SCHEME OF MBA E-COMMERCE COURSE

FIRST SEMESTER:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Course No.</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>1</td>
<td>101MECOM</td>
<td>Introduction to e-Commerce</td>
<td>Core</td>
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<td>2</td>
<td>102MECOM</td>
<td>Introduction to Information Technology</td>
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<td>3</td>
<td>103MECOM</td>
<td>Programming in 'C'</td>
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<td>4</td>
<td>104MECOM</td>
<td>Operating System</td>
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<tr>
<td>5</td>
<td>105MECOM</td>
<td>System Analysis &amp; Design</td>
<td>Core</td>
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<tr>
<td>6</td>
<td>106MECOM</td>
<td>Operations Research</td>
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<td>107MECOM</td>
<td>Operations Research (Lab)</td>
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<td>108MECOM</td>
<td>Programming Laboratory in C language</td>
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<td>11</td>
<td>111MECOM</td>
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Total Credit: #26+4 (Virtual Credit)

SECOND SEMESTER:

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<td>1</td>
<td>201MECOM</td>
<td>OOPs using 'C++'</td>
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<td>202MECOM</td>
<td>Software Engineering and Software Project management</td>
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<td>Database Management System</td>
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<td>204MECOM</td>
<td>Visual Basic</td>
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<td>206MECOM</td>
<td>Networking Concepts &amp; Design</td>
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<td>207MECOM</td>
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<td>208MECOM</td>
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Total Credit: #26+4 (Virtual Credit)
### THIRD SEMESTER:

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<td>E-Marketing</td>
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<td>Data mining &amp; Data warehousing</td>
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**Total Credit : #26+4 (Virtual Credit)**

### FOURTH SEMESTER:

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<th>Course No.</th>
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<td>ERP &amp; BPR Allied concepts</td>
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<td>403MECOM</td>
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**Total Credit : #22+4 (Virtual Credit)**

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<tr>
<td>E1</td>
<td>Accounting &amp; Management Control</td>
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<td>E2</td>
<td>Distributed System</td>
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<tr>
<td>E3</td>
<td>Internet &amp; its Applications</td>
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<tr>
<td>E4</td>
<td>Mobile Communication</td>
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101MECOM  INTRODUCTION TO E-COMMERCE

UNIT 1: Introduction
Brief history of e-com, Types, Advantages & Disadvantages of e-com, Elements of e-com, Principles of e-com, Messaging and Information distribution, Messaging and information distribution, Common service infrastructure, other key support layers.

UNIT 2: EDI to e-com

UNIT 3: Electronic communication
PC and networking, Network topologies and communication media, E-mail, OSI and TCP/IP Models, LAN, WAN, MAN, Internetworking – Bridges and gateways, Internet Vs Online services, Open vs. Closed Architecture, Controlled contained Vs Uncontrolled contained, Metered Pricing Vs Flat pricing, Innovation Vs Control.

UNIT 4: WWW & Electronic Payment System:
Applications – what is web, Why is the Web such a hit, The Web and E-Com, Concepts & Technology – Key concepts, Web Software development Tools. Electronic payment system – Overview, Electronic or digital cash, Electronic Checks, Online credit card based system, other Engineering financial instruments, Consumer legal and Business issues.

UNIT 5: Security and Application:

REFERENCE BOOKS:
2. "Web Commerce Technologies Handbook" By Daniel Minoli & Emma Minoli
3. "E-Commerce" By Dr. Varinder Bhatia
4. "Promise Of E-Governance" By M. P Gupta
102MECOM – INTRODUCTION TO INFORMATION TECHNOLOGY

UNIT 1-INTRODUCTION: Basic concepts of information technology, Application of IT in business, education, industry, home and training, entertainment, science and engineering and medicine, multimedia data types (graphics, images, audio, video), virtual reality applications, History of computers, Classification of computers, Organization of computers, Input/Output Devices, Storage Devices, File organization, System software, application software.


UNIT 3-COMPUTER LANGUAGES :- Machine Language, Assembly Language, High Level Language, Compiler, Interpreters, General Concepts of OOPS, SQL.

UNIT 4-OPERATING SYSTEM :- Introduction to Operating System, Function Provided by O.S, Introduction to Multiprogramming, Timesharing, Real-time, Batch processing.
DOS: Functions of DOS, structure booting, simple internal & external command.
WINDOWS.

UNIT 5-COMMUNICATION & NW TECHNOLOGIES: Goals & Application, protocol hierarchies, design issues, connection oriented & connectionless services, communication modes (Simplex, Half Duplex, Full Duplex), Switching Techniques (circuit switching and packet switching), communication media (Twisted pair & Coaxial cables, fiber optics), network topologies, LAN, WAN & MAN.

References:
1. Computer Fundamentals by P.K. Sinha
2. Operating System by Silberschatz Galvin
3. Computer Network by A.S Tannenbaum
4. Computer Architecture by Morris mano
103MECOM : Programming in 'C'

UNIT 1-An Overview : Problem identification, analysis, design, coding, testing & debugging, implementation, modification & maintenance; algorithm & flowcharts; Characteristics of a good program - accuracy simplicity, robustness, portability, minimum resource & time requirement, modularization; Rules/conventions of coding, documentation, naming variables; Top down design ; Bottom up design.

UNIT 2-Fundamentals of C Programming : History of C, structure of a C program, Data types, Constants & Variables Operators & expressions; Control Constructs - if-else, for, while, do-while; Case statement; Arrays; Formatted and unformatted I/O; Type modifiers & storage classes; Ternary operator; Type conversion & type casting; Priority & associativity of operators.

UNIT 3-Modular Programming: functions; Arguments; Return value; Parameter passing -call by value, call by reference; Return statement; Scope visibility and life-time rules for various types of variable, static variable; Calling a function ; Recursion - basics, comparison with iteration, tail recursion, when to avoid recursion examples.

UNIT 4-Advanced Programming techniques : Special constructs- break, continue, exit , goto & level; pointers- & and * operator , pointer expression , pointer arithmetic, dynamic memory management functions like malloc(), calloc() , free() ;string(); pointer v/s array ; array of pointer and its limitations ; function returning pointer , function as parameter ; structure-basic, declaration ,pointer to structure , referential operator, self referential structure , array of structure; Union -basic, declaration, enumerated data type; Typedef.

UNIT 5-Miscellaneous Features : File handling and related functions , printf and scanf family C preprocessor- basics, #include, #define, #undef.

References :
1. The C Programming Language - B.W. Kernighan & D.M. Ritchie
2. The Spirit of C - Cooper, Mullish
3. Kanetkar Y : Let us C
4. Kanetkar Y : Pointers in C
104MECOM: OPERATING SYSTEMS

UNIT 1-Introduction: Evolution of operating systems, Types of operating systems, Different views of the operating system, operating system concepts and structure.
Processes: The Process concept, systems programmer's view of processes, operating system services for process management. Scheduling algorithms. Performance evaluation.

UNIT 2-Memory Management: Memory management without swapping or paging, swapping, virtual memory, page replacement algorithms, modeling paging algorithms, design issues for paging systems, segmentation.
Inter-process Communication and Synchronization: The need for inter-process synchronization, mutual exclusion, semaphores, hardware support for mutual exclusion, queuing implementation of semaphores, classical problems, in concurrent programming, critical region and conditional critical region, monitors, messages.
Deadlocks: Deadlock Prevention, deadlock avoidance.

UNIT 3-File Systems: File systems, directories, file system implementation, security protection mechanisms.
Input/output: Principles of I/O Hardware: I/O devices, device controllers, direct memory access.
Principles of I/O Software: Goals, interrupt handlers, device drivers, device independent I/O software.
User space I/O Software.

UNIT 4-Disk: Disk hardware, scheduling algorithms, RAM Disks.
Processes and Processors in Distributed Systems:
Threads, System models, processor allocation, scheduling.

UNIT 5-Performance Measurement, monitoring and evaluation: Introduction, important trends affecting performance issues, why performance monitoring and evaluation are needed, performance measures.

References:
105MECOM: System Analysis And Design

UNIT 1- System Definition And Concept: Characteristics and Types of System, System Environment And Boundaries, Role and Need of system Analyst. Qualification and Responsibilities, system analyst as an agent of change, as investigator and Monitor, as Architect, as Psychologist.

UNIT 2- System Development Cycle: Introduction to various phases of system development life cycle (SDLC), Fact Gathering Techniques (Review of literature, Procedure & Forms, On-Site Observation, Interview, Questionnaire), Feasibility study and Feasibility Reports, Prototyping, Cost-Benefit Analysis.

UNIT 3- System Analysis: Structures system analysis, Process Modeling using DFD (Data Flow Diagram), Logic Modeling (structured English, Decision tables, Decision trees), Conceptual data modeling (E-R diagram), Issues in generating Alternative design strategies, selecting the best alternative design strategies.

UNIT 4- System Design: Logical & Physical design, Design Representation, System Flowcharts & structured charts, Designing forms & reports, Designing Interfaces & dialogues, file organization and database design.

UNIT 5- System Testing and Quality Assurance: Need of Testing, Test plan- Activity network for system testing, system testing-Types of system test, Quality Assurance: Goals, Levels of quality assurance.

Reference:


106MECOM: Operation Research
UNIT 1-Overview of Operation Research Problem formulation; Model Construction; O.R. Techniques. Introduction to Linear Programming; Construction of the L.P. Model; graphical L.P. solution, simplex method, Big m method, Two phase method, primal & dual problem.

UNIT 2-Replacement Problems: Capital equipment; Discounted Cost; replacement in anticipation of failure; Age replacement, Transportation and Assignment Problems.

UNIT 3-Queueing Models; Description of Queues; Arrival and Service Times; Birth & Death queueing system; M/M/1 model.

UNIT 4-Game Theory: Pure and Mixed strategy; two person zero sum game; game with and without saddle points; rule of dominance. Project Management Techniques; Network representation; CPM and PERT; Determination of Critical Path; optimization of project time and cost; crash cost and crash time.

UNIT 5-Dynamic Programming: Deterministic and probabilistic dynamic programming, Bellman's Principle. Integer Programming Problem, Gomory, Branch and Bound technique.

REFERENCES:
1. "Introduction to Operation Research" by F. S. Hiter & Liberman
2. "Operation Research" by H.A. Tara
3. "Operation Research" by S.D. Sharma
201MECOM : OOPS USING C++

UNIT 1-OOPS Fundamental :- OOPS terminology, data abstraction, data hiding, encapsulation, class, object and methods, inheritance, polymorphism, merits & demerits of OO methodology.

UNIT 2-C++ Basic :- Structure of C++ character set, tokens-keywords, variables, constants, special characters, data types & sizes, operators- arithmetic, relational, logical, assignment, increment & decrement, conditional, bitwise, special-extraction & insertion operation, scope resolution, member dereferencing, memory management, operator manipulator, type cast, qualifiers, symbolic constant, operator precedence, reference variable, statements- assignment, if-else, nested if-else, for loop, while, do while, break, switch, continue, goto.

UNIT 3-Functions in C++ :- the main function, function prototype, call by reference, return by reference, inline functions, default argument, friend & virtual functions, introduction to pointers.

UNIT 4-Classes and Objects :- declaration of arrays & structure, specifying class and definition of class, class members, accessing class members, defining member +functions-within class & outside class. Array within class, memory allocating for objects, array of objects, pointer to members. Constructors & Destructors :- Introduction to constructors, parameterized constructors, multiple constructors in a class, dynamic initialization of objects, copy constructors, destructors.

UNIT 5-Operator overloading & Inheritance :- Defining operator overloading, overloading- unary & binary operator, defining derived classes, inheritance type, this pointer, virtual functions.

File Input / Output : File handling in detail.

Reference :-

1. Object Oriented Programming - Robert Lafore (Galgotia Publication)
2. Object Oriented Programming - E. Balguruswami
202ME-COM  Software Engineering and Software Project management


Planning a Software Project: Project Plan, guidelines for Software planning, planning tasks, CPM/PERT, Gantt chart.


UNIT 3-Software Quality Assurance and Testing: Software quality assurance. Factors of software quality. SQA activities, s/w review basics, Documentation & issues. Verification and validation: white box and black box testing, unit testing, acceptance testing, system testing, integration testing.

Software Configuration Management: Fundamental of software configuration management (SCM) & its major elements.


Software Reliability: Definition and concept of software reliability, software errors, faults, software reliability metrics, repair and availability.

UNIT 5 -Software Maintenance: Fundamental of software maintenance, types of software maintenance, strategies, and maintenance of object-oriented system design.

CASE tools and Environment: Concept, scope of CASE, classification of CASE tools, categories of CASE environment.

Communication & Business technical reports: Role of communication in s/w project management & its types. Various Types of Reports according to different phases of SDLC.

Reference:

4. Project Management - "Harold Kerznes"
203MECOM- DATABASE MANAGEMENT SYSTEM

UNIT 1-Introduction :- Advantages of DBMS approach: Various views of data, data independence, schema & sub-schema; Primary concept of data models; Database languages; Transaction management; Database administration & user; Data dictionary; Overall system architecture.

ER Model: - Basic concept; Design issues; Mapping constraints; Keys; ER diagram; Weak & Strong entity-sets; Specialization & generalization, aggregation, inheritance; Design of ER schema; Reduction of ER schema to tables.

Domains, Relation & Keys: - Domains; Relations; Kinds of relations; Relational databases; Various types of keys; candidate, primary, alternate & foreign keys.

UNIT 2-Relation Algebra & SQL: - The structure; Relational algebra with extended operations; Modification of database; Idea of relational calculus; Basic structure of SQL; Set Operations; Aggregate functions; Null values; Nested sub queries; Derived relations; Views; Modification of database; Join relations; DDL in SQL. Database Integrity: - General idea; Integrity rules; Domain rules; Attribute rules; Relation rules; Database rules; assertions; integrity & SQL.

UNIT 3-Functional Dependencies & Normalization: - Basic definitions; Trivial & nontrivial dependencies; Closure set of dependencies & of attributes; Irreducible set of dependencies; Introduction to normalization; Nonplus decomposition; FD diagram; First, second & third normal forms; Dependency preservation; BCNF; Multivalued dependencies and fourth normal form; Join dependencies and fifth normal form.

Transactions, Concurrency & Recovery: - Basic concept; ACID properties; Transaction state; Implementation of atomicity & durability; Concurrent executions; Basic idea of serializability; Basic idea of concurrency control; Basic idea of deadlock; Failure classification; Storage structures-types, stable storage implementation, data access; Recovery & Atomicity- log based recovery, deferred database modification, immediate database modification, checkpoints.

Distributed Databases: - Basic idea; distributed data storage; Data replication; Data fragmentation-historical, vertical & mixed fragmentation.

UNIT 4- PL/SQL: - Features of PL/sql: Block Structure, Variables and Types, PL/sql Types: Scalar Type definition of composite and reference type using % type, user defined subtype, Expressions and operators, PL/sql Control structures.


UNIT 5-Storage Structure & File Organization: - Overview of physical storage media; Magnetic disk-performance & optimization; Basic idea of RAID; Organization of records in files; Basic concepts of indexing; Ordered indices; Basic idea of B-tree & B+ tree organization

Network & Hierarchical Models: - Basic idea; Data structure diagram; DBTG model; implementation; Tree structure diagram; Implementation techniques; Comparison of the three models.

Reference:
2. An Introduction to Database System: C.J. Date (6th Ed.) (Addison Wesley)
4. An Introduction to Database Systems: B.C. Desai (Galgotia Publishers)
5. Oracle & PL/SQL Programming by TMH/urman
204MECOM – Visual Basic

UNIT 1- A profile of VB - Menus, Tool bar Buttons, Tool box, Form, Project, controls, Properties, Program window.
Programming Essentials- General Procedures, Sub Procedures and function-designing, Calling & passing controls as arguments, Constant & variable Declaration, Scope and types.

UNIT 2- Designing a project - start up form, Properties and Program design, Managing multiple forms.
Flow of control - decisions - if statement, Else if clause, Select case structure, Nested decisions.
Loops - Do loops, For loops

UNIT 3- Arrays, Declaring arrays, Multidimensional & dynamic arrays, User defined types - Recorded structures, With statement array of records.

UNIT 4- Input & Output Procedures - Defining a Menu, Control Arrays, Input Techniques - Validating & Formatting the input, Moving the focus, Menu choices output techniques - Calculation & Display, Drawing chart.

UNIT 5- Visual basic controls - Intrinsic Controls, Custom control, Common dialog control, Printer object.
Object, Classes and Collections - Developing classes & collection MDI form, OLE controls. Data base connections. Data manager programme, Data control, Bound controls.

Reference:
1. Foundation of Visual Basic - Douglass Hergert.
4. Visual Basic Programming by Content development group, Tata McGraw Hill Publication
20SMECOM : MANAGERIAL ECONOMICS


References:
206ME-COM-NETWORKING CONCEPTS & DESIGN


UNIT 2-The medium access sublayer - ALOHA- pure aloha ,slotted aloha, LAN protocols (CSMA, collision free etc.), LAN standards- comparison if Token bus, Token ring & CSMA/CD.


UNIT 4-Internetworking :- Bridges & Gateways, Remote Procedure Call(RPC), Client-server Model.
Network Security :- Cryptography, Secret Key Algorithm, Public Key Algorithm, Data Encryption standard DES, Authentication protocol, Digital signatures, Secret Key signatures, Public Key signatures.

UNIT 5-Concepts in protocol design, Network architecture & protocols, state diagrams, petrinets, flow control techniques such as centralized flow control, distributed flow control, comparision, of flow control techniques, Deadlocks such as Protocol deadlocks and Buffer deadlocks.

References:

1. Computer Networks- by Andrew S. Tannenbaum (3rd edition)- PHI publications
3. Computer Networks by Ahuja.

UNIT 2: Marketing Knowledge: the electronic marketing information system, marketing knowledge, source 1: Internal records, Source 2: Secondary data, Source 3: Primary data, Marketing databases & warehouse, data analysis & distribution.


References:
1. "e-Marketing" by Judy Strauss & Raymond Frost (PHI publications).
302ME-COM Data Mining & Data Warehouse

UNIT 1- Introduction to Data Mining: Data Mining, features, business context, technical context, approaches to data mining. Types of Data Mining: Direct & Undirected, Virtuous Cycle.

UNIT 2- Data Mining Process & Technique: Data Mining Techniques: automatic, cluster detection, Decision trees, Neural Networks, Data Mining Methodologies: Conventional System Development, Waterfall process, Rapid Prototyping.

UNIT 3- Introduction to Data Warehouse: Data warehousing concepts, Goals & objectives, Issues involved in Data Warehousing, The three C's of Data Warehousing: Commitment, Completeness & Connectivity, OLAP, Types of Data Warehouse.

Constructing a Data Warehouse System:

UNIT 4- Stages of the project: Planning stage: Justifying the data warehouse, obtaining user buy-in, overcoming Resistance to the Data Warehouse, Developing a project plan; Data Warehouse Design approaches. Architectural stage: Process architecture, Introduction, Load manager, Query manager, Detailed Information, Summary Information, Metadata, Data Marting.

UNIT 5- Testing the Data Warehouse: Introduction, developing the test plan, testing backup recovery, testing the operational environment, testing the database, testing the application, Logistics of the test, Security: Requirements, performance, impact of security, security impact on design.

References:

1. "Data Warehousing" by Amitesh Sinha.
2. "Data Warehouse in the real world" by Sam Anahory & Dennis Murray.
Flat Panel Displays: Plasma panels, liquid crystal displays
Input Devices: Digitizing tables, mouse, touch panels, Image scanners.

UNIT 2 - Drawing Geometry: Line drawing and 2D Transformations: A simple line drawing algorithm, use of homogeneous coordinate systems, translation, scaling, rotation, mirror reflection, rotation about an arbitrary point, zooming and panning, parametric representation of a line segment.
Curve Drawing: Parametric representation, cubic Bezier and B-Spline curves (no derivation), conditions for smoothly joining curve segments.

UNIT 3 - Graphic Operations:
Clipping: Window port and view port, elimination of totally visible and totally invisible lines with respect to rectangular window using line end-point codes, Explicit line clipping algorithm, Sutherland-Cohen algorithm, Mid-point subdivision algorithm. Filling: Stack based and queue-based seed fill algorithms, scan line seed-fill algorithm.

UNIT 4 - 3D Graphics:
Transformations: Right Handed coordinate system with vertical y-axis, transformation matrices for translation, scaling, rotation around axis.
Parallel projection: multi views front, top and side views, oblique view.
Perspective projection: Transformation matrix to yield one vanishing point perspective view with viewpoint lying on z-axis, effects of translating the object.
Hidden Surface Removal: Back face removal, painter’s algorithm.

UNIT 5 - Multimedia:
Concept of hypertext/hypermedia, applications (Education, video conferencing, training, entertainment, electronic encyclopedias) multimedia hardware (CD-Rom, Audio speakers, sound cards, video cameras, scanners, MIDI). Introduction to image formats (Gif, Tif, Jpeg, BMP etc.), Introduction to sound formats (wav, au etc.), video formats (MPEG, AVI).
References:
2. "Computer Graphics Principles and Practice": Foley Van Dam, Feiner Hughes, Addison-Wesley Publishing Company
304 MECOM E1: ACCOUNTING AND MANAGEMENT CONTROL

UNIT 1: Meaning & Objects of Accounting Concepts & Conventions, Accounting Equation, Rules Of Journalizing, Cash Book, Ledger Posting, Preparation Of Trial Balance

UNIT 2: Trading And P/L Account, Balance Sheet With Adjustments Relating to Closing Stock, Outstanding Expenses, Prepaid Expenses, Accrued Income, Depreciation, Bad Debt, Provision For Bad Debt, Provision for Discount on Debtors & Creditors, Provision for Tax

UNIT 3: Inventory Pricing, FIFO & LIFO Methods, Simple Problem of Fund Flow Statements, Cost-Volume Profit Analysis

UNIT 4: Standard Costing, Computation of Material & Labor Variances, Budgetary Control, Preparation of Cash Budget & Flexible Budget

UNIT 5: Management Control & its Characteristics, Goals and its Strategies, Structure and control, Responsibility Centres & Control Centres, Concept of Responsibility Centres, Revenue Center, Profit Center and Investment Center, Transfer Pricing & Responsibility Reporting.

References:

UNIT 1-Introduction to Distributed Systems: Goals of Distributed Systems, Hardware and Software concepts, the client server model, Remote procedure call, remote object invocation, message and stream oriented communications.

UNIT 2-Process and synchronization in Distributed Systems: Threads, clients, servers, code migration, clock synchronization, mutual exclusion, Bully and Ring Algorithm, Distributed transactions.

UNIT 3-Consistency, Replication, fault tolerance and security: Object replication, Data centric consistency model, client-centric consistency models, Introduction to fault tolerance, process resilience, recovery, distributed security architecture, security management, KERBEROS, secure socket layer, cryptography.

UNIT 4-Distributed Object Based and File Systems: CORBA, Distributed COM, Goals and Design Issues of Distributed file system, types of distributed file system, sun network file system.

UNIT 5-Distributed shared memory, DSM servers, shared memory consistency model, distributed document based systems: the world wide web, distributed co-ordination based systems: JINI.

References:

2. Lui “Distributed Computing Principles and Applications”.
3. Harry Singh “Progressing to Distributed Multiprocessing” Prentice-Hall Inc.
5. Parker Y. Verjes J. P. “Distributed computing Systems, Synchronization, control & Communications” PHI.
305MECOM – JAVA PROGRAMMING

UNIT 1 - Overview of JAVA Programming:
History of JAVA, features of java, how it is differ from C & C++, java program structure, java Statements, JVM, command line arguments

Expression & Operator:
Data types, literals, variables, declaring a variable, dynamic initialization, Arrays, Operators - relational, Arithmetic, logical, assignment, increment & decrement, conditional operator, Bitwise operator, special operator, arithmetic expression, evaluation of expression.

Decision making & Branching:
Control Statements--IF, Switch, Loops, Break, Continue, Return.

UNIT 2 - Basic concept of OOPS:
Classes, methods, creating instance & class variable, accessing class member,
Constructor, Methods overloading, Method overriding, Static member, final classes, finalizer method,
Abstract method & classes, visibility control, Interfaces: Defining interfaces, extending interfaces, implementing interfaces, accessing interfaces, Variables, Package - system package, using system package, creating package, accessing a package, adding a class to a package, Hiding classes.

UNIT 3 - Exception Handling & Multithreaded Programming:
Exception Handling: Fundamental, types, uncaught exception, using try and catch, multiple catch, nested try, throw, throws, finally, Java thread model, creating threads, extending thread class, stopping & blocking a thread, Life cycle of thread, thread exception, thread priority, synchronization - implementing and runnable interface, inter thread communication, multithreading.

UNIT 4 - Developing web-based program:
What is an applet, applet architecture, applet life cycle, a simple applet program, AWT-Working with Graphics, line, rectangles, ellipses, circles, arcs, polygons Working with colors; Working with fonts.

UNIT 5 - Advance Java:
Streams and Files: JDBC, JDBC architecture, JDBC Basics, establishing a connection, JDBC Statements.

Reference:
1. Programming with java . A preimer by “E. Baluguruswamy “.
2. “Advance programming in Java by V.K. Jain & Hemlata
3. JAVA 2 platform in 21 DAYS by “Lemay and Cadenhead” by Techmedia pub.
4. The complete reference JAVA 2 by “Patrick Naughton & Herbert Schidt”.

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306 ME-COM--Data Structure Using C++


UNIT 2- *Arrays*: Abstract data types & the C++ class, Types of array: One-dimensional, two-dimensional, representation of arrays in memory, various operation performed on array; Matrix: addition, multiplication, transpose; definition of sparse matrix.

UNIT 3- *Stacks & Queues*:
Stack: Definition, its representation, implementation of stacks using arrays: Push, Pop; Polish Notation: Prefix, Postfix, Infix.
Queue: Definition, Implementation of queues, circular queues, double-ended queues, priority queues.

UNIT 4- *Linked List, Searching & Sorting*:
Linked List: Definition, Memory representation of linked list, operation: traversing, insertion, deletion; doubly linked list, various operations on it, Header linked list: Grounded & Circular.
Searching & Sorting: Linear & Binary Search, Bubble sort, Quick Sort, Selection Sort, Insertion Sort, Merge Sort.

UNIT 5- *Trees & Graphs*:
Trees: Terminology: height, depth, order, degree, parent, sibling, forest; Representation of trees, Binary trees, Representation of binary tree, traversal: Preorder, Postorder, Inorder; Complete Binary tree.
Graph: Related definition, graph representation- adjacency matrix, adjacency list, adjacency multilist; Types of graph, graph traversal: Depth-First Search, Breadth-First Search; Shortest path algorithm: Kruskal, Dijkstra algorithm.

Reference:
2. "*Fundamentals of Data Structures in C++*": Ellis Horowitz, Sartaj Sahni; Dinesh Mehta.
401MECOM -- ERP AND BPR ALLIED CONCEPTS

UNIT 1- *Introduction to ERP*: Evolution of ERP, Growth of ERP Market, advantages of ERP, ERP & Related technologies: BPR, MIS, DSS, EIS, Data Warehousing & Data Mining, OLAP, Supply Chain Management.


UNIT 4- *ERP Implementation Life Cycle*: Pre-evaluation screening, Package evaluation, Project Planning phase, Gap Analysis, Reengineering, Configuration, Implementation team training, Testing, Going live, End user training, Post-implementation, Role of vendors & consultants.

UNIT 5- *Business Process Reengineering (BPR) & its Implementation*: BPR, five step methodology to implement BPR. Development process vision & determining process objectives, defining the processes to be reengineered, understanding & measuring the existing processes, identifying the IT levels, designing the prototype & implementing it.

**BOOKS:**
2. Business Process Reengineering: Jayaraman Natarajan & Rangamanjan
3. ERP Concepts & Practice V.K Garg & Venkitakrishan.
4. Enterprise Resource Planning: Alexis Leon
402 MECOM E3 - Internet and its Application

Unit 1: Introduction of Networking
TCP/IP internet, internet services, protocol, standardization, Ethernet, FDDI, LAN, WAN, MAN, ATM, HTTP. Properties of internet, internet architecture, Internet addresses, routers, bridges.

Unit 2: Introduction of Browser and Web Page
Browser, Features of browser, types of browser, use of browser. About IE and its versions, Mozilla, AOL. What is webpage and it uses, structure of webpage.

Unit 3: HTML
What is HTML and it use, HTML TAGS, URL, head, body, anchor link, tables, frameset, span, div, image, audio, buttons, submit, reset, cancel, lists, font.

Unit 4: HTML FORMS
What is Forms. Use of forms, method, action, POST, GET etc. Events mouse over, click, mouse down. Form Designing. Introduction of DHTML.

Unit 5:
Good web design, the process of web publishing, document overview, header elements, website hosting, HTTP & URL, search engines, FTP, downloading ad uploading FTP, site promotions.

References:
1) Thomas A. Powell “The complete reference HTML”, TMH.
3) Joel Sklar “Principles of Web design”, Vikash publication
4) K. Kalata “Internet programming Thomson learning”.

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402 MECOM E4: Mobile Communications

Unit I

Unit II
Medium Access Control – Motivation for a specialized MAC – SDMA – FDMA – DDMA – CDMA – Comparison of S/T/F/CDMA.

Unit III

Unit IV

Unit V

Reference Book
403 MECOM UNIX & Shell Scripting

UNIT 1: Overview UNIX & LINUX

Structure of UNIX, evolution of UNIX, Kernel and shell, features of UNIX, UNIX: Installation and booting.

UNIT 2: File System

Unix file system, types of Unix files, Login Directory, Inode-User Identification, file system hierarchy, working directories & path names, pwd. Basic command for file manipulation like ls, cat, cp, rm, mv, ln, touch, cd, mkdir, rmdir, file access permission, types of permissions, determining & changing permission, chown, chgrp, newgrp, changing your password: passwd.

UNIT 3: Advanced features

Multi user communication & Scheduling: who, write, mesg, wall, mail, at, lp, lpslap, pr, news, mload, Multiple commands on command line, redirecting : standard output to a file, standard input from a file and both, pipelines and filter: head, tail, paste, sort, uniq, grep, egrep, fgrep, awk, n1. The Process running a process in the background, process status, terminating a process, delay process. General purpose utilities: more, file, wc, od, cat, banner, cmp, tty, sty, date etc.

UNIT 4: Introduction To Shell Script:

Unix editors: vi, ex, Bourne Shell, C Shell, advance features of shell. Shell variable – system shell variables, local & global variables. Shell meta characters and environment, if and case statements, for, while and until loops. Shell Programming.

UNIT 5: Introduction to LINUX: History and features of Linux, Linux structure, Various flavors of Linux, Installing Linux.

System Administration: Understanding System Administration, Managing user accounts, backing up data, system security.

References:

1. UNIX System – Rebecca Thomas (McGraw-Hill)
2. Advanced UNIX – Stephen Prata (BPS Publication)
3. UNIX System – Sumitabha Das
405 MECOM Project work

The project is to be done by the student reflecting the knowledge gained during the course of work and submit a project report as per prescribed format. Presentation of the project will be in the accepted norms and should be of real life value.

Project report will be submitted by the students latest on the date announced by the department and then evaluated by the examiner.