

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>SCHEME OF EXAMINATION</b>										
<b>Semester I</b>								<i>w.e.f. 2014-2015 session</i>		
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit	Evaluation Scheme		
								Ext	Int	Total
1	Mathematical Foundation of Computer Science	CAL-501-A	4	1	0	5	5	100	50	150
2	C Programming	CAL-503-A	4	1	0	5	5	100	50	150
3	Internet Concept & Web Designing	CAL-505-A	4	1	0	5	5	100	50	150
4	Basic of Digital Design	ECL- 535-A	3	1	0	4	4	100	50	150
5	Communicative English	AHL-505-A	4	0	0	4	4	100	50	150
6	Soft Skills-I	AHP-501-A	0	0	2	2	1	30	20	50
7	C Programming Lab	CAP-503-A	0	0	2	2	1	30	20	50
8	Internet Concept & Web Designing Lab	CAP-505-A	0	0	2	2	1	30	20	50
<b>Total</b>			<b>19</b>	<b>4</b>	<b>6</b>	<b>29</b>	<b>26</b>	<b>590</b>	<b>310</b>	<b>900</b>
<b>Semester II</b>								<i>w.e.f. 2014-2015 session</i>		
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit	Evaluation Scheme		
								Ext	Int	Total
1	Object Oriented Programming Using C++	CAL-502-A	4	1	0	5	5	100	50	150
2	Computer Organization and Architecture	CAL-504-A	3	1	0	4	4	100	50	150
3	Data Structure	CAL-506-A	4	1	0	5	5	100	50	150
4	System Analysis and Design	CAL-508-A	3	1	0	4	4	100	50	150
5	POM	MSL-518-A	4	0	0	4	4	100	50	150
6	Soft Skills-II	AHP-502-A	0	0	2	2	1	30	20	50
7	Environmental Studies	AHL-110-A	2	0	0	2	AC	100	50	150
8	Object Oriented Programming Lab	CAP-502-A	0	0	2	2	1	30	20	50
9	Data Structure Lab	CAP-506-A	0	0	2	2	1	30	20	50
<b>Total</b>			<b>20</b>	<b>4</b>	<b>6</b>	<b>30</b>	<b>25</b>	<b>690</b>	<b>360</b>	<b>1050</b>

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>Semester III</b>											<i>w.e.f. 2015-2016 session</i>
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit	Evaluation Scheme			
								Ext	Int	Total	
1	Principal Of Operating System	CAL-601-A	4	1	0	5	5	100	50	150	
2	Data Base Management System	CAL-603-A	4	1	0	5	5	100	50	150	
3	Principal Of Artificial Intelligence	CAL-605-A	3	1	0	4	4	100	50	150	
4	Principal Of Software Engineering	CAL-607-A	4	0	0	4	4	100	50	150	
5	Computer Network	CAL-609-A	3	1	0	4	4	100	50	150	
6	Soft Skills-III	AHP-601-A	0	0	2	2	1	30	20	50	
7	Buzz Session	CAS – 611-A	0	0	2	2	1	0	50	50	
8	Principal Of Operating System Lab	CAP-601-A	0	0	2	2	1	30	20	50	
9	Data Base Management System Lab	CAP-603-A	0	0	2	2	1	30	20	50	
			<b>18</b>	<b>4</b>	<b>8</b>	<b>30</b>	<b>26</b>	<b>590</b>	<b>360</b>	<b>950</b>	
<b>Semester IV</b>											<i>w.e.f. 2015-2016 session</i>
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit	Evaluation Scheme			
								Ext	Int	Total	
1	Advance Computer Architecture	CAL – 602-A	3	1	0	4	4	100	50	150	
2	C# & ASP.NET	CAL – 604-A	4	1	0	5	5	100	50	150	
3	Computer Graphics & Multimedia	CAL – 606-A	4	1	0	5	5	100	50	150	
4	System Programming & Compiler Design	CAL – 608-A	3	1	0	4	4	100	50	150	
5	Elective - 3		4	0	0	4	4	100	50	150	
6	SOFT SKILLS- 4	AHP-602-A	0	0	2	2	1	30	20	50	
7	Powwow	CAS – 612-A	0	0	2	2	1	0	50	50	
8	C# & ASP.NET Lab	CAP – 604-A	0	0	2	2	1	30	20	50	
9	Computer Graphics & Multimedia Lab	CAP – 606-A	0	0	2	2	1	30	20	50	
			<b>18</b>	<b>4</b>	<b>8</b>	<b>30</b>	<b>26</b>	<b>590</b>	<b>360</b>	<b>950</b>	
<b>Departmental Elective - 3</b>											
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit	Evaluation Scheme			
								Ext	Int	Total	
1	E-Commerce	CAL-614-A	4	0	0	4	4	100	50	150	
2	Management Information System	CAL-616-A	4	0	0	4	4	100	50	150	

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>Semester V</b>											<i>w.e.f. 2016-2017 session</i>
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit	Evaluation Scheme			
								Ext	Int	Total	
1	Advanced Java Technology	CAL – 701-A	4	1	0	5	5	100	50	150	
2	Analysis and Design of Algorithms	CAL – 703-A	4	1	0	5	5	100	50	150	
3	Dataware house and data mining	CAL – 705-A	4	0	0	4	4	100	50	150	
4	Network Security	CAL – 707-A	4	0	0	4	4	100	50	150	
5	Elective - 4		4	0	0	4	4	100	50	150	
6	Soft Skills-V	AHP-701-A	0	0	2	2	1	30	20	50	
7	Clambake	CAS -709-A	0	0	2	2	1	0	50	50	
8	Advanced Java Technology Lab	CAP– 701-A	0	0	2	2	1	30	20	50	
9	Analysis and Design of Algorithms Lab	CAP – 703-A	0	0	2	2	1	30	20	50	
<b>Total</b>			<b>20</b>	<b>2</b>	<b>8</b>	<b>30</b>	<b>26</b>	<b>590</b>	<b>360</b>	<b>950</b>	
<b>Departmental Elective - 2</b>											
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit	Evaluation Scheme			
								Ext	Int	Total	
1	Distributed Operating System	CAL-711-A	4	0	0	4	4	100	50	150	
2	Software Project Management	CAL-713-A	4	0	0	4	4	100	50	150	
<b>Semester VI</b>											<i>w.e.f. 2016-2017 session</i>
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit	Evaluation Scheme			
								Ext	Int	Total	
1	Major Project	CAP-702-A	0	0	20	20	10	120	80	200	

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>CAL- 501-A</b>	<b>Mathematical Foundation Of Computer Science</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
		<b>4</b>	<b>1</b>	<b>0</b>	<b>5</b>

Objective : To provide the basic architecture about the mathematical concept of computer that will help the students to understand that how the data is stored and traverse in computer.

THEORY:

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

**SECTION - A**

**UNIT - 1**

Relation: Relations, Properties of Binary relation, Matrix representation of relations, Closures of relations, Equivalence relations, Partial order relation. Function: Types, Composition of function, Recursively defined function.

Algebraic Structures: Properties, Semi group, Monoid, Group, Abelian group, Subgroup, Cyclic group, Cosets Normal Subgroups, Lagranges Theorem, Permutation groups.

**UNIT - 2**

Graph Theory: Graphs Theory: Euler and Hamiltonian path and circuits, Coloring, Directed Graphs Planar Graphs, Matrix Representation of Graphs, Weighted Graphs, Network flows, Max-flow Min-cut theorem.

**UNIT-3**

Propositional Logic: Propositions, logical operations, Tautologies, Contradictions, Logical implication, Logical equivalence, Normal forms, Theory of Inference and deduction. Predicate Calculus: Predicates and quantifiers. Mathematical Induction.

**SECTION - B**

**UNIT - 4**

Lattices and Boolean Algebra: Introduction, Partially Ordered Set, Hasse diagram, Well ordered set, Lattices, Properties of lattices, Bounded lattices, Complemented and Distributive lattices, Boolean Algebra.

**UNIT - 5**

Introduction to defining language, Kleene Closure, Arithmetic expressions, Chomsky Hierarchy, Regular

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

expressions, Generalized Transition graph.

UNIT-6

Conversion of regular expression to Finite Automata, NFA, DFA, Conversion of NFA to DFA, Optimizing DFA, FA with output: Moore machine, Mealy machine, Conversions, Introduction to Turing Machine.

**Suggested Reading:**

**Text Books:**

1. Lipschutz, Seymour: Discrete Mathematics, Schaums Series
2. C.L.Liu: Elements of Discrete Mathematics, McGraw Hill.
3. Kenneth H. Rosen: Discrete Mathematics and its applications, TMH.

**Reference Books:**

1. Doerr Alan & Levasseur Kenneth: Applied Discrete Structures for Computer Science, Galgotia Pub. Pvt. Ltd.
2. Trembley, J.P & R. Manohar: Discrete Mathematical Structure with Application to Computer Science, TMH.
3. Bubo Ram: Discrete Mathematics, Vinayek Publishers, New Delhi.
4. Gersting: Mathematical Structure for Computer Science, WH Freeman & Macmillan.

**Note:** Latest and additional good books may be suggested and added from time to time.

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

CAL- 503-A	C Programming	L	T	P	Cr
		4	1	0	5

**Objective:**

To provide sound conceptual understanding of the fundamental and advanced concept of programming.

**THEORY:**

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

**SECTION A**

**UNIT-1**

Evolution of information processing: Concept of data and information, data processing. Hardware - CPU, Storage Devices & Media, VDU, Input ` Output, Devices, Type of Software - System Software, Application Software. Overview of OS. Programming Languages and its Classification, Compiler, Interpreter Linker, Loader. Binary Number. Impacts, Computer Crimes, Viruses and their remedial solutions.

**UNIT -2**

Concept of variables and constants, structure of a C program. Operators & Expressions: Arithmetic, Unary, Logical, Bit-wise, Assignment & Conditional Operators, Library Functions, Control Statements: while, do..While, for statements, Nested loops, if..else, switch, break, continue and goto statements, Comma operator.

**UNIT -3**

Functions: Defining & Accessing : Passing arguments, Function Prototype, Recursion, Use of Library Functions, Storage Classes: Automatic, External and Static Variables (Register), Arrays: Defining & Processing, Passing to a function, Multidimensional Arrays.

**SECTION - B**

**UNIT-4**

String: Operations of Strings (String handling through built-in & UDF; Length, Compare Concatenate, Reverse, Copy, .Character Search using array). Pointers: Declarations, Passing to a function, Operations on Pointers, Pointers & Arrays, Array of Pointer, Pointer Arithmetic, Array accessing through pointers  
Pointer to structure, Pointer to functions, Function returning pointers, Dynamic Memory Allocations.

**UNIT - 5**

Structures: Defining & Processing, Passing to a function, Unions (Array within structure, Array of structure, Nesting of structure, Passing structure and its pointer to UDF, Introduction to Unions and its Utilities)

## **UNIT-6**

Data Files: Open, Close, Create, Process Unformatted Data Files. (Formatted Console I/O functions, Unformatted Console I/O functions, Modes Of Files, Use Of fopen(), fclose(), fgetc(), fputc(), fgets(), fplintf(), fscanf(), fread(), fwrite(), Command Line Arguments). Documentation, debugging, C Processors, Macros. Examples illustrating structured program development methodology and use of a block\_structured algorithmic language to solve specific problems.

### **Suggested Reading:**

#### **Text Books:**

1. Fundamentals of Computers & Programming with C, A.K. Sharma, Dhanpat Rai Publishing.
2. Gill, Nasib Singh: Essentials of Computer and Network Technology, Khanna Books Publishing Co., New Delhi.
3. Kenneth.A.: C problem solving and programming, Prentice Hall.
4. Y. Kanetkar: Let us C, BPB Publication
5. E. Balaguruswamy: Programming in C, Tata McGraw Hill.

#### **Reference Books:**

1. Gottfried, B.: Theory and problems of Programming in C, Schaum
2. Sanders, D.: Computers Today, Tata McGraw-Hill.
3. Rajender Singh: Application of IT to Business, Ramesh Publishers
4. Kernighan & Ritchie: The C Programming Language, PHI.
5. H. Schildt: C-The Complete Reference,,Tata McGraw Hill.

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

CAL- 505-A	<b>Internet Concept &amp; Web Designing</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
		<b>4</b>	<b>1</b>	<b>0</b>	<b>5</b>

**Objective:**

To have a fundamental understanding of the design, performance and state of the art of Internet. Topics covered include state of the art E-mail, Internet and research.

**THEORY:**

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

**SECTION - A**

**UNIT-1**

Introduction to World Wide Web, Introduction to w3 consortium Surfing & searching the www: Directories search engines and Meta search engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP. Browser architecture & types, HTTP, URL, Web page types, Using Plug-ins. User generated Content: Blogs & Wikies.

**UNIT - 2**

Introduction to E-mail, advantages and disadvantages, message components, mailer features, E-mail management, Mime types, Newsgroups, mailing lists, chat rooms.

**UNIT - 3**

Introduction to networks and Internet: history, working of Internet, Internet Congestion. Collaborative computing. Modes of Connecting to Internet, Internet Service Providers (ISPs), Introduction to IETF, Internet address, standard address, DNS, Introduction to IPv6.

**SECTION - B**

**UNIT - 4**

HTML document, Tags & their Types, Images & tables. Java script language, Client and Server Side Programming in Java script. Forms and data in Java script, XML basics.

**UNIT - 5**

Introduction to Web Servers: HS, Apache; Microson Personal Web Server. Accessing & using Apache server.

**UNIT-6**

Introduction to cryptography: Encryption schemes, including private key, public key, symmetric &



MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

asymmetric, Encryption schemes, Secure Web document, Digital Signatures, Firewalls, Proxy servers, HTTPS, SSL.

**Suggested Reading:**

Text Books:

1. Fundamental of Internet & the world wide web, Raymond Green Law. & Ellen Hepp, 2001, TMH

**Reference Books:**

1. Internet & Web Design, Ramesh Bangia, LaXmi Publication
2. Complete Reference, Internet, TMH.
3. Pankaj Sharma, Web Administration, S.K. Kataria & Sons.

<b>CAP- 505-A</b>	<b>Internet concepts and Web Design Lab</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
		<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**Internet concepts and web designing lab**

1. Introduction to HTML
2. WAP to use different font tags and styles
3. WAP to use Marquee tags
4. WAP to List
5. WAP to create Table
6. WAP to insert an Image
7. WAP to implement Frames
8. WAP to use different arithmetic operations

<b>CAP- 503-A</b>	<b>C Programming Lab</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
		<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

- 1 Introduction of Turbo C IDE and Programming Environment
- 2 C Building Blocks
- 3 Looping constructs in C-Language
- 4 Nested looping
- 5 Decision making the if and if-else structure
- 6 Decision making the Switch case and conditional operator
- 7 Debugging and Single-Stepping of C Programs
- 8 Functions in C-Language programming
- 9 Preprocessor Directives
- 10 Arrays in C (single dimensional)
- 11 Arrays in C (Multidimensional)
- 12 Learning Text and Graphics modes of display in C
- 13 Structures
- 14 Pointers in C-Language
- 15 Pointers with arrays and function
- 16 Filing in C-Language

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>ECL- 535-A</b>	<b>Basic of Digital Design</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
		<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>

Objective :

To provide the knowledge of different digital devices and their functioning.

THEORY:

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

**Section A**

Unit-I

Digital Design and Binary Numbers: Binary Arithmetic, Negative Numbers and their Arithmetic, Floating point representation, Binary Codes, Cyclic Codes, Error Detecting and Correcting Codes, Hamming Codes.

Unit II

Minterm and Maxterm Realization of Boolean Functions, Gate-level minimization: The map method up to four variable, don't care conditions, SOP and POS simplification, NAND and NOR implementation, Quine Mc-Cluskey Method (Tabular method).

Unit-III

Combinational Logic: Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adder, Subtractor, Code Converters, Parity Generators and Checkers, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, Hazards and Threshold Logic

**Section B**

Unit-IV

Memory and Programmable Logic Devices: Semiconductor Memories, RAM, ROM, PLA, PAL, Memory System design.

Unit-V

Synchronous Sequential Logic: Sequential Circuits, Storage Elements: Latches, Flip Flops, Analysis of Clocked Sequential circuits, state reduction and assignments, design procedure.  
Registers and Counters: Shift Registers, Ripple Counter, Synchronous Counter, Other Counters.

Unit-VI

Asynchronous Sequential Logic: Analysis procedure, circuit with latches, design procedure, reduction of state and flow table, race free state assignment, hazards.

**References:**

1. M. Morris Mano and M. D. Ciletti, "Digital Design", Pearson Education
2. A.K .Singh, "Foundation of Digital Electronics and Logic design", New Age international

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

- 3.M. Rafiqzaman, “Fundamentals of Digital Logic and Microcomputer Design”, Wiley Dreamtech Publication.
- 4.ZVI Kohavi, “Switching and Finite Automata theory”,Tata McGraw Hill
- 5 C.H Roth,Jr., “Fundamentals of Logic Design”, ,Jaico Publishing
- 6.Rajaraman & Radhakrishnan, “Digital Logic and Computer Organization”,PHI Learning Private Limited,Delhi India.

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>AHL-505-A</b>	<b>COMMUNICATIVE ENGLISH</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
		<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

(Common for MCA and Integrated MCA)

**SECTION-A**

**UNIT-1: INTRODUCTION**

- Concept of communication
- Verbal and non-verbal modes of communication
- Function and Role of effective communication
- The process of communication – the four skills of listening, speaking, reading and writing (LSRW)

**UNIT-2: ACTIVE LISTENING AND EFFECTIVE READING**

- Listening skills – reiteration and application of concepts
- Reading skills – reiteration and application of concepts
- Listening Comprehension - speeches (general and business) professional texts (based on business reports/work related issues/ current affairs/ environment etc).

**UNIT-3: PROFESSIONAL SPEAKING**

- Speaking skills – reiteration of concepts
- Group Discussion with evaluation
- Debate
- Presentation with evaluation
- Jam/ Extempore
- Mock Interview and Meetings with evaluation
- Case Studies and SWOT analysis

**SECTION-B**

**UNIT-4: BUSINESS WRITING**

- Principles of Communicative Writing
- Business Letters – application, enquiry, complaints, reservations
- E –Mails
- CV Writing
- Reports – a) Graph Sales Report b) Field/Survey Report c) Minutes and Agenda

**UNIT-5: FUNCTIONAL GRAMMAR AND BUSINESS VOCABULARY**

- English for Specific Purposes – vocabulary related to the fields of Hospitality, Travel and Tourism, Airlines, Banking, Media and Corporate.
- Phrasal Verbs, Word Pairs, Synonyms and Antonyms
- Use of Tense & Modals

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>AHP-501-A</b>	<b>SOFT SKILLS – 1</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
		<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

(Common for MCA and Integrated MCA)

**SECTION-A**

**UNIT-1: INTRODUCTION**

- Soft Skills – What and Why?
- Ingredients
- Utility & Scope

**UNIT-2: BETTER ENGLISH USAGE AND ACCENT TRAINING**

- Introduction to phonetic sounds
- Stress
- Intonation

**UNIT-3: ORAL COMMUNICATION**

- Art of Conversation
- Speaking at home, office/college, in the market, bank, airport/ railway station and with government and private officials

**SECTION-B**

**UNIT-4: WRITTEN COMMUNICATION**

- Art of Written Communication
- Domains of Written Communication : Letter Writing , Resume & covering letter, E-mail

**UNIT-5: PRESENTATION SKILLS**

- Tools of Presentation Skills
- Power Point Presentation

**UNIT-6: WINNING SKILLS:**

- Development of leadership skills in the light of all professional needs
- Negotiation
- Presentation
- Risk taking
- Managing Challenges
- Thinking ahead



MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

CAL- 502-A	<b>Object Oriented Programming Using C++</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
		<b>4</b>	<b>1</b>	<b>0</b>	<b>5</b>

**Objective:**

To relay the theoretical and practical fundamental knowledge of most commonly used object oriented language which deals with objects and real time applications.

**THEORY:**

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

**SECTION - A**

**UNIT - 1**

**Introduction:** Introducing Object-Oriented Approach Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new operators Scope Resolution operators, tokens, keywords.

**UNIT - 2**

**Classes and Objects:** Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Metaclass/abstract classes.

**UNIT - 3**

**Operator overloading:** Introduction; fundamentals of operator overloading; restrictions on operators overloading; operator functions as class members vs. as friend functions; overloading; <<; >> overloading unary operators; overloading binary operators.

**SECTION - B**

**UNIT - 4**

Inheritance; virtual functions and polymorphism: Introduction; inheritance: base classes and derived classes; protected members; casting base-class pointers to derived-class pointers; using member functions; overriding base\_class members in a derived class; public; protected and private inheritance; using constructors and destructors in derived classes.

**Unit -5**

**Files and i/o streams:** Files and streams; creating a sequential access file; reading data from a sequential

access me; updating sequential access files; random access files; creating a random access file; writing data randomly to a random access file; reading data sequentially from a random access file.

### **Unit - 6**

**Templates & exception handling:** Function templates; overloading template functions; class template; templates and inheritance; templates and friends; templates and static members; basics of C++ exception handling: try; throw; catch; throwing an exception; catching an exception.

Suggested Readings:

- 1, Data Structure using C, Pearsons Publishing.
- 2.Data Structures & Algorithm using C by RS.Salaria.
- 3.Lipschutz, "Data Structures" Schaums Outline Series, TMH

Reference Books:

- 1.Aaron M. Tenebaum, Yedidyah, Langsam and Moshe J. Augenstein "Data Structure using C / C++", PHI
- 2.Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication
- 3.R. Kruse et.al, "Data Structures and Program Design in C", Pearson Education

Note: Latest and additional good books may be suggested and added from time to time

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>CAP- 502-A</b>	<b>Object Oriented Programming Lab</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
		<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

Program 1:- Given that an EMPLOYEE class contains the following members:

- a. Data members: Employee\_number, Employee\_name, Basic , DA, IT, Net\_Sal.
- b. Member functions: To read data, to calculate net\_sal and to print datamembers.

Write a C++ program to read data on employees and compute the net\_sal of each employee (DA =52 % of basic and income tax=30% of the gross salary)

Program 2:- Define a STUDENT class with USN, name and marks in 3 test of a subjects. Declare an array of 10 STUDENT objects. Using appropriate functions, find the average of the two better marks for each student. Print the USN , name and the average marks of all the subjects.

Program 3: Write a C++ program to create a class called COMPLEX and implement the following overloading functions ADD that return a complex number:

- a. ADD(a,s2)-where 'a' is an integer (real part) and s2 is a complex number.
- b. ADD(s1,s2)-where s1 and s2 are complex numbers.

Program 4:- Write a C++ program to create a class called DATE. Accept two valid dates in the form dd/mm/yy. Implement the following operations by overloading the operators + and - . After every operation display the results by overloading the operator <<.

- a) no\_of\_days=d1-d2; where d1 and d2 are DATE objects.d1>=d2 and no\_of\_days is an integer.
- b) d2=d1-no\_of\_days; where d1 is a DATE object and no\_of\_days is an integer.

Program 5:Create a class called MATRIX using two-dimensional array of integers. Implement the following operations by overloading the operator ++ which checks the compatibility of two matrices to be added and subtracted. Perform the addition and subtractions by overloading the + and - operators respectively. Display the result by overloading the operator << if(m1==m2) then m3=m1+m2 and m4=m1-m2 else display error.

Program 6: Write a C++ program to create a class called OCTAL which has the characteristics of an octal number. Implement the following operations by writing an appropriate constructor and an overload operator +.

- a. OCTAL h=x; where x is an integer.
- b. Int y=h + k; where h is an OCTAL object and k is an integer.

Display the OCTAL result by overloading the operator <<. Also display the values of h and y.

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>CAL- 504-A</b>	<b>Computer Organization &amp; Architecture</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
		<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>

Objective: To provide basic knowledge of internals of microprocessor, its architecture, components, terminologies, etc. at minute level and ultimately about the working of a digital computer hardware as a whole.

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION - A

UNIT - 1

Number representation; fixed and floating point number representation, IEEE standard for floating point representation. Error detection and correction codes: Hamming code. Digital computer generation.

UNIT - 2

Computer types and classifications, functional units and their interconnections, buses, bus architecture, types of buses and bus arbitration. Register, bus and memory transfer.

UNIT-3

Addition and subtraction of signed numbers, look ahead carry adders. Multiplication: Signed operand multiplication, Booths algorithm and array multiplier. Division and logic operations. Floating point arithmetic operation Processor organization, general register organization, stack organization and Addressing modes

SECTION - B

UNIT - 4

Instruction types, formats, instruction cycles and sub cycles (fetch and execute etc) ,micro-operations, execution of a complete instruction. Hardwire and micro programmed control: microprogramme sequencing, wide branch addressing, and microinstruction with next address field, pre-fetching microinstructions, concept of horizontal and vertical microprogramming.

UNIT - 5

Basic concept and hierarchy, semiconductor RAM memories, 2D & 2 I/2D memory organization. ROM memories. Cache memories: concept and design issues 9 performance, address mapping and replacement) Auxiliary memories: magnetic disk, magnetic tape and optical disks Virtual memory: concept implementation.

UNIT - 6

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt hardware, types of interrupts and exceptions. Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors. Serial Communication: Synchronous & asynchronous communication, standard

**Suggested Reading:**

**Text Books:**

1. Mano, "Computer System Architecture", Pm

**Reference Books:**

1. Computer Organization & Architecture By SPS Saini

2. Tannenbaum, "Structured Computer Organization, Pm

Note: Latest and additional good books may be suggested and added from time to time.

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>CAL- 506-A</b>	<b>Data Structure</b>	<b>L T P</b>	<b>Cr</b>
		<b>4 1 0</b>	<b>5</b>

**Objective:**

To relay the theoretical and practical fundamental knowledge of most commonly used data structures and algorithms.

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION-A

UNIT - 1

Basic Terminology, Elementary Data Organization, Algorithm, Efficiency of an Algorithm, Time and Space Complexity, Asymptotic notations: Big-Oh, Time-Space trade-off. Abstract Data Types (ADT). Arrays: Definition, Single and Multidimensional Arrays, Representation of Arrays: Row Major Order, and Column Major Order, Application of arrays, Sparse Matrices and their representations. Array Implementation and Dynamic Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Doubly Circular Linked List, Operations on a Linked List. Insertion, Deletion, Traversal.

UNIT - 2

Stacks: Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Recursion, Principles of recursion.

UNIT - 3

Queues: Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues in C, Dequeue and Priority Queue.

SECTION - B

UNIT - 4

Trees: Basic terminology, Binary Trees, Binary Tree Representation: Array Representation and Dynamic Representation, Complete Binary Tree, Algebraic Expressions, Extended Binary Trees, Array and Linked

Representation of Binary trees, Tree Traversal algorithms: Inorder, Preorder and Postorder, Threaded Binary trees, Traversing Threaded Binary trees, Huffman algorithm.

Graphs: Terminology, Sequential and linked Representations of Graphs: Adjacency Matrices, Adjacency List, Adjacency Multi list, Graph Traversal : Depth First Search and Breadth First Search, Connected Component, Spanning Trees, Minimum Cost Spanning Trees: Prim and Kruskal algorithm. Shortest Path algorithm: Warshal Algorithm and Dijkstra Algorithm

UNIT - 5-

Searching : Sequential search, Binary Search, Comparison and Analysis Internal Sorting: Insertion Sort, Selection, Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort, Radix Sort, Practical consideration for Internal Sorting.

UNIT - 6

Files: Sequential file organization, creating updating retrieving from sequential files advantages and disadvantages of sequential file organization. Data representation and density, parity and error control techniques, devices and channels, double buffering and block buffering, handling sequential files in C language, seeking, positioning, reading and writing binary files in C. External Sorting and merging files k way and polyphase merge

**Suggested Reading:**

**Text Books:**

I. Operating System Concept, Galvin, Wiley India

**Reference Books**

1. Operating System, Tanenbaum, Pearsons
2. Operating System, Schaum Series, Jyoti Singh, TMH

Note: Latest and additional good books may be suggested and added from time to time.

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>CAP- 506-A</b>	<b>Data Structure Lab</b>	<b>L T P</b>	<b>Cr</b>
		<b>0 0 2</b>	<b>1</b>

1. Write a program to calculate sum of n numbers using 1D array.
2. Write a program to find the transpose of a matrix.
3. Write a program to multiply two matrices.
4. Write a program to calculate factorial of a number using recursion.
5. Write a program to search a number in an array using linear search.
6. Write a program to search a number in an array using Binary search.
7. Write a program to implement insertion sort.
8. Write a program to implement stack using array.
9. Write a program to implement queue using array.
10. Write a program for implementation of creation, insertion, deletion, and searching operation in singly linked list.
11. Write a program to implement stack using linked list.
12. Write a program to implement queue using linked list.
13. Write a program to implement circular linked list.
14. Write a program for implementation of creation, insertion, deletion, and searching operation in doubly linked list.
15. Write a program to traverse the graph in Depth first Traversal.



MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

CAL- 508-A	System Analysis & Design	L T P	Cr
		3 1 0	4

**Objective:**

To have the fundamental concept of system, how its work, system design and planning and many more about system.

**THEORY:**

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

**SECTION - A**

**UNIT - 1**

**Introduction:** introduction to system, characteristics of system, component of system, type of system, Models and contemporary systems Analysis : Effective communication in systems analysis: Tools of the systems Analysis, System development life cycle, role of system analyst.

**UNIT -2**

**System Analysis:** What is planning, need of planning, feasibility study, steps in feasibility study, feasibility report, information gathering tool, tools of structured analysis

**UNIT-3**

**A structured Approach to System Design:** Structured Top-down design, Logical design requirements, Forms requirements design, CRT screen design; Program specification, development completion schedule, Structured Walk Through.

**SECTION - B**

**UNIT - 4**

**System Cost Determination:** System costs and system benefits, comparative cost analysis, data Processing costs, DP cost centre concept

**UNIT -5**

**Project Management and Control:** Development of standards, project control, Gantt Charts, PERT & CPM.

**Systems Conversion and Implementation:** Planning considerations, Conversions methods, systems follow-up quality assurance of new~systems.

## UNIT - 6

Testing: What is testing, what is the need of testing? Quality assurance, audit trail.

### **Suggested Reading:**

#### **Text Books:**

1. System Analysis & Design, Elias M. Awad. Galgotia Publications.
2. Systems analysis and design , Kenneth E. Kendall, Julie E, Prentice Hall, 2001

#### **Reference Books:**

1. System Analysis & Design, George M. Makaras, Prentice Hall, 2001
- 2 System Analysis & Design, Hoffer, Pearson Education

**MSL- 518-A Principles of Management**

**L.T.P-4.0.0**

**Credits 4**

**Unit-I Fundamentals of Management** Concepts, Nature, Importance; Management: As an Art and Science, Management as a profession, Professionalization of Management in India, Management vs. Administration, Levels of Management.

**Unit-II Human Relations:** Evolution of Management: Taylor and Scientific Management, Fayol's Administrative Management, Bureaucracy, Hawthorne Experiments and Human Relations, Social System Approach, Decision Theory Approach, Social Responsibility of Management.

**Unit-III Management Functions:** Introduction to functions of Management, Planning: Nature, Significance, Types, Process, limitations to Effective Planning, Decision Making.

**Unit-IV Organizing:** Concept, Forms of Organizational Structure, Departmentation, Span of Control, Delegation of Authority, Authority and Responsibility, Organizational Design.

**Unit-V Decision making and Motivation:** Basics of Motivation: Concept, Importance of motivation , theories of Motivation, Methods for improving Motivation, Manpower Planning, Job Design.

**Unit-VI Leadership:** Concept of Leadership: importance, Functions of Leaders, Leadership Styles, **Controlling:** Concept, Characteristics, Types of control, Significance, Process, Relationship between planning and control.

**Text Books:**

1. C.B Gupta, Management Concepts and Application, Sultan Chand.
2. Robbins S.P & Decenzo David A., Fundamentals of Management; Essential Concepts and Applications, Pearson Education.
3. P.K Aggrawal, Fundamentals of Management.
4. T. N Chabra, Principles of Management.

**Reference Books:**

1. Prasad L.M. - Principles and Practice of Management
2. Stoner & Wankel - Management
3. Peter F. Drucker - Practice of Management
4. Harold Koontz, Aryasri & Heniz Weirich - Principles of Management - Tata McGraw-Hill

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School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

<b>AHP-502-A</b>	<b>SOFT SKILLS – 2</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credit</b>
		<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

(Common for MCA and Integrated MCA)

**SECTION-A**

**UNIT-1: TEAM BUILDING**

- Concept of Group
- Consideration and Cooperation
- Team building practices through group exercises
- Team task / Role play
- Ability to work together

**UNIT-2: CRITICAL THINKING**

- Analyse
- Prioritise
- Evaluating the problems
- Understands how to use decision making skills to support mission
- Demonstrated systems thinking ability
- External environments

**UNIT-3: BUSINESS ETIQUETTE AND PERSONAL GROOMING**

- Introduction to Etiquette
- Various accepted practices in the corporate world
- Unsaid codes of conduct
- Personality, manners, awareness and positive attitude

**SECTION-B**

**UNIT-4: ORGANIZATIONAL SKILLS**

- Understanding organizational mission
- Understanding ethics concerned with public trust and organization
- Demonstrates ability in conflict management and dispute resolution
- Understanding how to acquire needed resources
- Understanding organizational culture

**UNIT-5: INNOVATION**

- Able to manage change
- Understands creative processes
- Capable of systems thinking
- Adept at framing issues
- Comfortable with risk taking

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MASTER OF COMPUTER APPLICATION

Annexure3-A

AHL-110-A	ENVIRONMENTAL STUDIES	L	T	P	Cr.
		2	0	0	AC

**Objective:**

This subject provides the basic knowledge about the environment, factors affecting environment etc.

**Theory:**

**Note :**For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

**SECTION-A**

**UNIT-I**

**The Multidisciplinary Nature of Environmental studies:** – Nature, scope and importance, need for public awareness.

**UNIT-II**

**Natural resources:** – Renewable and non-renewable resources,natural resources and associated problems:

- (a) **Forest resource:** Use and over-exploitation, deformation and case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- (b) **Water resources:** Use and overutilization of surface and ground water, flood, drought, conflicts over water, dams-benefit and problem.
- (c) **Mineral resources:** Use and exploitation, environmental effects of extracting and using mineral resources.
- (d) **Food resources:** World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problem, water logging, salinity.
- (e) **Land resource:** Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

**UNIT-III**

**Ecosystems** :- Concept, structure and function of an ecosystem; energy flow in the ecosystem; ecological succession; food chains, food webs and ecological pyramids; types of ecosystem – forest ecosystem, grassland ecosystem, aquatic ecosystems.

**SECTION-B**

**UNIT-IV**

**Environmental Pollution:** – Definition, cause, effects and control measures of different types of pollutions – air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal

MVN University, Palwal  
School of Computer and Information Science  
MASTER OF COMPUTER APPLICATION

Annexure3-A

pollution, nuclear hazards; solid waste management- causes, effects and control measures of urban and industrial wastes; role of an individual in prevention of pollution.

**UNIT-V**

**Social issues and environment:**– Urban problems related to energy, water conservation, rain water harvesting, resettlement and rehabilitation of people and its problems; global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

**UNIT-VI**

**Human population and environment** :-Population growth, variation among nation, population explosion- family welfare programme, environment and human health, Human rights, HIV/AIDS, woman and child welfare.

**SUGGESTED READINGS:**

**Text Books:**

1. Rajagopalan R, Environmental Studies, Oxford University Press, New Delhi

**Reference Books:**

1. Kaushik Anubha, C.P. Kaushik, Perspective in Environmental Studies, New Age International (P) Ltd. Publishers
2. Joseph Benny, Environmental Studies, Tata McGraw Hill Publishing Company Ltd., New Delhi
3. Ubaroi, N.K., Environment Management, Excel Books, New Delhi