First Year Engineering Experience at Ferdowsi University of Mashhad

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Abstract – This paper describes our initial effort to develop a first year seminar for electrical engineering students at Ferdowsi University of Mashhad, Iran. This course was recently added to the curriculum and taught, for the first time, during the spring 2014 semester. The main goal is to motivate electrical engineering freshmen students by exposing them to an academic experience that combines fundamental concepts of engineering design, practical experience, problem solving skills, management and communication skills, and teamwork. This course was developed through collaborations with a colleague at Pennsylvania State University. A more detailed description of the course including discussion and students' reaction will be provided at the conference.

Keyword – First-Year Experience, First Year Seminar, Engineering Education.

I. INTRODUCTION

Many of today’s engineering educators have recognized the need to develop a first-year engineering course [1]-[4], which would help students in areas such as: making a successful transition from high school to college; recognizing the importance of academic performance; stimulating interest; initiating the development of important engineering skills such as teamwork, leadership, and communications; making an informed major choice [5]; and appreciating the role of engineers in society [6]-[8]. This need was also recognized by the Electrical Engineering Department at the Ferdowsi University of Mashhad. Consequently, after obtaining approval to offer such a course, based on collaboration with a colleague at the Pennsylvania State University, considering the goals and resources of the department, a first year experience course that would address the aforementioned key points was designed. This work describes our first attempt to deliver such a course, describing our teaching and learning objectives. Although such a course is commonly taught at major U.S. universities, we are not aware of any other university in Iran, which has introduced such a course at this time.

Ferdowsi University of Mashhad was established in 1949 and it is the oldest and largest University in the eastern part of Iran. The academic units consist of thirteen colleges, with 700 faculty. Currently, more than 20,000 students study at the university, which includes 2,500 Ph.D., and 6000 M.S. students. The department of electrical engineering is the largest department in the college of engineering, offering five focus areas: Biomedical Electronics, Communication Systems, Control Systems, and Power Systems to over 1000 undergraduate students. Electrical engineering students would choose their focus area/major by the end of their second year.

In this work, we describe our teaching objectives and the planned improvement process, based on anticipated feedback from the students and the course instructor.

II. COURSE STRUCTURE

Our teaching objectives were shaped by our desire to enrich the lives of our students, to transmit knowledge to our students along with the necessary skills for applying it in the service of our society, and to expand the base of knowledge through research and scholarship. We realized that to accomplish our goals we need to make sure that our students have an in-depth knowledge of their major field of study, broad understanding of the engineering and its impact on society, skills in communication and in critical inquiry, multi-cultural and global perspectives, active participation in professional communities, and a clear understanding of ethical choices inherent in human development.

The Introduction-to-Electrical Engineering Course is to be offered as a three-credit-hour course required for all freshmen electrical engineering students. The course has no prerequisites and it would be offered by the electrical engineering department as a FYE course for the incoming freshmen students. There is no required textbook for the course and the topics covered are grouped and designed by the instructor according to the approved teaching and learning objectives that will be explained shortly. Class will meet once a week for two hours. Student assessment will be based on the following components:

- Class participation
- Individual homework assignments
- Team-based homework/project assignments/reports
- Team-based presentation

In designing the course content, we have incorporated topics that are covered at Penn State Brandywine’s First Year Seminar course as well as subjects that are relevant to our students.