

SYLLABUS

EC3352 - DIGITAL SYSTEMS DESIGN

UNIT I: BASIC CONCEPTS

9

Review of number systems-representation-conversions, Review of Boolean algebra- theorems, sum of product and product of sum simplification, canonical forms min term and max term, Simplification of Boolean expressions-Karnaugh map, completely and incompletely specified functions, Implementation of Boolean expressions using universal gates, Tabulation methods.

UNIT II: COMBINATIONAL LOGIC CIRCUITS

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Problem formulation and design of combinational circuits - Code-Converters, Half and Full Adders, Binary Parallel Adder - Carry look ahead Adder, BCD Adder, Magnitude Comparator, Decoder, Encoder, Priority Encoder, Mux/Demux, Case study: Digital trans-receiver / 8 bit Arithmetic and logic unit, Parity Generator/Checker, Seven Segment display decoder

UNIT III: SYNCHRONOUS SEQUENTIAL CIRCUITS

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Latches, Flip flops - SR, JK, T, D, Master/Slave FF, Triggering of FF, Analysis and design of clocked sequential circuits - Design - Moore/Mealy models, state minimization, state assignment, lock - out condition circuit implementation - Counters, Ripple Counters, Ring Counters, Shift registers, Universal Shift Register. Model Development: Designing of rolling display/real time clock

UNIT IV : ASYNCHRONOUS SEQUENTIAL CIRCUITS

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Stable and Unstable states, output specifications, cycles and races, state reduction, race free assignments, Hazards, Essential Hazards, Fundamental and Pulse mode sequential circuits, Design of Hazard free circuits.

UNIT V: LOGIC FAMILIES AND PROGRAMMABLE LOGIC DEVICES

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Logic families- Propagation Delay, Fan - In and Fan - Out - Noise Margin - RTL, TTL, ECL, CMOS - Comparison of Logic families - Implementation of combinational logic/sequential logic design using standard ICs, PROM, PLA and PAL, basic memory, static ROM, PROM, EPROM, EEPROM EAPROM.

45 PERIODS

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