Workshops

Project-based Learning in Engineering Assessment and Design
William A Lucas, Director of Research,
MIT Gordon Engineering Leadership Program

The workshop will introduce an approach to the definition and measurement of undergraduate self-confidence widely used in cognitive psychology, usually referred to as "self-efficacy", one's belief that one has the capability to perform tasks in a specific domain, such as engineering design or working in teams. A brief overview of the use of this concept in the literature will be offered looking at how task performance and other experiences increase self-efficacy, followed by a summary presentation of the results of a study showing how and why the work placements of undergraduate engineering students may not have any beneficial effect, why Project-based Learning in engineering courses can be expected to strengthen self-efficacy, and why higher self-efficacy predicts higher retention of students in engineering courses of study.
A proposed project will then be described that seeks to enlist a number of engineering departments to assist in an effort to "deconstruct" project-based learning into its elements using a common research design, administration of the same surveys pre- and post- for first year engineering students, and an on-going collaborative review of results. (Each participating university or college would retain ownership of its own data, but would contribute a copy of their data without personal identifiers to the joint activity.) While the project is not dependent on external funding, the goal will seek funding for on-going travel and workshop activities, survey data costs, software for analysis, and otherwise support a community of colleagues who will both contribute to the research and strengthen the dissemination of its results.

Nios II Processor: Configurable µprocessor
Yung Wai of Johnson and Wales, Rhode Island.
Moderator is Tim Johnson of Wentworth Institute of Technology

Members of ASEE NE Region's Ad Hoc committee on the Nios II processor present a workshop for sharing developments and insight into course work on this advance processor. Time will be set aside for questions and answers on this topic and other related topics such as Quatus II, Eclipse, Altera University program, DE2 Development Board. More information on the Nios II processor is available at the Altera website: http://www.altera.com/products/ip/processors/nios2/ni2-index.html?GSA_pos=3&WT.oss_r=1&WT.oss=NIOS II

Texas Instrument MSP430 Wireless Network Design
Ross Kaplan, senior Electromechanical student at Wentworth Institute of Technology
Moderator is Tim Johnson from Wentworth Institute of Technology.

A presentation on designing wireless network design using various wireless development boards from Texas Instrument including the rf2500, Chronos and the CC1110 Development boards. Coding for peer-to-peer and the SimpliciTI open source software will be presented with working models. His presentation is based on his work from two different ASEE papers. Ross recently completed a COOP at Draper Laboratories in Boston as part of their Draper Scholar program. More information on the SimpliciTI network:
http://www.ti.com/corp/docs/landing/simpliciTI/index.htm?DCMP=hpa_rf_general&HQS=NotApplicable+OT+simpliciti

OpenTok™: A Free Open Source API for Video Conferencing in Distance Education
Jerald D. Cole, University of Bridgeport, Department of Instructional Technology

OpenTok™ is a free open source software application that supports synchronous online instructional delivery via video/audio conferencing. When used in conjunction with a remote screen sharing solution, it is possible to realize a virtual experience commensurate with (if not superior to) that of a traditional "ground-based" classroom. This workshop covers the advantages of synchronous delivery over asynchronous approaches and the presentation layer of OpenTok™. The functionality of several API calls are then deconstructed in the context of a standard HTML file exemplar that instructors can appropriate for use in their own courses. Finally, we demonstrate and evaluate the application in the context of an actual semester course in instructional technology.

System Dynamics Measurements and Experimentation at Home
William J. Palm, Musa Jouaneh, University of Rhode Island

We propose to present a 75 minute tutorial at the 2011 ASEE New England Section Regional Conference. Our tutorial will provide an overview of our results obtained under an NSF grant titled "System Dynamics Measurements and Experimentation at Home". We have developed a low-cost, microcontroller-based kit with built-in A/D and PWM interface, serial/USB interface, and control software, simple enough for students to use on their own at home. In addition, a number of low-cost experiments have been developed to accompany the kit. These include two thermal response experiments, two vibrating beam experiments, and a motor speed control experiment. For the tutorial we propose to briefly present the theory behind three of the experiments (one thermal, one vibration, and the motor control experiments) and then to demonstrate the use of the kit with these three experiments.

Hands-on Real-Time DSP Workshop using Simulink and TI TMS320C6713
Hisham Alnajjar, University of Hartford

The TI TMS320C6713™ DSP Starter Kit (DSK) platform provides power efficient DSP performance, enabling new innovations in cost and power-sensitive applications. The workshop is designed to give Participants the confidence, knowledge and skills to teach and/or implement DSP hardware topics using the DSK. It is a hands-on technical workshop that offers a practical and comprehensive introduction to real-time Digital Signal Processing, with an emphasis on how to use the TMS320C6713 DSK floating-point kit. Participants will learn how to implement practical DSP designs by using the DSK kit without being hardware experts and without the need for high level language through the use of Simulink™. Attendance is limited to 16.

Solar Energy Systems
Akram Abu-aisheh, University of Hartford

Energy from the sun can be used in many ways. We are interested in directly converting the sun's rays into a usable energy source: electricity. This is accomplished through the use of "solar collectors" which are more commonly known as solar panels. There are two ways in which solar power can be converted to energy. The first, known as "solar thermal applications," involve using the energy of the sun to

directly heat air or a liquid. The second, known as "photoelectric applications," involve the use of photovoltaic cells to convert solar energy directly to electricity. Learn more about them by following the links below. Solar Energy Systems are broadly classified into Active Solar Systems and Passive Solar Systems. In this workshop, the hands-on training and computer simulation parts will focus on active Solar Systems.

Photovoltaic (PV) based Solar Energy Systems are classified into the following categories:
1- Off-Grid Systems with backup
2- Off-Grid Systems without backup
3- Grid Connected Systems with backup
4- Grid Connected Systems without backup

This workshop (presentation, training and simulation) will focus on the first category, Off-Grid Systems with backup. Of all the renewable energy technologies, Photovoltaic (PV) cells show the greatest promise for worldwide acceptance and application. The universal appeal of PV cells lies in the fact that they generate electricity from the sun with no moving parts, and they are relatively simple in design, need very little maintenance, and are environmentally friendly. PV cells produce electricity whenever they are exposed to light.