MANGALORE UNIVERSITY

DEPARTMENT OF ELECTRONICS
MSc Electronics

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ELH 402 - DIGITAL SYSTEM DESIGN WITHVERILOG HDL

Unit -I

14 hours

Course Outcomes:

1. Familiarize with the CAD tool to write HDL programs.
2. Design, simulate and synthesize digital logic circuits using Verilog HDL
3. Design sequential and combinational logic circuits for real-time applications.
4. Exposure to hardware-software co-design

Interface hardware to programmable logical devices like CPLDs/FPGAs/Microcontroller
Introduction to Digital Design Methodology: Design Methodology, IC Technology Options
Review of Combinational Logic Design:Combinational Logic and Boolean algebra, Representation of Combinational Logic, simplification of Boolean Expression, glitches and Hazards, Building Block for Logic Design.
Fundamental of Sequential Logic Design: Storage Element, Flip-Flops, Busses and Three-state Device, Design Sequential Machines, and State- Transition Graph, Serial-Line code converter for Data Transmission, State Reduction and Equivalent States.

Unit -II

14 hours

Introduction to Logic Design with Verilog : Structural Models of combinational logic, Logic simulation, design verification and test methodology, propagation delay. Truth table Model of Combinational and Sequential Logic with Verilog, Logic Design with Behavioural Models of Combinational and Sequential logic
Synthesis of Combinational and Sequential Logic:Introduction to Synthesis, Synthesis of Combinational Logic, Synthesis of Sequential Logic, Synthesis of Explicit and Implicit State Machines, Registered Logic, State Encoding

Unit - III

14 hours

Design and Synthesis of Data path controllers: Partitioned Sequential Machines, Design Example: Binary Counter, design and synthesis of RISC stored Program Machine, Design Example: UART
Programmable Logic and Storage Devices: Programmable Logic Devices, Storage Devices, Programmable Logic Array, Programmable Array Logic, Programmability of PLDs. Complex PLDs, Altera Max 7000 CPLDs, Field- Programmable Gate Arrays, Altera Flex 8000 FPGAs.

Text Books:

1. "Advanced Digital Design with the Verilog HDL" Michael D. Ciletti,Prentice-Hall of India Pvt. Ltd, 2006.

Reference Books:

1. "Digital Design", Mano M M,Pearson Education Asia,3rd Edn. 2002.
2. "Digital Fundamentals", Floyd T L,Pearson Education Asia,8th Edn.2002