MCA

Semester-1	Course Name	L	T	P	Credit
MCA101	Introduction to IT	3	1	2	5
MCA102	Computer Architecture & Organization	3	1	0	4
MCA103	Programming & Data Structure	3	1	2	5
MCA104	Mathematical Foundation	3	1	0	4
MCA105	Introduction to Management Functions	3	1	0	4
	Total contact hours	15	5	4	22

Semester-2	Course Name	L	T	P	Credit
MCA201	Info Systems Analysis Design & Implementation	3	1	0	4
MCA202	Operating Systems	3	1	2	5
MCA203	Oral and Written Communications	3	0	2	4
MCA204	Accounting and Management Control	3	1	2	5
MCA205	Probability & Combinatonics	3	1	0	4
	Total contact hours	15	4	4	22

Semester-3	Course Name	L	T	P	Credit
MCA301	Data Base Management Systems	3	1	0	4
MCA302	Object Oriented Analysis and Design	3	1	2	5
MCA303	Design & Analysis Of Algorithm	3	1	2	5
MCA304	Management Support System	3	0	0	3
MCA305	Statistical Computing	3	1	2	5
	Total contact hours	15	4	6	22

Semester-4	Course Name	L	T	P	Credit
MCA401	Software Engineering	3	1	2	5
MCA402	Computer Networks	3	1	2	5
MCA403	Organizational Behavior	3	0	0	3
MCA404	Elective-1	3	0	2	4
MCA405	Elective-2	3	0	2	4
	Total contact hours	15	2	8	21

Semester-5	Course Name	L	T	P	Credit
MCA501	AI & Neural Network	3	1	2	5
MCA502	Optimization Techniques	3	0	2	4
MCA503	Elective-3	3	0	2	4
MCA504	Elective-4	3	0	2	4

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MCA505	Project-I	0	0	8	4
MCA506	Seminar	0	0	2	1
	Total contact hours	12	1	18	22

Semester-6	Course Name	L	T	P	Credit
MCA601	Project-II	0	0	18	9
MCA602	Grand Viva	0	0	4	2
	Total contact hours	0	0	22	11

MCA

MCA101: Introduction to Information Technology (36 Lectures)

Module 1 (4L): Information concepts and processing: Evolution of information processing, data information language and communication.

Module 2 (5L): Elements of a computer processing system: Hardware - CPU, storage devices and media, VDU, input-output devices, data communication equipment Software- system software, application software.

Module 3 (3L): Programming languages : Classification, machine code, assembly language, higher level languages, fourth generation languages.

Module 4 (6L): Operating systems : Concept as resource manager and coordinator of processor, devices and memory. Concept of priorities, protection and parallelism. Command interpreter, Typical commands of DOS/ UNIX/Network, Gul- Windows.

Module 5 (6L): Computers and Communication: Single user, multi-user, work station, client server systems, Computer networks, network protocols, LAN, WAN, Internet facilities through WWW, Mosaic, Gopher, html, elements of Java.

Module 6 (6L): Information integrity definition Ensuring integrity Computer security : Perverse software, concepts and components of security, Preventive measures and treatment.

Module 7 (6L): Range of application: Scientific, business, educational, industrial, national level weather forecasting, remote sensing, planning, multilingual applications.

References

Rajaraman V, "Fundamental of Computers" (2nd edition), Prentice Hall of India, New Delhi. 1996.

Sanders, D.H .. "Computers Today" McGraw Hill. 1988.

Trainer T., et al, "Computers" (4th edition) McGraw Hill, 1994.

MCA

MCA102: Computer Organization and Architecture (36 Lectures)

Module-1 (12L): Principles of Computer design - Software, hardware interaction layers in computer architecture. Central processing unit. Machine language instructions, Addressing modes, instruction types, Instruction set selection, Instruction cycle and execution cycle.

Module-2 (8L): Control unit, Data path and control path design, Microprogramming V s hardwired control, RISC Vs CISC, Pipelining in CPU design: Superscalar processors.

Module-3 (10L): Memory system, Storage technologies, Memory array organization, Memory hierarchy, interleaving, cache and virtual memories and architectural aids to implement these.

Module-4 (10L): Input-output devices and characteristics, Input-output processing, bus interface, data transfer techniques, I/O interrupts, channels.

Module-5 (6L): Performance evaluation - SPEC marks, Transaction Processing benchmarks.

References

Mano, M, "Computer System and Architecture", (3rd edition) Prentice Hall of India, New Delhi, 1994.

Pal Chauduri, P., "Computer Organisation and Design", Prentice Hall of India, New Delhi, 1994.

Rajaraman,V., and Radhakrishnan, T., "Introduction to Digital Computer Design" (4th edition). Prentice Hall of India, New Delhi, 1997.

Stallings. W, "Computer Organization and Architecture, (2nd edition) Prentice Hall of India, New Delhi

MCA103: Programming and Data Structures (40 Lectures)

Module-1 (6L): Introduction to algorithms, Flow charts, Tracing flow charts, Problem solving methods, Need for computer languages, Reading programs written in C language, C character set, Identifiers and keywords, Data types, Declarations, Expressions, statements and symbolic constants, Input-Output: getchar, putchar, scanf, printf, gets, puts, functions, Pre-processor command: # include, define, ifdef. Preparing and running a complete C program.

Module-2 (6L): Operators and expressions : Arithmetic, unary, logical, bit-wise, assignment and conditional operators, Library functions, Control statements: while, do-while, for statements, nested loops. If-else, switch, break, continue and goto statements, comma operator.

Module-3 (6L): Functions: Defining and accessing: passing arguments, Function prototypes, Recursion, Use of library functions, Storage classes: automatic, external and static variables, Arrays: Defining and processing, Passing to a function, Multi dimensional arrays.

MCA

Module-4 (6L): Strings, operations on strings. Pointers: Declarations. Passing to a function. Operations on pointers. Pointers and arrays. Arrays of pointers.

Module-5 (4L): Structures: Defining and processing. Passing to a function. Unions.

Module-6 (3L): Data files: Open, close, create, process. Unformatted data files.

Module-7 (9L): Data Structures: Stacks, queues, lists, trees and their application

References

Hutchison, R., "Programming in C". McGraw Hill, New York, 1990.

Johnsonbaugh, R., and Kalin, M., "Applications Programming in C", Prentice Hall of India, 1989. Rajaraman, V, "Computer Programming in C", Prentice Hall of India, New Delhi, 1995.

MCA-104: Introduction to Management Functions (36 Lectures)

Module-1 (3L): HRD : selection, appraisal, training and information systems.

Module-2 (4L): Marketing: Understand the concept of marketing mix. These marketing mix elements consist of product policy and design, pricing, choice of marketing intermediaries, methods of physical distribution, use of personal selling, advertising and sales promotion, marketing research, and marketing organization.

Module-3 (10L): Finance: Finance function (concept, scope, and its relationship with other functions) : tools of financial analysis (funds and cash flow analysis, ratio, analysis, risk-return trade-of): financial forecasting (profonna income statement and balance sheet, cash flow forecasting under uncertainty, financial planning): estimation and management of working capital (operating cycle concept, inventory, accounts receivables, cash and accounts payables, working capital requirements).

Module-4 (12L): Manufacturing: Operations Planning and Control (aggregate planning, multiple product batch, production cycles, short tenn scheduling of job shop, setting production rate in continuous production systems, activity scheduling in projects, introduction to project time calculations through PERT/CPM): Management of supply chain, materials management (introduction to materials management, systems and procedures for inventory management planning, and procurement of materials): quality management (quality concept and planning. standardizations, quality circles).

Module-5 (7L): Strategy: Firm and its Environment: strategies and resources; industry structure and analysis; evaluation of corporate strategy; strategies for growth and diversification; process of strategic planning.

References

Agarwal, R.D., "Organization and Management", Tata McGraw Hill, 1986. Massie, "Essentials of Management". 4th edition, Prentice Hall of India. 1996.

MCA

MCA105: Mathematical Foundations (38 Lectures)

Module-1 (10L): Mathematical Logic: Notation. Connectives Normal forms. Theory of inference for statement calculus.

Module-2 (10L): Predicate calculus. Inference theory of the predicate calculus. Relations and ordering. Functions. Recursion. Algebraic Structures: : Groups. Application of residue arithmetic to computers. Group codes.

Module-3 (10L): Graph theory: Definition. Paths, reach ability, connectedness. Matrix representation of graphs. Trees.

Module-4 (8L): Storage representation and manipulation of graphs: Trees. List structures and graphs. Pert and related techniques.

References

Kolman, B., and Busby. R., "Discrete Mathematical Structures for ComJ;luter Science", Prentice Hall. 1987.

Sahni, S., "Concepts in Discrete Mathematics". Camelot Publisher. U.S.A. 1981.

Tremblay, J.P., el. al. "Discrete Mathematical Structures with Applications to Computer Science" McGraw Hill, 1987.

MCA

MCA201:-Information Systems: Analysis, Design and Implementation (40 Lectures)

Module-1 (8L): Overview of Systems Analysis and Design : Systems Development Life Cycle. Concept and Models: requirements determination. logical design. physical design, test planning implementation planning and performance evaluation; communication, interviewing, presentation skills; group dynamics; risk and feasibility analysis; group-based approaches. JAD, structures walkthroughs, and design and code reviews; prototyping; database design; software quality metrics; application categories software package evaluation and acquisition.

Module-2 (6L): Information requirement Analysis: Process modelling with physical and logical data flow diagrams, data modelling with logical entity relationship diagrams; Developing a Proposal: Feasibility study and cost estimation.

Module-3 (6L): System Design: Design of input and control, design of output and control, file design/database design, Process design, user interface design; prototyping; software constructions; documentation.

Module-4 (8L): Application Development Methodologies and CASE tools: Information engineering, structured systems analysis and design and object oriented methodologies for application development data modeling, process modeling, user interface design and prototyping; use of computer aided software engineering (CASE) tools in the analysis, design and implementation of information systems.

Module-5 (6L): Design and Implementation of 00 platforms: Object oriented analysis and design through object modeling technique, object modeling, dynamic modeling and functional modeling, object oriented design and object oriented programming systems for implementation, object oriented data bases.

Module-6 (6L): Managerial Issues in Software Projects: Introduction to software markets; planning of software projects, size and cost estimations; project scheduling; measurement of software quality and productivity; ISO and capability maturity models for organizational growth.

The course should be based on lectures, case analysis and laboratory work. Cases should be used to illustrate each major topic in the course.

References

MCA

Haryszkiewycz, LT., "Introduction of Systems Analysis and Design". Prentice Hall of India, 1989.

Rajaraman, V, "Analysis and Design of Information Systems". Prentice Hall of India, 1991.

Senn, LA., "Analysis and Design of Information Systems". Tata McGraw Hill Book Company, 1986.

Whiten, 1.K., Bentley, L.D., Beslow, V.M., ''Systems Analysis and Design Methods". Galgotia Publications Pvt. Ltd. 1994.

MCA-202: Operating Systems (40 Lectures)

Module-1 (3L): Introduction-Evolution of operating systems. Types of operating systems. Different views of the operating system, operating system concepts and structure.

Module-2 (3L): Processes: The Process concept, systems programmer's view of processes. The operating system services for process management. Scheduling algorithms. Performance evaluation.

Module-3 (6L): Memory Management: Memory management without swapping or paging, swapping, virtual memory, page replacement algorithms, modeling paging algorithms, design issues for paging systems, segmentation.

Module-4 (6L): Inter-process Communication and synchronization, The need for interprocess synchronization, mutual exclusion, semaphores, hardware sport for mutual exclusion. queuing implementation of semaphores, classical problems in concurrent programming, critical region and conditional critical region, monitors, messages, deadlocks.

Module-5 (4L): File Systems: File systems, directories, file system implementation, security protection mechanisms.

Module-6 (3L): Input/Output: Principles of I/O Hardware: I/O devices, device controllers, direct memory access.

Module-7 (3L): Principles of I/O Software : Goals, interrupt handlers, device drivers, device independent I/O software. User space I/O software.

Module-8 (4L): Disks: Disk hardware, scheduling algorithms, Error handling, trac-at-a-time caching, RAM Disks. Clocks: Clock hardware, memory mapped terminals, I/O software. Terminals: Terminal hardware, memory mapped terminals, I/O software.

Module-9 (4L): Processes and Processors in Distributed Systems: Threads, system models, processor allocation, scheduling. Distributed File Systems: Design, implementation, trends.

MCA

Module-10 (4L): Performance Measurement, monitoring and evaluation, important trends affecting performance issues, why performance monitoring and evaluation are needed, performance measures, evaluation techniques, bottlenecks and saturation, feedback loops.

Case Studies: MS, DOS. MS WINDOWS, LINUX (UNIX) operating system.

References

Deitel. H.M .. "An Introduction to Operating Systems". Addison Wesley Publishing Company 1984. Milenkovic, M., "Operating Systems· Concepts and Design". McGraw Hill International Edition Computer Science series 1992.

Peterson, J.L .. Abraham Silberschatz. "Operating System Concepts". Addison Wesley Publishing Company. 1989.

Tanenbaum, A.S., "Modem Operating Systems", Prentice Hall of India Pvt. Ltd. 1995.

MCA-203: Oral and Written Technical Communication (36 Lectures)

Note taking from lectures and reference material. essay and precis writing, slide preparation and oral presentation principles, written presentation of technical material, preparation of bibliography, basic of official correspondence, preparation of bio-data, students should be asked to prepare and present seminars during the practice session. Group discussions should also be used and feedback given to students.

References

The Chicago Manual of Style, 13th Edition, Prentice Hall of India, 1989 Gowers, Ernest, "The Complete Words". Penguin, 1973.

IEEE Transactions on ''Written and Oral Communications" has many papers of relevance

Ludlow, R., and Panton, F., "The Essence of Effective Communication", Prentice Hall of India Pvt. Ltd. 1995.

Menzel, D.H., Jones, H.M., Boyd, L.G., ''Writing a Technical Paper". McGraw Hill, 1961.

Strunk, W., White. E.B., ''The Elements of Style", 3rd Edition, McMillan, 1979.

Munter, M., ''Business Communication: Strategy and Style" Prentice Hall, New Jersey, 1987.

Tubian, K.L., "A Manual for Writen of 1erm Papers, Thesis and Dissertation", Univ. of Chicago Press, 1973.

MCA-204: Accounting and Management Control (36 Lectures)

Module-1 (12L): Basic Accounting and conventions underlying preparation of Financial Statements (balance sheet highlighting accounting equation. profit and loss statement; accounting processes; basic

accounts, trial balance and financial statements; issues such as provisions for bad debts tax, dividends, losses such as bad debts, missing information, classification effect, cost of assets, rentals, etc); Income Measurement (revenue; recognition and matching costs and revenues; inventory valuation); Depreciation Accounting; Intangible Assets Accounting; Understanding published annual accounts including funds flow statement.

Module-2 (12L): Basic Cost Concepts: (introduction; cost classification; allocation, appointment and absorption; cost centers); Cost Analysis for Managerial Decisions (direct costing, break-even analysis; relevant costs; pricing; pricing-joint costs; make or buy; relevant fixed costs and sunk costs) Cost Analysis for Control (standard costing; variances; material, labour, overhead, sales, and profit); Standard Cost Accounting (budgeting and control; elements of budgeting; control of manufacturing and manufacturing expenses; performances appraisal, evaluation of cost control systems).

Module-3 (12L): Introduction to Management Control Systems; Goals, Strategies, and Key Variables; Performance Measures; Responsibility Centers and Transfer Price; Investment Centers; Reporting Systems; Management by Objectives; Budgeting and Control; Organizational Relationships in Control; Control Dynamics; Top Management and Control; Strategic and Long-Range Planning; Control of Service Module-4: Organizations; Control of Projects; Control of Non-Profit Organizations; Control of Multinational Companies.

References:

Bhattacharya, S.K., and Dearden, John, "Accounting for Management", Prentice Hall of India, New Delhi.

Chadwick, ''The Essence of Financial Accounting", Prentice Hall of India Pvt. Ltd., New Delhi.

Chadwick. ''The Essence of Management Accounting", Prentice Hall of India Pvt. Ltd., New Delhi.

Homgren, Sundem and Selto (9th ed), "Introduction to Management Accounting", Prentice Hall of India Pvt. Ltd.

Welch, Hilton and Gordon (5th ed). ''Budgeting: Profit Planning and Control", Prentice Hall of India Pvt. Ltd., New Delhi.

MCA-205: Probability and Combinatorics (36 Lectures)

Module-1 (8L): Probability: Sample space. Events. Axioms. Conditional probability. Bayes rule. Random variables: Discrete and continuous. Distribution and density functions. Marginal and conditional distributions. Stochastic independence.

Module-2 (10L): Expectation: Expectation of a function. Conditional expectation and variance. Moment generating function. Cumulant generating functions. Characteristic functions. Distributions: Discrete and continuous distributions.

Module-3 (10L): Permutations and combinations. Distinct and non-distinct objects. Generating functions for combinations. Enumerators for permutations. Distribution of distinct objects.

MCA

Module-4 (8L): Recurrence relations: Linear and with two indices. Principles of inclusion and exclusion. Formula derangement. Restrictions on relative positions.

References

Liu, C.L., "Introduction to Combinatorial Mathematics". McGraw Hill. 1996.

Ross, S., "A First Course in Probability", Collier Macmillan, New York, 1976.