

DEPARTMENT OF COMPUTERT ENGINEERING SYLLABUS

Coen 213 - C for Advanced Applied Engineering Applications

UNIT-I: Introduction to C: importance of C-basic structure of C program-header files. Constants Variables Data types: C Tokens- Constants- Key Words or Reserved words- Data Types- Declaration of Variables-Assigning values to the variables- Defining Symbolic Constants. Operators-Expressions: Evaluation of Expressions- Precedence of Arithmetic Operators- Mathematical Functions. Input & Output Functions: Formatted Input & Output Functions

UNIT-II: Decision Making And Branching: Introduction- Decision making with If-if.else- Nested if...else statement- The Switch Statement- The?: Operator. Loops: The While- Do...While -For loop statement - Jumps in Loops.

UNIT-III: Arrays: One Dimensional Arrays- Initializing One-Dimensional Arrays- Double Dimensional Arrays- Initializing Two-Dimensional Arrays. String handling functions: Declaring and Initializing String Variables-Reading Strings-Arithmetic Operations on Characters Comparison of Two Strings-String Handling Functions. Functions: Meaning-types of functions-storage classes-recursive function-local & global variables. Structures-Unions & Enumeration:

UNIT-IV: Pointers: Concept of Pointers and Applications – Pointer Variables -Arrays of Pointers - Pointers as Function Arguments: - Pointers and Structures - Dynamic Memory Allocation.

UNIT-V: File Management: Modes of opening a file- Different ways of accessing files – Streams - Command - Line Arguments - Creating a file - Reading contents from a file - Writing contents into a file - Copying a file - Appending contents into a file.

REFERENCE BOOKS:

1. Computer Programming in C: K.R. VENUGOPAL and SUDEEP R PRASAD
– Tata McGraw Hill Publishing Company Limited
2. Computer Programming in C: V Raja Raman-Prentice Hall India-2000.
3. Programming in ANSI C: Balagurusamy-3rd Edition-Tata McGraw Hill-2003.

Coen 212 - Oops with C++

UNIT – I

Introduction-Object Oriented basic concepts- Polymorphism – Inheritance- Introduction- Basic Data Types- Data Types- Variables.

UNIT – II

Basic Statement- Input /Output Statements- Simple C++ Program – Structure- Declaration Statement- Assignment Statements, Control Structures - Program Development.

Functions C++ Enhancements- Function Prototyping, calling a Function Parameters passing in functions, Returning Values-Inline Functions, Scope rules of variables.

UNIT-III

Structured Data Type-Arrays –Introduction, Single Dimension Array, Strings, Two dimensional arrays, Array of Strings.

Classes and Objects-Introduction to Classes, Specifying the members of a class, Data Abstraction, Members and Member Functions, Creating Objects of a class- Accessing class members-using dot operator, Defining methods of a class- Memory allocation of objects, Static members of a class, Arrays of Objects.

UNIT-IV

Introduction- Function overloading, Operator overloading.

Constructors and Destructors-Introduction, Constructors, Functions of Constructors, Constructor Overloading, Rules for constructor-definition and usage, Destructors, The rules for destructor definition and usage.

Inheritance- Introduction, Advantages of inheritance, Derived class and Base Classes, Visibility Mode, Types of Inheritance.

UNIT-V

Working with Files-Classes for file streams Operations-Opening and closing a File-End of file Detecting-File pointers- Updating a file- Error handling during file Operations-Command Line Arguments-Templates and exception handling.

Coen 214 - Data Structure and Algorithm Using C

UNIT-I Introduction and Preliminaries

Learning Objectives, Basic Concept of ‘Data structure’, 1.3 Basic principles of Data Structure, Algorithm Analysis, Characteristics of Algorithm, Complexity of Algorithm (Overview of Basic Data Structure-Learning objectives, Arrays, Stack, Recursion).

UNIT-II Linear Data Structures

Stack (Learning objectives, Stack and its operations, Application of Stack, Expression and its types, Conversion of expression, Tower of Hanoi, Review & Summary, Exercise), Queue (Learning objectives, Queue, De-queue, Operation on Queue, Application of queue), Linked List (Learning objectives, Linked List, Operation on Link List, Application, Two Way List).

UNIT-III Searching

Searching-Learning objectives, Searching Techniques Linear Search, Binary Search, Complexity comparison, Sorting, Learning objectives, Sorting Techniques, Bubble Sort, Insertion Sort, Merge Sort, Selection Sort.

UNIT-IV Non Linear Data Structures-I

Trees -Learning objectives, Preliminary concepts of Tree and Binary tree, Trees, Binary Trees, Tree Traversals – Inorder, Preorder, Postorder

UNIT-V Non Linear Data Structures-II

Graph and their applications, Learning objectives, Graph, Operations on Graph, Types of Graph, Representation of Graph, Application of Graph

TEXT BOOKS:

1. Data Structure and Program Design C++ Kruse
2. Data Structures an Advanced Approach Using C Esakor Weiss

COEN 312 Unix and Shell Programing

UNIT-I

Introduction to Unix: - Architecture of Unix, Features of Unix, Unix Commands – PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip.

UNIT-II

Unix Utilities: - Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin. Text processing utilities and backup utilities , detailed commands to be covered are tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio

UNIT-III

Introduction to Shells:

Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.

Filters:

Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files.

UNIT-IV

Grep:

Operation, grep Family, Searching for File Content.

Sed:

Scripts, Operation, Addresses, commands, Applications, grep and sed.

UNIT-V

awk:

Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep, sed and awk.

UNIT-VI

Interactive Korn Shell:

Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process.

Korn Shell Programming:

Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

UNIT-VII

Interactive C Shell:

C shell features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, On-Off Variables, Startup and Shutdown Scripts, Command History, Command Execution Scripts.

C Shell Programming:

Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

UNIT-VIII

File Management:

File Structures, System Calls for File Management – create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

TEXT BOOKS:

1. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg. Thomson
2. Your Unix the ultimate guide, Sumitabha Das, TMH. 2nd Edition.

REFERENCES:

1. Unix for programmers and users, 3rd edition, Graham Glass, King Ables, Pearson Education.
2. Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
3. The Complete Reference Unix, Rosen, Host, Klee, Farber, Rosinski, Second Edition, TMH.

COEN 322 Microprocessor

UNIT:- I Introduction – Definition - Evolution of Microprocessors – word length – Buses – Addressing capacity of CPU- Microcomputer and overview of a Microcomputer system – Instruction, Execution of an instruction - Basic processor cycles - Signal flow in executing an instruction.

UNIT – II: Intel 8085 Microprocessor Architecture: ALU- Accumulator, Program Counter, Status Register, Stack Pointer, General purpose Registers, Memory Address Register and Memory Buffer Register, Instruction Register and decoder, Temporary Registers, Timing and Control unit and Interrupts.

UNIT -III: Microprocessor Block Diagram and programming model - Pin Configuration of Intel 8085- Microprocessor instructions: Data Transfer instructions – Arithmetic instructions - Logical instructions – Branch instructions – Jump instructions – Call and Return instructions.

UNIT – IV: Addressing Modes: Direct addressing mode, Register addressing mode, Register indirect addressing mode, Immediate addressing mode, Implied addressing mode - How to write, assemble and execute a simple program, An overview of an 8086.

UNIT – V: Microprocessor Applications: Delay subroutines – seven segment display interface – Temperature measurement and control – Water level indicator – Microprocessor based Traffic Control.

TEXT BOOK:

1. Fundamentals of Microprocessors and Microcomputers – Badri Ram - 4th Revised and enlarged edition- Dhanpat Rai and sons – 1993
2. Fundamentals of Microprocessor-8085, V. Vijayendran

Coen 321 Computer Architecture

UNIT – I: Basics of Digital System

Number System - Conversions from one number system to another - Arithmetic in number system – Complements - Binary Codes - Boolean Algebra - Properties of Boolean Algebra - Karnaugh Maps

UNIT – II: Combinational Circuits and Sequential circuits

Logic Circuits – Half Adder - Full Adder – Half Subtractor – Full Subtractor – Parallel Binary adder – Parallel binary subtractor – 2's complement adder/subtractor – Multiplexer – Demultiplexer - Encoder – Decoder – Flip-flops – Registers – Counters.

UNIT – III: Micro Operations and Arithmetic Processor Design

Register transfer and Micro Operations – Bus and Memory transfer – Arithmetic Micro operations – Logic Micro operations - Shift Micro operations – Arithmetic and logic shift Unit- Fundamental concepts of Instruction codes, computer instructions, timing and control, execution of instruction; Design of Arithmetic Unit – Design of Logic Unit – Design of Arithmetic and Logic Unit.

UNIT-IV: Input- Output Organization

Peripheral Devices, I/O Interface, Modes of Data Transfer, Priority interrupt, Input-output Processor (IOP), Multiprocessor System Organization, Data Communication Processor.

UNIT – V: Memory Organization

Auxiliary memory, Micro Computer Memory, Memory Hierarchy, Associative memory, Virtual Memory, Page Table, address mapping, Cache Memory, Hit Ratio, mapping techniques, Memory management hardware.

TEXT & REFERENCE BOOKS:

Computer Organization and Architecture: William Stallings

Computer system Architecture: M.Morris Mono

Digital Computer Fundamentals: Malvino and Leach

COEN 324 Embedded Systems**UNIT – I: Introduction to Microcontrollers**

Microprocessor – I/O -microcontroller – memory in microcontroller - peripheral modules in a typical microcontroller – timer module – serial port – analogue to digital conversion – special function units – serial peripheral port – CAN interface – Ethernet interface module – UART module – PWM module – Examples of microcontrollers.

UNIT – II: Introduction to 8051 microcontroller

8051 standards – architecture – pinout description – memory organization – special function registers – program counter – input/output ports – timers/counters – watchdog timer – power supply circuit.

UNIT – III: 8051 instruction set

Types of instructions – arithmetic instructions – branch instructions – data transfer instructions – logic instructions – bit-oriented instructions. – Examples programs.

UNIT – IV: Introduction to Embedded C and assembly language programming

Introduction – embedded system programming – Why embedded C – Difference between C and Embedded C – Embedded C programming steps and examples – assembly language programming introduction.

UNIT – V: Introduction to real time systems and RTOS – features and functions of Real Time Operating System – Introduction to real time Linux and its features.

TEXT BOOK: Embedded systems by Yashavant kanetkar and Asang dani.

REFERENCE BOOK/MATERIALS: 8051 microcontroller books, e books from mikroElektronika Architecture and Programming of 8051 Microcontrollers.

Coen 321 Operating System**UNIT – I**

Introduction – key Concepts – hierarchies and black boxes – resources and sharing – communication protocols and data types – system overhead and caching – system components – operating system services.

UNIT – II

Definition of a Process – process state – process operations – process state transition – process control block – threads – process Vs threads

UNIT – III

Deadlocks – introduction – preemptable and non-preemptable resources – necessary and sufficient deadlock conditions – dealing with deadlock problem – deadlock prevention – deadlock avoidance – deadlock detection

UNIT – IV

CPU/Process scheduling – goals of scheduling(objectives) – preemptive and non-preemptive scheduling – scheduling algorithms – FCFS – round robin – SJF – SRT – Priority

UNIT – V

Inter process communication – race conditions – critical section – mutual exclusion – mutual exclusion conditions – proposals for achieving mutual exclusion

Coen 331 Unified Modeling Language(UML)

UNIT – I: Introduction to Analysis and Design

Objectives – defining a system – system life cycle – phases of system development life cycle – system study – feasibility study – analysis and design – implementation – system development methodologies – process centered and data centered – structured design – rapid application development – agile development.

UNIT – II: Object Orientation and Modeling

Object oriented terms and concepts – object oriented analysis and design - fundamentals of object oriented modeling – abstraction – modeling – model organization – structured analysis – object orientation – encapsulation of hardware – encapsulation of software.

UNIT - III: Introduction to Unified Modelling Language (UML) Part I

Basic building blocks of UML – Things – Relationships – UML diagrams – use case diagrams – class diagram – sequence diagrams. state diagrams – activity diagrams – examples using UML diagrams - state diagrams – activity diagrams.

UNIT – IV: Introduction to Unified Modelling Language (UML) Part II and modeling

State diagrams – activity diagrams – examples using UML diagrams - System Development using UML concepts– business process modeling – system requirements definition - System analysis model - screen prototyping – the system design model – overall process flow – incremental development.

UNIT – V: Business process modeling and software intensive systems

Modeling the business process – process modeling notation – business process – inputs – resources – information – events – outputs – goals – architecture of software intensive systems – UML diagram hierarchy.

TEXT & REFERENCE BOOK:

1. The Unified Modeling Language Use Guide by Grady Booch, James Rumbaugh, and Ivar Jacobson

Coen 331 Formal Languages and Automata Theory

UNIT -I:

Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non-deterministic finite

automaton, transition diagrams and Language recognizers.

Chapter – 1, 2

UNIT- II:

Finite Automata: NFA with ϵ transitions, Conversions and Equivalence: Equivalence between NFA with and without ϵ transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay machines. Regular Languages Finite Automata for a given regular expression, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets

Chapter 2, 3

UNIT- III:

Grammar Formalism: Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, Context free grammar, derivation trees, sentential forms.

Right most and leftmost derivation of strings., Ambiguity in context free grammars.

Minimisation of Context Free Grammars. Chomsky normal form, Greiback normal form,

Pumping Lemma for Context Free Languages. Enumeration of properties of CFL

Chapter 5

UNIT- IV:

Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, Introduction to DPAD

Chapter -6

UNIT- V:

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines

Chapter -8

TEXT BOOKS:

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J. D.Pearson Education
2. Introduction to Theory of Computation –Sipser 2nd edition Thomson

REFERENCES:

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.

2. Introduction to languages and the Theory of Computation, John C Martin, TMH
3. “Elements of Theory of Computation”, Lewis H.P. & Papadimitriou C.H. Pearson /PHI.
- 4 Theory of Computer Science – Automata languages and computation -Mishra and Chandrashekar, 2nd edition, PHI

Coen 331 Relational Database Management System

UNIT-I: Database Environment: Introduction-Basic concepts and definition- Advantages of the Database Approach- Components of the Database Environment-Database Architecture-forms-reports-queries. E-R Diagrams- Data Names-Relationships and types - Entity-Entity Types-Attribute –types.

UNIT-II: Relational Model-Normalization-types- Ms-Access- Data types- Operators used in sql- procedure for creating tables- View- Referential integrity using SQL- create Indexes-functions and types of aggregations.

UNIT-III: Creation and modification of Tables-Retrieving data from a Table-Sorting, Grouping, using aggregate function of a Table-Join, set operators, Sub queries on Tables-Updating, Deleting, Dropping of tables

UNIT-IV: Creating forms and its types- Report Generations-procedure for design a report-creating mailing list. (Examples of student’s information, employee’s details information, customer details information, water/electricity billing systems etc.)

UNIT-V: Data and Database Administration: Functions of data Administration-Role of the data Administrator-Data Warehouse-Data dictionaries – Concurrency control- database security-Recovery and restart procedures - Types of database failure - Data quality.

TEXT BOOK:

MODERN DATABASE MANAGEMENT--By Jeffrey A. Hoffer Mary B. Prescott and Fred R.McFadden Pearson Education Asia (Sixth Edition)

REFERENCE BOOKS:

1. DATABASE SYSTEM CONCEPTS: -Abraham Silberschatz, Henry F. Korth and S. Sudarshan: Tata McGraw Hill 2002
2. DATABASE APPLICATION DESIGN AND DEVELOPMENT-By Michael V. Manino, McGraw Hill Irwin
3. DATABASE MANAGEMENT SYSTEMS -By Raghurama Krishnan and Johannes Gehrke McGraw Hill 2002

Coen 413 Java and Network Programming

UNIT-I:

Java Basics History of Java, Java buzzwords, datatypes, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java

program, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT-II:

Inheritance – Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes., Packages and Interfaces, **Exception** handling

UNIT-III:

Multithreading and AWT - Differences between multi-threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups., Event Handling , handling mouse and keyboard events, The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, dialogs, menubar, graphics, layout manager – layout manager types – boarder, grid, flow, card and grib bag.

UNIT-IV:

Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

Swing – Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

UNIT-VI:

Networking – Basics of network programming, addresses, ports, sockets, simple client server program, multiple clients, Java .net package

Database Access: Database Programming using JDBC, Studying Javax.sql. *

TEXT BOOKS:

1. Java; the complete reference, 7th editon, Herbert schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, pearson education.

REFERENCES:

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John wiley & sons.
2. An Introduction to OOP, second edition, T. Budd, pearson education.
3. Introduction to Java programming 6th edition, Y. Daniel Liang, pearson education.
4. An introduction to Java programming and object oriented application development, R.A. Johnson- Thomson.
5. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, seventh Edition, Pearson Education.

COEN 441 Software Engineering

UNIT-I: Introduction to Software engineering – What is a good software – Modeling the process: The meaning of process – Software process models – reasons for modeling-waterfall Model-V Model-Prototype model-spiral model – project personnel-staff roles and characteristics-work styles

UNIT-II: Capturing Requirements: The requirement process – Requirement elicitation – Types of requirements – requirement documentation- requirement definition document-requirement specification Document-Characteristics of requirements – Prototyping requirements – throw away prototype-evolutionary prototype- requirement Validation – Measuring requirements.

UNIT-III: Designing the system – conceptual and technical Design-Decomposition and modularity – architectural styles and strategies--pipes and filters-layering-repositories- Black board style - Issues in design creation – Design evaluation and validation – mathematical validation- design review – preliminary design review- critical design review- program design review- Documenting the design

UNIT-IV: Programming standards and procedures – standards for developers – standards for others – matching design with implementation – Programming guidelines – control structures – algorithms – data structures – general guidelines – Documentation – internal documentation – header comment block –formatting to enhance understanding – external documentation

UNIT-V: Testing the system: Unit testing – Integration testing – Test planning - Automated testing tools – Testing the system: Principles of system testing – Types of system testing- functional testing-performance testing-installation testing- Delivering the System – Training –user training-operator training- Documentation – Maintaining the system: The changing system – The nature of maintenance –corrective maintenance-Adaptive maintenance-perfective maintenance-preventive maintenance- Maintenance problems

TEXT BOOK: Software Engineering Theory and Practice - Shari Lawrence Pfleeger – Third Edition – Pearson Education Inc.

REFERENCE: Software Engineering – Roger.S. Pressman

COEN 442 Software Testing

UNIT -I:

Introduction – testing definitions - software development process – software testing process – software principles – introduction to test plan – components of good test plan- test plan generation

UNIT-II:

Introduction to test cases – BLACK BOX TESTING – Equivalence class partitioning – Boundary value analysis – WHITE BOX TESTING - Basic path testing (finding the cyclomatic complexity)- statement coverage testing-condition coverage testing. TESTING LEVELS – unit testing – integration testing – system testing – acceptance testing – regression testing – installation testing.

UNIT-III:

Debugging – strategies for Debugging – Debugging by brute force method – Debugging by induction method – Debugging by deduction method – Debugging by backtracking – Debugging by testing – Debugging principles – error repairing techniques – error analysis.

UNIT-IV:

Introduction to automated testing (Win Runner): Benefits of automated testing - Recording modes (Analog, context sensitive) - checking GUI applications - checking bitmaps

UNIT-V:

Checking text - checking databases (default checking - custom checking - runtime record checking)

Coen 451 Computer Network I**UNIT-I: Network Design Essentials**

Basics Of Networking , Advantages Of Computer Network , Main Types Of Computer Networks , Design a Network Layout , Understanding the various Networking Topologies , Understanding the various Network Architectures , Integrate the use of Hubs into your Network, Integrate the use of Switches into your Network , Integrate the use of Media into your Network , Integrate the use of Cable Preparation Tools , Integrate the use of Connectors for the new Network , Understanding Recommended distance among the Network Components , Understanding Straight , Cross and Roll Over Cabling and their Color combinations , Construct your Network layouts.

UNIT-II: Ip Addressing, Subnetting and Supernetting

Basic concept of Physical and logical addresses, IP Classes or Schemes, Role of Subnetmask and Internet Protocol, understanding subnetting and supernetting with examples, Diagnose the cause of a problem and resolve IP addressing problems.

UNIT-III: Network Communications and Networking with Tcp/Ip

OSI and 802 Networking Models, Role of a Reference Model, Identify the characteristics of TCP/IP, IPX/SPX, NetBIOS, and Apple talk, Understanding the position of network protocols in the OSI Model, Identify the core protocols of each protocol suite and its functions, understand each protocol's addressing scheme, Installing and Uninstalling TCP/IP, Configuring TCP/IP suite, Use of IPconfig and PING commands, Network Troubleshooting.

UNIT-IV: Networking in Workgroup Environment

Basic Concept of Workgroup , Use of netmeeting Utility , Sharing and accessing s/w and h/w resources , Differentiate user and group account , Drawbacks of single user account , Advantages of group account , Creating/implementing user and group accounts , Disabling and Deleting User

Accounts , Renaming User Accounts , Setting policies and users rights , Understanding Back Up And Copy Procedures , Understanding Recovery Procedure , Recovering System State And User Data With Windows 2003 Backup , Monitoring And Configuring Disk Quotas , Troubleshooting a Workgroup based Network.

UNIT-V: Wireless Networking

Understanding fundamentals of Wireless Networking , Importance of Wireless Networking , Evolution of Wireless LANs: An Overview , A Basic Wireless LAN , Basic Architecture of a Wireless LAN , Wireless LAN Adapters , Access Points (APs) , Wireless LAN Configurations (Ad-Hoc Mode , Infrastructure Mode) , Existing Wireless LAN Standards (IEEE 802.11 , IEEE 802.11 b , IEEE 802.11 a , HomeRF , Bluetooth) , Understanding Site Surveys , How to perform Site Surveys , Tools used to do Site Survey , Trouble shooting Wireless Networks.

RECOMMENDED BOOKS: Guide to Networking Essentials By Greg Tomsho, Networking Essentials By James Chellis, Building Secure Wireless Networks with 802.11 By JahanZeb Khan Anis Khan, Designing a Wireless Network (By Jeffrey Wheat, Randy Hiser,Jackie Tucker, Alicia Neely, Andy McCullough Technical Editor).

Coen 451 Computer Graphics

UNIT-I:

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices

UNIT-II:

Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

UNIT-III:

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. 2-D viewing: viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT-IV:

3-D object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

UNIT-V:

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D viewing: general projection transforms and clipping.

Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting.

TEXT BOOKS:

1. “Computer Graphics *C version*”, Donald Hearn and M.Pauline Baker, Pearson Education.
2. “Computer Graphics Principles & practice”, second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

REFERENCES:

1. “Computer Graphics”, second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.

Coen 452 Computer Network II

UNIT-I: Cisco IOS Basics and IP Routing

Understanding and configuring the Cisco Internetwork Operating System (IOS). , Internal compnents Of A Cisco Router , Managing Configuration Registers , Router Boot Sequence , Connecting to a router. , Bringing up a router and Logging into a router , Understanding the router prompts and Understanding the CLI prompts. , Perform an initial configuration on a router , Performing editing and help features and Gathering basic routing information , Viewing and saving router configurations and Verifying routing configurations , Performing interface configurations and Setting router hostnames , Setting router passwords , Seeting the Banner MOTD (Message of the Day) , Introduction To IP Routing , Understanding Host and Router Routing , Understanding the difference between Routed Protocols and Routing Protocols. , Understanding IP Routing Process , Understanding Static Routing , Understanding IP Routing in a Larger Network , Understanding Configuring IP Routing in Our Network , Verifying Your Configuration , Understanding Default Routing , Understanding Dynamic Routiing , Learn the differences between link-state and distance vector Algorithms. , Understanding the differences among RIP VS OSPF VS EIGRP , Understanding Administrative Distances , Understanding Configuring RIP Routing , Verifying the RIP Routing Tables , Understanding show protocols,show ip protocols and debug ip rip Commands , Review & Summary.

UNIT-II: Networking in Domain Environment

Role of A Computer In a Network , Types Of Network On The Basis of Role Of Computers , Workgroup Vs. Domain Environments , How Workgroup Based Network Works , How A Domain Or Client/Server Based Network Works , Promoting Workgroup Based Network to a Domain Based Network (Active Directory Installation, Minimum Requirements For Active Directory), Relegate Domain Based Network To Workgroup based Network (Removing Domain Controller - Uninstalling Active Directory) , Creating Domain User Accounts , Bringing Client Machines Under Domain Controller , Assigning Logon Rights and Log On To A particular Computer Restrictions , Creating Domain Groups , Implementing H/W And S/W Restrictions , Implementing Password And Account Lockout Policies (Password Attacks - Social Engineering ,Brute-Force , Easy Password And Careless) Mitigation (Implementing Password Policies , Implementing Account Lockout Policies) , Trouble Shooting Domain Based Environment .

UNIT-III: Managing Profiles

Understanding Hardware Profiles, Creating and Configuring Hardware Profiles, understanding User Profiles (Implementing Local User Profiles, Implementing Roaming User Profiles, Implementing Mandatory User Profiles, Understanding Temporary Profiles), Trouble Shooting Profiles.

UNIT-IV: Managing Dns and Dhcp Servers

Introducing Domain Name Service, DNS VS Net-BIOS, History of DNS, DNS Hierarchy, Levels in an FQDN, Components of Domain Name System, Registering a Domain Name, How DNS works? Or Resolving an FQDN, Installing and Configuring The DNS Server Service. Understand Types of DNS Server (Primary DNS Server, Secondary DNS Server), Understand DHCP Server, Installing and Configuring DHCP Servers, Authorizing a DHCP Server, Trouble Shooting DNS and DHCP Servers.

UNIT-V: Networking with Linux

Making a Workgroup based Network, creating local user accounts and local groups, making a Client/Server based Network, Creating Domain user accounts and Domain groups, Trouble shooting Linux based network. Summary.

Coen 411 - Internet and Web designing

UNIT-I

Introduction to HTML – Advantages of HTML – Structural commands –Character formatting commands – Paragraph formatting commands – Hyperlink commands – List specification commands – Tables –Forms – Frames –Marquees

UNIT-II

Cascading Style Sheets - Color and Background Properties - Image as Background - Text and Font Properties - Margin Properties-Border Properties - Padding Properties – list properties -Playing Sound and Videos

UNIT-II

Introduction to JavaScript – Integrating with HTML – Comment Lines – Variables – Operators – Dialog Boxes – Date Functions – Functions & Objects – Events & Methods.

UNIT-II

Loops – Conditional Statements – Arrays – Windows Properties & Methods – Timeouts - String Object – Math Objects – Validations.

REFERENCE BOOKS:

World wide web design with HTML By C.Xavier

Java Script pocket Reference by David Flanagan

COEN 412 Server Side Programming

UNIT-I: Introduction to PHP: Benefits of Server Side Processing, a typical PHP and MySQL development framework, Basic PHP syntax, Operators, Decision making, Loops, PHP arrays, Numeric and Associative arrays, Multi-dimensional Arrays, Merging Arrays, Sorting Arrays, Processing HTML forms

UNIT-II: PHP database connectivity: PHP MySQL connectivity, basic connection and interaction functions, working with date and time fields, ODBC connections

UNIT –III: User defined functions: creating functions, returning values, arrays as argument and return types, variable scope, passing by value and by reference, importing function definitions, using files: reading from file, writing to file.

UNIT-IV: PHP cookies: create, retrieve and delete cookies, PHP Session: starting a session, storing session variables, destroying sessions, PHP mail: mail function, sending mails

TEXT BOOK:

“How to Do Everything with PHP and MySQL”, by ViKram Vaswani

REFERENCE:

“PHP and MySQL Web Development”, by Luke Welling, Laura Thompson

COEN 414 Visual Programming

UNIT-I: Introduction to Visual Basic – Development environment – features of visual environment – Designing a user interface – forms – toolbox – dockable windows: project window, property window and form layout – common controls – menus – dialog boxes.

UNIT-II: Programming concepts: Variables, data types, operators, variable scope, and constants – program flow controls- built in functions.

UNIT-III: Functions- procedures- modules-arrays-control arrays-collections- files management.

UNIT-IV: Graphics and animation – mouse and keyboard events- database tools – database management

UNIT-V: MDI – Active X control – OLE - Objects and class modules – windows APIs.

COEN 454 Distributed Computing

UNIT – I: Introduction to distributed Systems - Introduction - characterization of distributed systems – definition - examples of distributed system – advantages and disadvantages – design issues with distributed systems – models of distributed systems – architectural models –

interaction models – fault models – comparison of distributed systems with other computing systems.

UNIT – II: Communication in Distributed Systems – communication system – layered implementation – network protocol – Request and Reply primitives – Remote Method Invocation(RMI) - Remote Procedure Call(RPC) – RMI and RPC semantics and failures - Group communication

UNIT – III: Distributed Transaction Processing - distributed transactions – session trees for distributed transactions – two-phase commit mechanism – in-doubt transactions – distributed transaction processing.

UNIT – IV: Distributed Data Base Design – Distribution design strategies – distribution design issues – fragmentation – horizontal fragmentation – primary – derived – vertical fragmentation – hybrid fragmentation.

UNIT – V: Distributed Systems Security – Security definition – specific problem areas of security – distributed architecture and security architecture – security protocols – security inter/intra/extranet applications – security middleware - managing securities in distributed systems.

TEXT AND REFERENCE BOOKS:

Distributed Systems by Andrew S. Tanenbaum, Maarten Van Steen – Prentice Hall International.
Distributed System – Concepts and Design by George Conlouris, Jean Dollimore, Tim Kindberg – Addison Wesley Publication company 4th Edition.

Coen 511 Visual Basic dot Net

UNIT-I: Introduction to VB dot net- dot net framework – dot net architecture-jit – class library- introduction Visual Studio dot net – VB dot net development environment – creating applications – building projects using simple components- running VB dot net application – VB dot net language – data, operators, control logic, procedures, dialog boxes.

UNIT-II: OOPs in VB dot net – classes and objects – properties methods fields and events – constructors and destructors – overloading and overriding. FILE I/O and system objects – error handling – namespaces – multithreading.

UNIT-III: Window forms – controls – specific controls – visual inheritance – graphics.

UNIT-IV: Data access – introduction to data access in dot net – ADO dot net – data access in visual studio dot net – introduction to XML in dot net.

UNIT-V: VB dot net and the Web – Introduction to web programming – accessing data on the web – XML web services.

TEXT BOOKS:

1. Mastering visual basic dot net Evangelos Petroustos

Coen 523 Advanced PC Hardware and interfacing

UNIT-I: Managing PC Power Supplies

Basics Components of a System Unit including Power Supply, Types of PC Power Supply, Roles of PC power supply, Types of PC Power Supply, parts of ATX Power Supply, How A Power Supply Works? Specifications of A Power Supply, Installing & Upgrading a Power supply, Troubleshooting a Power Supply.

UNIT-II: Managing Motherboard, Processor and Chipsets

Motherboard, Roles of Motherboard, Types of Motherboard, Parts of ATX-motherboard Specification of Motherboard, Installing & Upgrading of Motherboard, Troubleshooting a Motherboard Processor (CPU), Roles of a Processor, CPU manufacturers, Intel & AMD processors Specification of a CPU, Installing & Upgrading a CPU, Troubleshooting a CPU Chipsets and Motherboard Resources Configuration, Roles of Chipsets (Northbridge and Southbridge), Motherboard Resources configuration, Troubleshooting Resources configuration

UNIT-III: Managing Primary Memories, Bios, Cmos, Hard Disk, Optical Discs, Optical Drives & Removable Disks and Trouble Shooting I/O Devices

Memory, Roles and Types of Memory (RAM & ROM), Types of RAM chips (SRAM & DRAM), Specification of Memory, Installing & Upgrading Memory (RAM), Troubleshooting Ram, CMOS and BIOS, Troubleshooting BIOS & CMOS Hard Disk, Specification of a Hard disk, Installing & Upgrading a Hard disk, Troubleshooting a Hard disk Optical Discs & Optical Drives, Specifications of a CD/DVD drive, Installing & Upgrading a CD/DVD drive, Troubleshooting CD/DVD discs and drives, Removable Disks, Troubleshooting Flash, MP3, MP4/iPod, MP5 & MP6, Troubleshooting.

UNIT-IV: Managing and Trouble Shooting I/O Devices

Introduction to Peripherals, Input devices and output devices, Troubleshooting Input devices, Video System, Parts of Video System (Video Adapter & Screen) , Types and Specification of Video Adapter , Types of Monitor , Parts of CRT Monitor , Specification of Monitor , Troubleshooting a Video System , Output devices used for hard copy , Printers and types , Improving printer performance , Troubleshooting guidelines for printers.

UNIT-V: Interfacing Computers to Mechatronic Systems

Introduction to Computer interfacing , General model for computer based interfacing system , interfacing Parallel Port (Modes of Parallel Port -SSP , Nibble , Byte , EPP , ECP), Interfacing the Serial /RS232 Port (Hardware Properties , Serial Pinouts (DB25 & DB9) , Pin Functions , Null Modems), Serial Port Registers (PC's) , External Hardware - Interfacing Methods , USB Interface (Various Versions USB, USB System Overview, USB Connectors & the Power Supply, USB Electrical Signaling, How do they communicate?, USB packets and Formats, Handshake Packets, Further development in USB.

Coen 551 Mobile Computing

UNIT - I

Introduction to Mobile Communications and Computing: Mobile Computing (MC): Introduction to MC, novel applications, limitations, and architecture. GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT-II

GPRS: Introduction to GPRS, architecture, DECT, UMTS, satellite communications, broadcast systems, DVB.

UNIT - III

(Wireless) Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA. Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

UNIT - IV

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP. Database Issues: Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

UNIT - V

Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs. Protocols and Tools: Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

TEXT BOOKS:

1. Jochen Schiller, "Mobile Communications", *Addison-Wesley*. (Chapters 4,7,9,10,11), second edition, 2004.
2. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", *Wiley*, 2002, ISBN 0471419028. (Chapters 11, 15, 17, 26 and 27)

REFERENCES:

1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004,
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.
3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", *Springer*, second

edition, 2003.

4. Martyn Mallick, “Mobile and Wireless Design Essentials”, Wiley *DreamTech*, 2003.

Coen 563 Artificial Intelligence

UNIT-I: Artificial Intelligence

Introduction to AI – History of AI – Expert System – Knowledge Management – Heuristic Knowledge – Intelligent systems – rule based system – Knowledge based system – forward & backward chaining – neural networks – semantic networks – criteria for success – production system characteristics — problems, problem spaces- specialized production systems – comments on different types of production systems- example problems.

UNIT – II: Search Techniques for AI production systems.

Generate and test - Hill Climbing – Backtracking strategies – Graph-search strategies – Heuristic search – Related algorithms (A*, AO*, AND/OR graphs, Alpha-beta pruning) – Searching game trees – example problems.

UNIT –III: Predicate calculus in AI

Knowledge representation (approaches & Issues) – Introduction to Predicate calculus – resolution – uses of predicate calculus in AI- refutations – extracting answers from resolution, refutations – rule-based systems – procedural & declarative knowledge – Logic programming – forward, backward reasoning – robot problem solving

UNIT –IV: Expert System (ES)

Introduction – architecture of ES – examples – knowledgebase and chaining functions – Prolog as an inference engine – Introduction to Prolog – syntax – operators, lists – input and output -example programs.

UNIT –V: Logic Programming

Programming style and technique – operations on data structure problems – prolog in AI – machine learning – example problems.

TEXT BOOKS:

1. Artificial Intelligence – Elaine Rich and Kevin Knight, Mc-Graw Hill Publication.
2. PROLOG Programming for Artificial Intelligence Ivan Bratko, Pearson Education.

REFERENCE BOOKS:

1. Principles of Artificial Intelligence Nils J.Nilsson, Narosa Publishing House.

Coen 532 Datamining and Warehousing

UNIT-I

Introduction to DW, Components of DW, DW delivery method, System process, Process flow with in DW, Query management process, Process architecture, Meta data, data marting.

UNIT -II

Design aspects, designing star flake scheme, Multi-dimensional scheme, Partitioning strategy, Aggregator, Data marting, Meta data, System data, warehousing process.

UNIT -III

Hardware and operational design, Parallel technology, Security input on design of hardware, Backup and recovery, Service level management, Operating the data warehouse.

UNIT -IV

Capacity planning –estimating the load, Timing the data warehouse, accessing performance, Taking the data load and queries, testing data warehouse, Development of test plan, Testing the data base and operational environment.

UNIT -V

Data mining concepts, Web mining, Text mining, Text clustering, Temporal and spatial data mining, Sequence mining problem, algorithms, Event prediction problem, Spatial mining.

Coen 542 - Software Quality Assurance

UNIT-I

Introduction - Software Quality Factors - Components of SQA - Pre-project Components.

UNIT-II

SQA Components in Project Life Cycle - Integrating quality activities in the PLC- - Reviews - CASE tools effect on Software quality

UNIT-III

Software quality infrastructure components - Procedures and work instructions - Supporting quality devices - Corrective and preventive actions (CAPA) - Configuration management- Documentation Control

UNIT-IV

Management components of software quality - Project progress control - Software quality metrics - Costs of software quality

UNIT-V

Standards, Certification and Assessment – Introduction - Quality Management Standards. IEEE Software Engineering / SQA project progress standards.

REFERENCES TEXT BOOKS:

Software Quality Assurance from Theory to Implementation.
-Daniel Galin, Pearson – Addison Wesley

Coen 552 Principles of Network Security

UNIT-I: Network Threats and Mitigation Understand Attackers Types of Attackers, Basic of Network Threats, Types of Threats, Reconnaissance Threat, Access Threats, Packet Capturing Threats, Viruses Threats, Switch Threats, Spoofing Threats, Mitigating Threats, Use Of Access List, Use Of Software, Creating Log Server (Kiwi syslog server), Implementing Intrusion Detection system (IDS), Signatures Definitions files(SDF).

UNIT-II: Cryptography Basic Concept of Cryptography, A Brief History of Cryptography, Encryption and Decryption, The Enigma Encryption system, Public Key Encryption and private key decryption, Private key encryption and public key Decryption, Key Management, Common Cryptography Algorithms.

UNIT –III: Internet Security Introduction, privacy, authentication, integrity, nonrepudiation, digital signature, security in the internet, application layer security, PGP, SSH transport layer security, position of TLS, two protocols, security at the IP layer, IPSec Authentication header AH protocol, Encapsulating security payload, firewalls

UNIT-IV: Security protocols Kerberos protocol overview, SSL, Encryption, PPTP, SLIP, PPP, Private networks, Intranet, Extranet, Addressing, Virtual private network technology, packet filtering, achieving privacy.

TEXT BOOK: TCP/IP protocol suit by Behrouz a Forouzan.

REFERENCE: Computer Network by Tananbaum, Networks by Stalin, Network security e-books.