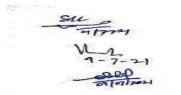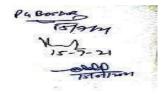**Learning Outcomes based Curriculum Framework**
(LOCF)

Bridge Course(s)
for
MCA 2-Year Programme

Department of Computer Science & Engineering
Chaudhary Devi Lal University
Sirsa-125055
2021

Scheme of Examination
for
Bridge Course(s)
for
MCA 2-Year Programme

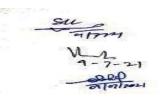| Course No./ Course Name	Course Type	Workload Hours/ Week	Internal Marks	External Marks	Total Marks	Credits
MCA-BC-01 MCA Bridge Course – 01	Theory	4	30	70	100	4
	Practical	4	-	50	50	2
MCA-BC-02 MCA Bridge Course – 02	Theory	4	30	70	100	4
	Practical	4	-	50	50	2

Note: Candidates admitted under category **3a(ii)**[1] of the MCA ordinance shall have to pass bridge courses designed and offered by the University during the duration of MCA programme failing which their MCA degree shall get delayed till the time they pass these courses.
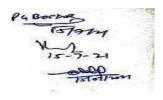
Bridge Courses' examination will be conducted by the University. The student has to secure 40% marks in both theory and practical examination in order to pass the bridge course(s). Examination fee shall be made applicable as per University rules. The respective University Teaching Department/Affiliated College shall arrange for the contact sessions for completing the bridge course(s). The University/College/Institute shall not charge any fee for the conduct of bridge course(s), however, the contact classes for bridge course(s) shall count towards teaching workload.

Candidates belonging to category **3a(ii)** of the MCA ordinance and having earned a diploma or a degree of at least 6-months duration in computer science, or information technology, or computer science & engineering, or software engineering shall be exempted from the requirement of studying and passing the bridge courses.

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[1] 3. A person who has passed one of the following examinations of this University or an examination recognized as equivalent thereto shall be eligible to join the First Semester of the programme:

a(i)   Passed BCA/Bachelor Degree in Computer Science Engineering or equivalent Degree[1].

OR

a(ii) Passed BSc/BCom/BA with Mathematics at 10+2 Level or at Graduation   level (with additional bridge courses as per the norms of Ch. Devi Lal University, Sirsa).
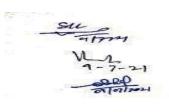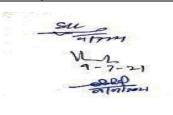
MCA-BC-01: MCA Bridge Course 01

Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration		Assessment Methods
				External	Internal			
Bridge Course	4 Theory	4 Theory	Lecture	70	30	TEE 3 Hours	MTE 2 Hours	TEE/MTE/ Assignment/ Attendance
					20 | 5 | 5			
	2 Practical	4 Practical	Practical	50	-	TEE 3 Hours		TEE/ Practical File

Instructions to paper setter for Term-End Examination: The question paper will consist of nine questions in all. First question will be compulsory and will consist of five short questions of 2 marks each covering the whole syllabus. In addition, eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt four more questions of 15 marks each selecting at least one question from each unit.

Course Objectives: The objective of the course is to bridge the gap between subjects studied by the BCA/Bachelor of CSE students and the BA/BSc/BCom students. The students taking this bridge course shall be taught in foundational mathematics, fundamental concepts of computers and C programming language

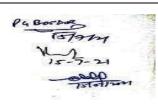| Course Outcomes	At the end of this course, the student will be able to:
CO1	name and enlist various programming constructs of C language; enumerate fundamental concepts of computer system and computer networks; and concepts of numbers, set theory, group theory and graph theory.
CO2	understand and describe various programming constructs of C language; describe fundamental concepts of computer system and computer networks; and concepts of numbers, set theory, group theory and graph theory.
CO3	use various programming constructs of C language and mathematical concepts to solve simple problems through C programs;
CO4	differentiate between various data types, flow-control constructs, structures and unions, computer types, storage types, problem solving tools, types of networks, numbers, sets, groups and graphs.
CO5	choose between various flow-control constructs, standard/user defined data type of C language, design representation tools, transmission media, network topologies, mathematical structures that suits better in a given situation.
CO6	design and represent the solutions of simple problems and create C programs therefor.

CO-PEO Mapping Matrix for Course MCA-BC-01

COs	PEO1	PEO2	PEO3	PEO4	PEO5
CO1	1	3	3	3	3

COs					
CO2	2	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
CO6	3	3	3	3	3
Average	2.5	3	3	3	3

CO-PO Mapping Matrix for Course MCA-BC-01

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	1	1	1	-	3	1	-	-	-	-
CO2	2	1	1	3	1	-	3	2	-	-	-	-
CO3	3	1	1	3	3	-	3	3	-	-	-	-
CO4	3	3	1	3	1	-	3	3	-	-	-	-
CO5	3	1	3	1	3	-	3	3	-	-	-	-
CO6	3	3	3	3	3	-	3	3	-	-	-	-
Average	2.5	2	1.66	2.33	2	-	3	2.5	-	-	-	-

CO-PSO Mapping Matrix for Course MCA-BC-01

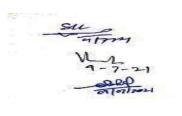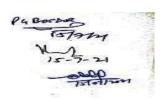| COs	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	-
CO2	3	2	2	2	-
CO3	3	3	3	3	-
CO4	3	3	3	3	-
CO5	3	3	3	3	-
CO6	3	3	3	3	-
Average	3	2.5	2.5	2.5	-

Course Content
MCA-BC-01: MCA Bridge Course – 01

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, go to statement.

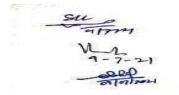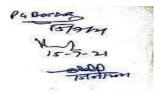|	
Unit - II	**Functions in C language**: Definition, prototype, passing parameters, recursion, Data structure: arrays, structures, union, string, data files. Pointers: Delectation, operations on pointers, array of pointers, pointers to arrays. C preprocessors
Unit - III	**Computer Fundamentals**: introduction, 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.
Text/Reference Books	
Text Books	1. Pradeep K. Sinha & Priti Sinha, Computer Fundamentals, BPB Publications 2. Rajaraman V, Fundamentals of Computers, Prentice Hall of India. 3. Seymour Lipschutz, Marc Lars Lipson, Discrete Mathematics, McGraw-Hill International Editions, Schaum's Outline Series. 4. Yashwant Kanetkar, Let us C, BPB Publications. 5. Behrouz, Frozen, Introduction to Data Communications and Networking, Tata McGraw Hill.
Reference Book	1. Thomas C. Bartee. 1985. Digital computer fundamentals (6th ed.). McGraw-Hill, Inc., USA.

				MCA-BC-02: MCA Bridge Course 02					

Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration		Assessment Methods
				External	Internal			
Bridge Course	4 Theory	4 Theory	Lecture	70	30	TEE 3 Hours	MTE 2 Hours	TEE/MTE/ Assignment/ Attendance
					20 / 5 / 5			
	2 Practical	4 Practical	Practical	50	-	TEE 3 Hours		TEE/ Practical File

Instructions to paper setter for Term-End Examination: The question paper will consist of nine questions in all. First question will be compulsory and will consist of five short questions of 2 marks each covering the whole syllabus. In addition, eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt four more questions of 15 marks each selecting at least one question from each unit.

Course Objectives: The objective of the course is to bridge the gap between subjects studied by the BCA/Bachelor of CSE students and the B.A/B.Sc/B.Com students. The students taking this bridge course shall be taught in foundational mathematics, fundamental concepts of computers and C programming language

Course Outcomes	At the end of this course, the student will be able to:
CO1	list/name various topics/terms/concepts in object orientation, C++ language, digital fundamentals, and computer organisation.
CO2	understand and describe various topics/terms/concepts in object orientation, C++ language and relate the features of C++ to concepts of object orientation as also the working of digital systems and organisation of a digital computer.
CO3	apply/use various constructs of C++ language and digital principles to write simple object oriented programs.
CO4	classify and illustrate various programming constructs of C++, computer codes, binary operations, logic gates, and digital circuits.
CO5	choose and justify a particular C++ feature, a Boolean simplification method, a particular digital circuit, an instruction format or an addressing mode.
CO6	use the knowledge of C++, digital fundamentals and computer organisation to create solutions for simple problems in an object oriented manner.

CO-PEO Mapping Matrix for Course MCA-BC-02					
COs	PEO1	PEO2	PEO3	PEO4	PEO5
CO1	1	3	3	3	3

CO2	2	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
CO6	3	3	3	3	3
Average	2.5	3	3	3	3

CO-PO Mapping Matrix for Course MCA-BC-02

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	1	1	1	-	3	1	-	-	-	-
CO2	2	1	1	3	1	-	3	2	-	-	-	-
CO3	3	1	1	3	3	-	3	3	-	-	-	-
CO4	3	3	1	3	1	-	3	3	-	-	-	-
CO5	3	1	3	1	3	-	3	3	-	-	-	-
CO6	3	3	3	3	3	-	3	3	-	-	-	-
Average	2.5	2	1.66	2.33	2	-	3	2.5	-	-	-	-

CO-PSO Mapping Matrix for Course MCA-BC-02

COs	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	-
CO2	3	2	2	2	-
CO3	3	3	3	3	-
CO4	3	3	3	3	-
CO5	3	3	3	3	-
CO6	3	3	3	3	-
Average	3	2.5	2.5	2.5	-

Course Content
MCA-BC-02: MCA Bridge Course II

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.
Text/Reference Books	
Text Books	1. Rumbaugh. J. et. al., Object Oriented Modeling and Design, Prentice Hall of India 1998. 2. Balaguruswami, Object Oriented Programming in C++ : Tata McGraw 3. Pradeep K. Sinha & Preeti Sinha, Computer Fundamentals, BPB Publications 4. Rajaraman V, Fundamentals of Computers, Prentice Hall of India 5. Mano. M. Morris Digital Logic & Computer Systems Design, Prentice Hall of India Pvt. Ltd., 2000.
Reference Book	1. Stroustrup, B., The C++ programming language, Addison –Wesley1993.