MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WB

Syllabus for Bachelor of Computer Application (BCA) Programme

(Effective for Students Admitted in Academic Session 2018-2019)

Detailed Syllabus

Semester I

Paper: Digital Electronics
Code : BCAN-101
Contacts Hours / Week : 4L+1CE
Credits : 3

1. Module I: Number Systems & Codes (6L) Decimal Number, Binary Number, Octal Number, Hexadecimal Number, Conversion – Decimal to Binary, Binary to Decimal, Octal to Binary, Binary to Octal, Hexadecimal to Binary, Binary to Hexadecimal, Octal to Binary to Hexadecimal, Hexadecimal to Binary to Octal; Floating Point Number Representation, Conversion of Floating Point Numbers, Binary Arithmetic, 1's and 2's Complement, 9's and 10's Complement, Complement Arithmetic, BCD, BCD addition, BCD subtraction, Weighted Binary codes, Non-weighted codes, Parity checker and generator, Alphanumeric codes
2. Module II: Logic Gates (2L) OR, AND, NOT, NAND, NOR, Exclusive – OR, Exclusive – NOR, Mixed logic
3. Module III: Boolean Algebra (4L) Boolean Logic Operations, Basic Law of Boolean Algebra, Demorgan's Theorem, Principle of Duality
4. Module IV: Minimization Techniques (5L) Sum of Products, Product of Sums, Karnaugh Map (up to 4 variables)
5. Module V: Multilevel Gate Network (3L) Implementation of Multilevel Gate Network, Conversion to NAND-NAND and NOR-NOR Gate Networks
6. Module VI: Arithmetic Circuits (5L) Half Adder, Full Adder, Half Subtractor, Full Subtractor, Carry Look Ahead Adder, 4-Bit Parallel Adder
7. Module VII: Combinational Circuits (5L) Basic 2-input and 4-input multiplexer, Demultiplexur, Basic binary decoder, BCD to binary converters, Binary to Gray code converters, Gray code to binary converters, Encoder.
8. Module VIII: Sequential Circuits (5L) Introduction to sequential circuit, Latch, SR Flip Flop, D Flip Flop, T Flip Flop, JK Flip Flop, Master Slave Flip Flop
9. Module IX: Basics of Counters (2L) Asynchronous (Ripple or serial) counter, Synchronous (parallel) counter
10. Module X: Basics of Registers (3L) SISO, SIPO, PISO, PIPO, Universal Registers

Suggested Readings:

1. **Digital Circuit & Design, Salivahan, VIKAS**
2. **Digital Design, M. Morris. Mano & Michael D. Ciletti, PEARSON**
3. **Fundamentals of Digital Circuits; Anand Kumar; PHI**
4. **Digital Electronics; Tokheim; TMH**
5. **Digital Electronics; S. Rangnekar; ISTE/EXCEL**