Pop Up Class – Microcontroller II

1. Class Overview
   o Description
     This class will continue to introduce the fundamentals of microcontrollers, give a brief
     overview of embedded programming, and provide practical hands-on experience in
     developing a dynamic display system.
   o Prerequisites
     None
   o Anticipated Class Size – 20 max
   o Class Duration – 1 ½ hours
   o Material Needed
      10 TI-MSP430 Launchpad (MSP430G2553)
      10 Breadboards
      10 each
        • Quadruple Digital Seven Segment Display (LTC5723HR)
        • Breadboard wire and jumper wire for hookup

2. Safety
   o Proper safety processes must be described and followed for connecting equipment,
     placing probes onto desired measurement points, and insuring safety of others in the
     immediate area.

3. Educational Objectives
   o Students will be able to:
      Gain a basic programming knowledge of microcontrollers.
      Create and manage designs by using the TI CCS (Code Composer Studio)
       integrated development environment.
      Design a dynamic display system using TI MSP430 microcontrollers.

4. Class Format
   o Pre-Class activity
     i. None
o In-Class activity
   i. Basic Microcontroller Programming
      1. Header file
      2. While (1) Loop
      3. If Statements
      4. Others
   ii. Introduction to Seven Segment Displays
       1. What is a Seven Segment Display?
       2. Seven Segment Display Character Representations
   iii. GPIO Controlling Multiple Seven Segment Display Circuit Design
        1. Multiplexing
        2. What to Display?
        3. Which to Display?
        4. Building the Circuit on a Breadboard
   iv. Dynamic Seven Segment Display System
        1. Programming
        2. Debugging the code in the IDE

5. Evaluation
   o Students fill out an evaluation on the content, learning objectives, and instructor.