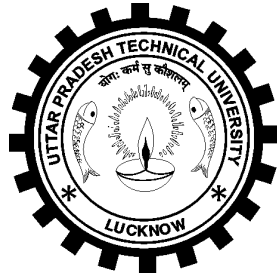# U.P. TECHNICAL UNIVERSITY LUCKNOW

Syllabus

[Effective from the Session : 2008-09]

MASTER OF COMPUTER APPLICATIONS
1st Year (I and II Semester)

U P TECHNICAL UNIVERSITY, LUCKNOW

STUDY AND EVALUATION SCHEME

MCA (Master of Computer Applications)

(Effective from session 2008-09)

YEAR-I SEMESTER-I

Sl. No	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME				
						SESSIONAL EXAM			ESE	SUBJET TOTAL
			L	T	P	CT	TA	Total		
1	MCA-111	Professional Communication	3	1	0	30	20	50	100	150
2	MCA-112	Accounting and Financial Management	3	1	0	30	20	50	100	150
3	MCA-113	Computer Concepts and Programming in C	3	1	0	30	20	50	100	150
4	MCA-114	Discrete Mathematics	3	1	0	30	20	50	100	150
5	MCA-115	Organizational Behaviour	3	1	0	30	20	50	100	150
PRACTICALS										
6	MCA-151	Programming Lab	0	0	3	30	20	50	50	100
7	MCA-152	Language Lab	0	0	3	30	20	50	50	100
8	GP-101	General Proficiency	0	0	0	-	-	50	-	50
		TOTAL	15	5	6					1000

YEAR-I SEMESTER-II

Sl. No	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME				
						SESSIONAL EXAM			ESE	SUBJET TOTAL
			L	T	P	CT	TA	Total		
1	MCA-211	Environmental Science and Ethics	3	1	0	30	20	50	100	150
2	MCA-212	Computer Based Numerical & Statistical Techniques	3	1	0	30	20	50	100	150
3	MCA-213	Data Structures using C	3	1	0	30	20	50	100	150
4	MCA-214	Principles of Management	3	1	0	30	20	50	100	150
5	MCA-215	Computer Organization	3	1	0	30	20	50	100	150
PRACTICALS										
6	MCA-251	Data Structures Lab	0	0	3	30	20	50	50	100
7	MCA-252	Computer Based Numerical and Statistical Techniques Lab	0	0	3	30	20	50	50	100
8	GP-201	General Proficiency	0	0	0	-	-	50	-	50
		TOTAL	15	5	6					1000

MCA-111 : PROFESSIONAL COMMUNICATION

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Unit -1 Basics of Technical Communication

Technical Communication: features; Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communication; The flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group); Importance of technical communication;   Barriers to Communication.

Unit - II Constituents of Technical Written Communication

Words and Phrases: Word formation. Synonyms and Antonyms; Homophones; Select vocabulary of about 500-1000 New words; Requisites of Sentence Construction: Paragraph Development: Techniques and Methods -Inductive, Deductive, Spatial, Linear, Chronological etc; The Art of Condensation- various steps.

Unit - III Forms of Technical Communication

Business Letters: Sales and Credit letters; Letter of Enquiry; Letter of Quotation, Order,

Claim and Adjustment Letters; Job application and Resumes.

Official Letters: D.O. Letters; Govt. Letters, Letters to Authorities etc.

Reports: Types; Significance; Structure, Style & Writing of Reports.

Technical Proposal; Parts; Types; Writing of Proposal; Significance.

Technical Paper, Project. Dissertation and Thesis Writing: Features, Methods & Writing.

Unit - IV Presentation Strategies

Defining Purpose; Audience & Locale; Organizing Contents; Preparing Outline; Audio-visual Aids; Nuances of Delivery; Body Language; Space; Setting Nuances of Voice Dynamics; Time- Dimension.

Unit - V Value- Based Text Readings

Following essays form the suggested text book with emphasis on Mechanics of writing,

(i)   The Aims of Science and the Humanities by M.E. Prior

(ii)   The Language of Literature and Science by A.Huxley

(iii)   Man and Nature by J.Bronowski

(iv)   The Mother of the Sciences by A.J.Bahm

(v)   Science and Survival by Barry Commoner

(vi)   Humanistic and Scientific Approaches to Human Activity by Moody E. Prior

(vii)   The Effect of Scientific Temper on Man by Bertrand Russell.

Text Book

1.   Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, New Delhi .

2.   Technical Communication – Principles and Practices by Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press 2007, New Delhi.

Reference Books

1. Effective Technical Communication by Barun K. Mitra, Oxford Univ. Press, 2006, New Delhi

2. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., New Delhi.

3. How to Build Better Vocabulary by M.Rosen Blum, Bloomsbury Pub. London.

4. Word Power Made Easy by Norman Lewis, W.R.Goyal Pub. & Distributors; Delhi.

5. Developing Communication Skills by Krishna Mohan, Meera Banerji- Macmillan India Ltd. Delhi.

6. Manual of Practical Communication by L.U.B. Pandey & R.P. Singh; A.I.T.B.S. Publications India Ltd.; Krishan Nagar, Delhi.

MCA 112 : ACCOUNTING AND FINANCIAL MANAGEMENT

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Unit I (6 Sessions)
Overview: Accounting concepts, conventions and principles; Accounting Equation, International Accounting principles and standards; Matching of Indian Accounting Standards with International Accounting Standards.

Unit II (12 Sessions)
Mechanics of Accounting: Double entry system of accounting, journalizing of transactions; preparation of final accounts, Profit & Loss Account, Profit & Loss Appropriation account and Balance Sheet, Policies related with depreciation, inventory and intangible assets like copyright, trademark, patents and goodwill.

Unit III (12 Sessions)
Analysis of financial statement: Ratio Analysis- solvency ratios, profitability ratios, activity ratios, liquidity ratios, market capitalization ratios ; Common Size Statement ; Comparative Balance Sheet and Trend Analysis of manufacturing, service & banking organizations.

Unit IV (10 Sessions)
Funds Flow Statement: Meaning, Concept of Gross and Net Working Capital, Preparation of Schedule of Changes in Working Capital, Preparation of Funds Flow Statement and its analysis ; Cash Flow Statement: Various cash and non-cash transactions, flow of cash, preparation of Cash Flow Statement and its analysis.

SUGGESTED READINGS
1) Narayanswami - *Financial Accounting: A Managerial Perspective (*PHI, 2nd Edition).
2) Mukherjee - *Financial Accounting for Management* (TMH, 1st Edition).
3) Ramchandran & Kakani - *Financial Accounting for Management* (TMH, 2nd Edition).
4) Ghosh T P - *Accounting and Finance for Managers* (Taxman, 1st Edition).
5) Maheshwari S.N & Maheshwari S K – *An Introduction to Accountancy* (Vikas, 9th Edition)
6) Ashish K. Bhattacharya- *Essentials of Financial Accounting* (PHI, New Delhi)
7) Ghosh T.P- *Financial Accounting for Managers* (Taxman, 3rd Edition)
8) Maheshwari S.N & Maheshwari S K – *A text book of Accounting for Management* (Vikas, 1st Edition)
9) Gupta Ambrish - *Financial Accounting for Management* (Pearson Education, 2nd Edition)
10) Chowdhary Anil - *Fundamentals of Accounting and Financial Analysis* (Pearson Education, 1st Edition).

MCA-113 : COMPUTER CONCEPTS AND PROGRAMMING IN C

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UNIT 1:

Introduction to any Operating System [Unix, Linux, Windows], Programming Environment, Write and Execute the first program, Introduction to the Digital Computer; Concept of an algorithm; termination and correctness. Algorithms to programs: specification, top-down development and stepwise refinement. Introduction to Programming, Use of high level programming language for the systematic development of programs. Introduction to the design and implementation of correct, efficient and maintainable programs, Structured Programming, Trace an algorithm to depict the logic, Number Systems and conversion methods

UNIT 2:

Standard I/O in "C", **Fundamental Data Types and Storage Classes:** Character types, Integer, short, long, unsigned, single and double-precision floating point, storage classes, automatic, register, static and external, **Operators and Expressions:** Using numeric and relational operators, mixed operands and type conversion, Logical operators, Bit operations, Operator precedence and associativity,

UNIT 3:

Conditional Program Execution: Applying if and switch statements, nesting if and else, restrictions on switch values, use of break and default with switch, **Program Loops and Iteration:** Uses of while, do and for loops, multiple loop variables, assignment operators, using break and continue, **Modular Programming:** Passing arguments by value, scope rules and global variables, separate compilation, and linkage, building your own modules.

UNIT 4:

Arrays: Array notation and representation, manipulating array elements, using multidimensional arrays, arrays of unknown or varying size, **Structures:** Purpose and usage of structures, declaring structures, assigning of structures, **Pointers to Objects:** Pointer and address arithmetic, pointer operations and declarations, using pointers as function arguments, Dynamic memory allocation, defining and using stacks and linked lists.

UNIT 5:

Sequential search, Sorting arrays, Strings, Text files, **The Standard C Preprocessor:** Defining and calling macros, utilizing conditional compilation, passing values to the compiler, **The Standard C Library:** Input/Output : fopen, fread, etc, string handling functions, Math functions : log, sin, alike Other Standard C functions.

Lecture-wise Break-UP

Week	Lecture 1	Lecture 2	Lecture 3	Lab Meeting
Week-1	Introduction to any OS, Programming Environment	A Simple C program	Need of Datastructures & Algorithms	Get familiar with OS and Environment.
Week-2	An Example, Termination, Correctness	Different Types of Programming Languages	Number Systems	Get familiar with C compiler Implement and Test Small Routine in C
Week-3	Number Systems	Standard I/O in C	Data Types and Variables	Implement and Test Small Routine in C

Week-4	Data Types and Variable	Data Types and Variable	Operators & Expression	Evaluation of Expression
Week-5	Operators & Expression	Operators & Expression	Operators & Expression	Evaluation of Expression
Week-6	IF, SWITCH Statements	IF, SWITCH Statements	Nested If Statement	Iteration
Week-7	Repetition structure in C	Repetition structure in C	Modular Programming	Iteration, Function
Week-8	Modular Programming	Modular Programming	Arrays	Recursion, Function
Week-9	Arrays	Structures	Structures	Arrays, Structures
Week-10	Pointers	Pointers	Pointers	Linked Lists
Week-11	Searching	Selection	Sorting	Searching, Selection
Week-12	Sorting	Strings	Strings	Sorting, Strings
Week-13	Files	Files	Std C Preprocessor	Files
Week-14	Std C Library	Std C Library	Std C Library	Use of Std. C Library

Text Books :
1. Problem Solving and Program Design in C, by Jeri R. Hanly, Elliot B. Koffman, Pearson Addison-Wesley, 2006.
2. Computer Science- A Structured Programming Approach Using C, by Behrouz A. Forouzan, Richard F. Gilberg, Thomson, Third Edition [India Edition], 2007.

MCA-114 : DISCRETE MATHEMATICS

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Unit-I:

Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets

Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, equivalence relation, partial ordering relation.

Function: Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions.

Notion of Proof: Proof by counter-example, the contra-positive, proof by contradiction, inductive proofs.

Unit-II:

Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.

Unit-III:

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, and complemented lattices.

Boolean Algebra: Basic definitions, Sum of Products and Product of Sums, Form in Boolean Algebra, Logic gates and Karnaugh maps.

Graphs: Simple graph, multi graph, graph terminology, representation of graphs, Bipartite, Regular, Planar and connected graphs, connected components in a graph, Euler graphs, Hamiltonian path and circuits, Graph coloring, chromatic number, isomorphism and Homomorphism of graphs.

Tree: Definition, Rooted tree, properties of trees, binary search tree, tree traversal.

Unit-IV:

Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Universal and existential quantifiers.

Unit-V:

Combinatorics: Basic Counting Technique, Pigeon-hole Principle, Recurrence Relation, Generating function, Polya's Counting Theorem

Text books and Supplementary reading:
1.   Discrete Mathematics and Its Applications, By Kenneth H Rosen, McGraw Hill, Sept.2002.
2.   Discrete Mathematical Structures with Applications to Computer Science, By J. P. Tremblay, R. Manohar, McGraw Hill Pub, 1975.
3.   Graph Theory With Applications to Engineering and Computer Science, By Prentice Hall, Englewood Cliffs, N. J, 1974
4.   Combinatorics: Theory and Applications, By V. Krishnamurthy, East-West Press Pvt. Ltd., New Delhi, 1986.

MCA-115 : ORGANISATIONAL BEHAVIOUR

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UNIT I (8 Sessions)
Concept, Nature, Characteristics, Conceptual Foundations and Importance, Models of Organizational Behaviour, Management Challenge, A Paradigm Shift, Relationship with Other Fields, Organisational Behaviour: Cognitive Framework, Behaviouristic Framework and Social Cognitive Framework.

UNIT II (10 Sessions)
Perception and Attribution: Concept, Nature, Process, Importance. Management and Behavioural Applications of Perception.
Attitude: Concept, Process and Importance, Attitude Measurement. Attitudes and Workforce Diversity.
Personality: Concept, Nature, Types and Theories of Personality Shaping, Personality Attitude and Job Satisfaction.
Learning: Concept and Theories of Learning.

UNIT III (10 Sessions)
Motivation: Concepts and Their Application, Principles, Theories, Employee Recognition, Involvement, Motivating a Diverse Workforce.
Leadership: Concept, Function, Style and Theories of Leadership-Trait, Behavioural and Situational Theories.
Analysis of Interpersonal Relationship, Group Dynamics: Definition, Stages of Group Development, Group Cohesiveness, Formal and Informal Groups, Group Processes and Decision Making, Dysfunctional Groups.

UNIT IV (12 Sessions)
Organisational Power and Politics: Concept, Sources of Power, Distinction Between Power, Authority and Influence, Approaches to Power, Political Implications of Power: Dysfunctional Uses of Power.
Knowledge Management & Emotional Intelligence in Contemporary Business Organisation

Organisational Change : Concept, Nature, Resistance to change, Managing resistance to change, Implementing Change, Kurt Lewin Theory of Change.

Conflict: Concept, Sources, Types, Functionality and Dysfunctionality of Conflict, Classification of Conflict Intra, Individual, Interpersonal, Intergroup and Organisational, Resolution of Conflict, Meaning and Types of Grievance and Process of Grievance Handling.
Stress: Understanding Stress and Its Consequences, Causes of Stress, Managing Stress.

Organisational Culture : Concept, Charactersitics, Elements of Culture, Implications of Organisation culture, Process of Organisational Culture.

Suggested Reading:
1. Newstrom John W. **-** Organizational Behaviour: Human Behavour at Work (Tata Mc Graw Hill, 12th Edition)
2. Luthans Fred - Organizational Behaviour (Tata Mc Graw Hill)
3. Mc Shane L. Steven, Glinow Mary Ann Von & Sharma Radha R. - Organizational Behaviour (Tata Mc Graw Hill, 3rd Edition)
4. Robbins Stephen P**. -** Organizational Behaviour (Pearson Education, 12th Edition)
5. Hersey Paul, Blanchard, Kenneth H and Johnson Dewey E. - Management of Organsational Behavior: Leading Human Resources (Pearson Education, 8th Edition)
6. Greenberg Jerald and Baron Robert A. - Behavior In Organisations: Understanding and Managing the Human Side of Work (Prentice Hall of India)
7. Davis, Keith - Human Behaviour at Works – Tata Mc Graw Hill, New Delhi.
8. Pareek, Udai - Behavioural Process in Organization (Oxford 4 IBH, New Delhi).

MCA-151 : PROGRAMMING LAB

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Suggested Assignments to be conducted on a 3-hour slot. It will be conducted in tandem with the theory course so the topics for problems given in the lab are already initiated in the theory class. The topics taught in the theory course should be appropriately be sequenced for synchronization with the laboratory. A sample sequence of topics and lab classes for the topic are given below:
1. Familiarization of a computer and the environment and execution of sample programs
2. Expression evaluation
3. Conditionals and branching
4. Iteration
5. Functions
6. Recursion
7. Arrays
8. Structures
9. Linked lists
10. Data structures

It is suggested that some problems related to continuous domain problems in engineering and their numerical solutions are given as laboratory assignments. It may be noted that some of basic numerical methods are taught in the Mathematics course.

MCA-152 : LANGUAGE LAB

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Interactive and Communicative Practical with emphasis on Oral Presentation/Spoken Communication based on International Phonetic Alphabets (I.P.A.)

LIST OF PRACTICALS

1.   Group Discussion: Practical based on Accurate and Current Grammatical Patterns.

2.   Conversational Skills for Interviews under suitable Professional Communication Lab conditions with emphasis on Kinesics.

3.   Communication Skills for Seminars/Conferences/Workshops with emphasis on Paralinguistics/Kinesics.

4.   Presentation Skills for Technical Paper/Project Reports/ Professional Reports based on proper Stress and Intonation Mechanics.

5.   Official/Public Speaking based on suitable Rhythmic Patterns.

6.   Theme- Presentation/ Key-Note Presentation based on correct argumentation methodologies.

7.   Individual Speech Delivery/Conferences with skills to defend Interjections/Quizzes.

8.   Argumentative Skills/Role Play Presentation with Stress and Intonation.

9.   Comprehension Skills based on Reading and Listening Practicals on a model Audio-Visual Usage.

Reference Books

1.   Bansal R.K. & Harrison: Phonetics in English, Orient Longman, New Delhi.

2.   Sethi & Dhamija: A Course in Phonetics and Spoken English, Prentice Hall, New Delhi.

3.   L.U.B.Pandey & R.P.Singh, A Manual of Practical Communication, A.I.T.B.S. Pub. India Ltd. Krishan Nagar, Delhi.

4.   Joans Daniel, English Pronouncing Dictionary, Cambridge Univ. Press.

MCA- 211 : ENVIRONMENTAL SCIENCE AND ETHICS

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MCA-212: COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES

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Unit-I

Floating point Arithmetic: Representation of floating point numbers, Operations, Normalization, Pitfalls of floating point representation, Errors in numerical computation

Iterative Methods: Zeros of a single transcendental equation and zeros of polynomial using Bisection Method, Iteration Method, Regula-Falsi method, Newton Raphson method, Secant method, Rate of convergence of iterative methods.

Unit-II

Simultaneous Linear Equations: Solutions of system of Linear equations, Gauss Elimination direct method and pivoting, Ill Conditioned system of equations, Refinement of solution. Gauss Seidal iterative method, Rate of Convergence

Interpolation and approximation: Finite Differences, Difference tables

Polynomial Interpolation**:** Newton's forward and backward formula

Central Difference Formulae: Gauss forward and backward formula, Stirling's, Bessel's, Everett's formula.

Interpolation with unequal intervals: Langrange's Interpolation, Newton Divided difference formula, Hermite's Interpolation

Approximation of function by Taylor's series and Chebyshev polynomial

Unit-III

Numerical Differentiation and Integration: Introduction, Numerical Differentiation, Numerical Integration, Trapezoidal rule, Simpson's rules, Boole's Rule, Weddle's Rule Euler- Maclaurin Formula

Solution of differential equations: Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta methods, Predictor-corrector method, Automatic error monitoring, stability of solution.

Unit-IV

Curve fitting, Cubic Spline and Approximation: Method of least squares, fitting of straight lines, polynomials, exponential curves etc

Frequency Chart: Different frequency chart like Histogram, Frequency curve, Pi-chart.

Regression analysis: Linear and Non-linear regression, Multiple regression

Unit-V

Time series and forcasting: Moving averages, smoothening of curves, forecasting models and methods. Statistical Quality Controls methods

Testing of Hypothesis: Test of significance, Chi-square test, t-test, ANOVA, F-Test

Application to medicine, agriculture etc.

References:
1. Rajaraman V., "Computer Oriented Numerical Methods", PHI
2. Gerald & Wheatley, "Applied Numerical Analyses", AW
3. Jain, Iyengar and Jain, "Numerical Methods for Scientific and Engineering Computations", New Age Int.
4. Grewal B. S., "Numerical methods in Engineering and Science", Khanna Publishers, Delhi
5. T. Veerarajan, T Ramachandran, "Theory and Problems in Numerical Methods", TMH
6. Pradip Niyogi, "Numerical Analysis and Algorithms", TMH
7. Francis Scheld, "Numerical Analysis", TMH
9. Gupta S. P., "Statistical Methods", Sultan and Sons

MCA-213 : DATA STRUCTURES USING 'C'

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Unit -I

Introduction: Basic Terminology, Elementary Data Organization, Data Structure operations, Algorithm Complexity and Time-Space trade-off

Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Array as Parameters, Ordered List, Sparse Matrices, and Vectors.

Stacks: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack.

Recursion: Recursive definition and processes, recursion in C, example of recursion, Tower of Hanoi Problem, simulating recursion. Backtracking, recursive algorithms, principles of recursion, tail recursion, removal of recursion.

Unit - II

Queues: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty. Circular queue, Deque, and Priority Queue**.**

Linked list: Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly linked list, Linked List in Array, Polynomial representation and addition, Generalized linked list, Garbage Collection and Compaction.

Unit - III

Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree. Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees. Traversing Threaded Binary trees, Huffman algorithm**.**

Searching and Hashing: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.

Unit - IV

Sorting: Insertion Sort, Bubble Sorting, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting.

Binary Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm, Path Length, AVL Trees, B-trees.

Unit - V

Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees.

File Structures: Physical Storage Media File Organization, Organization of records into Blocks, Sequential Files, Indexing and Hashing, Primary indices, Secondary indices, B+ Tree index Files, B Tree index Files, Indexing and Hashing Comparisons.

References
Text Books
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.

Reference Books
1. S. Lipschutz, Data Structures Mc-Graw Hill International Editions, 1986.
2. Jean-Paul Tremblay, Paul. G. Soresan, An introduction to data structures with Applications, Tata Mc-Graw Hill International Editions, 2nd edition 1984.
3. A. Michael Berman, Data structures via C++, Oxford University Press, 2002.
4. M. Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education, 2002, 2nd edition.

MCA- 214 : PRINCIPLES OF MANAGEMENT

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UNIT I (8 Sessions)
Management: Concept, Nature, Importance; Management : Art and Science, Management As a Profession, Management Vs. Administration, Management Skills, Levels of Management, Characteristics of Quality Managers.

Evolution of Management: Early contributions, Taylor and Scientific Management, Fayol's Administrative Management, Bureaucracy, Hawthorne Experiments and Human Relations, Social System Approach, Decision Theory Approach.

Business Ethics and Social Responsibility: Concept, Shift to Ethics, Tools of Ethics.

UNIT II (10 Sessions)
Introduction to Functions of Management
Planning: Nature, Scope, Objectives and Significance of Planning, Types of Planning, Process of Planning, Barriers to Effective Planning, Planning Premises and Forecasting, Key to Planning, Decision Making.

Organizing: Concept, Organisation Theories, Forms of Organisational Structure, Combining Jobs: Departmentation, Span of Control, Delegation of Authority, Authority & Responsibility, Organisational Design.

UNIT III (10 Sessions)
Staffing: Concept, System Approach, Manpower Planning, Job Design, Recruitment & Selection, Training & Development, Performance Appraisal

Directing: Concept, Direction and Supervision
Motivation: Concept, Motivation and Performance, Theories Of Motivation, Approaches for Improving Motivation, Pay and Job Performance, Quality of Work Life, Morale Building.

UNIT IV (12 Sessions)
Leadership: The Core of Leadership: Influence, Functions of Leaders, Leadership Style, Leadership Development.
Communication: Communication Process, Importance of Communication, Communication Channels, Barriers to Communication.

Controlling: Concept, Types of Control, Methods: Pre-control: Concurrent Control: Post-control, An Integrated Control System, The Quality Concept Factors affecting Quality, Developing a Quality Control System, Total Quality Control, Pre-control of Inputs, Concurrent Control of Operations. Post Control of Outputs.
Change and Development: Model for Managing Change, Forces for Change, Need for Change, Alternative Change Techniques, New Trends in Organisational Change.

Suggested Reading:
1. Stoner, Freeman & Gilbert Jr - Management (Prentice Hall of India, 6th Edition)
2. Koontz - Principles of Management (Tata Mc Graw Hill, Ist Edition 2008)
3. Robbins & Coulter - Management (Prentice Hall of India, 8th Edition)
4. Robbins S.P. and Decenzo David A. - Fundamentals of Management: Essential Concepts and Applications (Pearson Education, 5th Edition)
5. Hillier Frederick S. and Hillier Mark S. - Introduction to Management Science: A Modeling and Case Studies Approach with Spreadsheets (Tata Mc Graw Hill, 2nd Edition 2008)
6. Weihrich Heinz and Koontz Harold - Management: A Global and Entrepreneurial Perspective (Mc Graw Hill, 12th Edition 2008)

MCA-215 : COMPUTER ORGANIZATION

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Unit-I

Register Transfer Language, Bus and Memory Transfers, Bus Architecture, Bus Arbitration, Arithmetic Logic, Shift Microoperation, Arithmetic Logic Shift Unit, Design of Fast address, Arithmetic Algorithms (addition, subtraction, Booth Multiplication), IEEE standard for Floating point numbers.

Unit-II
Control Design:

Hardwired & Micro Programmed (Control Unit): Fundamental Concepts (Register Transfers, Performing of arithmetic or logical operations, Fetching a word from memory, storing a word in memory), Execution of a complete instruction, Multiple-Bus organization, Hardwired Control, Micro programmed control(Microinstruction, Microprogram sequencing, Wide-Branch addressing, Microinstruction with Next-address field, Prefetching Microinstruction).

Unit-III
Processor Design:

Processor Organization: General register organization, Stack organization, Addressing mode, Instruction format, Data transfer & manipulations, Program Control, Reduced Instruction Set Computer.

Unit -IV
Input-Output Organization:

I/O Interface, Modes of transfer, Interrupts & Interrupt handling, Direct Memory access, Input-Output processor, Serial Communication.

Unit-V
Memory Organization:

Memory Hierarchy, Main Memory (RAM and ROM Chips), organization of 2D and $2^{1/2}$D, Auxiliary memory, Cache memory, Virtual Memory, Memory management hardware.

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

Reference Books
1. Computer Organization, Vravice, Zaky & Hamacher (TMH Publication)
2. Structured Computer Organization, Tannenbaum(PHI)
3. Computer Organization, Stallings(PHI)
4. Computer Organization, John P.Hayes (McGraw Hill)

MCA-251 : DATA STRUCTURES LAB

Write Program in C or C++ for following:
- Sorting programs: Bubble sort, Merge sort, Insertion sort, Selection sort, and Quick sort.
- Searching programs: Linear Search, Binary Search.
- Array implementation of Stack, Queue, Circular Queue, Linked List.
- Implementation of Stack, Queue, Circular Queue, Linked List using dynamic memory allocation.
- Implementation of Binary tree.
- Program for Tree Traversals (preorder, inorder, postorder).
- Program for graph traversal (BFS, DFS).
- Program for minimum cost spanning tree, shortest path.

MCA-252 : COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES LAB

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Write programs in C

- To implement floating point arithmetic operations i.e., addition, subtraction, multiplication and division.
- To deduce errors involved in polynomial interpolation.
  Algebraic and trancedental equations using Bisection, Newton Raphson,
  Iterative, method of false position, rate of conversions of roots in tabular form for each of these methods.
- To implement formulae by Bessels, Newton, Stirling, Langranges etc.
- To implement method of least square curve fitting.
- Implement numerical differentiation.
- Implement numerical integration using Simpson's 1/3 and 3/8 rules, trapezoidal rule.
- To show frequency chart, regression analysis, Linear square fit, and polynomial fit.

NOTE- Institutions are required to add four more experiments as per available expertise with them