MCA – I Semester
Tentative Lecture Plan of Paper - 1
MCA 101 – Computer organization & Architecture
(Changes in contents, if any will be notified)

S. NO.	Unit	Topic	Lecture No.
1	I	Brief introduction to computer organization,.	2
2	I	representation of data, bits and bytes, Number system (binary, octal, decimal, hexadecimal), Representation of integers, real numbers, positive and negative numbers. Binary arithmetic,	4
3	I	Simple concepts and theorems of Boolean Algebra. Representation of characters: BCD, ASCII, EBCDIC Codes, Self Complementary Codes, Error Detecting and Error correcting codes (Parity, Gray& Hamming Codes)	6
4	II	Logic Gates and Boolean Algebra,	2
5	II	Basics of logic families, Karnaugh Map, Combinational Circuit Design: Adder, subtractor, Encoder, Decoder, Multiplexer, Demultiplexer, Magnitude Comparator.	3
6	II	Sequential Circuits, Flip-Flops, Shift Registers, Asynchronous and Synchronous Counters.	4
7	III	CPU Organization: Design of ALU, design of shifter and accumulator	2
8	III	Status Register, Processor unit, Control unit organization.	3
9	III	Micro instruction format, Hardwired and micro-programmed control.	3
10	IV	Data bus and address bus, stack organization, various registers, instruction formats, addressing techniques.	4
11	IV	I/O Organization – Simple I/O devices and their properties	2
12	IV	device interfacing, DMA interface, program & interrupt control transfer.	2
13	V	Semiconductor Memories: Types of Memories, Sequential and Random Access Memory (RAM, ROM, PROM, EPROM)	1
14	V	Storage location and address, fixed and variable word length storage	3
15	V	Cache Memory, bubble memory, Secondary Memory devices and their	3

MCA – I Semester
Tentative Lecture Plan of Paper - 2
MCA 102 – Programming in C
Changes in contents, if any will be notified)

S. No.	Unit	Topics to be Covered	No. of Lectures
1	I	Concept of good program, from problems to programs (Algorithm, specification of algorithm. Flowcharts).	1-3
2	I	Introduction to 'C' Language, History of 'C', 'C' character Set, Identifiers and Keywords, Data types	4-6
3	I	Constants and Variables, declarations, statement, symbolic constants, Operators and expressions.	7-9
4	I	Precedence and order evaluating, formatted and unformatted input and output functions.	10-12
5	I	All types of Control Statements.	13-15
6	II	Basics and needs of functions, Types of functions. Declaration, definition and calling of function in a program.	16-18
7	II	Parameter passing, Call by value, call by reference.	19
8	II	Recursion, Meaning and need of Recursion, Implementation of Recursive Functions.	20-21
9	II	C Pre-Processors, Command-Line Arguments	22-24
10	III	Concept, types, declaration and use of Arrays and Pointers. Pointer Arithmetic.	25-28
11	III	Pointers and functions :- Passing pointers to functions, Returning Pointers from functions.	29-31
12	III	Concept, use and implementation of dynamic memory allocation.	32-33
13	IV	Structures: Basics, structures and functions, Array of structures	34-36
14	IV	Pointers to structures, self referential Structures, table look up fields.	37-39
15	IV	Union and typedef, enumerations etc.	40
16	V	File Structure, Concept of Record, file operations: storing, creating, retrieving, updating, deleting, text and library files, File handling, file pointers.	41-43
17	V	File accessing function, low level I/O, Error handling, command line argument.	44-45

Text/Reference books:

1. The C Programming Language by Brian W. Kernighan, Dennis M. Ritchie, Prentice Hall Software Series, 2nd Edition.

2. Let us C by Y.Kanetkar, BPB Publications.

3. Mastering C by Vijay Prasad, TMH.

4. Programing with C, Balaguruswamy, Tata McGraw-Hill.

5. How to Solve it by Computers, Dromey, PHI.

6. Schaums Outline of Theory and Problem of Programming with C: Gottfried B.S., TMH.

7. C Project by Kanetkar, BPB Publications,2006.

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MCA – I Semester
Tentative Lecture Plan of Paper - 3
MCA 103 – Discrete Mathematics
Changes in contents, if any will be notified)

S. No.	Unit	Topics to be Covered	No. of Lectures
	I	Fundamentals: Sets and Subsets, Operations on Sets.	3
1	I	Sequences, Properties of Integers, Matrices, Mathematical Structures.	2
2	I	Logic & Propositional Logic: Introduction to Logic, Propositional Logic and Predicate Logic, Elements of Propositional Logic - Negation, Conjunction, Disjunction; Truth Table, Tautology, Connectives, Construction of Proposition.	4
3	I	Semantics, normal forms, Reasoning with Propositions, Implications, Proof of Identities, Proof of Implications.	2
4	II	Predicate Logic: Well Formed Formula of Predicate Logic.	3
5	II	Predicate, Validity, Quantification, Constructing Formulas, Reasoning with Predicate Logic, Quantifiers and Connectives.	5
6	III	Verification: Model checking, Linear-time temporal logic, program verification. Induction and Recursion,	4
7	III	Recurrence Relations, Proof by Induction.	2
8	III	Set and Functions: Sets, relations, functions, operations, and equivalence Relations, relation of partial order, partitions, binary relations, Equivalence relations, growth of functions, Complexity of Algorithms..	5
9	IV	Combinatorics: Permutation, combinations.	2
10	IV	Binomial theorem, Counting, Pigenhole principle.	3
11	IV	Generalized Inclusion-Exclusion Principle (GIEP), Discrete probability.	3
12	V	Trees and Graphs: Trees, traversals, spanning trees	4
13	V	graphs – path, connectivity, reachability, cycles and circuits, planar graphs..	3
14	V	Euler and Hamilonian graphs, graph traversals, topological sorting, graph coloring.	3

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MCA – I Semester
Tentative Lecture Plan of Paper - 4
MCA 104 – Database Management System
Changes in contents, if any will be notified)

S. No.	Unit	Topics to be Covered	No. of Lectures
1	I	Introduction: DBMS, Basic DBMS terminology and Data base System versus file System.	3
2	I	Data independence architecture of DBMS	2
3	I	Entity Relationship model : Basic Concepts, keys, design issues, E-R diagram, weak entity sets, extended E-R features, reduction of E-R scheme to tables..	4
4	II	Relational model: structure of relational database relational algebra, tuple relational calculus, domain relational calculus..	4
5	II	SQL: Basic structure, set operations, aggregate functions, null values.	3
6	III	Data Base Design: Functional Dependencies,	3
7	III	normal forms, first, second and third normal form, BCNF multivalued dependencies, fourth normal form, join dependencies.	6
8	IV	Query processing and optimization.	2
9	IV	Transaction processing concepts, ACID Properties, Concurrency control technique locking techniques..	3
10	IV	Time stamping, Recovery, Integrity and security of database.	4
11	V	Distributed database system:	1
12	V	Fragments of relations, optimization	2
13	V	Distributed Concurrency Control, management of deadlocks and crashes.	4
14	V	Database recovery Management.	

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MCA – I Semester
Tentative Lecture Plan of Paper - 5
MCA 105 – Programming in C Lab
Changes in contents, if any will be notified)

S. No.	Unit / Section	Topics to be Covered	No. of Lectures
1	I	Preparing Algorithms and Flowcharts for simple problems.	1-3
2	I	Writing Simple Programs in C	4-6
3	I	Writing programs for simple arithmetic calculations using variables and constants.	7-9
4	I	Programs for accepting input and displaying output using formatted and unformatted I/O functions.	10-12
5	I	Programs to implement various types of Control Statements.	13-15
6	II	Breaking already written programs in parts to convert them in functions.	16-18
7	II	Programs to implement Parameter passing, Call by value, call by reference.	19
8	II	Programs to implement Recursion.	20-21
9	II	Programs to demonstrate the use of C Pre-Processors and Command-Line Arguments.	22-24
10	III	Programs to implement arrays and array operations.	25-27
11	III	Programs to implement Pointers and pointer arithmetic, Passing pointers to functions.	28-30
12	III	Programs to return Pointers from functions and implementation of dynamic memory allocation.	31-33
13	IV	Programs to implement Structures, Array of structures	34-36
14	IV	Programs to implement Pointers to structures, self referential Structures	37-39
15	IV	Programs to implement Union, typedef, enumerations etc.	40-41
16	V	Programs to implement file operations like storing, creating, retrieving, updating, deleting, text and library files	42-44
17	V	Programs to implement File accessing function, low level I/O, Error handling, command line argument.	45-46

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