Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Electronics & Communication Engineering
(Applicable from the academic session 2018-2019)

Course Code : EC 302	**Category :** Core Courses
Course Title : Digital System Design	**Semester** : Third
L-T-P : **3-0-0**	**Credit:3**
Pre-Requisites:	

Detailed contents:

Module I   **10L**

Review of Number System, Signed and Unsigned Number.

Logic Simplification and Combinational Logic Design: Review of Boolean Algebra and De Morgan's Theorem, SOP & POS forms, Canonical forms, Karnaugh's map, Binary codes, Code Conversion.

MSI devices like Comparators, Multiplexers, Encoder, Decoder, Half and Full Adders, Subtractors, Serial and Parallel Adders, BCD Adder, Fast adders, Barrel shifter and ALU.

Module II   **6L**
Sequential Logic Design: Building blocks like S-R, JK and Master-Slave JK FF, Edge triggered FF, Ripple and Synchronous counters, Shift registers, Finite state machines, Design of synchronous FSM. Designing synchronous circuits like Synchronous Counter, Pulse train generator, Pseudo Random Binary Sequence generator,

Module III   **8L**

Logic Families and Semiconductor Memories: TTL, ECL, CMOS families

Semiconductor Memories, Concept of Programmable logic devices like FPGA. Logic implementation using Programmable Devices.

Different types of A/D and D/A conversion techniques. Sample & Hold Cirtcuit

Module IV   **8L**

VLSI Design flow: Design entry Schematic, FSM & HDL, different modeling styles in
VHDL, Data types and objects, Dataflow, Behavioral and Structural Modeling, Synthesis and Simulation
VHDL constructs and codes for combinational and sequential circuits.

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Text/Reference Books:
1. R.P. Jain, "Modern digital Electronics", Tata McGraw Hill, 4th edition, 2009.
2. Schilling & Belove, Digital Integrated Electronics, Tata McGraw Hill,
2. Douglas Perry, "VHDL", Tata McGraw Hill, 4th edition, 2002.
3. W.H. Gothmann, "Digital Electronics- An introduction to theory and practice", PHI, 2nd
    edition ,2006.
4. D.V. Hall, "Digital Circuits and Systems", Tata McGraw Hill, 1989
5. Charles Roth, "Digital System Design using VHDL", Tata McGraw Hill 2nd edition 2012.

Course outcomes:
At the end of this course students will demonstrate the ability to
1. Design and analyze combinational logic circuits
2. Design & analyze modular combinational circuits with MUX/DEMUX, Decoder, Encoder
3. Design & analyze synchronous sequential logic circuits