

<u>Question</u>	<u>Answer</u>
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Title of Paper	In-depth Look at Redesign of Freshman Electrical Engineering Courses for Improved Motivation and Early Introduction of Design

Abstract

Over the last three years we implemented a new freshman curriculum for electrical engineering students with these goals: a) introducing design immediately, b) improving programming skills, c) improving soft-skills, and d) attracting undecided and under-represented students. This curriculum was implemented in three, four-credit hour courses: “Exploring Electrical Engineering” is a hands-on, project-based class that introduces students to the practice of electrical engineering in a fun, non-lecture format. Classroom exercises include team-building, problem solving, ethics, and communication. Lab activities expose students to lab equipment, procedures, and software. For the final project, students form teams to design, construct, document, and demonstrate an electro-mechanical “Rube Goldberg” machine.

“Engineering Computation” focuses on engineering analysis, with an emphasis on electrical concepts and simple DC circuits. Students utilize MATLAB and Mathcad software to assist in calculating problem solutions. The course project requires students to design, code, and demonstrate a MATLAB program that controls a LabJack, which is a programmable analog and digital I/O adapter.

“Engineering Programming” formally introduces computer programming using the C language. Students gain experience with the software and hardware development process by designing, building, and coding more complex LabJack projects, such as a multiplexed LED display.

Initial descriptions and early assessment data were reported at a 2011 ASEE conference.

In this presentation we will:

a) Provide expanded coverage of the topics, activities and pedagogy as a resource for other educators. b) Provide expanded and updated assessment data to illustrate how well we are attaining our goals.

We will discuss preliminary data from our longitudinal study that we hope establishes how much difference the new curriculum makes in follow-on higher level courses. Initial results indicate further work is needed to reinforce student knowledge and skills with appropriate assignments and activities in their sophomore and junior years.