**MCA-BC-02 MCA Bridge Course II**

**L -3 Internal Marks- 30(Theory) External Marks- 70 (Theory)**

**P -2 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**

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.