STRUCTURE OF THE CLASS

The analog to digital converter (ADC) and digital to analog converter (DAC) are the chosen mechanism to bridge the computer and electrical worlds. Electrical engineering concepts include Ohms Law, LED voltage/current, resistance measurement, and motor control. Computer engineering concepts include I/O device drivers, debugging, stacks, FIFO queues, local variables and interrupts. The hardware construction is performed on a breadboard and debugged using a multimeter (students learn to measure voltage). Software is developed in C; all labs will be first simulated then run on the real microcontroller. Software debugging occurs during the simulation stage. Verification occurs in both stages.

The course has 11 labs and a final project. Each lab has a small and well-defined educational objective. Students begin by learning the fundamental concepts via lectures, interactive animations and readings. The second task is for students to observe an expert working through an example lab project (interactive tutorial where the students are required to follow along by building exactly what the instructor is building). Third, students are examined to make sure they understand the concepts by solving homework problems. Fourth, they are given a lab assignment where they must design hardware and software. Students connect circuits to their microcontroller board and write software to run on the board. The automatic grading system to verify specifications have been met. If the students are unsuccessful they will interact with their peers and be able to attempt the lab again.

VIDEO KIT AND LAB SOLUTIONS

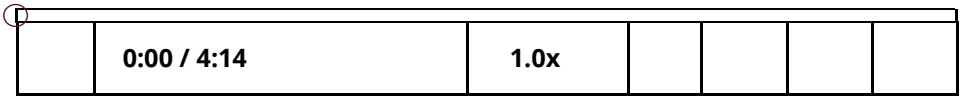
RAMESH YERRABALLI: Hi.

I'm Ramesh Yerraballi.

JON VALVANO: And I'm Jon Valvano.

And in this video, we will show you the lab kit.

And just to get you excited about this



class, we will also demonstrate the

completed labs.

RAMESH YERRABALLI: Here they are.

JON VALVANO: The most important part of the kit is the

microcontroller board.

And each of you will purchase a Tiva LaunchPad development system, which

comes with a standard USB cable.

And this is the ARM Cortex-M processor.

You will be using this board to complete five of the labs.

RAMESH YERRABALLI: The remaining labs, which are a little more exciting,

require some external components.

The components you will need are a few resistors of various sizes, a few

light-emitting diodes of different colors, a

few switches

Help

The course web site has buying instructions and intructions for downloading software, **http://edx-org-utaustinx.s3.amazonaws.com/UT601x/index.html** (http://edx-org-utaustinx.s3.amazonaws.com/UT601x/index.html).