

## Ameya Center for Robotics and Embedded Technology

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### Syllabus for Study of PIC18F4520

**Duration: 1 month [5 days a week, 2 hours a day, total 40 hours]**

- 1. Definition of embedded systems,** Processor Technology, IC Technology, Design Technology and tradeoffs. Examples of embedded systems.
- 2. Introduction to PIC 18F4520 microcontroller:** Block diagram, Architecture, Pin functions, register set, register banks, flags, Internal memory Structure, Stack, stack overflow & underflow, overview of main features such as I/O Ports, Timers, interrupts serial port, ADC, WDT, etc.
- 3. Different power modes & power saving,** Sleep mode, Idle mode Instruction cycle
- 4. Addressing modes & Instruction set:** Byte oriented instructions, Bit oriented instructions, Literal instructions & Control instructions. Single & double word instructions. Extended mode instructions, Table Read & Write.
- 5. Detailed Study of peripheral features:** I/O Ports, Timers & Interrupts, USART, SPI, ADC, I2C etc.

#### List of Practicals:

1. Familiarization with MPLAB IDE and C18 Assembler / Compiler / Simulator
2. Writing a simple Assembly Program, compiling, simulation & testing, burning the hex code into the controller flash memory.
3. Interfacing discrete LEDs, Binary counter, Seven Segment LEDs, Decimal counter.
4. Interfacing LCD
5. Keyboard Interface
6. Using RS-232 Serial port
7. Using Built in ADC
8. Interfacing external ADC / DAC.
9. RTC & EEPROM
10. DC Motor control using PWM
11. Temperature Measurement & Control (Using a Relay)
12. I2C Bus