# Fundamentals of Embedded Systems Design
# &
# Programming

U.C. Irvine Division of Continuing Education

EECS X497.32

Instructor: Saleem Yamani

## Programming Assignment:
## LED ON/OFF program using Timer

# Programming Assignment:
# LED ON/OFF using Timer

1. Use the Xmega timer 0(TCC0) hardware to create delay code by replacing the software delay loop used in Programming assignment #3. Look at section 34 for the base address for the TCC0 timer and section 14 for the details on the usage timer in the Xmega document below
   http://ww1.microchip.com/downloads/en/DeviceDoc/Atmel-8331-8-and-16-bit-AVR-Microcontroller-XMEGA-AU_Manual.pdf

1. Use an internal clock source with prescaler factor of 1024 in the Control Register A(CTRLA)

1. Use the Counter Register Low(CNTL) to store the expected delay you want. This timer will count up, so make sure you subtract the expected delay count from the maximum count value that can be stored. Set the Counter Register Hi(CNTH) to 0xFF, since we are
   only using the low 8 bits for our delay routine.

# Programming Assignment:
# LED ON/OFF using Timer (Contd)

4. Use the OVFIF bit in the Interrupt Flag Register(INTFLAGS) to check for the overflow condition, this occurs when the timer reaches the expected delay count

5. Update the devreg.h header file with the memory mapped registers for the is timer.

6. Hint: Make sure to clear the OVFIF bit each time the overflow condition occurs.