Rajiv Gandhi Proudhyogiki Vishwavidyalaya, Bhopal
Computer Application (MCA- Dual Degree) II Semester

Subject Code	Subject Name	Periods per week			Credits	Maximum Marks (Theory Slot)			Maximum Marks (Practical Slot)		Total Marks
		L	T	P		End Sem. Marks	Test (Two)	Assign. /Quiz	End Semester Practical/Viva	Practical Record /Assign./Quiz/ Presentation	
MCA DD -201	Computer Architecture	5		-	5	70	20	10	-	-	100

UNIT-I BASIC STRUCTURE OF COMPUTERS Functional units - Basic operational concepts - Bus structures -Software performance – Memory locations and addresses – Memory operations – Instruction and instruction

UNIT-II Register Transfer Language and Micro-operations: concept of bus, data movement among registers, a language to represent conditional data transfer, data movement from/to memory. Design of simple Arithmetic & Logic Unit & Control Unit, arithmetic and logical operations Along with register transfer, timing in register transfer.

UNIT-III Architecture of a simple processor: A simple computer organization and instruction set, instruction formats, addressing modes, instruction cycle, instruction execution in terms of microinstructions, interrupt cycle, concepts of interrupt and simple I/O organization, Synchronous & Asynchronous data transfer, Data Transfer Mode: Program Controlled, Interrupt driven, DMA (Direct Memory Access). Implementation of processor using the building blocks.

UNIT-IV Assembly Language programming: Pin Diagram of 8086, Architecture of 8086,Addresing Mode of 8086,detailed study of 8086/8088 assembly language, instruction set of 8086, loops and Comparisons, conditions and procedures, arithmetic operations in assembly language. Simple Assembly Language program of 8086.

UNIT-V Memory organization: Secondary Memory, Primary Memory :Random access memory, Read Only memory basic cell of static and dynamic RAM, Building large memories using chips, Concept of segmentation & Paging, Associative memory, cache memory organization, virtual memory organization.

BOOKS

1. M. Morris Mano, "Computer System Architecture", PHI, 3rd edition, 1993
2. Govindarajalu "Computer Architecture & Organisation".
3. Liu and Gibson, "8086/8088 Micro processor Assembly Language".
4. M.Mano "Digital Logic & Computer Design"
5. Malvino, "Digital Computer Electronics". Note : Paper is to be set unit wise with internal choice.

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MCA DD -202	Data Structure using C	5		-	5	70	20	10	-	-	100

Prerequisites: Array, Structure, pointers, pointer to structure, functions, parameter passing, recursion.

UNIT-I Stack and Queue: contiguous implementations of stack, various operations on stack, various polish notations-infix, prefix, postfix, conversion from one to another-using stack; evaluation of post and prefix expressions. Contiguous implementation of queue: Linear queue, its drawback; circular queue; various operations on queue; linked implementation of stack and queue- operations

UNIT-II General List: list and it's contiguous implementation, it's drawback; singly linked list-operations on it; doubly linked list-operations on it; circular linked list; linked list using arrays.

UNIT-III Trees: definitions-height, depth, order, degree, parent and child relationship etc; Binary Trees- various theorems, complete binary tree, almost complete binary tree; Tree traversals-preorder, in order and post order traversals, their recursive and non recursive implementations; expression tree- evaluation; linked representation of binary tree-operations. Threaded binary trees; forests, conversion of forest into tree. Heap-definition.

UNIT-IV Searching, Hashing and Sorting: requirements of a search algorithm; sequential search, binary search, indexed sequential search, interpolation search; hashing-basics, methods, collision, resolution of collision, chaining; Internal sorting- Bubble sort, selection sort, insertion sort, quick sort, merge sort on linked and contiguous list, shell sort, heap sort, tree sort.

UNIT-V Graphs: related definitions: graph representations- adjacency matrix, adjacency lists, adjacency multilist; traversal schemes- depth first search, breadth first search; Minimum spanning tree; shortest path algorithm; kruskals & dijkstras algorithm. Miscellaneous features Basic idea of AVL tree- definition, insertion & deletion operations; basic idea of B-tree- definition, order, degree, insertion & deletion operations; B+-Tree- definitions, comparison with B-tree; basic idea of string processing.

BOOKS
1. Kruse R.L. Data Structures and Program Design in C; PHI
2. Aho "Data Structure & Algorithms".
3. Trembly "Introduction to Data Structure with Applications".
4. TennenBaum A.M. & others: Data Structures using C & C++; PHI
5. Horowitz & Sawhaney: Fundamentals of Data Structures, Galgotia Publishers.
Note : Paper is to be set unit wise with internal choice.

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MCA DD -203	Statistics	5		-	5	70	20	10	-	-	100

Unit I Introduction Meaning and scope,Definations, the statistical methods, Frequency distributions, Measures of cental tendancy: Arithmetic Mean, Median,Mode, Empirical relations between Mean, Median and Mode,

Unit II Measures of Dispersion and Skewness, Moments Dispersion, Measures of Dispersions, Range, Standard Deviation: Root-mean Square Deviation , Relation between Standard and : Root-mean Square Deviation, Coefficient of Dispersion, Skewness, Moments, Kurtosis.

Unit III Correlation and Regression Karl Pearson's Coefficients of Correlation, Standard Error and Probable Error, Correlation of Ranks, Regression, Line of Regression, Regression Coefficients, Covariance, Definition of Correlation Coefficient.

Unit-IV Theory of probability Definitions, Mathematical definitions, Empirical definitions, Mutually Exclusive Events, Additive law of probability, Compound Events, Conditional Probability, Independent events, Multiplicative law of probability, Use of Binomial theorem.

Unit-V Theoretical Distributions Binomial Distributions, Poisson's Distribution, Normal Distribution or Gaussian Distribution, Standard form of the Normal Curve, Properties of Normal Curve, Chi-square Distribution.

BOOKS
1. Gupta S.C, Kapoor V.K, Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi, 1994.
2. Rohatgi, V. K. and Saleh, A. K. Md. E. (2009): An Introduction to Probability and Statistics, 2nd Edn. (Reprint). John Wiley and Sons.
3. Mood, A.M., Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn. (Reprint), Tata McGraw-Hill Pub. Co. Ltd.
4. Ray M., Sharma H., Mathematical Statistics, Ram Prasad & Sons.

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MCA DD -204	Technical Communication & Personality Development	5		-	5	70	20	10	-	-	100

Unit I : - Introduction, Need for Communication, Process of Communication - Written and Verbal Communication, Visual communication, Signs, Signals and Symbols, Silence as a Mode of Communication - Inter-cultural, Intra-cultural, Cross-cultural and International communication - Communications skills, Communication through Questionnaires, Business Letter Writing, Electronic Communication

Unit II : -Business Cases and Presentations, Letters within the Organizations, Letters from Top Management, Circulars and Memos - Business Presentations to Customers and other stakeholders, Presenting a Positive Image through Verbal and Non-verbal Cues, Preparing and Delivering the Presentations, Use of Audio-visual Aids - Report Writing

Unit III : Barriers to Communication Improving Communication Skills -Preparation of Promotional Material -Non-verbal communication -Body language -Postures and gestures -Value of time -Organizational body language - Importance of Listening -Emotional Intelligence

UNIT 4 Individual Interaction and skills Basic Interaction Skills –Within family, Society Personal and interpersonal intrapersonal skills Types of skills; conceptual, supervisory, technical, managerial and decision making skills. Problem Solving, Lateral Thinking Self Awareness and Self Esteem Group Influence on Interaction Skills Human relations examples through role – play and cases

UNIT 5 Leadership Skills Working individually and in a team Leadership skills Leadership Lessons through Literature Team work & Team building Interpersonal skills – Conversation, Feedback, Feed forward Interpersonal skills – Delegation, Humor, Trust, Expectations, Values, Status, Compatibility and their role in building team – work Conflict Management – Types of conflicts, how to cope with them Small cases including role – plays will be used as teaching methodology. Negotiation Skills (To be Taught through Role Plays and Cases) Types of Negotiation Strategies Selling skills – Selling to customers Selling to Superiors Selling to peer groups, team mates & subordinates Conceptual selling, Strategic selling skills – Body language

1. Simon Sweeny, "English for Business Communication", CUP, First South Asian Edition, 2010.
2. M. Ashraf Rizvi, "Effective Technical Communication", Tata McGraw-Hill Publishing Company Ltd. 2005.

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3. Andrea J. Rutherford, "Basic Communication Skills for Technology", 2nd Edition, Pearson Education, 2007.
4. Sunita Mishra & C. Muralikrishna, "Communication Skills for Engineers", Pearson Education, 2007.

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MCA DD -205	Principal of Management	5		-	5	70	20	10	-	-	100

Unit –I Basic concepts of management: Definition – Need and Scope – Different schools of management thought – Behavioural, Scientific, Systems, and Contingency, Contribution of Management Thinkers: Taylor, Fayol, Elton Mayo

Unit-II Functions of Management: Planning – Concept, Nature, Importance, Steps, Limitations, Management by objectives, Organizing - Concept, Nature, Importance, Principles, Centralization, Decentralization, Organization Structures- Line and Staff Authority, Functional, Product, Matrix, Geographical, Customer, New Forms of Organization – Virtual, Organizations as Networks - Types of Network Organizations/Clusters - SelfOrganizing Systems. Organizational Designs for Change and Innovation - Designing Principles for New Forms of Organizations, Staffing - Concept, Nature, Importance, Steps, Concept of knowledge worker, Directing – Concept, Nature, Importance, Controlling - Concept, Nature, Importance, Process of controlling, Control Techniques.

Unit-III Group Dynamics and Team Management: Theories of Group Formation – Formal and Informal Groups and their interaction, Importance of teams - Formation of teams – Team Work, Leading the team, Team Meeting, Conflict Management - Traditional vis-à-vis Modern view of conflict, Conflict Process - Strategies for resolving destructive conflict, Stress management, employee welfare, energy management and energy audit

Unit-IV Decision making: Concept, Nature, Importance, and Process. Types of decisions, Problems in decision making. Modern approaches to management Concept of Knowledge management, change management, technology management, supply chain management, introduction to Intellectual Property Rights (IPR) and cyber laws, process and project quality standards – six sigma, CMM, CMMI, PCMM, Impact of IT quality management systems, learning organizations

Unit-V Contemporary Issues: Social Responsibility & Ethics, Globalization & Management Inventing & Reinventing Organizations, Culture & Multiculturalism, Managing Organizational Change & Innovation

Book:

1. Koontz Essentials of Management Tata McGraw Hill Latest Edition

2. Anil Bhat, Arya Kumar Management Principles, Process and Practices Oxford Latest Edition

3. Shejwalkar and Ghanekar Principles and Practices of Management Tata McGraw Hill Latest Edition