SCHEME OF COURSE WORK

Course Details:

Course Title	: Embedded Systems-1		
Course Code	: 13CT1117	**L T P C**	**: 4 0 0 3**
Program:	: B.Tech		
Specialization:	: Computer Science & Engineering Information Technology		
Semester	: V		
Prerequisites	: Electronic Devices and Circuits, Digital Logic Design, Computer Organization		
Courses to which it is a prerequisite	: Embedded Systems-2		

Course Outcomes (COs):
At the end of the course the student will be able to

CO No.	Course outcomes
CO1	Outline INTEL 8051 Architecture and it's instruction set
CO2	Describe PIC architetcure and its peripheral devices
CO3	Describe ATMEGA Architetcure
CO4	Utilize ATMEGA instruction set in controlling peripheral systems
CO5	Explain serial communication busses with difeerent processes

Course Outcome versus **Program Outcomes:**

Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	S	M	M	S	M						
CO2	M	S										
CO3	S	S	M	S	S							
CO4	S	S	S	M	M							
CO5	S	S	S		S							

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

Teaching-Learning and Evaluation

Week	Topic / Contents	Course Outcomes	Sample Questions	Teaching-Learning Strategy	Assessment Method & Schedule
1	**UNIT-1:** Introduction to Classic 8051 family Architecture. Address and data bus with multiplexed I/O pins. Registers Examples with arithmetic and Boolean instruction set.	CO1,2	1) Explain 8051 Architecture.	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1
2	Applications using, Timers, Counters and I/O programming for external logic sensing and control.	CO2,3	1) Explain the working of Timers & Counters.	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1 Assignement-1
3	Interrupts and their real-time programming in all applications. This processor is based on the classic architecture the Von Neumann Architecture.	CO2,3	1) Explain the registers required for Interrupt Handing. 2) Write a program for Timer1 Mode1 Operation with Interrupts.	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1
4	**UNIT-2:** Introduction to the advanced Harvard architecture for faster instructions. Introduction to PIC family Architecture and instruction set.	CO1,2	1) What is the difference between Von Neumann & Harvard Architectures?	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1 Assignement-1
5	Introduction to the shorter RISC instruction set and its usage with example programs. Interrupts using change of state on ports and its use in all application programming.	CO2,3	1) Explain the instructions required for Logical Operations.	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1
6	**PERIPHERAL SYSTEMS IN PIC 16F877A PROCESSOR.** (a) Digital Input and Output Programming, (b) Timers and Counters	CO2,3	1) Explain Seven- Segment Display working. 2) Explain the working of timers and counters in PIC16F877A.	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1 Assignement-1
7	(c) Capture Control and PWM (d) Analog to Digital Converters and their Programming (e) Simple data acquisition systems and programming.	CO2,3	1) Explain Capture and Compare Operations. 2) Write a program for producing a pulse of with 5Khz	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1
8	**UNIT-3:** Introduction to Atmega processor with a large register set. Family architecture exposes Accumulator free programming, with advanced addressing modes and faster Cache memory controlled I/O .	CO1	1) Explain Atmega8535 Architecture. 2) Explain Addressing Modes in Atmega8535.	=Lecture =Working Examples =Program Writing	Quiz-1 Mid-1
9	MID TEST-1				
10	Programming using the popular Atmega 8535 processor and instruction set.	CO2,3	1) Explain the necessary instructions for Rotating Operations.	=Lecture =Working Examples =Program Writing	Quiz-2 Mid-2 Assignment-2
11	The versatile peripherals and their applications in 8535.	CO4	1) Explain the Timer1 Operations in Atmega8535. 2) Explain the Timer2 operation in Atmega8535.	=Lecture =Working Examples =Program Writing	Quiz-2 Mid-2 Assignement-2
12	Logical sequence of steps to design a program to suit an objective.	CO3	1) Explain creating a project, writing and debugging of programs in AVR Studio.	=Lecture =Working Examples =Program Writing	Quiz-2 Mid-2
13	Examples in Robotics, Motor control, Display control will be exposed.	CO3	1) Explain the working of stepper motor	=Lecture =Working Examples =Program Writing	Quiz-2 Mid-2 Assignement-2
14	**UNIT-4:** **PERIPHERAL SYSTEMS IN ATMEGA 8535** (a) Digital Input and Output Programming (b) Timers and Counters wave form generation.	CO4	1) Explain Seven- Segment Display working. 2) Explain the working of timers and counters in Atmega8535.	=Lecture =Working Examples =Program Writing	Quiz-2 Mid-2
15	(c) Capture Control and PWM (d) Analog to Digital Converters and their Programming (e) Simple data acquisition programming.	CO4	1) Explain working of capture mode in Atmega8535, 2) Explain Analog to Digital Converter and it's control with Atmega8535.	=Lecture =Working Examples =Program Writing	Quiz-2 Mid-2
16	**UNIT-5:** **SERIAL COMMUNICATION BUSSES** (a) USART, with addressable communication feature	CO5	1) Explain USART. 2) Explain SPI Bus.	=Lecture =Working Examples =Program Writing	Quiz-2 Mid-2

	(b) SPI bus, ants speed and versatility				
17	(c) 12c {inter integrated bus] the two wire communication bus. (d) Introduction to USB bus and its features for synchronous communication.	CO5	1) Explain the working of I2C Bus 2) Explain the USB bus characteristics and	=Lecture	Quiz-2 Mid-2 Assignement-2
18	**MID TEST-2**				
19/20	**END EXAM**				