Programme:	B.Tech
Programme Specialization:	CSE
Programmed School:	SCSE
Course Code:	CSE306
Course Title:	Embedded Systems Laboratory
LTPC:	0 0 3 2
Course Type:	Lab
Semester Offered:	Fall
Academic Year:	2012 – 2013
Slot:	<TBD>
Class Room:	SJT 316
Faculty Name:	Yokesh Babu Sundaresan
Faculty School:	SCSE
School offering the Course:	SCSE
Is this Course offered to more than one Batch? If yes, please indicate the name(s) of other faculty who is/are sharing this Course Plan	Yes

CSE306 EMBEDDED SYSTEMS LAB

L	T	P	C
0	0	3	2

Objectives

- To teach microcontroller programming
- To write, assemble, link, execute, and debug programs running on a single board microcomputer.
- To Interface the single board microcomputer to a variety of peripheral devices using serial and parallel communications.

Expected Outcome

The students will be able to

- Understand and implement microcontroller programming to solve engineering problems
- Design and conduct experiments of interfacing with different hardware with single board microcomputer
- Use current principles of embedded system to design and model simple embedded system

Prerequisites/Exposure

- Computer Programming and Problem Solving Lab
- Digital Logic and Lab
- Computer Architecture and Organization Lab
- Microprocessor and Interfacing Lab

Prerequisites for

- REAL TIME SYSTEMS
- ROBOTICS
- AUTOMOTIVE ELECTRONICS
- HARDWARE SOFTWARE CO-DESIGN

Programming in 8051

a. Handling Port
b. Waveform generation
c. ADC; DAC
d. Interrupt Programming
e. Stepper Motor Interfacing

Mode of Evaluation

CAT, Written examinations, seminar, assignments, surprise tests and quizzes

CSE306 – Embedded Systems Lab

CSE306 EMBEDDED SYSTEMS LAB (c, e, i, k, m)

- Students apply the knowledge to design and analyze program modeling concepts for any embedded system.

- The concept of embedded programming helps students to identify the impact of real time systems in conducting experiments using tools & techniques.

Course Outcome	Description of the outcomes
c	An ability to design, implement and evaluate a system / computer-based system process, component or program to meet desired needs
e	An ability to identify, formulate and solve engineering problems
i	Design and conduct experiments as well as analyze and interpret data
k	An ability to use current techniques, skills and tools necessary for computing and engineering practice.
m	An ability to apply design and development principles in the construction of software systems

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			Sem: **FALL**

Course Details

Name of the Programme	: B. Tech	Batch	:A to F ....
Branch	:Computer Science And Engineering.......................	Semester	:V................................
Title of the Subject	: Embedded Systems Lab…………………………….	Subject Code	:CSE306......................
	CORE	No. of Students	:60 each ....

Outcome weightage of the course

Program Outcome	Description of the outcomes	Outcome weightage %
C	An ability to design, implement and evaluate a system / computer-based system process, component or program to meet desired needs	
E	An ability to identify, formulate and solve engineering problems	
I	Design and conduct experiments as well as analyze and interpret data	
K	An ability to use current techniques, skills and tools necessary for computing and engineering practice.	
M	An ability to apply design and development principles in the construction of software systems	

Signature of Director / Program Manager of School
Date:

Signature of Faculty
Date:

Cycle Sheet

Experiment	Tue	Wed	Thu	List of Exercises	Outcome
1				**1.Introduction to Embedded Systems:** 1.1. Study on 89C51 based microcontrollers 1.2. Study on Embedded C Programming	
2				**2.Keil Micro Vision and Simulation** 2.1 Study on Keil Micro Vision 3 IDE	
3				**3. Handling of Parallel IO Ports - Simulation of sample C programs**	
4				**4.Hardware Timer's and Handling of Ports** 4.1 Delay generation using hardware timers 4.2 Waveform Generation using Timer's 4.2.1 Square Waveform 4.2.2 Triangular Waveform 4.3 Handling of IO Ports	
5				**5. Introduction to AT89C51ED2 Kit and Flip Software** 5.1 Shift Register Interface Description 5.2 Illustration of SIPO data flow 5.3 Simulation of 4-bit Counter	
				CAT-I	
6				**6. Interfacing 7-Segment Display** 6.1 Display numbers and messages on 7 Segment Display	
7				**7. Interfacing 4x4 keypad** 7.1 Scan a number from 4x4 keypad interface using polling	
8				**8. Interfacing LCD Display** 8.1 Display number on LCD display using LCD library routines	
9				**9. Interfacing Stepper Motor**	
				CAT-II	
10				**10. Serial Communication** 10.1 Send and receive bytes using polling	
11				**11. Interrupt Service Routine** 11.1 Generation of Square Waveform using Timer0 Overflow Interrupt 11.2 Send and Receive bytes using interrupt 11.3 Control the rotation of stepper motor using external interrupt 11.4 Scan a number from keypad interface using interrupt	
			Assignments		
				Digital Clock Simulation of 24 hour format Digital Clock Display the digital clock on LCD and 7-Segement display's **4-way Traffic Controller System**	
				TEE	

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COURSE SCHEDULE

Year : **2012-2013**

Sem: **FALL**

1. Name of the Faculty: **Yokesh Babu Sundaresan**

2. Subject : Embedded Systems Lab   Subject Code: **CSE306**

3. Branch :COMPUTER SCIENCE & ENGINEERING ....

4. The Schedule for the whole Course / Subject is:

S. No.	Description	Duration (Date)		Total No. of Periods
		From	**To**	
1.	Introduction to 8051 Microcontroller			
2.	Introduction to Embedded C Programming and Keil IDE Simulation: Study of Simulator and bubble sort and Handling of IO Ports			
3.	Hardware Timers: Write an 8051 alp to generate a triangular wave , square wave			
4.	Introduction to AT89C51ED2 Kit and Flip Software	Max of One week each		3 hrs
5.	Study of 8051 board and write 8051 alp for four bit counter on 7S Display			
6.	Interfacing 4x4 keypad			
7.	Interfacing LCD Display			
8.	Interfacing Stepper Motor			
9.	Serial Communication			
10.	ISR			
11.	Digital Clock			
12.	4-way Traffic Controller System			

Total No. of Instructional periods available for the course: **17** Hours / Periods