Course Updates & News

APRIL 20, 2014

Chapter 15

Chapter 15 is now ready (captions should be ready in a few days). Lab 15 will not be graded. If you wish to build a game but do not have a LCD display, then you can use the virtual Nokia display. The virtual display uses the TExaSdisplay application to render the graphics. You can find the installer for the virtual display as step 8 at http://edx-org-utaustinx.s3.amazonaws.com/UT601x/download.html (http://edx-org-utaustinx.s3.amazonaws.com/UT601x/download.html). Lab 15 is optional and not graded. From now until May 7 we will accept submissions for Lab 15 game code and game videos. After May 7, we will lock the upload and open the download. After May 8 you will be able to watch videos and download/play games written by your fellow students.

Progress

Over the last 7 days students have made great progress working on labs. These numbers represent finishing labs both in simulation and on the real board. A total of 1272 labs have been completed in the last 7 days, bringing the grand total to 27840 completed labs. *The following data means students are spread pretty evenly across the class.*

47 have completed Lab 2
82 have completed Lab 5
95 have completed Lab 6
110 have completed Lab 7
137 have completed Lab 8
151 have completed Lab 9
112 have completed Lab 10
205 have completed Lab 11
196 have completed Lab 12
137 have completed Lab 13
134 have completed Lab 14

Coming up on May 14

There is less than a month until the course ends on May 14. The course material (edX readings, videos, downloads) will continue for a while so you can continue to learn after May 14. However the forum, quizzes, and uploading lab grades will end on May 14. If you are trying to finish the class by May 14, remember we encourage you to find a lab partner with

whom you can work. To earn the certificate you need an average of 70% on all material. There are 14 quizzes and 11 labs.

Some of the possible paths to certification

0 quizzes and 9 or more labs

7 or more quizzes and 8 or more labs

13 or more quizzes and 7.5 or more labs

Google hangout

The next hangout will be Friday 25, 16:15 UTC (11:15am Central daylight saving time).

Windows 8 (repeated from earlier)

We have witnessed an interesting behavior with some Windows 8 machines. Here are the symptoms: Keil works perfectly for some time, and then Keil will not start the debugger on the real board. You can compile and download, but when you start to debug, it quickly and automatically dumps you back into the editor. This site (Window8KeilDebuggerFix.htm (http://users.ece.utexas.edu/~valvano/edX/Window8KeilDebuggerFix.htm)) explains how to put things back right again.

APRIL 10, 2014

Chapter 14

Chapter 14 is now ready (captions should be ready in a few days). Lab 14 will be the last lab that will be graded. Lab 15 will be fun but ungraded. Some of the fun things available for this installment are the software solution for the autonomous robot, a virtual Nokia display, ADC simulation, Timer0 Timer1 Timer2 Timer3 simulation, edge-triggered interrupts on GPIO pins, graders for Lab 14, and the starter project for the hand-held video game. The voltage calibration for TExaSdisplay results in improved accuracy. You can find the installer for Chapter 14 as step 7 at http://edx-org-utaustinx.s3.amazonaws.com/UT601x/download.html (http://edx-org-utaustinx.s3.amazonaws.com/UT601x/download.html)

Progress

Over the last 11 days students have made great progress working on labs. These numbers represent finishing labs both in simulation and on the real board. A total of 2699 labs have been completed in the last 11 days, bringing the grand total to 26434 completed labs.

136 have completed Lab 2
188 have completed Lab 5
196 have completed Lab 6
251 have completed Lab 7
300 have completed Lab 8
354 have completed Lab 9
319 have completed Lab 10
449 have completed Lab 11
350 have completed Lab 12
156 have completed Lab 13

Students are still running this class

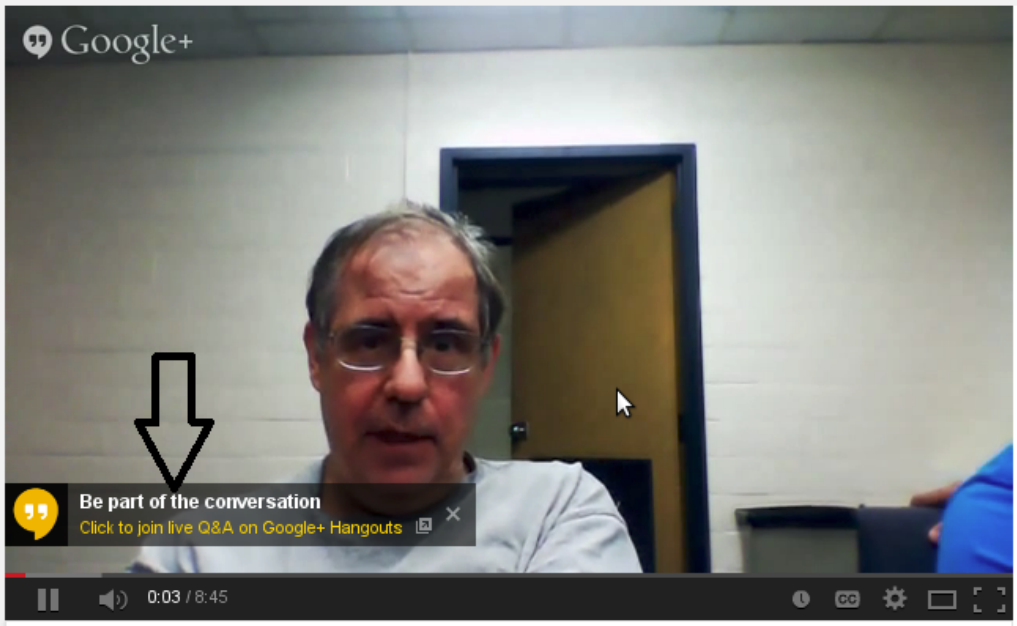
There have been 22751 contributions to the Piazza forum. This is much appreciated. microwattbott, Nabila, BillW, MLDev, and John continue to be special friends of the class.

APRIL 3, 2014

Live Google Hangout

Professors Yerraballi and Valvano did a video stream on Google Hangouts on Air. Students interacted with us live! Students posted questions during this Hangouts Air event, and the professors answered them in real time on video. The video was broadcast live on YouTube as it happened. Students asked questions, and could see other students' questions. If you like it, we will come back next week with more! The interactions aren't limited to questions, and we encourage you to provide feedback as well.

The YouTube link is **http://youtu.be/7mKl_kMk8yM** (http://youtu.be/7mKl_kMk8yM) . Click the link to watch the video stream.



(http://youtu.be/7mKl_kMk8yM)

We look forward to trying it again.

MARCH 26, 2014

Lab 12 hints

In Chapter 12 we taught you how to use edge-triggered interrupts. Unfortunately, you cannot use edge triggered interrupts in Lab 12 for two reasons. First, the TExaS simulator does not yet simulate edge-triggerring. Second, the real-board grader does use edge-triggered interrupts on your output pin to make an accurate measurement of your 440 Hz wave. We are currently updating TExaS so you will be able to use edge triggered interrupts in Lab 15, the hand-held video game.

To create a 440Hz wave, you will need a 880 Hz periodic interrupt. In the ISR, you should read the switch and toggle the output once if necessary. This will create a very accurate 440 Hz wave.

Program 12.6 is a simple but simular problem. You will make three changes: the clock is changed from 16 to 80 MHz, the frequency is changed from 1000 to 440 Hz, and the switch causes the wave to start and stop. You will need two global variables, as described in the Lab 12 assignment.

MARCH 20, 2014

After a cold winter it is finally spring in Austin, Texas. Here at the University of Texas we are back from spring break. We are excited to announce that Chapters 12 and 13 are now available.

Progress

We understand there are many reasons people are taking our class, and we are truly happy you have joined us. We are pleased with student progress.

2,916 students have completed some of or all of Lab 7

2,061 have completed some of or all of Lab 8
1,403 have completed some of or all of Lab 9
497 have completed some of or all of Lab 10
317 have completed some of or all of Lab 11

Of the students doing labs, over 90% are doing labs both in simulation and on the board. This means once the labs are complete in simulation, it has been straightforward to convert them to the board.

New stuff in Chapter 12 and 13

These two chapters have some exciting topics like interrupts and creating sounds with the DAC. For the lab experience we have created an oscilloscope for you to use during debugging on the real board, and it is free. You connect PD3 to a place on your circuit, and voltage versus time data is streamed through your LaunchPad and plotted on the PC using the TExaSdisplay application. This VERY simple scope works alongside your program while debugging Labs 12 and 13. Our experience with teaching this course yields the fact that students find making sounds in Lab 13 the most fun.

How to download next set of TExaS

You can get the new set of graders and example projects on this page **http://edx-org-utaustinx.s3.amazonaws.com/UT601x/download.html** (http://edx-org-utaustinx.s3.amazonaws.com/UT601x/download.html) as step 6.

Pasting code into Piazza

There is a delicate balance concerning the issue of pasting code into Piazza. You need to paste enough code so that others can help you find your mistake, but not too much code that others don't have the joy of discovering how to do labs on their own. We think 10 lines of C is a good compromise. This means you need to first isolate your bug into a 10-line region, and then post that piece of code.

Help

How to earn your Certificate

To earn a certificate, you need to complete 70% of the course content by May 14. Labs are worth 90% and quizzes are worth 10%. One possibility is to complete 7.5 out of 11 labs and all quizzes. Another possibility is to complete 8 of 11 labs and 100% on 9 of 14 quizzes. We think Lab 10 is the most difficult so far. If you are stuck on a lab, we suggest you go on to the next lab. In particular Lab 12 uses interrupts, but is actually pretty easy. As always, use the Piazza forum to get help if you have questions.

MARCH 2, 2014

Next Installment

Chapters 12 and 13 is ready. These are some of the most interesting chapters. Chapter 12 presents interrupts, and we begin the second robot project. Chapter 13 teaches the digital to analog converter, and you will build a DAC and use it to create a digital piano. You can get the new set of graders and example projects as step 6 at **http://edx-org-utaustinx.s3.amazonaws.com/UT601x/download.html** (http://edx-org-utaustinx.s3.amazonaws.com/UT601x/download.html)

Progress

As of March 15, we recommend you have finished Chapter 9. 2051 students have finished Quiz 9, and 1403 students have finished some or all of Lab 9. If you are behind, there is still plenty of time to get back on track. Remember to ask questions in the forum.

Students are still running this class

There have been 2633 student responses in the Piazza forum. This is much appreciated. In addition to the continued help from microwattbott, BillW, MLDev, Charles, and Nabila, we wish to add John and Vasily.Sib to the list of helpful students.

Lab 6 simulation grader

Some people have reported problems with the Lab6 simulation grader. The specific problem is Keil will not recognize edXLab6 when starting the simulator. If you are experiencing this issue, download the March 2 patch, **Download the TExaS patch** (http://edx-org-utaustinx.s3.amazonaws.com/UT601x/TExaS_Patch.exe)

Lab 10 graders

The labs are getting more interesting and more difficult to grade. We added details about how the Lab 10 grader works, with some specific hints about what the grader does and does not look for. If you are having trouble with figuring out what the Lab 10 simulation grader is doing, the March 2 version it a little more lenient and displays the state transitions in the command window as it grades. You can get the new Lab10 simulation grader at **Download the TExaS patch** (http://edx-org-utaustinx.s3.amazonaws.com/UT601x/TExaS_Patch.exe)

Cool new stuff

We are working on chapters 12 and 13 now and should be ready around March 19. These two chapters have some exciting topics like interrupts and creating sounds with the DAC. For the lab experience we have created an oscilloscope for you to use during debugging on the real board, and it is free. You connect PD3 to a place on your circuit, and voltage versus time data is streamed through your LaunchPad and plotted on the PC using the TExaSdisplay application. This VERY simple scope works alongside your program.

Certificate Deadline Extended

ID Verified Certificates available again until 11:59pm US Eastern Time on March 19th. Remember, you must achieve a passing score of 70% on the course quizzes, simulated labs, and real board labs to qualify for a certificate.

FEBRUARY 19, 2014

TExaS versions downloaded prior to 2/19/2014 did not properly simulate bit-specific addressing to I/O Ports A-F. So, if you installed TExaS prior to 2/19/2014 5pm Central Time, please download and install this patch. You will need to first install Keil before installing this update for TExaS. This installation only updates the DLLs in the to **Keil\ARM\BIN** folder, however, it is good practice to backup any Keil projects you have edited prior to installation.

1) **Download the TExaS patch** (http://edx-org-utaustinx.s3.amazonaws.com/UT601x/TExaS_Patch.exe) saving the 11.5M file on your computer.

2) Execute the **TExaS_Patch.exe** file to update all the DLLs.

FEBRUARY 18, 2014

Progress

We have placed a suggested schedule farther down on this page. At this point, 4693 students have finished Quiz 5, and 3348 students have finished some or all of Lab 5. Remember, if your LaunchPad has not yet arrived, please work on the labs in simulation. If you are behind, there is still plenty of time to get back on track. Remember to ask questions in the forum.

Round 2

Chapters 8-11 are now available. We know many of you have been looking forward to this since completing the Lab 7. Chapter 8 requires the breadboard as we connect external switches and LEDs to the LaunchPad. Chapter 10 includes the stepper motor car you saw in some of the promotion videos. We will add the remaining transcription files for some of the

lab videos as soon as they are ready later this week.

What to do if you are stuck?
Lab classes are best performed with a partner. We strongly suggest you use social media and/or the forum to find someone to work with. Some of you have already used the "Search for Teammates" feature in Piazza to find partners. Even if you understand most things, explaining things to someone else and having a second set of eyes on your work is very instructive. Here is our rule about partners: connect with another student and work on a lab together, but when that lab is finished feel free to either continue on to the next lab, or to politely tell your partner "it didn't work out".

Students are running this class
There are only six TAs answering questions on the forums. We believe the forums have been very successful to date, because nice and helpful students are answering questions. In particular, we wish to specifically thank **microwattbott**, **BillW**, **MLDev**, **Charles**, and **Nabila** for their positive contribution to the forum. In our TA meeting last Friday, the TAs suggested we give prizes at the end of the semester. So, each TA will choose a student they think is most helpful (think quality not quantity) on the forum. The professors are thinking about prizes.

Advice about using the forums
Since we have a limited number of TA hours, they are focusing on unresolved questions. So, if you think you asked a question, and know it hasn't been answered, please mark it unresolved. Screen shots are very helpful for us understanding what your problem is.

Help

Windows 8
We have witnessed an interesting behavior with some Windows 8 machines. Here are the symptoms: Keil works perfectly for some time, and then Keil will not start the debugger on the real board. You can compile and download, but when you start to debug, it quickly and automatically dumps you back into the editor. This site (http://users.ece.utexas.edu/~valvano/edX/Window8KeilDebuggerFix.htm (http://users.ece.utexas.edu/%7Evalvano/edX/Window8KeilDebuggerFix.htm)) explains how to put things back right again.

USB debug cable
Remember the USB connector on the LaunchPad is VERY FRAGILE. Please reduce the amount of twisting and turning at the point where the cable connects to the LaunchPad. If it falls off it can often be soldered back on, but the pins are real close together.

Certificate Deadline
ID Verified Certificates available again until 11:59pm US Eastern Time on March 19th. This option may help you achieve your personal and professional goals. Remember, you must achieve a passing score of 70% on the course quizzes, simulated labs, and real board labs to qualify for a certificate.

JANUARY 31, 2014

We are so happy people are enjoying this class. Many students have asked for two things: 1) a more linear or book-like resource of the class material; and 2) a list of the video links. Professors Valvano and Yerraballi have created a web site at **http://users.ece.utexas.edu/~valvano/Volume1/E-Book/** (http://users.ece.utexas.edu/~valvano/Volume1/E-Book/) which provides both a linear or book-like resource and a list of video links. The material for Chapters 1 to 7 as you know is ready, and we are working on the next set, Chapters 8 to 11. This website is meant to supplement not replace the content on edX. This site is our sandbox where we first build the information before uploading to edX. If you need closed captions, please use the edX site because the captions on edX have been reviewed and edited by Valvano and Yerraballi. When

viewing the videos on YouTube you can activate YouTube closed captioning, but these captions have not been (and will not be) reviewed or edited. All **videos** (http://users.ece.utexas.edu/~valvano/Volume1/E-Book/VideoLinks.htm) are hosted in two places: YouTube and Amazon S3. It is our plan to make the edX pages as accurate as possible and will strive to make corrections to the edX material as we can. Again, the **http://users.ece.utexas.edu/~valvano/Volume1/E-Book/** website contains the material prior to uploading to edX and hence may be more inaccurate. Knowing that however, it is our goal to reach as many people as possible and we hope this site makes the class more accessible for those having technical issues reading and watching the material on edX. All quizzes and labs must be performed on the edX site.

JANUARY 24, 2014

ARM, Texas Instruments, Zyante, and Digilent have been instrumental for the success of this class. ARM and Texas Instruments have communities to assist students learning their products.
1) You can join **Texas Instruments E2E community** at **http://e2e.ti.com/** (http://e2e.ti.com/). This is a good place to ask TM4C123-specific questions like *"how do I install windows drivers for the LaunchPad?"*, or *"what happens if I try to source 20mA into an LED from a GPIO pin?"* or *"what do I do if the USB socket on the LaunchPad breaks off? How do I solder it back on?"*
2) You can join **ARM University** at **http://www.arm.com/university/** (http://www.arm.com/university). This is a good place to ask ARM-specific questions like *"does the CortexM4 have 5 busses or 6 busses? why?"*, or *"why does the CortexM4 execute instructions out of order?"*, or *"why does the stack-pointer need to be aligned?"* or *"what is the difference between Thumb and Thumb2?"*
3) **Zyante** has agreed to provide a subset of their on-line C programming reference for free to students in this class. Reading Zyante is optional and not a formal part of this class. If you would like to access Zyante learning tools:
a) Go to **http://utedxfall13.zyante.com** (http://utedxfall13.zyante.com)
b) Click **Register** in the upper right (do not click **Subscribe for full access**)
c) Registering is free but subsequent visits to this site you will Login.
4) Students in the edX class may purchase their own **Analog Discovery logic analyzer/scope** at **http://www.digilentinc.com** (http://www.digilentinc.com) for $99 plus shipping. This hardware debugging tool is not required for this class, but we love ours a lot. When purchasing the Analog Discovery identify your school as edX and your class as UT.6.01x. If you have any questions about the Analog Discovery logic analyzer/scope please contact Digilent at **awong@digilentinc.com**. I did ask Digilent about shipping policies. The student price applies to all students in this class and they do ship world-wide. The cost of shipping will vary, so please contact Digilent directly for questions about price, shipping, import/export fees, and availability. In the order it asks for an .edu email; use your regular email and add a note that you are in edX UT.6.01x.

JANUARY 21, 2014

Suggested schedule By Friday 1/31: Finish Chapters C1 and C2 (install Keil, TExaS)
By Friday 2/7: Finish Chapters C3 and C4 (electronics and digital logic)
By Friday 2/14: Finish Chapter C5 (C programming)
By Friday 2/21: Finish Chapter C6 (I/O ports)
By Friday 2/28: Finish Chapter C7 (Design)
By Friday 3/7: Finish Chapter C8 (Interfacing switches and LEDs)
By Friday 3/14: Finish Chapter C9 (How to debug)

Help

By Friday 3/21: Finish Chapter C10 (Finite state machine)
By Friday 3/28: Finish Chapter C11 (Serial port interface)
By Friday 4/4: Finish Chapter C12 (Interrupts)
By Friday 4/11: Finish Chapter C13 (DAC and sound)
By Friday 4/18: Finish Chapter C14 (ADC and measurements)
By Friday 5/2: Finish Chapter C15 (Hand-held game)
Course closes Wednesday 5/14

JANUARY 28, 2014

Tasks to complete the first week of the course:
1) Order the kit. If you do not have yet received the kit, you can do the labs in simulation now, and then go back and complete the labs on the board when your kit arrives. Instructions for ordering the kit can be found at **Course Web Site** (http://edx-org-utaustinx.s3.amazonaws.com/UT601x/worldwide.html);
2) Watch the videos and read the content of the first two chapters;
3) Take the quiz at the end of chapter 1 and chapter 2;
4) Perform the first lab (Lab 2), which involves installing software and running an existing program both in simulation and on the real board.
5) Download the software (step 1 of the first lab) at **instructions to download and install required software** (http://edx-org-utaustinx.s3.amazonaws.com/UT601x/download.html).

Help