

MCA-BC-01 MCA Bridge Course I

L -3
P -2

Internal Marks- 30(Theory)

External Marks- 70(Theory)

External Marks- 50(Practical)

Note:- Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

Course Objectives: The main objective of the course is to bridge the gap between subjects studied at Pre-university level and subjects they would be studying in computer science. The students are trained in subjects such as Mathematics, Computer Science.

- To act as a buffer for the new entrants.
- Applications based self-learning and intermingling of a large cross section of students from vastly varying backgrounds.
- To provide adequate time for the transition to hard-core engineering courses.

Learning Outcomes:

- It has provided students the confidence and skills to successfully transition into the field of Computer Science.
- It has assisted students in their personal development of soft skills.
- It has helped students for enhancing critical thinking skills through self-exploration and class experiences.

Unit-I

Elements of C language: C character set, identifiers & keywords, data types: declaration & definition.

Operators: Arithmetic relational, logical, bitwise, unary, assignment and conditional operators & their hierarchy & associativity, Data input/output.

Control statements: Sequencing, Selection: if and switch statement; iteration, repetition: for, while, and do-while loop; break, continue, goto statement.

Unit-II

Functions in C language: Definition, prototype, passing parameters, recursion,

Data structure: arrays, structures, union, string, data files.

Pointers: Declaration, operations on pointers, array of pointers, pointers to arrays.

C preprocessors

Unit-III

Computer Fundamentals: introduction, characteristics of computers, the evolution of computers, the computer's generations, basic computer organization, storage hierarchy, primary & secondary storage, input-output devices.

Computer Software: introduction, relationship between hardware and software, types of software, planning the computer program: purpose of program planning, algorithm, flowcharts, decision tables, pseudocodes, application software packages.

Data Communications and Computer Networks: Introduction, data transmission modes, data transmission speed, transmission media, digital and analog transmission, the internet, multimedia.

Unit-IV

Foundational Mathematics: Types of numbers and their properties, natural numbers, whole numbers, integers, real numbers, rational numbers, irrational numbers, complex numbers, imaginary numbers.

Set theory: Basic concept, set types, set operations, cardinality, and notation.

Group theory: Basic concept, subgroups, group axioms, subgroups, co-sets, normal subgroups, semigroups.

Graph theory: Directed and undirected graphs, chains, circuits, paths, cycles, connectivity, adjacency matrix.

References:

- C Programming, Yashwant Kanitkar, Let us C, BPB Publications.
- Pradeep k. Sinha & Priti Sinha, Computer Fundamentals, BPB Publications
- Behrouz, Frozen, *Introduction to Data Communications and Networking*- Tata MC-Graw Hill.
- Rajaraman V, Fundamentals of Computers, PHI
- Seymour Lipschutz, Marc Lars Lipson, Discrete mathematics, McGraw-Hill international editions, Schaum's series.

MCA-BC-02 MCA Bridge Course II

L -3
P -2

Internal Marks- 30(Theory)

External Marks- 70 (Theory)

External Marks- 50 (Practical)

Note:- Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

Course Objectives: The main objective of the course is to bridge the gap between subjects studied at Pre-university level and subjects they would be studying in computer science. The students are trained in subjects such as Mathematics, Computer Science.

- To act as a buffer for the new entrants.
- Applications based self-learning and intermingling of a large cross section of students from vastly varying backgrounds.
- To provide adequate time for the transition to hard-core engineering courses.

Learning Outcomes:

- It has provided students the confidence and skills to successfully transition into the field of Computer Science.
- It has assisted students in their personal development of soft skills.
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Unit-I

Object oriented concept: Data abstraction, encapsulation, classes and objects modularity, hierarchy, typing, concurrency, object-oriented methodology: advantages and disadvantages of OO methodologies. aggregation, generalization and inheritance, abstract class, meta data, object diagram, dynamic model – events, states, scenarios, event traces, state diagram; functional model-data flow diagram, analysis, system design and object design.

Unit-II

C++ Programming: Data types, structures vs classes, static data and member function, constant parameters and destruction, dynamic objects, operator overloading, function overloading, abstract class, virtual class, inheritance, virtual functions, template functions & template classes, exception handling, I/O streams.

Unit-III

Digital Fundamentals: Information representation - number systems, codes, binary arithmetic operations; number systems - non positional number system, positional number system, number system conversion, fractional number conversion; computer codes - BCD code, EBCDIC code, ASCII, binary arithmetic - addition, subtraction, multiplication, division; binary logic - Boolean algebra, Boolean functions, truth table, simplification of Boolean functions, digital logic gates.

Unit-IV

Computer Organisation: Combinational logic - adders, subtractors, encoder, decoder, multiplexer, demultiplexer and comparators; processor organisation - machine instructions, instruction cycles, instruction formats and addressing modes, microprogramming concepts, microprocessor sequence; sequential logic - flip flops, shift registers and counters; I/O organisation - I/O interface, interrupt structure, transfer of information between CPU, memory and I/O devices.

References:

- Rumbaugh. J.et. al., Object oriented modeling and design, Prentice hall of India 1998.
- Stroustrup, B., The C++ programming language, Addison –Wesley1993.
- Balaguruswami, object oriented programming in C++ : Tata McGraw
- Pradeep k. Sinha & Priti Sinha, Computer Fundamentals, BPB Publications
- Rajaraman V, Fundamentals of Computers, PHI
- Mano. M. Morris Digital Logic & Computer systems Design, Prentice hall of India Pvt. Ltd., 2000.