

# **MSP430 launch pad based Embedded System Design**

(Value Added course)

---

VAC Coordinator: **Prof. B.Abdul Rahim, HOD, Dept.of ECE**

VAC Instructors: **1) K.Naganarasaiah Goud, Asst.Prof, Dept.of ECE**  
**2) M.Sreenath, Asst.Prof, Dept.of ECE**  
**And**  
**Resource person(s) from Industry**

## **Course Structure:**

Course	Class	No. of students	Duration	Date
MSP430 Launch pad Programming & Interfacing	M.Tech & B.Tech Students	74	3 hrs/week (Maximum of 30 hours)	12.10.2013

## **Prerequisite:**

This course has no specific prerequisites. However some familiarities with the following are especially helpful.

- 8051 Architecture
- Digital signal Processing
- C and Assembly Language Programming

## **Course Objectives:**

The goal of this course is to familiarize students with the concepts and practical skills required to successfully program embedded systems. After finishing the course, students should feel comfortable building their own projects using small microcontrollers such as the MSP430 from TI.

## **About MSP430:**

The Texas Instruments MSP430 family of ultra-low-power microcontrollers consists of several devices featuring different sets of peripherals targeted for various applications. The architecture, combined with five low-power modes, is optimized to achieve extended battery life in portable measurement applications. The device features a powerful 16-bit RISC CPU, 16-bit registers, and constant generators

that contribute to maximum code efficiency. The digitally controlled oscillator (DCO) allows wake-up from low-power modes to active mode in less than 1  $\mu$ s.

The MSP430G2 launch pad uses the IAR Embedded Workbench Integrated Development Environment (IDE) or Code Composer Studio (CCS) to write, download, and debug an application. The debugger is unobtrusive, allowing the user to run an application at full speed with hardware breakpoints and single stepping available while consuming no extra hardware resources.

### **Topics to be covered:**

- Basics of microcontrollers and its applications
- Introduction to MSP430, Its architecture
  - What is MSP430
  - Unique qualities of MSP430
  - System attributes
  - Different development tools
  
- Introduction to ccs and creating a project
  - What is code composer studio
  - Workspaces and projects
  
- Building, debugging and watching variables, Break points
  - Understanding build options
  - Building and loading the project
  - Debug environment
  
- GPIO, Clock and Timers
- ADC, UART
- Flash writing, Character LCD

### **Learning References:**

[www.ti.com/msp430](http://www.ti.com/msp430)

[www.ti.com/msp430usb](http://www.ti.com/msp430usb)

[www.ti.com/msp430userguides](http://www.ti.com/msp430userguides)

<http://e2e.ti.com>

- Introduction to MSP430 microcontroller by C.P.Ravi Kumar

### **Course outcome:**

After completion of this course, the student can able to implement different applications using MSP430 launch pad.

### **Assessment:**

1. Every student has to undergo periodic tests.
2. At the end, each student has to give a presentation on a topic covered in this course.