**ENGR 323L: Embedded System Design**
**Department of Engineering, Trinity College**
**Instructor: Professor T. Ning**

## Laboratory #2: Random Number Generation and Display

**Problem Statement:**
This Lab expands the previous *Digital Watch* design to include an additional function of generating and displa6ingy four random digits using an external interrupt. This lab assignment emphasizes assembly programming on an embedded system and will enable you to become familiar with TDM, Timer-Overflow Interrupts, External Interrupts, in 8051 Assembly language (MCS-51) functions. You are required to complete the lab assignment using functions to perform the following tasks:

- Update display numbers
- Convert hex number to decimal numbers

e.g.,

```
; function hex2Decimal
; converts an 8-bit hex number to HUND, TENs, and ONES in decimals

Hex2Decimal:    …MOV A, TempV
                …MOV B, #100
                …DIV AB
                ….
                RET


;calling the function Hex2Decimal
                ACALL Hex2Decimal
```

Note that the variables passed to the function for processing should be declared first in the main program before using.