5th Semester	REE5D001	Advanced Digital Electronics	L-T-P 3-0-0	3 Credits

Advanced Digital Electronics

MODULE-I **(10 Hours)**

Combinational Logic: Review of adders, Subtractor, Multipliers, Multiplexers, ROM,PLA, PAL and PLD.

Synchronous Sequential Logic: Flip-flops, Triggering of flip-flops, Analysis ofclocked sequential circuits, State reduction and assignment, Flip-flop excitationtables, Design procedure, Design of counters

MODULE-II **(08 Hours)**

Finite State Machines: Finite state model, Memory elements and their excitationfunctions, Synthesis of Synchronous sequential circuits, Capabilities and limitationsof FSM, Design, Modeling and Simulation of Moore and Mealy machines.

MODULE-III **(08 Hours)**

Asynchronous Sequential Logic: Analysis Procedure, Circuits with latches, Designprocedure, Reduction of state and flow tables, Race-free state assignment, Hazards, Design examples.

Module–IV **(12 Hours)**

Designing with Programmable Logic Devices and Programmable Gate Arrays: Read only memories, Programmable logic arrays, Programmable array logic,designing with FPGAs, Xilinx series FPGA

Algorithmic State Machines: ASM chart, Timing considerations, Controlimplementation, Control Design with multiplexers, PLAs, etc.Read only memories, Programmable logic arrays, Programmable array logic,designing with FPGAs, Xilinx series FPGA

Books:

[1] Stephen Brown, ZvonkoVranesic, "Fundamentals of Digital Logic with VHDL design", TMH, 3rd Edition, 2008.

[2] Douglas L Perry, "VHDL: Programming by Example", TMH, 3rd Edition, 2008

[3] William I Fletcher," Digital Design Principles", PHI, 3rd edition-1980

[4] Chales H. Roth," Digital System Design Using VHDL", Cengage Learning India, 2nd Edition,2012.

[5] John Wakerley," Digital System Design", Pearson Education, 4th Edition,2008

Digital Learning Resources:

Course Name:	Digital Systems Design with PLDs and FPGAs
Course Link:	https://nptel.ac.in/courses/117/108/117108040/
Course Instructor:	Prof. Kuruvilla Varghese, IISc Bangalore

Course Name:	Digital Circuits and Systems
Course Link:	https://nptel.ac.in/courses/117/106/117106086/
Course Instructor:	Prof. S. Srinivasan, IIT Madras