DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

EEM 336 Microprocessors I

LAB 4 – Introduction to MSP430 Assembly Programming

Learning Objectives

1. You will be able to write simple assembly programs in MSP430.
2. You will be able to upload and run your assembly programs into the LaunchPad.

Required Components

1. Code Composer Studio
2. MSP430 LaunchPad

Prelab Tasks

1. Follow the instructions provided below to find out final register and memory values.

Lab Tasks

1. This lab will be face-to-face.
2. You are expected to explain your programs and show their outputs.
3. Your lab assistant will ask you brief questions about your programs.

1. Create an "**Empty Assembly-only Project**" in Code Composer Studio for **Task 1** and **Task 2** separately.

2. Update **main.asm** template assembly file after the following comment lines so as to complete each task below and rename the file name **main1.asm** and **main2.asm** accordingly.

```
;-------------------------------------------------
;  Main loop here
;-------------------------------------------------
```

3. **Task 1**
   - **main1.asm**
   - Using the assembler directives, store the 64-bit number **0x2be5_1cf0_6549_a0d1** in a memory location labeled as **NUMBER**.
   - Write an MSP430 assembly program that reads the 64-bit number from the memory, shifts left once the whole number, and updates **NUMBER**.
   - Show the **NUMBER** memory content.

4. **Task 2**
   - **main2.asm**
   - Using assembler directives, store the date to the memory location labeled as **DATE** as three decimal words, e.g., 6, 3, 18 (day, month, year)
   - Using the representation below, format this date into a single 16-bit word and store the result in R9.
   - Show the content of R9.

Day (1-31)	**Month (1-12)**	**Year (00-99)**
5 bits **0011 0**	4 bits **001 1**	7 bits **001 0010**