

**III YEAR – V SEMESTER
COURSE CODE: 7BCEE2A**

**ELECTIVE COURSE-II (A)–DIGITAL PRINCIPLES AND COMPUTER
ORGANIZATION**

Unit I

Number Systems and Codes: Binary Number system – Binary to decimal – decimal to binary – hexa decimal – ASCII code – Excess-3 Code – Gray code.
Digital Logic: The Basic Gates – NOT, OR, AND - Universal Logic Gates – NOR, NAND.

Unit II

Combinatorial Logic Circuits: Boolean Laws and Theorems. - Sum of Products method - Truth table to Karnaugh Map – Pairs, Quads, Octets – Don't Care Conditions- Product-of sums method - Product-of sums Simplifications.

Data Processing Circuits: Multiplexers – Demultiplexers-1-of-16 Decoder – BDC-todecimal Decoders – Seven-segment Decoders – Encoders – Exclusive-OR Gates- Parity Generators and Checkers.

Unit III

Arithmetic Circuits: Binary Addition- Binary Subtraction – 2'S Complement Representation - 2'S Complement Arithmetic – Arithmetic Building Blocks.

Unit IV

Basic Computer organization and Design: Instruction codes - stored program organization - Computer registers and common bus system - Computer instructions - Timing and control - Instruction cycle: Fetch and Decode - Register reference instructions.

Micro programmed Control: Control memory organization - Address sequencing, micro instruction format and symbolic microinstructions - symbolic micro-program - binary microprogram.

Unit V

Central Processing Unit : General register organization - stack organization – instruction formats - addressing modes - Data transfer and manipulation - Program control. CISC and RISC - Parallel processing - Pipeline- general consideration.

Input-output organization: Peripheral devices - I/O interface - Memory organization: Memory hierarchy - Main memory - Auxiliary memory.

Text Book:

1. Digital Principles and Applications – Donald P Leach, Albert Paul Malvino, GoutamSaha, 8th edition , McGraw-Hill Education, 3rd reprint 2015. 2.
2. Computer System Architecture, M. Morris Mano, Pearson Education, 3rd edition.,2007

UNIT I	Chapters 5: (5.1 to 5.9) and 2: (2.1 to 2.3)	Text Book 1
UNIT II	Chapters 3: (3.1 to 3.8) and 4: (4.1 to 4.7)	Text Book 1
UNIT III	Chapters 6: (6.1 to 6.8)	Text Book 1
UNIT IV	Chapters 5 (5.1 to 5.5) and 7 (7.1 to 7.3)	Text Book 2
UNIT V	Chapters 8 (8.1 to 8.8), 9 (9.1 to 9.2), 11 (11.1 to 11.5) and 12(12.1 to 12.3)	Text Book 2

Books for Reference:

1. Digital design, R.Anantha Natarajan, PHI Learning, 2015.
2. Principles of digital Electronics, K.Meena, PHI Learning, 2013.
3. Digital Computer Fundamentals, Thomas C. Bartee TMH 2007.
4. Digital Circuits and Design, S. Salivahanan and S. Arivazhagan, Vikas Publishers, 2005.
5. Computer Organization and Architecture, V.Rajaraman and T.Radhakrishnan, PHI learning, 5th Print, 2015.
6. Computer Organization, Carl HamacherZvonkoVranesicSafwatZaky, McGraw Hill Education, 5th Edition, 11th reprint, 2015.
7. Computer Organization and Architecture, SmrutiRanjan Sarangi, McGraw Hill Education.

