

**INDIAN INSTITUTE OF INFORMATION TECHNOLOGY  
DESIGN AND MANUFACTURING (IIITDM) KANCHEEPURAM**

**SYLLABUS FOR THE COURSES OFFERED UNDER MINOR IN INTERNET OF THINGS**

Course Title	<b>Digital Systems and Microprocessor</b>	Course Code				
Dept./ Specialization	ECE	Structure (LTPC)	3	0	2	4
To be offered for	UG / PG	Status	Core <input type="checkbox"/>		Elective <input checked="" type="checkbox"/>	
Faculty Proposing the course		Type	New <input checked="" type="checkbox"/>		Modification <input type="checkbox"/>	
Recommendation from the DAC		Date of DAC				
External Expert(s)						
Pre-requisite	-	Submitted for approval				
Learning Objectives	This course introduces the students to the fundamental principle of digital circuits and understand the usage of microprocessors and microcontrollers so as to build simple systems.					
Learning Outcomes	<p>Upon completion of the course, the students will be able to</p> <ol style="list-style-type: none"> <li>1. Explain the fundamental principles of Combinational and Sequential digital circuits.</li> <li>2. Compare and describe the fundamental concepts of modern embedded microprocessor systems.</li> <li>3. Interface microprocessor with peripheral devices</li> </ol>					
Contents of the course (With approximate break-up of hours for L/T/P)	<p><b>Combinational Logic Design (9/0/2)</b></p> <p>Logic and Logic algebra, Combinational logic gates (AND, OR, NOT, NAND, NOR, EXOR, EXNOR), Combinational logic devices: multiplexer, encoder, decoder, Comparator, Logic minimisation and Karnaugh maps</p> <p><b>Sequential Logic Design (11/0/4)</b></p> <p>Introduction to sequential logic, Level-sensitive latches, Edge-sensitive flip-flops, synchronous and asynchronous circuits, Registers and shift registers, Counters, Algorithmic State Machine (ASM) design, Moore and Mealy machines</p> <p><b>Microprocessor (12/0/4)</b></p> <p>Introduction, RISC and CISC, 8086 Hardware description, memory Segmentation, Instruction set, addressing modes, Assembly Language Programming, Interfacing with programmable peripheral devices</p> <p><b>Microcontroller (10/0/4)</b></p> <p>Introduction, ARM Hardware description, Register and Memory organization, Introduction to embedded C, Interfacing with external devices.</p> <p><b>Practice includes experiments from following topics:</b></p> <p>Combinational design, sequential design, FSM-based design – 3 experiments</p> <p>Programming with 8086 and ARM (Arithmetic operations, Operations on Matrices and String, Interfacing-LED, LCD, Stepper motor) – 4 experiments</p>					
Text Book	1. M. Morris. Mano, Digital Design, 5th Edition, Pearson, ISBN: 9780132774208,					

	<p>2013</p> <ol style="list-style-type: none"> <li>2. T. L. Floyd and R. P. Jain, Digital Fundamentals, 10th Edition, Pearson, ISBN: 978- 8131734483, 2017.</li> <li>3. Kenneth J. Ayala, the 8086 Microprocessor: Programming and Interfacing The PC, 1st Edition, Delmar Publishers, ISBN: 9780314012425, 2007.</li> <li>4. J. W. Valavno, Embedded Systems: Introduction to Arm® Cortex(TM)-M Microcontrollers, 5th Edition, Create Space, ISBN: 978-1477508992, 2012.</li> </ol>
Reference Books	<ol style="list-style-type: none"> <li>1. R. J. Tocci, N. S.Widmer, and G. L.Moss Digital Systems Principles and applications, 12th Edition, Pearson Prentice Hall Edition ISBN : 9780134220215, 2017.</li> <li>2. K. Ray, K. M. Bhurchandi, Advanced Microprocessors and Peripherals, 3rd Edition, Tata McGraw Hill, ISBN:007014022, 2007.</li> <li>3. A. N. Sloss, D. Symes, C. Wright, ARM System Developer's Guide,1st Edition, Morgan Kaufmann,ISBN:9781493303748, 2004.</li> </ol>