

A
Report of
Add on Course on
“Foundations of Embedded System”



JSPM's
Bhivarabai Sawant Institute of Technology & Research
Wagholi, Pune.412207

Organized By
Department of Electronics & Telecommunication Engineering

Duration: - 19/09/2017 to 29/09/2017

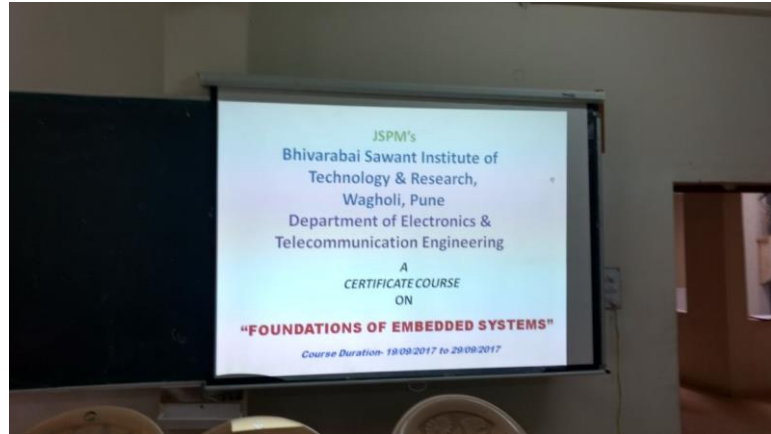
A.Y. 2017-18

The Department of Electronics and Telecommunication had organized an Add on Course on “Foundations of Embedded System” for TE students. This course is organized to cover the basics of embedded system organization, system on programmable-chip technologies and real-time systems. It provides the advance knowledge required for embedded computer design and development as well as real-time operating systems. Students are introduced to software development concepts applicable to real-time and embedded systems. Particularly 8051, PIC, Cortex and ARM Microcontrollers will be studied as a representative embedded processor and embedded software development is carried out for these CPUs.

At the end of this course, the successful student will be able to:

1. Interconnect engineering concepts related to microprocessors, computer hardware and software systems to design embedded systems for real-world applications. Learn to employ specialized knowledge of subsystems like processor cores and other hardware/software system components to design an embedded computer system
2. Improve their capabilities of using the technical knowledge of processor architecture, peripherals, programming, and CAD tools to design specific embedded computer systems. Solve various challenges of embedded software system design by employing real-time system software design methodologies to design, test and verify embedded software system design.

The course contents are designed and are covered in 30 Hrs duration during 19/09/2017 to 29/09/2017.



The Course is started with Inaugural Function at Dept of E&TC.



Prof. S.S. Dubal introduced this course to all the students.





The Brief introduction and details of course contents are explained by Course Coordinator Prof. V.G. Puranik.



Dr. Y.S. Angal, HOD (E&TC) guided the audience regarding importance of Embedded System and motivated the students.



Studentst and Faculty participation during Inaugural Function.



Vote of Thanks given By Prof. S.B. Deokar.

DETAILS OF SESSIONS CONDUCTED DURING THE COURSE

Day	Module Covered	Hands on Practice Covered	Expert Faculty
Day 1	Module 1:- 8051 Microcontroller.	1. ALP for Arithmetic Operation using 8051.	Prof. S.S. Dubal
Day 2		2. ALP for Block Transfer Using 8051. 3. Timer Programming for Waveform generation. 4. Serial Communication using 8051.	

The following points were discussed during the lecture:

- Overview of Processors & Microcontrollers
- 8051 Microcontroller Architecture
- Addressing modes
- Memory Organization
- Instruction Set
- Assembly and C Language Programming.

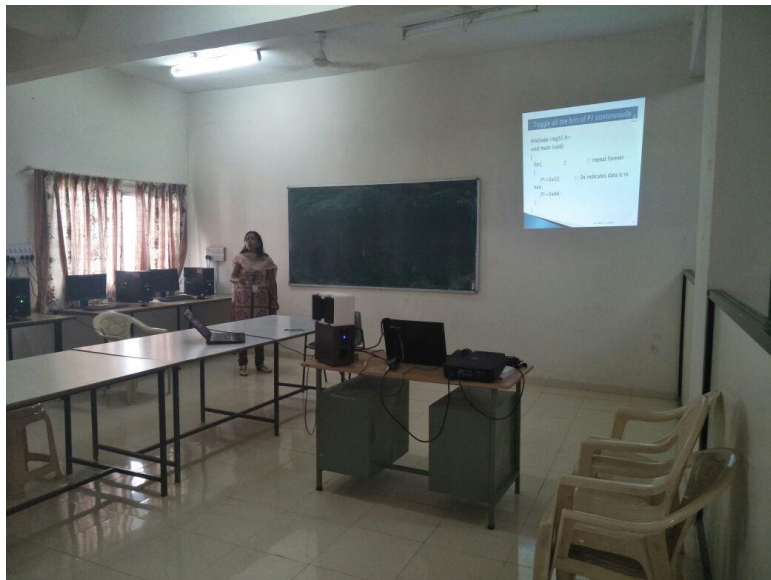
Photographs



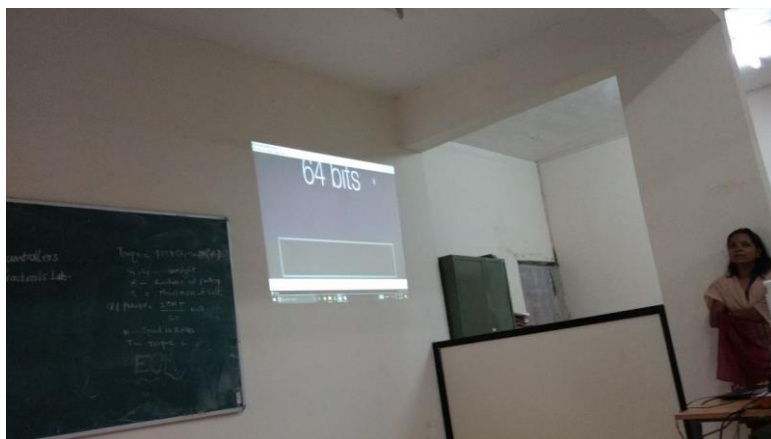
Prof. S.S. Dubal conducting Session on Module1



Prof. S.S. Dubal conducting Session on Module1



Prof. S.S. Dubal conducting Session on Module1



Prof. S.S. Dubal conducting Session on Module1

Day	Module Covered	Hands on Practice Covered	Expert Faculty
Day 3	Module 2:- PIC Microcontroller	1. LCD Interfacing using PIC 18F4520.	Prof.T.V. Kafare
Day 4		2. Relay/Buzzer/Switch Interfacing using PIC 18F4520.	
Day 5		3. UART Interfacing using PIC 18F4520.	
		4. Speed Control of DC motor using PIC 18F4520.	

The following points were discussed during the lecture:

- PIC Microcontroller families
- Architecture
- Programmers Module
- IDE tools
- C Language Programming
- Overview of Processors & Microcontrollers

Photographs



Prof. T.V. Kafare conducting Session on Module 2



Prof. T.V. Kafare conducting Session on Module 2



Prof. T.V. Kafare conducting Session on Module 2



Prof. T.V. Kafare conducting Session on Module 2

Day	Module Covered	Hands on Practice Covered	Expert Faculty
Day 6	Module3:- ARM Microcontroller. Module 5:- Overview of Embedded System, RTOS, Kernel, Scheduler.	1. Seven Segment Display Interfacing using LPC 2148	Prof.V. G. Puranik
Day 7		2. Keypad/LCD interfacing using LPC 2148.	
Day 8		3. Multitasking of 4 tasks using LPC 2148 using RTOS.	
		4. Serial Communication using LPC 2148 using RTOS.	

The following points were discussed during the lecture:

- RISC and CISC families
- ARM Series
- Data Flow model
- Instruction Set
- C Language Programming.
- Overview of Embedded System, RTOS, Kernel, Scheduler.

Photographs



Prof.V.G. Puranik conducting Session on Module 3 & 5



Prof.V.G. Puranik conducting Session on Module 3 & 5



Prof.V.G. Puranik conducting Session on Module 3 & 5



Prof.V.G. Puranik conducting Session on Module 3 & 5

Day	Module Covered	Hands on Practice Covered	Expert Faculty
Day 9	Module 4:- ARM Cortex Microcontroller	1. Interfacing of 7-segment Display using Cortex M3.	Prof.S.B. Deokar
Day 10		2. Stepper Motor Interfacing using Cortex M3.	
Day 10		Overview of Cortex Microcontroller, Industry perspective of Embedded Systems, Role of an engineer in Embedded Based Industries	Mr. Deepak Kadam, Industry Expert.

The following points were discussed during the lecture:

- ARM Vs Cortex
- Cortex Series-A, R, M
- CMSIS Standards
- C Language Programming.
- Expert Session by Industry Person Mr. Deepak Kadam.

Photographs



Prof.S.B. Deokar conducting Session on Module 4



Prof.S.B. Deokar conducting Session on Module 4



Prof.S.B. Deokar conducting Session on Module 4



Prof.S.B. Deokar conducting Session on Module 4

At the end of the course one laboratory test is conducted consisting of programming assignments.

All students have performed all the practical assignments given during laboratory test.

