

4138 - DIGITAL ELECTRONICS- II									
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)				
Lectures	Practical	Credits			Theory		Practical Ex.	Total	
3	2	5	25	25	3 Hrs	100	50	200	
Pre-requisite		Source	Semester	Theory	Test	Total	TW	PR	Gr Total
4134		EXN		75	25	100	25	-	125

Rationale: This subject deals with the design of digital circuits using gates and basic Boolean laws which were dealt in digital electronics- I. These digital circuits are basic building blocks of a digital computer i.e. adders, subtractors, decoders, encoders, ADC, DAC and semi-conductor memories which will enable the student to get in depth knowledge of computer hardware.

COURSE CONTENTS		Hrs	Mks
1. COMBINATIONAL CIRCUITS		8	16
Study the operation of Half adder, full adder, series and parallel adders, half subtractor, full subtractor, adder subtractor, BCD adder, Binary multiplication and division.			
2. DECODERS AND ENCODERS		8	16
Principles of operation of multiplexer, 16 to 1 multiplexer, Nibble multiplexer, Demultiplexer – 1 to 16, Decoder, Decoder Driver, Encoder – Decimal to BCD, Priority, Encoder. IC's 74147, 7448, 7446, 7445, 74154, 74157, 74153, 74151, 74150, 7442, 74141.			
3. A TO D AND D TO A CONVERTERS		10	20
Study of operation of D to A converter using weighed resistor method, Ladder network, use of operational amplifier staircase generator, Resolution Accuracy, Monotonicity and settling time. Principle of A to D conversion using simultaneous conversion, counter or staircase Ramp method, continuous conversion, successive approximation, Linear Ramp method, Dual slope method, Resolution, Accuracy, conversion time of ADC's.			
4. CLOCKS AND TIMERS		6	16
Study of clock waveforms, TTL clock circuit, 555 timer-Astable, and monostable, contact Bounce and Debounce circuits			
5. SEMI-CONDUCTOR MEMORIES		8	16
Study of memory addressing concepts of ROMs, PROMs and EPROMs, RAMs and DRAMS in detail.			
6. PROGRAMMEABLE LOGIC DEVICES		8	16
Introduction, ROM as PLD, PLA, Input Buffer, AND matrix, OR matrix, Invert matrix, Output Buffer, Programming the PLA, expanding PLA capacity, Appreciation of PLA's, Programmable Array logic, General logic device, PLD, FPGA.			
Total		48	100

LIST OF PRACTICALS:

Study of Half Adder and Full Adder using Gates.	Study of Monostable Multivibrator using IC 555
Study of BCD Adder.	Study of Multiplexer and Demultiplexer
Study of Encoder and Decoder	Study of Clock generator
Study of Half Subtractor and Full subtractor using Gates.	D to A converter using weighted resistor method and Ladder method.
Study of ALU	

TEXT BOOK

Digital Principles & Applications by Malvino & Leach

REFERENCE BOOKS:

1. Modern Digital Electronics by R. P. Jain, 2. Digital Computer Fundamentals by Bartee.