Guidelines for B.Sc. PS/MS - LOCF
Computer System Architecture
(BSCS04) Core Course –Credit: 6
For the Semester IV

Theory Examination – 3 Hours, (75 Marks + 25 Marks Internal Assessment as per University rules)
Practical Examination- **4 hours, 50 marks**

Reference Book for Theory:

Computer System Architecture by M.Morris Mano, Third edition, Prentice Hall of India. Same book Published by Pearson Education.

I & II : Introduction: Digital Logic Gates, Flip flops and their characteristic table, Logic circuit simplification using Boolean algebra and Karnaugh map, Don't care conditions, Combinational circuits, Sequential circuits, Decoders, Encoders, Multiplexers, Binary Adder, Binary Adder Subtractor, Binary Incrementer, Registers and memory units.

Chapter	Topic & Sections
1.	Digital Logic Circuits (Upto page 28-PHI Publication)
2.	Digital Components (2.1, 2.2, 2.3, 2.4, 2.6, 2.7)

III: Data Representation: Binary representation of both numeric and alphanumeric data, representation of numeric data in different number systems, (Binary, Octal, Decimal and Hexadecimal), conversion from one number system to another, complements, representation of decimal numbers, representation of signed and unsigned numbers, addition and subtraction of signed and unsigned numbers and overflow detection.

Chapter	Topic & Sections
3.	Data representation (Up to 3.4)

IV & V: Operations, Control and Instructions: Computer registers, general Register organization, stack organization arithmetic and logical micro-operations, instruction format, Instruction format illustration using single accumulator organization.
Micro programmed control vs hardwired control, and instruction set and their completeness, Timing and control. Instruction cycle, memory reference instructions and their implementation using arithmetic, logical, program control, transfer and input output micro operations, interrupt

cycle. Addressing modes, zero address instructions, one address instructions, two address instructions, and three address instructions.

Chapter	Topic & Sections
4.	Register transfer and micro-operations (4.1, 4.2, 4.4, 4.5)
5.	Basic Computer Organization and Design (Up to 5.8-PHI)
8.	Programming the Basic Computer(8.4 & 8.5)

VI: Peripheral Devices: I/O interface, I/O vs. Memory Bus, Isolated I/O, Memory Mapped I/O, Direct memory Access.

Chapter	Topic & Sections
11.	Input – Output Organization (11.1, 11.2, 11.4 and 11.6)

Computer System Architecture Practical

1) Write a program to convert an unsigned number in one radix 'A' to the equivalent number in another radix 'B', where A and B can be any positive integer.
2) Write a program that will prompt for the input of two integer values. Then using the Bitwise shift operators show the result of
    a. Left shifting the first number by the second
    b. Right shifting the first number by the second

3) Write a program that will prompt for the input of two integer values. Then using the logical operators show the result of
    a. Exclusive OR of the first number by the second bitwise
    b. OR of the first number by the second bitwise
    c. AND of the first number by the second bitwise

4) Write a program that will prompt for the input of a binary value and print
    a. One's complement
    b. Two's complement

5) Write a program to print the values of a 5 bit binary up-down counter. User should be able to specify the up or down nature of

the counter.

6) Write a program to implement bit-wise addition of two numbers.
7) Write a program to implement bit-wise Subtraction of two numbers using 2’s complement.
8) Write a program to implement Selective Set logical operation using bit-wise operators.
9) Write a program to implement Selective Complement logical operation using bit-wise operators.
10) Write a program to implement Selective Clear logical operation using bit-wise operators.