PM</td><td>Lights Out</td><td>Lights Out</td><td>Lights Out</td><td>Lights Out</td><td>In Rooms</td></tr>
</table>