SCHEME OF COURSE WORK

Course Title	: **EMBEDDED SYSTEM CONCEPTS**		
Course Code	: 13EC2201	L T P C	4 0 0 3
Program:	:M.Tech		
Specialization:	: VLSI Design and Embedded systems		
Semester	:I		
Prerequisites	: Embedded systems		
Courses to which it is a prerequisite	: Embedded Systems		

Course Outcomes (Cos):

1	Analyze various hardware and software units that comprise an embedded system.
2	Describe the various buses and protocols.
3	Comprehend concepts of interrupt procedures and device drivers.
4	Acquire knowledge in different Embedded Programming Languages.
5	Design the programming modeling concepts and synthesize Hardware and Software Co-Design.

Course Outcomes versus Program Outcomes:

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

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

Assessment Methods:	Assignment / Quiz / Seminar / Case Study / Mid-Test / End Exam

Week	Topic /Contents	Course Outcomes	Sample questions	Teaching-Learning Strategy	Assessment Method & Schedule
1	Embedded systems, processor embedded in to a system, hardware units and devices in a system	CO1	1. Explain Embedded systems 2. Explain hardware units of an embedded systems	Lecture	Assignment I/Quiz-I/Mid-I
2	Embedded software in a system, examples of embedded systems, SoC in VLSI circuits	CO1	1.Explain embedded systems with different examples 2.What Is SoC	Lecture/ Discussion	Assignment I/Quiz-I/Mid-I
3	Processor selection Memory selection	CO1	1.Explain processor selection 2. Explain memory selection	Lecture/ Discussion	Assignment I/Quiz-I/Mid-I
4	I/O types and examples, serial communication devices, parallel communication devices, Sophisticated interfacing features in a device ports,	CO2	1.Write short notes on different serial and parallel communication devices 2. Explain Sophisticated interfacing features in a device ports,	Lecture/ Discussion	Assignment I/Quiz-I/Mid-I
5	Wireless devices, Timer and counting devices, Watchdog timer, Real time clock, Sensors, Analog to Digital Converters, Actuators.	CO2	1.Explain timers and counting devices 2. Explain A/D converters	Lecture/ Discussion	Assignment I/Quiz-I/Mid-I
6	Defining Buses and Protocols, On-board buses for Embedded Systems, External Buses, Automotive Buses and Wireless	CO3	1.Explain different communication protocols	Lecture/ Problem solving	Assignment I/Quiz-I/Mid-I

	Communication Protocols.				
7	Programmed-I/O busy-wait approach without interrupt service mechanism, ISR concept,	CO2	1. Explain ISR 2. What is busy-wait approach	Lecture/ Problem solving	Assignment I/Quiz-I/Mid-I
8	Interrupt sources, Interrupt servicing (Handling) mechanism, Multiple Interrupts,	CO3	1.Explain Interrupt servicing handling mechanism	Lecture/ Problem solving	Assignment I/Quiz-I/Mid-I
9	Mid-Test 1	--		------	----------
10	Context and the periods for context switching, interrupt latency and deadline, Classification of processors,	CO3	1.write short notes on context switching and latency	Lecture/ Problem solving	Assignment II/Quiz-II/Mid-II
11	Interrupt service mechanism from context-saving angle, Device driver programming	CO3	1.What is context saving angle 2. Explain device driver programming	Lecture/ Problem solving	Assignment II/Quiz-II/Mid-II
12	Software programming in Assembly language (ALP) and in High level language ＿C', C program elements: Header and source files and preprocessor directives,	CO3	1.What are the program elements used in embedded systems	Lecture/ Discussion	Assignment II/Quiz-II/Mid-II
13	Program elements: Macros and functions Program elements: Data types, data structures, modifiers, statements,	CO4	1.Explain macros and functions 2.Describe data types and statements	Lecture/ Discussion	Assignment II/Quiz-II/Mid-II
14	loops and pointers, Object-Oriented	CO4	1.Explain loops and pointers in Object-	Lecture/ Problem solving	Assignment II/Quiz-II/Mid-II

	programming, embedded programming in C++, Embedded programming in Java.		Oriented programming		
15	Program Models, DFG Models, State Machine Programming Models for Event-controlled Program Flow,	CO5	1.Give any two Examples of programming models 2. What is event-controlled program flow	Lecture/ Problem solving	Assignment II/Quiz-II/Mid-II
16	Modeling of Multiprocessor systems. DESIGN TECHNOLOGY	CO5	1.Explain modeling of multiprocessor system	Lecture/ Discussion	Assignment II/Quiz-II/Mid-II
17	Systems Synthesis and Hardware/ Software Co-Design, Verification, Hardware/Software co-simulation.	CO5	1.Explain Hardware/ Software Co-Design, Verification,	Lecture/ Discussion	Assignment II/Quiz-II/Mid-II
18	Mid-Test 2	------			
19/20	END EXAM	------			