

Quiz2, open book, Friday, November 18, 2:00 to 2:50 pm, ACA1.104 Open book, open notes, calculator (no laptops, phones, devices with screens larger than a TI-89 calculator, devices with wireless communication). I recommend the notes (HKN+ADC.pdf+DAS.pdf) or the text book, and solutions to your Labs 5, 6 (SCH), and 7. You will not be allowed to share items with other students. I recommend that write in your book/notes and to place tabs on the pages to help you find things quickly (e.g., SPI timing, ADC registers, ADC parameters, fixed point definitions, and timer registers and examples, analog circuits.)

Other than calling SysCtlClockSet to initialize the PLL, you will not be allowed to call any StellarisWare functions. You can use the standard I/O port definitions as found in the book and LM3S1968.h. I expect you to be able to initialize and use

- parallel ports (all of Table 4.2)
- Systick interrupts,
- edge-triggered interrupts,
- periodic timer interrupts,
- SPI busy-wait,
- ADC software start, busy-wait,
- ADC timer triggering.

STUDY GUIDE for Quiz 2 (Quiz 1 stuff plus the following)

Lab Important Topics
 5 DAC, SPI, interrupts, data structures, audio amp
 6 Power, systems organization
 7 Temperature measurement, ADC, analog circuits, standard deviation, measurements, noise, FFT
 8 I/O interfacing

Lab 5 reading

- Valvano Section 4.5 on edge-triggered input
- Valvano Section 4.6 on output modes
- Valvano Chapter 5 on interrupts (Systick periodic, edge-triggered, and timer periodic)
- Valvano Section 9.4.1 on DAC parameters (8.4.1 in printed book)
- Valvano Section 9.4.2 on waveform generation. (8.4.2 in printed book)
- Valvano Section 8.5 on SPI. (7.5 in printed book)

Lab 7 reading

- Valvano Section 9.1 on resistors and capacitors (8.1 in printed book)
- Valvano Section 9.2 on op amps, instrumentation amp, circuit design, and threshold detector (8.2 in printed book)
- Valvano Section 9.3 on analog filters (8.3 in printed book)
- Valvano Section 8.5 on ADC and MACQ (ADC.pdf or printed book)
- Valvano Section 10.1 on Data Acquisition Systems (9.1 in printed book)
- Valvano Section 10.2 on Transducers (9.2 in printed book)
- Valvano Section 10.4 on Nyquist Theory, precision (9.4 in printed book)
- Valvano Section 10.5 on DAS design (9.5 in printed book)

Lab 8 review

- Figure 1.14 on capacitance
- LM2937-3.3 (capacitors, dropout voltage, output voltage, input voltage)
- Interfacing simple chips like 74HC165 74HC374 74HC595

SPI interfacing

- Spring 2001 Final, Question 3**, Two 6812 SPI interface
- EE345M Spring 2000, Final, Q1 (b-e)**, SPI interface
- EE345M Spring 2001, Final, Q3**, SPI interface
- Final Spring 2004, Question 6** SPI interface
- Final Spring 2004, Question 16**, Master/slave interface
- Spring 2005 Quiz 2, Question 5**, SPI interface
- Spring 2005 Final, Question 12**, DAC/SPI interface
- Spring 2006 Quiz 2, Question 1**, SPI interface to a shift register
- Spring 2006 Quiz 2, Question 5**, SPI interface

Spring 2007 Quiz 2, Question 2, SPI waveforms
Fall 2007 Quiz 2, Question 2, 74HC165 interface
Spring 2008 Quiz 2, Question 3, SPI timing and interface
Fall 2008 Quiz 2, Question 2, Virtual SPI using Port T
Fall 2008 Final, Question 4, SPI timing and interface
Fall 2008 Final, Question 5, RC time constant of signals on a cable
Fall 2009 Quiz 2, Question 5, SPI modes

Analog interfacing

Spring 2002 Final, Question 5, ADC resolution
Spring 2002 Final, Question 6 Nyquist theorem
Spring 2003 Final, Question 4, ADC resolution
Spring 2004 Quiz 2, Question 5 Nyquist theorem
Final Spring 2004, Question 5, ADC resolution
Final Spring 2004, Question 10, ADC operation, where are the results?
Spring 2005 Quiz 2, Question 1, ADC resolution
Spring 2005 Final, Question 11, ADC resolution
Spring 2006 Quiz 2, Question 4, ADC resolution
Spring 2006 Final, Question 10, ADC precision
Spring 2006 Final, Question 11, 9S12 ADC initialization
Spring 2007 Quiz 2, Question 4, Data acquisition design
Fall 2007 Quiz 2, Question 4, ADC setup, and data acquisition ISR
Fall 2007 Quiz 2, Question 5, Analog amplifier
Spring 2008 Quiz 2, Question 4, Data acquisition design
Fall 2008 Quiz 2, Question 4, Data acquisition design
Fall 2009 Quiz 2, Question 6, Analog amplifier
Fall 2010 Quiz 2, Question 7, Analog amplifier

Fixed Point

Spring 2003 Final, Question 6, Fixed-point calculation
Spring 2003 Quiz 1, Question 7-10, Fixed point numbers
Final Spring 2004, Question 7 Fixed-point calculation
Spring 2005 Quiz 1, Questions 1,7, Fixed point numbers
Fall 2008 Quiz 2, Question 1, Table look up and interpolation
Fall 2008 Final, Question 3, Fixed-point calculation
Fall 2009 Quiz 2, Question 1, Precision of various calculations
Fall 2010 Quiz 2, Question 5, Fixed-point design, implementation

Interrupt programming concepts and implementations

Quiz 1 Spring 2001, Question 1, C programming
Spring 2002 Quiz 1, Question 3, Interrupt stack
Spring 2001 Final, Question 5, Why doesn't the software disable interrupts in ISR?
Spring 2003 Final, Question 3, What happens if the ISR doesn't acknowledge?
Spring 2003 Final, Question 11,14,18, Definitions
Spring 2003 Final, Question 19d,19e, Acknowledge interrupt
Spring 2004 Quiz 2, Question 1, Interrupt programming
Spring 2004 Quiz 2, Question 3, I/O bound versus CPU bound
Spring 2004 Final, Question 2, When does an interrupt occur?
Spring 2004 Final, Question 3, What happens if the ISR doesn't acknowledge?
Spring 2004 Final, Question 17, Interrupt stack
Spring 2004 Final, Question 22, I/O bound versus CPU bound
Spring 2005 Quiz 2, Question 1, Sequence of events during a RDRF interrupt

Systems and interfacing

Fall 2009 Quiz 2, Question 2, Capacitors
Fall 2009 Quiz 2, Question 3, C programming

Fall 2009 Quiz 2, Question 4, Parallel port expander

Fall 2010 Quiz 2, Question 1, Parallel I/O macro

Fall 2010 Quiz 2, Question 2, Pi filter

Fall 2010 Quiz 2, Question 4, Solve in with edge-triggered interrupts

Fall 2010 Quiz 2, Question 6, Capacitors, what does 123 printed on it mean?