NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)

Affiliated to

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

Evaluation Scheme & Syllabus

For

MASTER OF COMPUTER APPLICATIONS (MCA) First Year

(Effective from the Session: 2021-2022)

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)

MCA
Evaluation Scheme
SEMESTER I

S. No	Subject Codes	Subjects	Periods			Evaluation Schemes				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	AMCA0101	Fundamentals of Computer and Programming in C	3	1	0	30	20	50		100		150	4
2	AMCA0102	Operating System	3	0	0	30	20	50		100		150	3
3	AMCA0103N	Professional Communication and Management Principles	3	0	0	30	20	50		100		150	2
4	AMCA0104	Computer System Organization	3	1	0	30	20	50		100		150	4
5	AMCA0105	Discrete Mathematics	3	0	0	30	20	50		100		150	3
6	AMCA0151	C Programming Lab	0	0	4	30	20		50		50	100	2
7	AMCA0152	Operating System Lab	0	0	4	30	20		50		50	100	2
8	AMCA0153N	Professional Communication Lab	0	0	4	30	20		50		50	100	2
9	AMCA0154	Computer Organization Lab	0	0	4	30	20		50		50	100	2
10	AMCANC0151	Computers Concepts & Emerging Technologies* (Non Credit)	0	0	2	30	20		50		50	100	0
		MOOCs**											
		TOTAL						250	200	500	200	1150	24

****List of MOOCs (Coursera) Based Recommended Courses for First Year (Semester-I) MCA Students**

S. No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	AMC0049	Speak English Professionally : In person, Online and on phone	Georgia Technical University	16	1

PLEASE NOTE:-

- ***Non Credit Course**

  *All Non Credit Courses (a qualifying exam) are awarded zero (0) credit.

  *Total and obtained marks are not added in the Grand Total.

Abbreviation Used:-

L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., PE: Practical End Semester Exam.

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MCA
Evaluation Scheme
SEMESTER II

S.No	Subject Codes	Subjects	Periods			Evaluation Schemes				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	AMCA0201N	Object Oriented Programming with JAVA	3	1	0	30	20	50		100		150	4
2	AMCA0202	Database Management System	3	0	0	30	20	50		100		150	3
3	AMCA0203N	Data Structures and Analysis of Algorithm	3	1	0	30	20	50		100		150	4
4	AMCA0205	Design Thinking	3	0	0	30	20	50		100		150	3
5		Elective-I	3	0	0	30	20	50		100		150	3
6	AMCA0251N	Object Oriented Programming with JAVA Lab	0	0	4	30	20		50		50	100	2
7	AMCA0252	Database Lab	0	0	4	30	20		50		50	100	2
8	AMCA0253N	Data Structures Lab	0	0	4	30	20		50		50	100	2
9	AMCA0259	Mini Project	0	0	2	30	20		50		50	100	1
10	AMCANC0201	Cyber Security*	2	0	0	30	20	50		50		100	0
		MOOCs**											
		TOTAL						**300**	**200**	**550**	**200**	**1150**	**24**

****List of MOOCs (Coursera) Based Recommended Courses for First Year (Semester-II) MCA Students**

S. No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	AMC0050	Foundation : Data Data Everywhere	Offered by Google	20	1.5
2	AMC0051	Ask question to make Data Driven Decision	Offered by Google	18	1
3	AMC0052	Prepare Data for Exploration	Offered by Google	22	1.5
4	AMC0053	Facebook, Instagram and Snapchat Marketing	Digital Marketing Institute	12	0.5
5	AMC0054	Social Media and digital Marketing Fundamental	University Colorado Boulder	10	0.5
6	AMC0055	Twitter Linkedin and Youtube Marketing	Digital Marketing Institute	13	1

PLEASE NOTE:-

- ***Non Credit Course**

*All Non Credit Courses (a qualifying exam) are awarded zero (0) credit.

*Total and obtained marks are not added in the Grand Total.

Abbreviation Used:-

L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., PE: Practical End Semester Exam.

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List of Elective: -

S. No.	Subject Code	Subject Name
ELECTIVE -I		
1	AMCA 0213	Computer Networks
2	AMCA 0214	Fundamentals of Digital Marketing and Analytics
3	AMCA 0215	Fundamentals of Digital Marketing and Optimization
4	AMCA 0216	CRM Administration
5	AMCA 0217	CRM Development

MCA - FIRST YEAR					
Course Code: AMCA0101		L	T	P	Credit
Course Title: Fundamental of Computers and Programming in C		3	1	0	4
Course objective:					
1	To understand basic concepts of C-programming language				
2	Implement C programs to solve complex problems				
3	Enhance debugging, analyzing and problem-solving skills				
4	Create diversified solutions for real world applications using C language				
5	Acquire the knowledge of variable allocation and binding, conditional statement, control flow, types, function, pointer, parameter passing, array, structure and file handling to solve real world problems				
Pre-requisites: Students are expected to be able to open command prompt window or terminal window, edit a text file, download and install software, and understand basic programming concepts.					
Course Contents / Syllabus					
UNIT-I	**Basic concepts**				**8 hours**
Generations of Computer, Classification of Computers, Software: Application and System Software, Memory Hierarchy, Primary and Auxiliary memory. Approaches to Problem Solving: Concept of Algorithms and Flow Chart. Programming Languages: Generation of Languages Attributes of a Good Language, Machine Language, Assembly Language and High Level Languages, Concept of Assembler, Compiler, Interpreter, Loader and Linker.					
UNIT-II	**Introduction to Programming**				**8 hours**
Programming using C: Applications of C programming, Structure of C program, Overview of compilation and execution process in an IDE, transition from algorithm to program, Syntax, logical errors and Run time errors, object and executable code, Tokens of C language: Keywords, identifiers, constant , data types. Operators and their types, Arithmetic expressions and precedence: Operators, operator precedence and associativity, type conversion, mixed operands.					
UNIT-III	**Decision Control Statements and Functions**				**8 hours**
Conditional Branching: if, else-if, nested if - else, switch statements, use of break, and default with switch. Iteration and loops: Concept of loops, for, while and do-while, multiple loop variables, use of break and continue statements, nested loop. Functions: Concept of Sub-programming, function, types of functions, passing parameters to functions: call by value, , recursive functions, Storage : scope of variable, local and global variables, Nesting of Scope, Storage classes: Auto, Register, Static and Extern					
UNIT-IV	**Arrays and Pointers**				**8 hours**
Pointers: defining and declaring pointer, pointer arithmetic and scaling, Pointer Aliasing. call by reference Arrays: Array notation and representation (one and two dimensional), array using pointers, manipulating array elements, 2-D arrays used in matrix computation. Strings: Introduction, Initializing strings, Accessing string elements, Array of strings, Passing strings to functions, String functions. Structure, Introduction, Initializing, defining and declaring structure, Accessing members, Operations on individual members, Operations on structures, Structure within structure, Array of structureUnion, Introduction, Initializing, defining and declaring structure, Accessing members, Operations on individual members, Operations on Union					
UNIT-V	**File handling and dynamic memory allocation**				**8 hours**

Dynamic Memory Allocation: Introduction, Library functions –malloc, calloc, realloc and free.
Pre-processor directives: defining and calling macros, File inclusion, conditional compilation
File Handling: Basics, File types, File operations, File pointer, File opening modes, File handling functions, File handling through command line argument, Record I/O in files

Course outcome: At the end of course, the student will be able to

CO 1	Develop simple algorithms for arithmetic and logical problems.	K_2
CO 2	Implement and trace the execution of programs written in C language.	K_1, K_2, K_4
CO 3	Implement conditional branching and iteration	K_3
CO 4	Use function, arrays and structures to develop algorithms and programs.	K_2, K_6
CO 5	Use searching and sorting algorithm to arrange data and use file handling for developing real life projects	K_2, K_4

Text books:

(1) Herbert Schildt, "C: The Complete Reference", Osbourne McGraw Hill, 4th Edition, 2002.

(2) Computer Concepts and Programming in C, E Balaguruswami, McGraw Hill

(3) Let Us C by Yashwant P. Kanetkar. BPB publication

(4) K.R Venugopal, "Mastering C", TMH

(5) Yashwant P. Kanetkar, "Working with C", BPB publication

Reference Books:

(1) The C programming by Kernighan Brain W. and Ritchie Dennis M., Pearson Education.

(2) Computer Science- A Structured Programming Approach Using C, by Behrouz A. Forouzan, Richard F. Gilberg, Thomson, Third Edition, Cengage Learning - 2007.

(3) Computer Basics and C Programming by V. Rajaraman, PHI Learning pvt. Limited, 2015.

(4) Schrum's Outline of Programming with C by Byron Gottfried, McGraw-Hill

(5) Computer Fundamentals and Programming in C. Reema Thareja, Oxford Publication

(6) Problem Solving and Programming in C, R.S. Salaria, Khanna Publishing House

E-Book Links:

(1) https://en.wikibooks.org/wiki/C_Programming

(2) https://en.wikibooks.org/wiki/A_Little_C_Primer

(3) https://www.goodreads.com/book/show/6968572-ansi-c-programming

(4)https://www.pdffiller.com/347652461-projects-in-c-by-yashwant-kanetkar-pdfpdf-c-projects-yashwant-kanetkar-pdf-form-

(5)http://www.freebookcentre.net/programming-books-download/Lecture-Notes-On-C-Programming-by-L.-V.-Narasimha-Prasad-and-E.-Krishnarao-Patro.html

Reference Links:

(1) https://nptel.ac.in/courses/106/104/106104128/
(2) https://nptel.ac.in/courses/106/104/106104074/
(3) https://nptel.ac.in/courses/106/102/106102066/
(4) https://nptel.ac.in/courses/106/105/106105171/
(5)https://www.youtube.com/watch?v=IdXrCPzNnkU&list=PLJ5C_6qdAvBFzL9su5J-FX8x80BMhkPy1&index=4
(6)https://www.youtube.com/watch?v=L2oataK7F10&list=PLJ5C_6qdAvBFzL9su5J-FX8x80BMhkPy1&index=11

MCA - FIRST YEAR					
Course Code	**AMCA0102**	**L**	**T**	**P**	**Credit**
Course Title	**Operating System**	**3**	**0**	**0**	**3**

Course objective:

1	To learn the fundamentals of Operating Systems.
2	To learn about the Process management and CPU scheduling algorithm
3	To understand the various issues in process synchronization and different strategies for handling the Deadlock
4	To understand the concepts of memory management policies and virtual memory.
5	To learn the file system implementation and mass storage management functions of operating systems.

Pre-requisites: Students are expected to be familiar with Computer Organization

Course Contents / Syllabus		
UNIT-I	**Fundamental Concepts of Operating System**	**8 hours**

Introduction: Operating System Structure- Layered structure, System Components, Operating system functions, Classification of Operating systems- Batch, Interactive, Time sharing, Real Time System, Multiprocessor Systems, Multiuser Systems, Multi process Systems, Multithreaded Systems, Operating System services, Reentrant Kernels, Monolithic and Microkernel Systems. issues in operating system design. Application of OS in different domain

UNIT-II	**Concurrent Processes**	**8 hours**

Concurrent Processes: Process Concept, Principle of Concurrency, Producer / Consumer Problem, Mutual Exclusion, Critical Section Problem, Dekker's solution, Peterson's solution, Semaphores, Test and Set operation, Classical Problem in Concurrency- Dining Philosopher Problem, Sleeping Barber Problem, Producer Consumer problem, Readers/Writers problem. Inter Process Communication models and Schemes, Process generation.

UNIT-III	**CPU Scheduling and Deadlock**	**8 hours**

CPU Scheduling: Scheduling Concepts, Performance Criteria, Process States, Process Transition Diagram, Schedulers, Process Control Block (PCB), Process address space, Process identification information, Threads and their management, Scheduling Algorithms, Multiprocessor Scheduling.

Real-Time Scheduling. Deadlock: System model, Deadlock characterization, Prevention, Avoidance and detection, Recovery from deadlock.

UNIT-IV	**Memory Management**	**8 hours**

Memory Management: Basic bare machine, Resident monitor, Multiprogramming with fixed partitions, Multiprogramming with variable partitions, Memory Allocation: Allocation Strategies (First Fit, Best Fit, and Worst Fit), Fragmentation, Protection schemes, Paging, Segmentation, Paged segmentation, Virtual memory concepts, Demand paging, Performance of demand paging, Page replacement algorithms, Thrashing, Cache memory organization, Locality of reference.

UNIT-V	**Input/output and File System**		**8 hours**

I/O Management and Disk Scheduling: I/O devices, and I/O subsystems, I/O buffering, Disk storage and disk scheduling, RAID. File System: File concept, File organization and access mechanism, File directories, and File sharing, File system implementation issues, File system protection and security. Features of different OS[Windows, Linux, Android],Comparative Study of Different OS, Case Study

Course outcome: At the end of course, the student will be able

CO 1	Explain main components, services, types and structure of Operating Systems.	K2
CO 2	Apply the algorithms and techniques to handle the various concurrency control issues.	K3
CO 3	Compare and apply CPU scheduling algorithms for process execution.	K2
CO 4	Identify occurrence of deadlock and describe ways to handle it.	K3
CO 5	Explain and apply memory, I/O and disk management techniques.	K5

Text books

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Operating System Concepts, 8th Ed., John Wiley, 2008.
2. William Stallings, Operating Systems: Internals and Design Principles. Prentice-Hall, 6th Ed., 2008.
3. AS Tanenbaum, Modern Operating Systems, 3rd Ed., Pearson, 2009.

Reference Books

1. Harvey M Dietel, " An Introduction to Operating System", Pearson Education
2. Flynn, "Understanding Operating System" , Cengage.
3. AS Tanenbaum, AS Woodhull, Operating Systems Design and Implementation, 3rd Ed., Prentice Hall, 2006.

MCA - FIRST YEAR			
Course Code	**AMCA0103N**	**L T P**	**Credit**
Course Title	**Professional Communication and Management Principles**	**3 0 0**	**2**
Course objective:			
1	The objective of the course is to ensure that the students can understand the basic features of professional communication		
2	That they can communicate effectively in a professional environment		
3	That they are equipped to appear for the International Business English Certification.		
4	They can explain functions of management in terms of planning and organizing		

Pre-requisites:

- The student should be able to communicate in basic English.

Course Contents / Syllabus

UNIT-I	**Introduction to Professional Communication**	**5 Hours**

- Communication – definition, process, levels, flow, types, and barriers
- Technical Communication and its importance

UNIT-II	**Reading and Listening Skills**	**5 Hours**

- Reading basics: Skimming, scanning, churning, assimilation
- Reading texts for note making, paraphrasing, diagrams, charts, picture reading.
- Process and types of listening
- Overcoming barriers to effective listening

UNIT- III	**Written Communication**	**10 Hours**

- Vocabulary building - word formation; etymology; root words, prefixes & suffixes; synonyms; antonyms; homophones; abbreviations; one-word substitutes
- Requisites of a good sentence
- Common errors - subject-verb agreement and concord, tenses, articles, preposition; punctuation
- Paragraph writing
- Basics of letter & email writing;
- Resume & Job application letter

UNIT IV	**Effective speaking Skills**	**10 Hours**

- Components of effective speaking
- Applied phonetics – phoneme, syllable, word accent, stress, rhythm & intonation
- Public Speaking – Kinesics, Chronemics, Proxemics
- Voice dynamics
- Presentation Skills
- Facing an Interview
- Do's & Don'ts of a GD

UNIT V	**Management & Management Practices**	**10Hours**

Meaning, Definition and Scope of Management, The process of Management, Development of Management thought, Contribution of F.W. Taylor and Henry Fayol, Hawthorne Studies,
Qualities of an Efficient Management, TQM.

Importance of Planning, Steps in Planning, Organizational Structures, Meaning and Methods of Recruitment and Selection Process, Motivation—Meaning and Theories of Motivation,
Leadership styles. Controlling Process.

Course outcome:	At the end of the course students will be able to	
CO 1	Understand the fundamentals of communication	K1
CO 2	Understand and applyreading and listening tasks for better professional competence.	K1, K4
CO 3	Write professionally in simple and correct English.	K2
CO4	Apply speaking skills in various professional situations.	K4
CO5	Understand and apply the concepts of planning and organizing.	K2,K4
Textbooks		

1. Technical Communication – Principles and Practices by Meenakshi Raman &Sangeeta Sharma, Oxford Univ. Press, 2016, New Delhi
2. Cambridge English Business Benchmark (Pre-intermediate to Intermediate), 2nd edition, Norman Whitby, Cambridge University Press, 2006, UK.
3. Technical Communication – Principles and Practices by Meenakshi Raman &Sangeeta Sharma, Oxford Univ. Press, 2016, New Delhi
4. Koontz Harold &Weihrich Heinz – Essentials of Management (Tata McGraw Hill, 5thEdition,2008)

Reference Books

1. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi.
2. Leech Geoffery.*Communicative Grammar ofEnglish.*PearsonEducation, Harlow, United Kingdom, 1994.
3. Sethi. J. Course in Phonetics and Spoken English, Prentice Hall, India Learning Private Limited; 2nd edition (1999)
4. Rebecca Corfield. *Preparing the Perfect CV*. Kogan Page Publishers, 2009.
5. Anderson, Paul V. *Technical communication*. 8th ed. Cengage Learning, 2011.
6. IELTS 11: General Training with answers. Cambridge English
7. L. M. Prasad- Principles and Practices of Management, Sultan Chand & Sons, 7th edition, 2007.
8. Principles of Management, George R. Terry & S.G. Franklin, AITBS, Delhi.

MCA - FIRST YEAR					
Course Code	**AMCA0104**	**L**	**T**	**P**	**Credit**
Course Title	**Computer System Organization**	**3**	**1**	**0**	**4**

Course objective:	**At the end of course, the student will be able to understand**	
1	The basic concepts and components of digital logic design	
2	The different methods of data representation in computers	
3	The different microoperations and data transfer methods	
4	Design, functionality and taxonomy of CPU	
5	Memory types and functionality with data transfer methods	

Pre-requisites: Students are familiar with the computer system and its basic operations.

Course Contents / Syllabus		
UNIT-I	**Introduction**	**8 hours**

Introduction: Digital Computers and Number System, Logic Gates, Boolean Algebra, Map Simplification upto five variables, Combinational Circuits, Sequential Circuits, Look ahead carry adders, Data types, Complements, Fixed point representation, Fixed Point Addition & Subtraction, floating point Representation, Booth's Multiplication, IEEE754 Floating point standards.

UNIT-II	**Register Transfer & Microoperations**	**8 hours**

Register Transfer Language, Register Transfer, Bus and Memory Transfers, Common Bus System, Two Bus Organization, Three Bus Organization, Arithmetic Microoperations, Logic Microoperations, Shift Microoperations, Arithmetic &Logic unit design.

UNIT-III	**Central Processing Unit**	**8 hours**

Microprogrammed Control Unit, Hardwired Control Unit, General register Organization, Stack Organization, Instruction types, formats, instruction cycles and sub cycles (Fetch, decode, execute etc.), execution of a complete instruction, Addressing Modes, Reduced Instruction set computer, Complex Instruction set Computer

UNIT-IV	**Memory Management**	**8 hours**

Memory Hierarchy, Main Memory (RAM and ROM chips), Auxiliary Memory, and Associative memory, Cache Memory, Memory Mapping: Associative mapping, Direct mapping, Set associative mapping. 2D and 2.5D memory organization

UNIT-V	Input/output	8 hours
I/O interface, I/O ports, Interrupts, Modes of data Transfer**:** Programmed I/O, Interrupt Initiated I/O, and Direct memory access (DMA), I/O channels and processors, Serial Communication, Standard communication interfaces. Case Study : Multicore processing, Multithreading architecture		

Courseoutcome:	**At the end of course, the student will be able**	
CO 1	To explain the number systems including computer arithmetic, logic gates, Boolean algebra, Minimization techniques etc.	K_1, K_2
CO 2	To discuss about the different binary codes and arithmetic operations.	K_1, K_4
CO 3	To elaborate about the register transfer operations andconstruction of buses by using differentdigital components.	K_3
CO 4	To analyze the functional units of the processor such as register file, arithmetic-logical unit and control unit.	K_2
CO 5	To demonstrate cache subsystem, memory mapping techniques and Input-Output subsystem and protocols for data communication.	K_2, K_4

Text Books

1. Computer System Architecture, M.Mano (PHI)
2. Computer Organization, Vravice, Zaky&Hamacher (TMH Publication)
3. Logic and Digital Design, Morris Mano and Kimi Charles 4th Edition, Prentice Hall.

Reference Books

1. Structured Computer Organization, Tannenbaum (PHI)
2. Computer Organization, Stallings (PHI)
3. Computer Organization, John P. Hayes (McGraw Hill)

MCA - FIRST YEAR					
Course Code	**AMCA0105**	**L**	**T**	**P**	**Credits**
Course Title	**Discrete Mathematics**	**3**	**0**	**0**	**3**

Course objective:

1	To develop mathematical ability in understanding mathematical reasoning, ability to perform combinatorial analysis and knowledge about discrete structures.
2	Perform operations on discrete mathematics such as sets, functions and relations.
3	Verify the correctness of an argument using symbolic logic and truth tables.
4	Solve problems using counting techniques and combinatorics.
5	To improve formal reasoning skills acquisition and mathematical knowledge

Pre-requisites: Students must be aware of basic set operations.

Course Contents / Syllabus		
UNIT-I	**Set Theory, Relations & Functions**	**8 hours**

Set Theory: Introduction, Size of sets and cardinals, Venn diagrams, Combination of sets, Multisets, Ordered pairs, Set identities and **Proofs of some general identities on sets**.
Relations & Functions: Definition, Operations on relations, Composite relations, Properties of relations, Equality of relations, Partial order relation and **Recursive definition of relation**.
Functions - Definition, Classification of functions, Operations on functions, Recursively defined functions and **Growth of Functions**.
Natural Numbers:Introduction, Piano's axioms, Mathematical Induction, Strong Induction and Induction with Nonzero Base cases.

UNIT-II	**Posets, Hasse Diagram, Lattices and Graph:**	**8 hours**

Posets, Hasse Diagram and Lattices: Introduction, Partial order sets, Combination of partial order sets, Hasse diagram, Introduction of lattices, Properties of lattices – Bounded, Complemented, Modular and Complete lattice.
Graphs: Definition and terminology, Representation of graphs, Multigraphs, Bipartite graphs, Planar graphs, Isomorphism and Homeomorphism of graphs, Euler and Hamiltonian paths, Graph coloring
Trees: Definition, Binary tree, Binary tree traversal (BFS and DFS), Binary search tree.

UNIT-III	**Algebraic Structures, Rings and Fields**	**8 hours**

Algebraic Structures: Introduction to algebraic Structures and properties. Types of algebraic structures: Semi group, Monoid, Group, Abelian group and Properties of group. Subgroup, Cyclic group, Cosets, Permutation and **Symmetric groups**, Homomorphism and Isomorphism of groups.

Rings and Fields: Definition and elementary properties of Rings and Fields.

UNIT-IV	Propositional & Predicate Logic	8 hours

Propositional & Predicate Logic: Propositions well formed formula, Truth tables, Tautology, Contradiction, Algebra of propositions, Theory of Inference and Natural Deduction.

Predicate Logic: Theory of predicates, First order predicate, Predicate formulas, quantifiers, Inference theory of predicate logic.

UNIT-V	Recurrence Relations & Combinatorics	8 hours

Recurrence Relations and Generating Function: Introduction and properties ofGeneratingFunction, Growth of functions, **Recurrences** from algorithms, Simple Recurrence relation with constant coefficients and Linear recurrence relation without constant coefficients. Methods of solving recurrences

Combinatorics: Introduction, Counting Techniques, Pigeonhole Principle, Pólya's Counting Theory.

Course outcome: At the end of course, the student will be able

CO1	Use mathematical and logical notation to define and formally reason about basic discrete structures such as Sets, Relations, Functions and Induction.	K1, K2
CO2	Apply mathematical arguments using logical connectives and quantifiers to check the validity of an argument through truth tables and propositional and predicate logic.	K1, K4
CO3	Identify and prove properties of Algebraic Structures like Groups, Rings and Fields	K3
CO4	Apply the concept of combinatorics to solve basic problems in discrete mathematics	K2
CO5	Formulate and solve recurrences and recursive functions	K2, K4

Text books

1. Discrete Mathematics and Its Applications, Kenneth H. Rosen, McGraw-Hill, 2006.

2. Discrete Mathematical Structures, B. Kolman, R. C. Busby, and S. C. Ross, Prentice Hall, 2004

Reference Books

1. Discrete and Combinatorial Mathematics, R.P. Grimaldi, Addison Wesley, 2004.

2. Discrete Mathematical Structures, Y N Singh, Wiley-India, First Edition, 2010.

MCA - FIRST YEAR					
Course Code	**AMCA0151**	**L**	**T**	**P**	**Credit**
Course Title	**C Programming Lab**	**0**	**0**	**4**	**2**

Course objective: At the end of course, the students will be able to do the following:

1	To introduce students to the basic knowledge of programming fundamentals of C language.
2	To impart writing skill of C programming to the students and solving problems.
3	To impart the concepts like looping, array, functions, pointers, file, structure.

Pre-requisites: Students are expected to be able to open command prompt window or Terminal window, edit a text file, download and install software, and understand basic programming concepts.

Course Contents / Syllabus

Introduction Programs

1. Program to explain the basic I/O Statement
2. Program to Explain the use and implementation of Data Types

Operators

1. Program to understand the use of Logical Operators
2. Program to implement Arithmetic and other Operators

Conditional Statement

1. Program to implement If..else statement
2. Program to implement nested if … else statement

Switch Statement

1. Implementation and use of Switch Statement

Basic Loop operations

1. Program to implement loops (for,while,do..while)
2. Programs to print characters(screen printing)

Arrays

1. Program for manipulation of Single Dimension Array
2. Program for illustration use and application of Multi-dimensional Array like addition, multiplication of Matrix
3. Program to implement Searching and Sorting.

Exercise 7: Functions

1. Program to illustrate the use of Functions

2. Program to implement Call by Value
3. Program to implement Call by function

Structure & Union

1. Program to show use of structure
2. Programs to show use of Union

Dynamic Memory Allocation

1. Program to make use of DMA function

File operations using command line arguments

1. Program to write and read from file
2. Program to illustrate use of File Operations
3. Program to implement Command line Arguments

Course outcome:	**At the end of course, the student will be able**
CO 1	Write the algorithm and draw a flow chart of a given problem.
CO 2	Recognize and understand the syntax and construction of C programming code.
CO 3	Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.

Text books

(1) Problem Solving and Program Design in C, 4th edition, by jeri R. Hanly and Elli B.Koffman.

(2) Programming in C by Pradip Dey, Manas Ghosh 2nd edition Oxford University Press.

(3) E.Balaguruswamy, Programming in ANSI C 5th Edition McGraw-Hill

Reference Books

(1) Brain W.Kernighan& Dennis Ritchie, C Programming Language, 2nd edition, PHI

MCA - FIRST YEAR			
Course Code	**AMCA0152**	**L T P**	**Credit**
Course Title	**Operating System Lab**	**0 0 4**	**2**

Course Objective:

Students will gain practical experience with designing and implementing concepts of operating systems such as CPU scheduling, memory management and deadlock handling using C language.

Suggested list of Experiment

Sr. No.	Name of Experiment
Introduction to Linux/Android/Windows Operating System: Directory commands, File Commands, Admin Commands, Introduction to Editor, Introduction to shell scripts.	
CPU scheduling	
1	Program to simulate different scheduling algorithms to find average turnaround time and waiting time
Memory Allocation	
2	Program to simulate the contiguous memory allocation techniques like a) Worst-fit b) Best-fit c) First-fit
Page Replacement	
3	Program to simulate the **Page Replacement Algorithms**
Deadlock	
4	Program to simulate algorithm for the purpose of deadlock avoidance

Lab Course Outcome: Upon the completion of Operating Systems practical course, the student will be able to:

CO 1	Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority.
CO 2	Implement page replacement schemes.
CO 3	Understand the concepts of deadlock in operating systems

MCA - FIRST YEAR			
Course Code	**AMCA0153N**	**L T P**	**Credit**
Course Title	**Professional Communication Lab**	**0 0 4**	**2**

Objective

- Students can converse effectively in English.
- They can face a job interview

Suggested list of Activities

	Activities	**Time**
1. Interactions Level 1:	• Greet and take leave of people • Introducing oneself and others • Conversations in different situations - * **role play** • Telephone conversations	4 hours
2. The Sounds of English – Pronunciation practice through Oral Drill	• Relationship between letters and sounds • Practice difficult consonant sounds • Practice difficult vowels and diphthongs • Learn and practice consonant clusters	6hours
3. Interactions Level 2: (Introducing the vocabulary & sentence structures of polite conversation)	• Getting someone's attention • Seeking clarifications politely • Expressing opinions, apologizing • Listening effectively	4hours
4. Stress and Tone - Pronunciation practice through Oral Drill	• Syllables and word stress • Sentence stress • Strong and weak forms of words	6 hours
5. Interactions level 3:	Handling basic interview questions	8 hours
6. *One-to-one Interview	• Emphasis on body language and voice dynamics	20 hours

[Note: *To be video recorded and graded]

	Course outcome: At the end of the course the students will be able to	Levels
CO 1	Understand the basic nuances of interpersonal and organizational communication	K2
CO 2	Enunciate individual speech sounds clearly	K3
CO 3	Express themselves effectively using appropriate vocabulary	K3
CO 4	Apply the knowledge of basic phonetics to speak more effectively and fluently	K3
CO 5	Learn interview skills with effective body language	K3

MCA - FIRST YEAR					
Course Code	**AMCA0154**	**L**	**T**	**P**	**Credits**
Course Title	**Computer Organization Lab**	**0**	**0**	**4**	**2**

Course objective: At the end of course, the students will be able to do the following:

1	Students will gain practical experience with designing and implementing concepts of gates , Multiplexer, Implement a simple instruction set computer

Pre-requisites: Students are expected to be able understand the basic concepts of computer.

Course Contents / Syllabus

1. Verification of the functionality of all logic gates.
2. Implementing HALF ADDER, FULL ADDER using basic logic gates.
3. Implementing Binary -to -Gray, Gray -to -Binary code conversions.
4. Implementing 3-8 line DECODER.
5. Implementing 4x1 and 8x1 MULTIPLEXERS.
6. Verify the excitation tables of various FLIP-FLOPS.

Perform the following experiments using Simulation:

7. Design of an 8-bit Input/ Output system with four 8-bit Internal Registers.
8. Design of an 8-bit ARITHMETIC LOGIC UNIT using simulator.
9. Design the data path of a computer from its register transfer language description.
10. Implement a simple instruction set computer with a control unit and a data path

Note: Experiment may vary or be changed as per the requirement.

Course outcome: At the end of course , the student will be able to

CO 1	Design and verify combinational circuits (adder, code converter, decoder, multiplexer) using basic gates. K1,K2
CO 2	Design and verify various flip-flops. K2,K3
CO 3	Demonstrate combinational circuit using simulator K1,K3

Text books

1. Computer System Architecture, M.Mano (PHI)

3. Logic and Digital Design, Morris Mano and Kimi Charles 4th Edition, Prentice Hall.

Reference Books

1. Structured Computer Organization, Tannenbaum (PHI)

2. Computer Organization, Stallings (PHI)

MCA- FIRST YEAR			
Course Code	**AMCANC0151**	**L T P**	**Credit**
Course Title	**Computers Concepts & Emerging Technologies**	**0 0 2**	**0**

Course Outcome (CO)	**Bloom's Knowledge Level (KL)**	
At the end of course , the student will be able to		
CO 1	Demonstratetheknowledgeofthebasicstructure,components,featuresandgenerations of computers.	K_1, K_2
CO 2	Compare and contrast features, functioning & types of operating system and computer networks.	K_4
CO 3	Demonstrate architecture, functioning & services of the Internet and basics ofmultimedia.	K_2
CO 4	Implement the working concepts of MS-Office	K_2
CO 5	Illustrate the emerging trends and technologies in the field of InformationTechnology.	K_1, K_2

DETAILED SYLLABUS

Unit I

Introduction to Computer: Definition, Computer Hardware & Computer Software

Components: Hardware – Introduction, Input devices, Output devices, Central Processing Unit Memory – Primary and Secondary Software – Introduction, Types– System and Application.

Computer Languages: Introduction, Concept of Compiler, Interpreter & Assembler

Problem solving concept: Algorithms – Introduction, Definition, Characteristics, Limitations, Conditions in pseudo-code, Loops in pseudo code.

Unit II

Operating system: Definition, Functions, Types, Classification, Elements of command based and GUI based operating system. Windows Operating System Commands

Computer Network: Overview, Standalone, Types (LAN, WAN and MAN), Data communication, topologies.

Unit III

Internet : Overview, Architecture, Functioning, Basic services like WWW, FTP, Telnet, Gopher etc., Search engines, E-mail, Web Browsers.

Internet of Things (IoT): Definition, Sensors, their types and features, Smart Cities, Industrial Internet of Things.

Unit IV

MS-Office : Basic Concepts, Features, Applications and handling of MS-Word, MS-PowerPoint and MS-Excel

Unit V

Emerging Technologies: Introduction, overview, features, limitations and application areas of Cloud Computing, Big data , Grid Computing, Artificial Intelligence and Virtual Reality

Text Books :

1. Raja Raman V., “Fundamentals of Computers”, Prentice-Hall ofIndia.
2. Norton P., “Introduction to Computers”, McGraw HillEducation.
3. Goel A., “Computer Fundamentals”,Pearson.

Reference :

1. BalagurusamyE.,“ FundamentalsofComputers”, McGraw-Hill
2. TharejaR., “FundamentalsofComputers”, OxfordUniversityPress.
3. BindraJ.,“TheTechWhisperer-onDigitalTransformationandtheTechnologiesthatEnableit”,Penguin

Links

https://www.youtube.com/watch?v=eEo_aacpwCw

https://www.youtube.com/watch?v=WJ-UaAaumNA

https://www.youtube.com/watch?v=cNwEVYkx2Kk

https://www.youtube.com/watch?v=W3yttwGE-C0

https://www.youtube.com/watch?v=yCVy5Kw0l8s

MCA - FIRST YEAR			
Course Code	**AMCA0201N**	**L T P**	**Credits**
Course Title	**Object Oriented Programming with JAVA**	**3 1 0**	**4**

Course Objectives:

1	The basic and advance concepts of OOPs programming.
2	Student will be able to implement Core Java programming.
3	Student will be able to implement Packages, Exception Handling and String Handling and its implementation
4	Able to understand Concurrency in Java and I/O Streamand its implementation
5	Able to understand GUI Programming, Generics, Collections and JDBC and their use.

Pre-requisites: Students must know at least the basics of how to use a computer, and should be able to start a command line shell.
Knowledge of basic programming concepts, as covered in 'Programming Basic" course is necessary

Course Contents / Syllabus

UNIT-I	**Introduction**	**8 HOURS**

Object Oriented Programming: Introduction and Features: Abstraction, Encapsulation, Polymorphism, and Inheritance concepts, Need of OOP's paradigm.
Modeling Concepts: Introduction,Class Diagram and Object Diagram.
Control Statements: Decision Making, Looping and Branching, Argument Passing Mechanism: Command Line Argument.

UNIT-II	**Basics of Java Programming**	**8 HOURS**

Class and Object: Object Reference, Constructor, Abstract Class,Interface and its uses, Defining Methods, Use of "this", "super", static and final keyword, Access control, modifiers, Nested class, Inner class, Anonymous inner class. Garbage Collection and finalize () Method.
Inheritance: Introduction and Types of Inheritance in Java, Constructors in Inheritance.
Polymorphism: Introduction and Types, Overloading and Overriding.
Lambda expression: Introduction and Working with Lambda Variables
Arrays: Introduction, single and multidimensional arrays

UNIT-III	**Packages, Exception Handling and String Handling**	**8 HOURS**

Packages: Introduction and Types, Access Protection in Packages, Import and Execution of Packages.
Exception Handling,Assertions and Localizations: Introduction and Types, Exceptions vs. Errors, Handling of Exception. Finally, Throws and Throw keyword, Multiple Catch Block, Nested Try and Finally Block. Assertions and Localizations Concepts and it's working, Tokenizer.
String Handling: Introduction and Types, Operations, Immutable String, Method of String class, String Buffer and StringBuilder class, Reading/Writing from console and files, Simple I/O using System. Out and the Scanner class.

UNIT-IV	**Concurrency in Java and I/O Stream**	**8 HOURS**

Threads: Introduction and Types, Creating Threads, Thread Life-Cycle, Thread Priorities, Daemon Thread, Runnable Class, Synchronizing Threads.
I/O Stream: Introduction and Types, Common I/O Stream Operations, Interaction with Console I/O and File I/O.
Annotations: Introduction, Custom Annotations and Applying Annotations with its types.

UNIT-V	**GUI Programming, Generics ,Collections and JDBC**	**8 HOURS**

GUI Programming: Introduction and Types of Swings, Abstract Window Toolkit, Components and Containers, Layout Managers and User-Defined Layout and Event Handling.
Generics and Collections: Introduction, Using Method References, Using Wrapper Class, Using Lists, Sets, Maps and Queues, Working with Generics.
Database Connectivity using JDBC: Introduction, JDBC Drivers, Select, Insert, Delete and Update

Statements and Prepared Statement Interface		
Course outcome: After completion of this course, students will be able to		
CO 1	Identify the concepts of object oriented programming and relationships among them needed inmodeling.	K2
CO 2	Demonstrate the Java programs using OOP principles with various types of classes and also implement the concepts of lambda expressions	K3
CO 3	Implement packages with different protection level resolving namespace collision and evaluate the error handling concepts for uninterrupted execution of Java program.	K3,K 5
CO 4	Implement Concurrency control, I/O Streams and Annotations concepts and its types by using Java program.	K3
CO 5	Design and develop the GUI based application, Generics, Collections and JDBC applications in Java programming language to solve the real world problem.	K6
Textbooks		
1. Herbert Schildt," Java - The Complete Reference", McGraw Hill Education 12th edition		
2. Herbert Schildt," Java: A Beginner's Guide", McGraw-Hill Education 2nd edition		
3. James Rumbaugh et. al, "Object Oriented Modeling and Design", PHI 2nd Edition		
Reference Books		
1. Cay S. Horstmann, "Core Java Volume I – Fundamentals", Prentice Hall		
2. Joshua Bloch," Effective Java", Addison Wesley		
3. E Balagurusamy, "Programming with Java A Primer", TMH, 4th edition.		
NPTEL/ YouTube/ Web Link		
Unit I https://www.youtube.com/watch?v=r59xYe3Vyks&list=PLS1QulWo1RIbfTjQvTdj8Y6yyq4R7g-Al		
Unit II https://www.youtube.com/watch?v=ZHLdVRXIuC8&list=PLS1QulWo1RIbfTjQvTdj8Y6yyq4R7g-Al&index=18		
Unit III https://www.youtube.com/watch?v=hBh_CC5y8-s		
Unit IV https://www.youtube.com/watch?v=qQVqfvs3p48		
Unit V https://www.youtube.com/watch?v=2qWPpgALJyw		

MCA - FIRST YEAR					
Course Code	**AMCA0202**	**L**	**T**	**P**	**Credits**
Course Title	**Database Management System**	**3**	**0**	**0**	**3**

Course objective: Student will Learn the

1	Features of a database system and its application and compare various types of data models.
2	Construction an ER Model for a given problem and transform it into a relation database schema
3	Formulate solution to a query problem using SQL Commands, relational algebra, tuple calculus and domain calculus.
4	The need of normalization and normalize a given relation to the desired normal form.
5	Different approaches of transaction processing and concurrency control.

Pre-requisites: Students are expected to be familiar with Data structure

Course Contents / Syllabus		
UNIT-I	**Introduction**	**8 hours**

Introduction: Overview, Database System vs File System, Database System Concept and Architecture, Data Model Schema and Instances, Data Independence and Database Language and Interfaces, Data Definitions Language, DML, Overall Database Structure. Data Modeling Using the Entity Relationship Model: ER Model Concepts, Notation for ER Diagram, Mapping Constraints, Candidate Key, Primary Key, Specialization**,** Generalization, Aggregation, Reduction of an ER Diagrams to Tables, Extended ER Model, Relationship of Higher Degree.

UNIT-II	**Relational data Model and Language**	**8 hours**

Relational Data Model Concepts, Integrity Constraints, Entity Integrity, Referential Integrity, Keys Constraints, Domain Constraints, Relational Algebra, Relational Calculus, Tuple and Domain Calculus. Introduction to SQL: Characteristics of SQL, Advantage of SQL. SQL Data Type and Literals. Types of SQL Commands. SQL Operators and their Procedure. Tables, Views and Indexes. Queries and Sub Queries Nested sub queries. Aggregate Functions. Group by, having clause ,Insert, Update and Delete Operations, Joins, Unions, Intersection, Minus, Cursors, Triggers, Procedures in SQL/PL SQL

UNIT-III	**Data Base Design & Normalization**	**8 hours**

Functional dependencies, Armstrong's inference rules,*canonical cover ,**Equivalence of Sets of Functional Dependencies*** normal forms, first, second, third normal forms, BCNF, inclusion dependence, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design

UNIT-IV	**Transaction Processing Concept**	**8 hours**

Transaction System, Transition Diagram, ACID Properties, Schedule, Testing of Serializability, Serializability of Schedules, Conflict & View Serializable Schedule, Recoverability, Recovery from Transaction Failures, Log Based Recovery, Checkpoints, Deadlock Handling. Distributed Database: Distributed Data Storage, Directory System, Failures and their classification, recovery and atomicity

UNIT-V	**Concurrency Control Techniques**	**8 hours**

Concurrency Control, Locking Techniques for Concurrency Control, Time Stamping Protocols for Concurrency Control, Validation Based Protocol, Multiple Granularity, Multi Version Schemes, Recovery with Concurrent Transaction, Concurrency Control in distributed database.

Advance Concepts: Case Study , Introduction to NOSQL

Course outcome: At the end of course, the student will be able

CO 1	Describe the features of a database system and its application and compare various types of data models.	K2
CO 2	Construct an ER Model for a given problem and transform it into a relation database schema.	K5, K6
CO 3	Formulate solution to a query problem using SQL Commands, relational algebra, tuple calculus and domain calculus.	K5, K6
CO 4	Explain the need of normalization and normalize a given relation to the desired normal form.	K2, K3
CO 5	Explain different approaches of transaction processing and concurrency control, NOSQL	K2

Text books

1. Silberschatz, H. Korth and Sudarshan S., "Database System Concepts", 6th Edition, McGraw-Hill International, 2010

2. Elmasri R. and ShamakantB.Navathe, "Fundamentals of Database Systems", 6th Edition,AddisionWesley , 2011

3. Date C J, "An Introduction To Database System", Addision Wesley

Reference Books

1. Bipin C. Desai, "An introduction to Database Systems", Galgotia Publication Pvt. Ltd. New Delhi.

2. Majumdar & Bhattacharya, "Database Management System", Tata Mcgraw-hill Education (India) Pvt. Ltd.

3. Ramakrishnan, Gehrke, "Database Management System", McGraw Hill (India) Pvt Ltd. New Delhi.

MCA - FIRST YEAR			
Subject Code	**AMCA0203N**	**L T P**	**Credits**
Subject Name	**Data Structures & Analysis of Algorithms**	**3 1 0**	**4**
Course Outcome (CO) At the end of course , the student will be able to			
CO 1	Explain the concept of data structure, abstract data types, algorithms, analysis of algorithms and basic data organization schemes such asarrays and linkedlists.		K_2
CO 2	Describe the applications of stacks and queues and implement variousoperations on them using arrays and linked lists.		K_3
CO 3	Describe the properties of graphs and trees and implement variousoperations such as searching and traversal on them.		K_3
CO 4	Compare incremental and divide-and-conquer approaches of designingalgorithms for problems such as sorting and searching.		K_4
CO 5	Apply and analyze various design approaches such as Divide-and-Conquer,greedy and dynamic for problem solving.		K_4
Unit I	**Introduction To Data Structure**		**8 Hours**
Introduction to data structure: Data, Entity, Information, Difference between Data and Information, Data type , Build in data type, Abstract data type, Definition of data structures, Types of Data Structures: Linear and Non-Linear Data Structure, Introduction to Algorithms: Definition of Algorithms, Difference between algorithm and programs, properties of algorithm, Algorithm Design Techniques, Performance Analysis of Algorithms, Complexity of various code structures, Order of Growth, Asymptotic Notations.			
Arrays: Definition, Single and Multidimensional Arrays, Representation of Arrays: Row Major Order, and Column Major Order, Derivation of Index Formulae for 1-D,2-D Array Application of arrays, Sparse Matrices and their representations.			
Linked lists: Array Implementation and Pointer Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal, Polynomial Representation and Addition Subtraction & Multiplications of Single variable.			
UNIT - II	**Stacks & Queue**		**8 Hours**
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, Iteration and Recursion- Principles of recursion, Tail recursion, Removal of recursion Problem solving using iteration and recursion with examples such as binary search, Fibonacci numbers, and Hanoi towers.			
Queues: Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues in C, Dequeue and Priority Queue.			
Searching: Concept of Searching, Sequential search, Index Sequential Search, Binary Search. Concept of Hashing & Collisionre solution Techniques used in Hashing.			
UNIT - III	**Sorting & Graph**		**8 HOURS**

Sorting: Insertion Sort, Selection Sort, Bubble Sort, Heap Sort, Comparison of Sorting Algorithms, Sortingin Linear Time: Counting Sort and Bucket Sort.
Graphs: Terminology used with Graph, Data Structure for Graph Representations: Adjacency Matrices, Adjacency List, Adjacency. Graph Traversal: Depth First Search and Breadth First Search, Connected Component.

UNIT - IV	**Tree**	**8 HOURS**

Trees: Basic terminology used with Tree, Binary Trees, Binary Tree Representation: Array Representation and Pointer (Linked List) Representation, Binary Search Tree, Complete Binary Tree, An Extended Binary Trees, Tree Traversal algorithms: Inorder, Preorder and Post order, Constructing Binary Tree from given Tree Traversal, Operation of Insertion, Deletion, Searching & Modification of data in Binary Search Tree, Threaded Binary trees, Huffman coding using Binary Tree, AVL Tree and B Tree.

UNIT - V	**Dynamic Programming**	**8 HOURS**

Divide and Conquer with Examples Such as Merge Sort, Quick Sort, Matrix Multiplication: Strassen's Algorithm

Dynamic Programming: Dijikstra Algorithm, Bellman Ford Algorithm, All- pair Shortest Path: Warshal Algorithm, Longest Common Sub-sequence, Greedy Programming: Prims and Kruskal algorithm.

Text Books

1. Cormen T. H., Leiserson C. E., RivestR. L., and Stein C., "Introduction to Algorithms", PHI, Third Edition August 2009.
2. Horowitz Ellis, SahniSartaj and Rajasekharan S., "Fundamentals of Computer Algorithms", 2nd Edition, Universities Press, Third Edition 2010.
3. DaveP.H.,H.B.Dave,"DesignandAnalysisofAlgorithms",2NDEdition 2012,PearsonEducation.

Reference

1. LipschutzDataStructuresWithC-SIE-SOS,McGrawHill, 2ndEdition 2012
2. SamantaD. "ClassicDataStructures",2ndEditionPrenticeHall India.
3. Sridhar S., "Design and Analysis of Algorithms", Oxford Univ.Press.2ndEdition 15 December 2014
4. Aho, Ullman and Hopcroft, "Design and Analysis of algorithms", PearsonEducation.3rd Edition. Levitin. 2012
5. R. Neapolitan and K. Naimipour, "Foundations of Algorithms", 4th edition, Jones an Bartlett Studentedition.

MCA - FIRST YEAR			
Course Code	**AMCA0205**	**L T P**	**Credits**
Course Title	**Design Thinking**	**3 0 0**	**3**

Course Objectives:

1	To introduce students with the design process as a tool for breakthrough innovation.
2	To help students develop into professionals with good interpersonal and presentation skills
3	To help students becoming efficient team players with potent leadership skills
4	To participate and lead teams in order to collaborate and create innovative ideas and solutions
5	To apply design thinking skills for understanding the assumptions and claims that frame the idea

Pre-requisites: None

Course Contents / Syllabus

UNIT-I	**Introduction**	**8 HOURS**

Introduction to design thinking, traditional problem solving versus design thinking, history of design thinking, wicked problems. Innovation and creativity, the role of innovation and creativity in organizations, creativity in teams and their environments, creativity to innovation, design mindset. Introduction to elements and principles of design. Arcturus IV case study, individual activity on identifying an opportunity in different scenarios.

UNIT-II	**Ethical Values and Empathy**	**8 HOURS**

Understanding humans as a combination of I (self) and body, basic physical needs up to actualization, prosperity, the gap between desires and actualization. Understanding culture in family, society, institution, startup, socialization process. Ethical behavior: effects on self, society, understanding core values and feelings, negative sentiments and how to overcome them, definite human conduct: universal human goal, developing human consciousness in values, policy, and character. Understand stakeholders, techniques to empathize, identify key user problems. Empathy tools- Interviews, empathy maps, emotional mapping, immersion and observations, customer journey maps, and brainstorming. Individual activity- 'Moccasin walk', scenario-based role-play activities using empathy mapping.

UNIT-III	**Problem Statement and Ideation**	**10 HOURS**

Defining the problem statement, synthesis frameworks, creating personas, Point of View (POV) statements. Research- identifying drivers, information gathering, target groups, samples, and feedbacks. Idea Generation-basic design directions, Themes of Thinking, inspirations and references, brainstorming, value, inclusion, sketching and presenting ideas, idea evaluation, double diamond approach, analyze – four W's, 5 why's, "How Might We", Conflict of Interest and Six Thinking Hats. Case study /Group activities - making right personas and defining the key problem, ideation activity games - six thinking hats, million-dollar idea

UNIT-IV	**Critical Thinking**	**6 HOURS**

Fundamental concepts of critical thinking, the difference between critical and ordinary thinking, characteristics of critical thinkers, critical thinking skills- linking ideas, structuring arguments,

recognizing incongruences, five pillars of critical thinking, argumentation versus rhetoric, cognitive bias, tribalism, and politics. Case study on applying critical thinking on different scenarios.

UNIT-V	**Logic and Argumentation**	**8 HOURS**

The argument, claim, and statement, identifying premises and conclusion, truth and logic conditions, valid/invalid arguments, strong/weak arguments, deductive argument, argument diagrams, logical reasoning, scientific reasoning, logical fallacies, propositional logic, probability, and judgment, obstacles to critical thinking. Group activity/role plays on evaluating arguments

Course outcome: After completion of this course, students will be able to

CO 1	Develop a strong understanding of the design process and how it can be applied in a variety of business settings	K1
CO 2	Understand and analyze self, culture and exhibit ethical behavior	K1,K2
CO 3	Use empathy tools for target segment from different cultures by understanding their unique needs	K2
CO 4	Generate innovative ideas and define specific problem statement to lead nurturing	K1,K2
CO 5	Demonstrate an enhanced ability to apply design thinking skills for evaluation of claims and arguments	K2,K3

Textbooks

2. 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization by Vijay Kumar
3. This is Service Design Thinking: Basics, Tools, Cases by Marc Stickdorn and Jakob Schneider
4. Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation by Tim Brown
5. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
6. BP Banerjee, 2005, Foundations of Ethics and Management, Excel Books.

Reference Books

2. How to kill creativity by Amabile, T.
3. The era of open innovation by Chesbrough, H.
4. A Foundation Course in Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, 2009
5. Foundations of Ethics and Management, BP Banerjee, 2005, Excel Books.
6. Mindware: Tools for Smart Thinking, Richard E. Nisbett, 2016, Doubleday publisher, Canada
7. Fundamentals of Ethics for Scientists & Engineers by E G Seebauer& Robert L. Berry, 2000, Oxford University Press
8. Universal Principles of Design by William Lidwell, Kritina Holden, Jill Butler
9. The Art of Empathy: A Complete Guide to life's most essential skill - Karla McLaren
10. Basics Design 08: Design Thinking 0th Edition by Gavin Ambrose, Paul Harris.
11. Design Thinking: Business Innovation by MaurícioVianna, YsmarVianna, Isabel K. Adler, Brenda Lucena, Beatriz Russo.
12. Design of Business: Why Design Thinking is the Next Competitive Advantage by Roger L. Martin.

NPTEL/ YouTube/ Web Link
Unit I https://nptel.ac.in/courses/110/106/110106124/ https://nptel.ac.in/courses/109/104/109104109/ https://designthinking.ideo.com/ https://www.invisionapp.com/inside-design/what-is-design-thinking/ https://blog.hypeinnovation.com/an-introduction-to-design-thinking-for-innovation-managers https://www.creativityatwork.com/design-thinking-strategy-for-innovation/ https://www.youtube.com/watch?v=GFffb2H-gK0
Unit II https://aktu.ac.in/hvpe/ http://aktu.uhv.org.in/ https://nptel.ac.in/courses/110/106/110106124/ https://swayam.gov.in/nd1_noc19_mg60/preview
Unit III https://nptel.ac.in/courses/110/106/110106124/ https://swayam.gov.in/nd1_noc19_mg60/preview https://www.udemy.com/course/design-thinking-for-beginners/ https://www.designthinking-methods.com/en/ https://www.youtube.com/watch?v=GNvLpfXCge8 https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them
Unit IV https://en.wikipedia.org/wiki/Critical_thinking https://www.forbes.com/sites/sap/2016/08/25/innovation-with-design-thinking-demands-critical-thinking/#340511486908 https://www.criticalthinking.org/pages/defining-critical-thinking/766
Unit V https://www.udemy.com/course/critical-thinker-academy/ https://swayam.gov.in/nd2_aic19_ma06/preview

MCA - FIRST YEAR

Course Code	AMCA0251N	L T P	Credits
Course Title	Object Oriented Programming with JAVA Lab	0 0 2	2

Course objectives: The course enable the students to:

1	To familiarize with Java IDE and basic programs.	K1
2	To introduce the Operator, arrays programs and oops concepts.	K2
3	Able to know packages, exception handling and string handling program of java.	K3
4	To understand the concurrency in Java and I/O Stream.	K4
5	To familiar with the concept of Swings, Generics, Collections and JDBC.	K5

Pre-requisites: Students are expected to be able to open command prompt window or terminal window, edit a text file, download and install software, and understand basic programming concepts.

List of Experiments

S.No.	Name of Experiment
1.	Write a JAVA program to display default value of all primitive data type of JAVA
2.	Write a JAVA program to implement class mechanism. – Create a class, methods and invoke them inside main method.
3.	Write a JAVA program to implement constructor and constructor overloading.
4.	Write a JAVA program implement method overloading and method overriding.
5.	Write a JAVA program to implement Single Inheritance and multi-level inheritance.
6.	Write a JAVA program to implement Interface. What kind of Inheritance can be achieved?
7.	Write a JAVA program that describes exception handling mechanism.
8.	Write a JAVA program Illustrating Multiple catch clauses.
9.	Write a Java program for handling mouse & key events.
10.	Program a program in Java (a) that prints prime numbers between 1 to n. Number n should be accepted as command line input, (b) for getting address and name of the computer.
11.	Write a JDBC program to select the all record in the table.
12.	Write a Java program to insert the multiple records in a table by using Prepared Statement.
13.	Write a Java program using thread.
14.	Program for calling a method using class instance, and create a class fruit with the following attributes: • Name of the fruit

	• Single fruit or bunch fruit • Price Define a suitable constructor and display Fruit () method that displays values of all the attributes. Write a program that creates 2 objects of fruit class and display their attributes.
15.	Program to sort the elements of an array in ascending order.

Course outcomes: After completing this course student will be able to:

CO 1	To understand how to design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.	K1, K5
CO 2	To identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem	K2, K5
CO 3	To demonstrate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.	K3, K4
CO4	To demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.	K4
CO5	To Demonstrate the event handling process in GUI and JDBC based application in Java Programming language.	K5

Text books:

(1.) Java; the complete reference, 7th edition, Herbert Scheldt, TMH.

(2.) Understanding OOP with Java, updated edition, T. Budd, Pearson education.

(3.) An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John Wiley & sons.

References:

1. An Introduction to OOP, third edition, T. Budd, Pearson education
2. Introduction to Java programming, Y. Daniel Liang, Pearson education.
3. An introduction to Java programming and object-oriented application development, R.A. Johnson-Thomson.

MCA - FIRST YEAR			
Course Code	**AMCA0252**	**L T P**	**Credit**
Course Title	**Database Lab**	**0 0 4**	**2**

Course Objectives:

The student should be made to:

- Learn to create and use a database
- Be familiarized with a query language
- Have hands on experience on DDL Commands
- Have a good understanding of DML Commands and DCL commands
- Familiarize advanced SQL queries and PL/SQL

Suggested list of Experiment

Sr. No.	**Name of Experiment**
SQL Commands:	
1	Creation of a database and writing SQL queries to retrieve information from the database.
2	Performing Insertion, Deletion, Modifying, Altering, Updating and Viewing records based on conditions.
3	Creating an Employee database to set various constraints.
4	Creating relationship between the databases.
5	Creation of Views, Synonyms, Sequence, Indexes, save point
PL/SQL :	
6	Write a PL/SQL block to satisfy some conditions by accepting input from the user.
7	Creation of Procedures.
8	Creation of database triggers and functions
Basics of NoSQL:	
9	Introduction to NoSQL
10	Connectivity with Database

Lab Course Outcome: Upon the completion course, the student will be able to:

CO 1	Design and implement a database schema for a given problem-domain	K1, K5
CO 2	Implement the database connectivity with application	K2
CO 3	Create and maintain tables using PL/SQL and Design the model of given problem using NoSQL	K3 , K4

Text Book/ References

1. Ivan Bayross,"SQL, PL/SQL the Programming Language of Oracle" 4th Edition, , BPB publication

2. Silberschatz, H. Korth and Sudarshan S., "Database System Concepts", 6th Edition, McGraw-Hill International, 2010

3. Elmasri R. and ShamakantB.Navathe, "Fundamentals of Database Systems", 6th Edition,AddisionWesley , 2011

4. Date C J, "An Introduction To Database System", Addision Wesley

MCA - FIRST YEAR			
Course Code	**AMCA0253N**	**L T P**	**Credits**
Course Title	**Data Structure Lab**	**0 0 4**	**2**

Course objectives: The course enables the students:

1	To familiarize with Turbo C editor, simple programs and array processing programs.
2	To introduce the like stacks, queue, linked lists, trees, sparse matrices, graphs using various strategies involving use of arrays in programs.
3	To familiar with the various states of data structures.
4	To understand the time taken &draw graphs of performance and critically comment on the observations.
5	To know efficient sorting and searching programs.

Pre-requisites: Students are expected to be able to open command prompt window or terminal window, edit a text file, download and install software, and understand basic programming concepts.

List of Experiments

Sorting

1. Sorting Algorithms-Non-Recursive.
2. Sorting Algorithms-Recursive.

Searching

3. Searching Algorithm.

Stacks implementation

4. Implementation of Stack using Array.

Queue Implementation

5. Implementation of Queue using Array.
6. Implementation of Circular Queue using Array.
7. Implementation of Stack and Queues using Linked List.

Tree and Binary Tree

8. Implementation of Tree Structures, Binary Tree, Tree Traversal, Binary Search Tree, Insertion and Deletion inBST.

Graph Implementation

9. Graph Implementation, BFS, DFS, Minimum cost spanning tree, shortest path algorithm

File Handling

10. File Handling using Structure and File handling concepts

Note: Experiment may vary or be changed as per the requirement.

Course outcomes: After completing this course student will be able to:

CO 1	Implement C programs for solving mathematical problems, array processing problems, taking care of all input, output possibilities and error conditions.	K4
CO 2	Implement various data structures like stacks, queue, linked lists, trees, sparse matrices, graphs using various strategies involving use of arrays, and DMA	K2, K5
CO 3	Draw visual representations of various states of data structures.	K1
CO 4	Measure the time taken by a program practically, draw graphs of performance and critically comment on the observations.	K3
CO 5	Write efficient sorting and searching programs.	K4

Text books / References:

(1.)Y. Langsam, M. Augenstin and A. Tannenbaum, Data Structures using C and C++, Pearson Education Asia, 2nd Edition,2002.

(2.) Ellis Horowitz, S. Sahni, D. Mehta Fundamentals of Data Structures in C++, Galgotia Book Source, New Delhi.

(3.) Timothy A. Budd, ―Exploring Python‖, Mc-Graw Hill Education (India) Private Ltd.,2015.

(4.) S. Lipschutz, Data Structures Mc-Graw Hill International Editions,1986.

(5.) Jean-Paul Tremblay, Paul. G. Soresan, An introduction to data structures with Applications, Tata Mc-Graw Hill International Editions, 2nd edition1984.

(6.) A. Michael Berman, Data structures via C++, Oxford University Press,2002

(7.)M.Weiss,DataStructuresandAlgorithmAnalysisinC++,PearsonEducation,2002,2nd editio n

MCA - FIRST YEAR			
Course Code	**AMCANC0201**	**L P T**	**Credit**
Course Title	**Cyber Security**	**2 0 0**	**0**

Course objective:

1	Achieve knowledge about Security of Information system and Risk factors.
2	Able to examine security threats and vulnerability in various scenarios.
3	Incorporate the design methodology for system security and web security.
4	Understand concept of cryptography and encryption technique to protect the data from cyber attack
5	Able to design policy and strategy which diminish crimes in this domain and provide protection for software and hardware.

Pre-requisites: Basics recognition in the domain of Computer Science, Concept of network and operating system

Course Contents / Syllabus

UNIT-I	**INTRODUCTION**	**8 hours**

Introduction to Information Systems: Types of Information Systems, Development of Information Systems, Need for Information Security, Threats to Information Systems, Information Assurance, Guidelines for secure password and wi-fi security and social media and Windows security Cyber Security, and Security Risk Analysis, Risk Management

UNIT-II	**APPLICATION LAYER SECURITY**	**8 hours**

Data Security Considerations-Backups, Archival Storage and Disposal of Data, Security Technology-Firewall and VPNs, Intrusion Detection, Access Control, Security Threats -Viruses, Worms, Trojan Horse, Bombs, Trapdoors, Spoofs, E-mail Viruses, Macro Viruses, Malicious Software, Network and Denial of Services Attack, Security ,Threats to E-Commerce: Electronic Payment System, e-Cash, Issues with Credit/Debit Cards.

UNIT-III	**SECURE SYSTEM DEVELOPMENT**	**8 hours**

Application Development Security, Architecture &Design ,Security Issues in Hardware: Data Storage & Downloadable Devices,mobile protection ,Security threats involving in Social Media, Physical Security of IT Assets, Access Control, CCTV and Intrusion Detection Systems, Backup Security Measures

UNIT-IV	**CRYPTOGRAPHY**	**8 hours**

Public key Cryptography, Digital signature, Public key distribution ,Real world protocols: Basic terminologies, Email security certificates, Transport Layer security, IP security, DNS security

UNIT-V	**SECURITY POLICY**	**8 hours**

Policy design Task, WWW Policies, Email based Policies, Policy Revaluation Process-Corporate Policies-Sample Security Policies, Publishing and Notification Requirement of the updated and new Policies. Evolving Technology Security – Mobile, Cloud, and Security in supply chain management

Course outcome: At the end of course, the student will be able to

CO 1	Analyze and evaluate the cyber security needs of an organization.	K_1, K_2
CO 2	Determine and analyze software vulnerabilities and security solutions.	K_3

CO 3	Comprehend IT Assets security (hardware and Software) and performance indicators	K_2
CO 4	Measure the performance and encoding strategies of security systems.	K_3
CO 5	Design operational a cyber security methods and policies to enhance current scenario security.	K_3, K_6

Text books
Charles P. Pfleeger, Shari LawerancePfleeger, "Analysing Computer Security", Pearson Education India
V.K.Pachghare, "Cryptography and information Security", PHI Learning Private Limited, Delhi India
Sarika Gupta & Gaurav Gupta, Information Security and Cyber Laws, Khanna Publishing House
Michael E.Whitman and Herbert J Mattord "Principle of Information Security" Cengage
Reference Books
Schou, Shoemaker, "Information Assurance for the Enterprise", Tata McGraw Hill.
Chander, Harish," Cyber Laws And It Protection " , PHI Learning Private Limited ,Delhi
V.K. Jain, Cryptography and Network Security, Khanna Publishing House, Delhi
William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall, 4th edition, 2010
E-books& E-Contents:
https://prutor.ai/welcome/
https://crypto.stanford.edu/cs155old/cs155-spring11/lectures/03-ctrl-hijack.pdf
https://cybermap.kaspersky.com/stats
https://www.fireeye.com/cyber-map/threat-map.html
Reference Links
https://crypto.stanford.edu/cs155old/cs155-spring11/lectures/03-ctrl-hijack.pdf
https://cs155.stanford.edu/lectures/03-isolation.pdf
http://uru.ac.in/uruonlinelibrary/Cyber_Security/Cryptography_and_Network_Security.pdf
https://www.youtube.com/watch?v=_9QayISruzo

MCA - FIRST YEAR					
Course Code	**AMCA0213**	**L**	**T**	**P**	**Credits**
Course Title	**Computer Networks**	**3**	**0**	**0**	**3**

Course objective: Student will understand the

1	Configure switches and end devices to provide access to local and remote network resources.
2	The physical and data link layer protocols support the operation of Ethernet in a switched network.
3	Configure routers to enable end-to-end connectivity between remote devices.
4	IPv4 and IPv6 addressing schemes and verifies network connectivity between devices.
5	how the upper layers of the OSI model support network applications.Configure a small network with security best practices. Troubleshoot connectivity in a small network

Pre-requisites: Students are expected to be familiar with computer basics.

Course Contents / Syllabus		
UNIT-I	**Introduction**	**8 hours**

Introduction-Basic Concepts of Computer Network**,** Globally Connected LANs, WANs, and the Internet, The Network as a Platform, The Changing Network Environment. Configuring a Network Operating System - Introduction to Cisco IOS, IOS Bootcamp , Console Access Method , IOS Command Structure,

UNIT-II	**Network Protocols and Communications**	**8 hours**

Rules of Communication, Network Protocols and Standards, Moving Data in the Network, **Network Access-** Physical Layer Protocols, Network Media- Copper Cabling, UTP Cabling, Fiber Optic Cabling, Wireless Media, Data Link Layer Protocols, Media Access Control

UNIT-III	**Ethernet**	**8 hours**

Ethernet Protocol, Ethernet Frame Attributes, Ethernet MAC, Address Resolution Protocol-ARP, LAN Switches

Network Layer- Network Layer Protocols, Routing, Routers, Configuring a Cisco Router.

UNIT-IV	**Transportation Layer**	**8 hours**

Transport Layer Protocols, TCP and UDP IP

Addressing- IPv4 Network Addresses, Types of IPv4 Addresses, IPv4 Subnet Mask, IPv6 Network Addresses.

UNIT-V	Sub netting IP Networks	8 hours	
Subnetting an IPv4 Network, Addressing Schemes, Subnetting an IPv6 Network Application Layer- Application Layer Protocols, Application Layer Protocols and Services,Build a Small Network			
Course outcome: At the end of course, the student will be able			
CO 1	To configure switches and end devices to provide access to local and remote network resources.		K_1, K_2
CO 2	To explain how physical and data link layer protocols support the operation of Ethernet in a switched network.		K_1, K_4
CO 3	To configure routers to enable end-to-end connectivity between remote devices.		K_3
CO 4	To create IPv4 and IPv6 addressing schemes and verifies network connectivity between devices.		K_2
CO 5	To explain how the upper layers of the OSI model support network applications.Configure a small network with security best practices. Troubleshoot connectivity in a small network.		K_2, K_4
Reference Link: -			
https://www.netacad.com/			

MCA – First Year			
Course Code	**AMCA0214**	**L T P**	**Credits**
Course Title	**Fundamentals of Digital Marketing and Analytics**	**3 0 0**	**3**

Course objective:

1	To help students understand digital marketing practices, inclination of digital consumers and role of content marketing.
2	To provide understanding of the concept of E-commerce and developing marketing strategies in the virtual world
3	To impart learning on various digital channels and how to acquire and engage consumers online.
4	To provide insights on building organizational competency by way of digital marketing practices and cost considerations.
5	To develop understanding of the latest digital practices for marketing and promotion.

Pre-requisites: Creative thinking and which is being used by the creative talent in your business areas.

Course Contents / Syllabus		
UNIT-I	**Foundation Data Everywhere**	**8 hours**

Introducing data analytics and thinking - use data analytics and the tools of their trade to inform those decisions.All about analytical thinking- these roles and the key skills used by analysts. The wonderful world of data- how the data life cycle and data analysts' work both relate to your progress through this program

UNIT-II	**Make Data Driven Decision**	**9 hours**

Make Data Driven Decision Set up your toolbox: - spreadsheets, query languages, and data visualization tools. Endless career possibilities - data analysts, data analyst certificate. Effective questions- common analysis challenges and how analysts address them, guide your analysis

UNIT-III	**Data-driven decisions and spreadsheets**	**8 hours**

Data-driven decisions and spreadsheets - data of all kinds and its impact on real-life choices and strategies, reports and dashboards. Spreadsheet basics- data analysts use, spreadsheets work, structured thinking, analysts understand problems, problems solutions.

UNIT-IV	**Prepare Data for Exploration and Stakeholder**	**7 hours**

Prepare Data for Exploration and Stakeholder - data analysts, balance needs and expectations, managing stakeholder expectations, communication with your team. Data types and structures- generate data, Collection of data, analysis for data, Bias, credibility, privacy, ethics, and access- data analysts work, data is unbiased and credible, different types of bias in data, importance of data ethics and data privacy.

UNIT-V	**Organizing and protecting your data**	**8 hours**

Organizing and protecting your data Databases: Where data lives-databases, access them and extract, filter, and sort the data, metadata and its different types and how analysts use them. Organizing and protecting your data- organizing data and keeping it secure, analysts use file naming conventions. Engaging in the data community- how to manage your online presence, benefits of networking with other data analytics professionals.

Course outcome: At the end of course, the student will be able

CO1	It will develop proficiency in interpreting marketing strategies in the digital age and provide fundamental knowledge for working in an	K1, K2

	online team.	
CO2	It will enable them to develop various online marketing strategies for various marketing-mix measures.	K1, K4
CO3	It will guide them to use various digital marketing channels for consumer acquisition and engagement.	K3
CO4	It will help in evaluating the productivity of digital marketing channels for business success.	K2
CO5	It will prepare candidates for global exposure of digital marketing practices to make them employable in a high growth industry	K2, K4

Text books

1. Vandana, Ahuja; Digital Marketing, Oxford University Press India (November, 2015).

2. Eric Greenberg, and Kates, Alexander; Strategic Digital Marketing: Top Digital Experts Share the Formula for Tangible Returns on Your Marketing Investment; McGraw-Hill Professional (October, 2013).

3. David Whiteley; E-Commerce: Strategy, Technologies and Applications, McGraw Hill Education

Reference Books

1. Menon, Arpita; Media Planning and Buying; McGraw Hill (1st Edition, 2010)

2. Arnold, George; Media Writer's Handbook: A Guide to Common Writing and Editing Problems; McGraw-Hill Education; (5thedition, 2008)

3. Ryan, Damian; Understanding Digital Marketing: marketing strategies for engaging the digital generation; Kogan Page (3rd Edition, 2014).

MCA – First Year			
Course Code	**AMCA0215**	**L T P**	**Credits**
Course Title	**Fundamentals of Digital Marketing and Optimization**	**3 0 0**	**3**
Course Objectives:			
1	To introduce students to Understand how digital and social media have disrupted the way businesses sell to consumers.		
2	To help students to Recognize how marketers use the customer journey model to influence purchase decisions on digital platforms using digital content and tools.		
3	To help students to Appreciate the benefits of integrating traditional and digital marketing with the advantages of inbound and outbound marketing strategies.		
4	To Identify the benefits and advantages to a business of using social media to engage an audience.		
5	To Build, manage, and sustain an active social media community.		
Pre-requisites: Basic Marketing Concepts, Basic Knowledge of Computers			
Course Contents / Syllabus			
UNIT-I	**Social Media and Digital Marketing Fundamental**		**8 HOURS**
Digital Marketing Landscape: Digital Consumer Behavior, The Digital Customer Journey, The Digital Opportunity, Digital and Your Organization, Business Growth and Digital. Digital Marketing Principles: Key Digital Marketing Concepts, Traditional and Digital Marketing, 3i Principles, Integrating Traditional and Digital Marketing, Tools for Digital Marketing.			
UNIT-II	**Social Media and Social Content Strategy**		**8 HOURS**
Content Marketing for Social: Content Marketing, Content Types, Social Media Platforms, Content Creation Tools, Influencer Marketing, eBook and Whitepapers **Social Media and Business Strategy: Social Media Platforms, Key Concepts of Social Media, Types and Primary Uses of Social Media Platforms, Benefits of Social Media to Business, Role of Social Media ,Social Media Platforms for Business: Social Media Marketing Concepts, Key Social Media Platforms, Setting up Social on Key Platforms, The Value of Building a Social Media Community**			
UNIT-III	Social Content Strategy and Promotion		**8 HOURS**
Social Content Strategy: Content Seeding, Social Media Formats, Content Promotion, Content Optimization, Influencer Marketing, Word of Mouth Marketing, Measurement and Tracking, Content Promotion Strategy, Audience Segmentation **Facebook Marketing Fundamentals: Introduction to Facebook, The Value to Marketers, Page Management, Facebook Live, Messenger** **Facebook Ads and Marketing: Facebook Ads, Ads Manager, Strategy Process, Buying Channels and Ad Auctions**			
UNIT-IV	**Instagram and Snapchat Marketing**		**8 HOURS**
Instagram and Snapchat - Social Apps: Introduction to Social Apps, Differentiating Social Apps, Basic Features, Instagram: Video, stories, live, Instagram Posts, Snapchat Meanings, Snapchat Story, Basic Features **Instagram and Snapchat Marketing: Instagram Account Overview, Audience Development, Advertising Overview, 3V Advertising, Ads Manager, SnapAds, Instagram Analysis, Snapchat Analysis, Campaign Setup, Snapchat Geofilters**			
UNIT-V	**Twitter LinkedIn and YouTube Marketing**		**8 HOURS**

Twitter Marketing: Twitter Concepts, Platform Features, Profile Promotion and management, Hashtags, Analysis and Reporting.
LinkedIn and Social Selling: Social Selling and Personal Branding, The Benefits of Personal Branding, LinkedIn Concepts, Features and Functions, LinkedIn Social Plugins, LinkedIn Analytics.
YouTube and Social Video Marketing: Misconceptions and Benefits, Platform Features, Channel Setup, Channel Promotion, Channel Management, YouTube Native Formats.

Course outcome: After completion of this course, students will be able to

CO 1	Understand important concepts of digital and social media.	K1
CO 2	Understand to Recognize how marketers use the customer journey model to influence purchase decisions on digital platforms.	K1
CO 3	Understandthe benefits of integrating traditional and digital marketing.	K1,K2
CO 4	Understandthe benefits and advantages to a business of using social media to engage an audience.	K2
CO 5	Understand the use of an active social media community.	K2

Textbooks

1) **Digital Marketing for Dummies, Author: Ryan Deiss& Russ Henneberry, Publisher: John Wiley & Sons, Inc**
2) **Youtility, Author: Jay Baer, Publisher: Gildan Media, LLC**
3) **Epic Content Marketing, Author: Joe Pulizzi, Publication: McGraw Hill Education**

Reference Books

1) **New Rules of Marketing and PR, Author: David Meerman Scott, Latest Edition: 6th Edition, Publication: John Wiley & Sons**
2) **Social Media Marketing All-in-one Dummies, Author: Jan Zimmerman, Deborah Ng, and Latest Edition: 4th Edition, Publication: John Wiley & Sons Inc.,**

NPTEL/ YouTube/ Web Link

Unit I
- **https://www.coursera.org/learn/social-media-digital-marketing-fundamentals**

Unit II
- **https://www.coursera.org/learn/social-media-social-content-strategy**

Unit III
- **https://www.coursera.org/learn/facebook-instagram-snapchat-marketing**

Unit IV
- **https://www.coursera.org/learn/facebook-instagram-snapchat-marketing**

Unit V
- **https://www.coursera.org/learn/twitter-linkedin-youtube-marketing**

MCA –First Year					
Course Code	**AMCA0216**	**L**	**T**	**P**	**Credits**
Course Title	**CRM Administration**	**3**	**0**	**0**	**3**

Course objective:

1	Understand the working concept of Trailhead
2	Understand the importance of Salesforce
3	Familiarize with concepts of Data Modelling
4	Will Have insight of User Management
5	Get knowledge of Security Concepts

Pre-requisites: Creative thinking and which is being used by the creative talent in your business areas.

Course Contents / Syllabus		
UNIT-I	**Trailhead and Trailblazer Community**	**8 hours**
TrailMix-1 : Trailhead and Trailblazer Community, Impacts of the fourth Industrial Revolution, Trailhead Playground Management,		
UNIT-2	**Salesforce Platform Basic**	**8 hours**
Salesforce Platform Basic, Salesforce User Basic, Lightening Experience User Basic, Lightening Experience Basics		
UNIT-3	**Data Modelling**	**8 hours**
Trail Mix -2 :Data Modelling , Formulas and Validations, Picklist Administration, AppExchange Basic Data Management		
UNIT-4	**Lightening Experience Customization**	**8 hours**
TrailMix-3 : Lightening Experience Customization, Salesforce Mobile App Basics, User Management		
UNIT 5	**Data Security**	**8 hours**
Data Security, Salesforce Mobile App Customization, Security specialist		

Course Outcome: At the end of course , the student will be able to:

CO1	Understand the working of Trailhead	K1,K2
CO2	Describe the importance of Salesforce and its features	K1,K2
CO3	Implement the validations	K3
CO4	Understand the concept and importance of user management	K1,K2
CO5	Identify and implement Security concepts in Industry	K1,K3

Text Books:

1. Alok Kumar Rai : Customer Relationship Management : Concepts and Cases(Second Edition), PHI Learning, 2018
2. Bhasin- Customer Relationship Management (Wiley Dreamtech) ,2019

3. Salesforce for beginners by ShaarifSahaalane book by Amazon (Online edition)
Reference :
1. Salesfore Essentials for Administrators , By ShrivasthavaMohith, Edition Ist ,2018
2. Salesforce : A quick Study laminated Reference Guide by Christopher Mathew Spencer eBook by Amazon (Online)
3. Mastering Salesforce CRM Administration By Gupta Rakesh Edition IInd 2018
Online Link :
www. Trailhead.salesforce.com
www.mindmajix.com/salesforce-tutorial
www,youtube.com/watch?v=7K42geizQCI

MCA – First Year					
Course Code	**AMCA0217**	**L**	**T**	**P**	**Credits**
Course Title	**CRM Development**	**3**	**0**	**0**	**3**

Course objective:

1	Understand the working concept of Trailhead
2	Understand the importance of Quality Administration
3	Familiarize with concepts of Data Modelling
4	Will Have insight of User Management
5	Implement Data Model and Quality Check

Pre-requisites: Creative thinking and which is being used by the creative talent in your business areas.

Course Contents / Syllabus		
UNIT 1	**Salesforce Platform Basic**	**8 Hours**

Trailhead and Trailblazer Community, Salesforce Platform Basic, Platform Development Basic

UNIT 2	**Quality Administration**	**8 Hours**

Picklist Administration: Get Started with Picklist, manage your picklist values, share values with global set, Duplicate Management: Improve Data Quality, Resolve and Prevent Duplicate Data

UNIT 3	**Data Modelling**	**8 Hours**

Data Modelling and its basic concepts, Understanding Custom Objects, Create Object Relationship, Work with Schema Builder

UNIT 4	**Formulas and Validations**	**8 Hours**

Formulas and Validations: Use formula Fields, Implement Roll-up Summary Fields, Create Validation Rules

UNIT 5	**Implementation of Data Model and Data Quality**	**8 Hours**

Build a Data Model for a Travel Approval App,Improve Data Quality for a Recruiting App,Customize a Salesforce ObjectCustomize the User Interface for a Recruiting App,Automate Business Processes for a Recruiting App

Course Outcome: At the end of course , the student will be able to:

CO1	Understand the working of Trailhead	K1,K2
CO2	Describe the importance of Quality Administration	K1,K2
CO3	Implement the Formulas and validations	K3
CO4	Understand the concept and importance of user management	K1,K2
CO5	Implement Data Model and Quality in industry	K1,K3

Text Books:

1. Alok Kumar Rai : Customer Relationship Management : Concepts and Cases(Second Edition), PHI Learning, 2018
2. Bhasin- Customer Relationship Management (Wiley Dreamtech) ,2019
3. Salesforce for beginners by ShaarifSahaalane book by Amazon (Online edition)
Reference :
1. Salesforce : A quick Study laminated Reference Guide by Christopher Mathew Spencer eBook by Amazon(Online)
2. Salesforce Platform Developer By Vandevelde Jain Edition Ist 2016
3. Learning Salesforce Development By Paul Battisson Online(EBook)
Online Link :
www. Trailhead.salesforce.com
www.mindmajix.com/salesforce-tutorial
www,youtube.com/watch?v=7K42geizQCI