Ameya Center for Robotics and Embedded Technology

acret

Syllabus for Study of ARM 7
LPC 2148 (Philips)

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

1. Background of ARM family of microcontrollers, Introduction to ARM7, study of LPC 2148 (Philips)

2. ARM 7: Block diagram, Pin Functions, Architectural overview, Register set, On chip Flash program memory, On chip static RAM.

3. **Key Features(Overview)** :Memory Map, Interrupt controller, Interrupt sources, Pin Connect Block, Fast General Purpose I/O (GPIO), ADC, USB 2.0 device controller, UART, I2C Bus Serial I/O controller, SPI Serial I/O controller, SSP Serial I/O controller, General purpose timers / Event counters, Watch Dog Timer(WDT), Real Time Clock (RTC), Pulse Width Modulator (PWM), Crystal oscillator, Phase Locked Loop (PLL), Power control, VPB bus, Emulation & debugging features.mm

4. ARM 7 Operating modes, Register Identifiers, Registers, Program Counter, accessing registers, CPSR & SPSR registers, Flags, Exception handling, Vector Table, Instruction Pipeline, Addressing modes, Instruction format, Instruction set summery, 32-bit instructions & thumb instruction set, condition field, condition code summary, branch instructions, Arithmetic operations, comparisons, Logical operations, data movement instructions, Barrel Shifter Left & Right shifts, Extended Multiply Instructions, Multiply & accumulate long, Load & Store instructions, Pre-indexed and Post-indexed addressing, Little and Big endian, block data transfer, block copy, Stack operations, subroutines, Swap and Swap byte instructions.

5. ARM 7 Timers, PWM, RTC, WDT, UART, I2C, SPI, ADC, DAC, CAN Controller, PLL, Faast Interrupt, Vector Interrupt, nested interrupts,.

6. Using Thumb Instruction Mode.

List of Practicals:

1. Familiarization with Crossware software for ARM 7. Writing a simple program in Assembly / C Language, compiling, simulating & debugging the program. Burning the hex code in flash memory and testing it. Interfacing discrete LEDs, Binary counter, Seven Segment LEDs, Decimal counter.
2. Interfacing LCD
3. Keyboard Interface
4. Using RS-232 Serial port
5. Using Built in ADC / DAC
6. Timer
7. Interrupt
8. Inbuilt RTC
9. DC Motor control using PWM
10. SPI