

# Extended Abstract: The Gupta First-Year Experience in the College of Engineering at Carnegie Mellon University

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**Abstract - The Deepak and Sunita Gupta First Year Experience (FYE) at Carnegie Mellon University provides programming for first-year students as they transition from high school into the College of Engineering. The program has been in place for 4 years and offers a combination of academic and professional development and social opportunities for students. Students enter the College without a declared major and must choose their engineering major after the completion of their first year, which provides them with an introduction to engineering fields and concepts as well as the fundamental background in mathematics, science and other skills important to all engineering disciplines. The success of the program has been evaluated through a number of means, including a survey that measured students' reactions to and preferences for various aspects of the program. This survey was administered to the first-year students, on-line, in late February. Access began during the student's Major Declaration Night celebration with a raffle entry awarded to those who completed the survey at the event. The survey remained available for one week after the event. One finding of the survey suggests that 57% of students find social events to be an important part of their first-year experience, 75% find academic events to be important, and 71% find career development events to be important. Although no differences were found by gender, race, or citizenship in the level of importance of social events, women and minority students placed more importance on career development events than men and majority students. Women also placed more importance on academic events than men.**

**Index Terms - Carnegie Mellon University, First Year engineering experience**

## THE GUPTA FYE

First-year students in Carnegie Mellon's College of Engineering are not asked to declare their major until the middle of the Spring semester during their first year. As such, the college assumes responsibility for curricular

advising of all first-year engineering students. The critical responsibilities include: facilitating first-year student integration into the university and the college; guiding them through a curriculum that provides them with the math and science fundamentals that will underpin their subsequent engineering curriculum; and, most importantly, ensuring that they gain sufficient understanding of the different engineering disciplines that they are able to make an informed choice of major. One goal of this program is to minimize the number of students changing their majors in mid-stream and thereby requiring additional time to complete their degree.

The academic portion of the Gupta FYE begins before the first-year students come to campus. Advising by college staff, faculty and trained peers begins during the summer using email, Facebook, G-chat, Skype, and phone. Students learn about the curriculum through a Blackboard course site that covers registration and provides other pertinent information such as access to the undergraduate catalog of courses. Ninety percent of survey respondents reported using the Blackboard system, of which 74% reported that it was helpful in registering for classes. Students may contact their advisor at any point to get clarification on a question or to establish a connection with them as needed. The advising team creates a class-year specific, engineering Facebook group page and enrolls the incoming students. This provides a place for students to begin to connect with one another. The Facebook page is staffed by eight Peer Advisors, who are upper-class engineering students trained to answer first-year questions about both academics and student life. Among the survey respondents who used the virtual peer advisors, 83% indicated they were helpful in preparing to come to campus.

This efficient process makes it possible for students to schedule their classes after extensive discussion with their advisors and before they arrive for Orientation in August. Once on campus, students and advisors meet in person to address any additional questions or issues that students may have. Students are also required to meet with advisors in November to plan spring semester course registration.

During the first year, all entering students are required to take two introductory engineering courses from the seven

major areas offered, as well as co-requisite math and science and general education courses. The introductory engineering courses are:

- Introduction to Biomedical Engineering
- Introduction to Chemical Engineering
- Introduction to Civil and Environmental Engineering
- Introduction to Electrical and Computer Engineering
- Introduction to Engineering and Public Policy
- Fundamentals of Mechanical Engineering
- Engineering the Materials of the Future

These courses, taught by faculty in each program, provide a foundation for each discipline. They are the first required course for each major. An example of the content of one of these courses was presented at the FYEE 2012 conference [1].

From their first day, students begin to build a practical foundation from which to choose their engineering major. In addition to their course choices, information about the engineering majors is disseminated at multiple events during the fall semester. These events also connect students with faculty, professional advisors, and upperclassmen and enable the first-year students to ask questions and obtain multiple perspectives on various issues before they declare their engineering major in the spring semester. One example of this type of event is faculty visits to the introductory engineering courses, during which professors present each engineering program to the students. Prior to spring registration an event was held at which students mingle with departmental representatives from each major, which provides them with the opportunity to learn more about each major and strengthen their confidence in their choice. Seventy-one percent of survey respondents reported that conversations with a faculty member helped them to decide or confirm their choice of major. Sixty-eight percent reported the same for conversations with fellow engineering students. Compared to other Gupta FYE experiences, these conversations were reported to be helpful in selecting their major by the greatest number of students. Students declare their majors at a special event, celebrating their transition to their programs with engineering faculty and staff. Throughout the first year, students are encouraged at every turn to develop their communication skills and start to build their professional network. They are urged to think of themselves as future engineers and approach their work and interactions with this in mind. With the aid of Carnegie Mellon's alumni base and career center, a networking event has been created for the fall semester. A representative from the Carnegie Mellon's Career and Professional Development Center gives a brief presentation on the importance of networking, then a panel of alumni discusses what their network means to them and what they wish they had done as college students to develop better networking skills. After the formal program ends, students attend a networking reception, where additional alumni have

gathered. The next hour is spent having the students practice what they have just learned.

With more than 60% undergraduate student participation, research is an integral component of a Carnegie Mellon engineering education. To help students acquire these skills and gain this experience, a research information session is held in the fall semester led by the university's Undergraduate Research Office.

Social events are also a part of the Gupta FYE and many are organized by the First-Year Advisory Board (FAB). The FAB is a group of twelve students who are selected to serve in a leadership role for their freshman year. These students plan first-year events within the college based on the interests expressed by their peers. They take the lead on all aspects of these events, with minimal oversight from a staff advisor. The FAB holds events such as game nights, scavenger hunts, and K'nex parties. There is also a very popular "What I Wish I Had Known" event in which upperclassmen answer questions from the first year students in a student-run format. FAB students take the lead in promoting all Gupta FYE events to their peers.

The college also holds a social event for all engineering first-year students during orientation week. The students are taken off campus to an entertainment facility where they have an entire evening to play games, bowl and get to know one another. At that event, all first-year students receive a class t-shirt that was designed by one of the first year students. The t-shirt design competition is held electronically over the summer and first year students vote to determine which design is used. Eighty-four percent of survey respondents attended this event, of which three-quarters reported that it made them feel more connected to the College of Engineering.

The first year ends with a final social event planned by the FAB, celebrating the successful completion of their first year. The format of this event varies each year and has taken the form of activities ranging from a paintball trip to a barbecue.

### ASSESSMENT RESULTS

In order to assess the experiences offered through the Gupta FYE, a survey was taken during the Spring 2013 semester to evaluate their impressions of the various events and experiences during their first year. Forty-one percent of first-year students responded to the survey.

In review of this data, we found that the largest fractions of students reported that academic events (76%) and career development events (71%) were important to them. By comparison, only 57% of respondents reported that social events were important offerings (figure 1). Women found the academic and the career development events to be more important than did the men.

With respect to choice of major, larger percentages of respondents reported that the Introduction to Engineering courses and their conversations with faculty and students had an effect on their choice of major than did events such

as visits by faculty to the introductory courses, undergraduate research information sessions, networking sessions, social events or conversations with their advisors (figure2). In addition, nearly three-quarters of students reported that the intro courses had an effect on their selection or confirmation of a major. Finally, among the 95% of respondents who had selected a major in the Spring semester of their first year, nearly three-quarters were 'certain' or 'very certain' that their choice of major was the right fit for them. Three percent were 'uncertain' or 'very uncertain' and 20% percent were ambivalent.

In the future, we will continue to provide programming on academics, professional development and social opportunities. We also plan to survey students annually to determine their preferences for and reactions to the various aspects of the program. We also hope to collect data to determine how many students change their major after the first year declaration, in order to help us understand the success of our program.

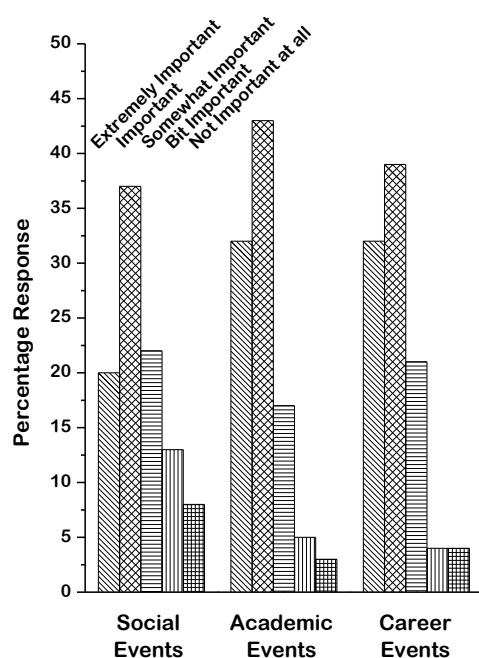


Figure 1. Assessment of the importance to students of the various types of first year events offered by the Gupta FYE.

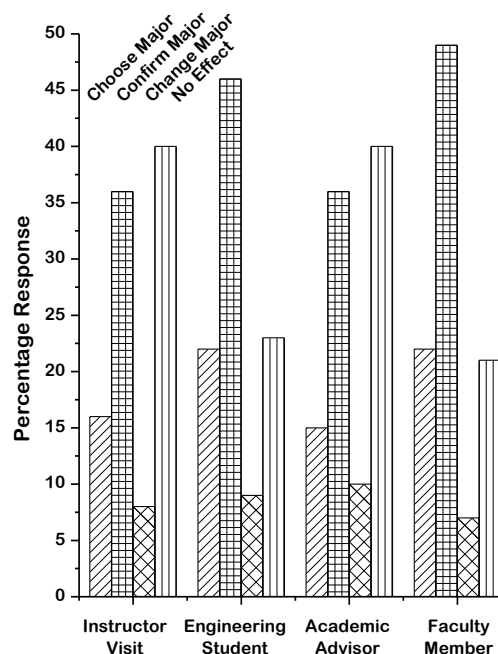


Figure 2: Effect of FYE events on choice of major by first year engineering students.

#### REFERENCES:

- [1]. Cartwright, L. G., Dzombak D. A., Garrett J. H. Jr., Hendrickson C. T., Oppenheim I. J., Thompson J. M., VanBriesen J. M., "Immersive Group Projects for First-Year Civil and Environmental Engineering Students" 4<sup>th</sup> First Year Engineering Experience (FYEE) Conference, August 9 – 10, 2012, Pittsburgh, PA

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