Name of the Department/Centre: Computer Science
Discipline Centric Course
Course Type (Please tick appropriate box):

Major	☐	Discipline Specific Core	√	Ability Enhancement	☐
Minor	√	Multidisciplinary	☐	Skill Enhancement	☐
Value Added	☐	Any other	☐		

Course Title: Digital Logic Design
Code: 24-DCS-M-151
Semester: II
Total Credits: 4   Lecture-Tutorial-Practical (LTP) breakup: (3-1-0)
Maximum Marks: 100   No of seats: 50
Course Advisor Name: NA
Course Advisor's Email: computerscience@jmi.ac.in
Prerequisites: Nil
Special Requirements (if any): Nil
Expected Learning Outcomes:

- Understand basic concepts and logic circuits
- Understanding the simplification of logical statements
- Identification of various addresses.
- Application of combinational circuit and understanding counters and registers

Course Syllabus (Unit wise):

1. **Data Representation:** Number Systems-Binary, Octal, Decimal, and Hexa-Decimal; Base Conversions; Binary Arithmetic; Complements: (r-1)'s Complement, r's Complement, Subtraction using Complements; Integer Representation, Floating-point Representation; Binary Codes for Decimal Digits: BCD Code, Excess-3 Code, 84-2-1 Code, 2421 Code, Error Detection Code; Character Representation - ASCII, EBCDIC.
2. **Boolean Algebra, and Logic Gates:** Boolean Algebra, Huntington's Postulate, Switching Algebra, Basic Theorems and Properties of Boolean Algebra; Boolean Functions: Basic Definition, Literals, Minimization of Boolean Functions by Algebraic Manipulation, Complement of a Boolean Function; canon 1 Cal and Standard Forms: Minterms and Maxterms, Conversion Between Canonical and Standard Forms of a Boolean Function; Boolean Function Simplification using k-Map; Digital Logic Gates: Basic Gates - AND, OR, NOT; Universal Gates - NAND, NOR; Other Gates - XOR, XNOR, AND-OR-INVERT, and OR-AND-INVERT.
3. **Combinational Logic Circuit:** Overview of Combinational Logic Circuit; Design of Some Standard Combinational Circuits: Half Adder, Full Adder, Half Subtractor, Full Subtractor, Code Conversion; Binary Adder, BCD Adder, Decoders, Encoder, Multiplexers, De-multiplexer.
4. **Sequential Logic Circuit:** Overview of Sequential Logic Circuits, Flip-Flops, Categories of Flip-Flop - RS, JK, T, and D Flip Flops, Registers and Counters.

Text Book:
M. Morris Mano: Digital Logic and Computer Design, Prentice Hall of India
V. Rajaraman & T. Radhakrishnan: An Introduction to Digital Computer Design, PHI.
References Books:

Stephen Brown and Zvonko Vranesic: Fundamentals of Digital Logic with Verilog Design, 3rd Edition, McGraw-Hill
John F. Wakerly: Digital Logic Design, 4th Edition, Pearson Education

Approved by Board of Studies held on October 23, 2024