SCHEME OF COURSE WORK

Course Details:

Course Title	**: Embedded Systems-1 Lab**		
Course Code	**: 13CT1120**	**L T P C**	**: 0 0 3 2**
Program:	**: B.Tech.**		
Specialization:	**: Computer Science & Engineering, Information Technology**		
Semester	**: V**		
Prerequisites	**: No Prerequisite**		
Courses to which it is a prerequisite	**: Embedded Systems-2 Lab**		

Course Outcomes (COs):

CO1	Implement number conversions
CO2	Create speed control programs
CO3	Write programs in assembly language
CO4	Design applications by interfacing system peripherals
CO5	Create serial communication buses

Course Outcome Versus **Program Outcomes:**

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO-1	S	S			S	M					
CO-2	M	S									
CO-3	S	S	M	S	S				M		
CO-4	S	S	S	M	M						
CO-5	S	S	S		S						

S - Strongly correlated, *M* - *Moderately* correlated, *Blank* - *No correlation*

Assessment Methods:	Lab Internal Exam/Day-to-Day Analysis (observation, record and viva)

Teaching-Learning and Evaluation

Week	Topic / Contents	Course Outcomes	Sample Questions	Teaching-Learning Strategy	Assessment Method & Schedule
1	**ELEMENTARY OPERATIONS:** i. Multi precision Addition, Subtraction, and Multiplication. ii. Handling Fractional numbers iii. BCD-Binary Conversion examples iv. ASCII to BCD conversion v. Binary to ASCII conversion	CO1,2	1) Write a program to implement fractional Division	=Lecture =Working Examples =Program Writing	
2	**ELEMENTARY OPERATIONS:** i. Multi precision Addition, Subtraction, and Multiplication. ii. Handling Fractional numbers iii. BCD-Binary Conversion examples iv. ASCII to BCD conversion v. Binary to ASCII conversion	CO1,2	1) Write a program to implement BCD- Binary conversion	=Lecture =Program Writing	
3	**ELEMENTARY OPERATIONS:** i. Multi precision Addition, Subtraction, and Multiplication. ii. Handling Fractional numbers iii. BCD-Binary Conversion examples iv. ASCII to BCD conversion v. Binary to ASCII conversion	CO1,2	1) Write a program to implement ASCII-BCD and BCD-ASCII Conversion 2) Write a program to implement 16-bit addition.	=Lecture =Program Writing	Day to day Analysis – 1
4	**INPUT OUTPUT CONTROL PROGRAMMING:** i. Controlling the external logical switching, for DC motors, Steppers ii. Clock generation and timing using Timers ad Counters	CO1,2,3	1) Write a program to implement stepper motor	=Lecture =Program Writing	Lab Internal – 1 (Week-9)
5	**INPUT OUTPUT CONTROL PROGRAMMING:** iii. Pulse width modulation s for DAC application. iv. Capture control of external events	CO1,2	1) Write a program to implement capture and compare mode of operations	=Lecture =Program Writing	
6	**ANALOG TO DIGITAL CONVERTERS:** Usage of multiplexed channels for in fast data acquisition and storage. Learn about acquisition speed, and waveform storage by sampling. Interrupt driven data acquisition.	CO1,2	1) Write a program to implement square wave generation	=Lecture =Program Writing	
7	**PROGRAMMING USING BUILT IN TIMERS:** i. As Event Timers ii. As fast Counters	CO1,2	1) Write a program to implement timer and counter operations	=Lecture =Program Writing	
8	**PROGRAMMING USING BUILT IN TIMERS:** iii. Frequency Generation iv. Simple programs to generate FSK	CO1,2	1) Write a program to implement frequency square wave generation	=Lecture =Program Writing	
9	**MID TEST-1**				
10	**CAPTURE CONTROL AND ITS APPLICATION EXAMPLES:** i. Measurement of pulse width using I/O ii. Measurement of Duty cycle, power factor etc.	CO1,2	1) Write a program to implement pulse width of 5Khz with 75% duty cycle	=Lecture =Program Writing	Day to day Analysis – 2
11	**CAPTURE CONTROL AND ITS APPLICATION EXAMPLES:** iii. Measurement of velocity and acceleration. iv. Sensing touch.	CO1,2	1) Write a program to implement velocity measurement and acceleration	=Lecture =Program Writing	
12	**SERIAL COMMUNICATION METHODS:** i. USART and its programming	CO1,2	1) Write a program to implement USART operation to transmit the character	=Lecture =Program Writing	
13	**SERIAL COMMUNICATION METHODS:** ii. SPI bus and its programming	CO1,2	1) Write a program to implement SPI operation to transmit the character	=Lecture =Program Writing	Lab Internal – 2 (Week-16)
14	**WAVE FORM GENERATION USING PWM METHODS:** i. Generation of Sine wave	CO1,2	2) Write a program to generate sine wave	=Lecture =Program Writing	

15	**WAVE FORM GENERATION USING PWM METHODS:** ii. Generation of FSK	CO1,2	3) Write a program to generate FSK.	=Lecture =Program Writing	
16	**MID TEST-2**				
17/18	**END EXAM**				