UTTARAKHAND TECHNICAL UNIVERSITY

Program: B. Tech-CSE

Year: Session: 2011 – 2012

Scheme and Evaluation Pattern

S.No	Course No.	Subject	Periods			Evaluation				Total Marks
			L	T	P	Sessional			External Exam	
						CT	TA	Total		
Semester:5th										
Theory										
1.	TCS – 501	Computer Graphics	3	1	0	30	20	50	100	150
2.	TCS – 502	Computer Network	3	1	0	30	20	50	100	150
3.	TCS – 503	Design & Analysis of Algorithms	3	1	0	30	20	50	100	150
4.	TCS – 504	Principles of Programming Languages	2	1	0	15	10	25	50	75
5.	TCS – 505	Advance Java Programming	3	1	0	30	20	50	100	150
6.	TCS – 506	Modeling & Simulation	2	1	0	15	10	25	50	75
Practical/Design										
1.	PCS -551	Computer Graphics Lab.	0	0	2	0	0	25	25	50
2.	PCS-552	Computer Network Lab.	0	0	2	0	0	25	25	50
3.	PCS-553	Algorithms Lab.	0	0	2	0	0	25	25	50
4	PCS-555	Adv. Java Lab.	0	0	2	0	0	25	25	50
5.		Discipline	0	0	2	0	0	50	0	50
Semester: 6th										
Theory										
S.No	**Course No.**	**Subject**	**Periods**			**Evaluation**				**Total Marks**
			L	T	P	Sessional			External Exam	
						CT	TA	Total		
1.	TCS – 601	Operating System	3	1	0	30	20	50	100	150
2.	TCS – 602	Compiler Design	3	1	0	30	20	50	100	150
3.	TCS – 603	Artificial Intelligence	3	1	0	30	20	50	100	150
4.	TCS – 604	Graph Theory	2	1	0	15	10	25	50	75
5.	TCS – 605	Visual Programming & DotNet Technologies	3	1	0	30	20	50	100	150
6.	THU – 608	Principles of Management	2	1	0	15	10	25	50	75
Practical/Design										
1.	PCS-651	Operating System Lab.	0	0	2	0	0	25	25	50
2	PCS-652	Compiler Design Lab.	0	0	2	0	0	0	25	25
3.	PCS-653	Artificial Intelligence Lab.	0	0	2	0	0	25	25	50
4.	PCS-655	Visual Programming Lab.	0	0	2	0	0	25	25	50
5.		Discipline	0	0	2	0	0	50	0	50

UTTARAKHAND TECHNICAL UNIVERSITY

Program: B. Tech-CSE

Year: Session: 2012 – 2013

Scheme and Evaluation Pattern

S.No	Course No.	Subject	Periods			Evaluation				Total Marks
			L	T	P	Sessional			External Exam	
						CT	TA	Total		
Semester:7th										
Theory										
1.	TCS- 701	System Administration	3	1	0	30	20	50	100	150
2.	TCS -702	Advance Computer Architecture	3	1	0	30	20	50	100	150
3.	TCS -703	Data Warehousing & Mining	3	1	0	30	20	50	100	150
4.	TCS-07X	ELECTIVE-I	3	1	0	30	20	50	100	150
5.	TOE-XX	Open Elective	3	1	0	30	20	50	100	150
Practical/Design										
1.	PCS -757	Project	0	0	4	0	0	50	50	100
2.	PCS-758	Industrial Interaction/ Seminar (Term Paper)	0	0	2	0	0	25	25	50
3.	PCS-751	System Administration Lab	0	0	2	0	0	25	25	50
4.		**Discipline**	0	0	0	0	0	50	0	50
Semester: 8th										
Theory										
S.No	**Course No.**	**Subject**	**Periods**			**Evaluation**				**Total Marks**
			L	T	P	Sessional			External Exam	
						CT	TA	Total		
1.	TCS -801	Distributed Computing	3	1	0	30	20	50	100	150
2.	TCS-802	Web Technology	3	1	0	30	20	50	100	150
3.	TCS-02X	ELECTIVE-II	3	1	0	30	20	50	100	150
4.	TCS-03X	ELECTIVE-III	3	1	0	30	20	50	100	150
Practical/Project										
1.	PCS-857	Project	0	0	6	0	0	100	200	300
2.	PCS-852	Web Technology Lab.	0	0	2	0	0	50	0	50
3.		**Discipline**	0	0	0	0	0	50	0	50

ELECTIVE-I

TCS-071	Digital Image Processing
TCS-072	Soft Computing
TCS-073	Wireless Networks
TCS-074	Information Security

ELECTIVE-II

TCS-081	Parallel Computing
TCS-082	Database Administration
TCS-083	Advance Computer Network
TCS-084	Fault Tolerant Computing

ELECTIVE-III

TCS-086	Computer Vision
TCS-087	Advanced DBMS
TCS-088	Intrusion Detection Systems
TCS-089	Cryptography & Network Security

COMPUTER GRAPHICS (TCS-501)

Unit-I

Line generation: Points lines, Planes, Pixels and Frame buffers, vector and character generation. Graphics Primitives: Display devices, Primitive devices, Display File Structure, Display control text.

Unit-II

Polygon: Polygon Representation, Entering polygons, Filling polygons. Segments: Segments table, creating deleting and renaming segments, visibility, image transformations.

Unit-III

Transformations: Matrices transformation, transformation routines, displays procedure. Windowing and Clipping: Viewing transformation and clipping, generalize clipping, multiple windowing.

Unit-IV

Three Dimension: 3-D geometry primitives, transformations, projection clipping.

Hidden Line and Surface: Back face removal algorithms, hidden line methods

Unit-V

Graphics Programming: The Sierpinski Gasket, Programming Two-Dimensional Applications, The OpenGL API, Primitives and Attributes, Color, Viewing, Control Functions, Polygons and Recursion, The Three-Dimensional Gasket, Plotting Implicit Functions

Input and Interaction: Interaction, Input Devices, Clients and Servers, Display Lists, Programming Event-Driven Input, Menus, Picking, Building Interactive Models, Animating Interactive Programs, Design of Interactive Programs, Logic Operations.

References :

1. Hill, Jr. & Kelley; Computer Graphics Using OpenGL, 3rd Ed. , Phi Learning Pvt. Ltd. (2009)
2. Donald D. Hearn**,** M. Pauline Baker**;** Computer Graphics with OpenGL; 3/E; Pearson Education
3. Rogers, "Procedural Elements of Computer Graphics", McGraw Hill
4. Asthana, Sinha, "Computer Graphics", Addison Wesley
5. Newman and Sproul, "Principle of Interactive Computer Graphics", McGraw Hill
6. Steven Harrington, "Computer Graphics:, A Programming Approach", 2nd Edition6.
7. Rogar and Adams, "Mathematical Elements of Computer Graphics", McGraw Hill.

COMPUTER NETWORKS (TCS-502)

Unit -I

Introduction Concepts : Goals and Applications of Networks, Network structure and architecture, The OSI reference model, services, Network Topology Design - Delay Analysis, Back Bone Design, Local Access Network Design. Physical Layer Transmission Media, Switching methods, ISDN, Terminal Handling.

Unit-II

Medium Access sub layer: Medium Access sub layer – Channel Allocations, LAN protocols - ALOHA protocols - Overview of IEEE standards - FDDI. Data Link Layer - Elementary Data Link Protocols, Sliding Window protocols, Error Handling.

Unit - III

Network Layer: Network Layer - Point - to Pont Networks, routing, Congestion control ,Internetworking -TCP / IP - IP packet, IP address, IPv6. '

Unit - IV

Transport Layer: Transport Layer - Design issues, connection management, session Layer-Design issues, remote procedure call. Presentation Layer-Design issues, Data compression techniques, cryptography - TCP – Window Management.

Unit-V

Application Layer: Application Layer: File Transfer, Access and Management, Electronic mail, Virtual Terminals, Other application, Example Networks - Internet and Public Networks.

References:

1. Forouzen, "Data Communication and Networking", TMH
2. A.S. Tanenbaum, “Computer Networks”, 3rd Edition, Prentice Hall India, 1997.
3. S. Keshav, “An Engineering Approach on Computer Networking”, Addison Wesley, 1997
4. W. Stallings, “Data and Computer Communication”, Macmillan Press.

DESIGN & ANALYSIS OF ALGORITHMS (TCS-503)

Unit -I

Introduction: Algorithms, analysis of algorithms, Growth of Functions, Master's Theorem, Designing of Algorithms. Sorting and order Statistics: Heap sort, Quick sort, Sorting in Linear time, Medians and Order Statistics.

Unit -II

Advanced Data Structure: Red-Black Trees, Augmenting Data Structure. B Trees, Binomial Heaps, Fibonacci Heaps, Data Stricture for Disjoint Sets.

Unit -III

Advanced Design and Analysis Techniques : Dynamic Programming, Greedy Algorithms, Amortized Analysis, Back Tracking.

Unit -IV

Graph Algorithms: Elementary Graphs Algorithms, Minimum Spanning Trees, Single-source Shortest Paths, Al l-Pairs Shortest Paths, Maximum Flow, and Traveling Salesman Problem.

Unit -V

Selected Topics: Randomized Algorithms, String Matching, NP Completeness, Approximation Algorithms.

References:

1. Coreman, Rivest, Lisserson, "Algorithm", PHI.
2. Basse, "Computer Algorithms: Introduction to Design & Analysis", Addision Wesley.
3. Horowitz, Sahani, and Rajasekaran "Fundamental of Computer Algorithms", Universities Press

PRINCIPLES OF PROGRAMMING LANGUAGES (TCS-504)

Unit -I

Introduction: Characteristics of programming Languages, Factors influencing the evolution of programming language, developments in programming methodologies, desirable features and design issues. Programming language processors: Structure and operations of translators, software simulated computer, syntax, semantics, structure, virtual computers, binding and binding time.

Unit -II

Elementary and Structured Data Types, Structured data type and objects, Sub Program and programmer defined data types: Evolution of data types, abstractions, encapsulations, information hiding, sub programmes, abstract data types. Sequence Control; Implicit and Explicit sequence control, sequence control with within expression and statements, recursive sub programmes, exception handling, co-routines, Scheduled sub programmes, concurrent execution.

Unit -III

Data control referencing environments, static and dynamic scope, local data local data referencing environment, shared data: Explicit common environment dynamic scope parameter passing mechanism. Storage Management: Major run time requirements, storage management phases, static storage management, stack based, heap based storage management.

Unit -IV

Syntax and translation: General syntactic criteria, syntactic element of a language, stages in translation, formal syntax and semantics.

Introduction to Functional Programming, Lambda calculus, Data flow language and Object Oriented language, Comparison in various general and special purpose programming languages e.g. Fortran, C, Pascal, Lisp, etc.

References:

1. Terrance W Pratt, "Programming Languages: Design and Implementation" PHI
2. Sebesta, "Concept of Programming Language", Addison Wesley
3. E Horowitz , "Programming Languages", 2nd Edition, Addison Wesley
4. "Fundamentals of Programming Languages", Galgotia.

Advance Java Programming (TCS-505)

UNIT-1

Java Beans and Web Servers: Introduction to Java Beans, Advantage, Properties, BDK, Introduction to EJB, Java Beans API Introduction to Servelets, Lifecycle, JSDK, Servlet API, Servlet Packages: HTTP package, Working with Http request and response, Security Issues.

Java Script: Data types, variables, operators, conditional statements, array object, date object, string object, Dynamic Positioning and front end validation, Event Handling

UNIT-2

JSP: Introduction to JSP, JSP processing, JSP Application Design, Tomcat Server, Implicit JSP objects, Conditional Processing, Declaring variables and methods, Error Handling and Debugging, Sharing data between JSP pages- Sharing Session and Application Data.

Database Connectivity: Database Programming using JDBC, Studying Javax.sql.*package, accessing a database from a JSP page, Application-specific Database Action, Developing Java Beans in a JSP page, introduction to Struts framework.

UNIT-4

Java Servlet: Brief origin and advantages over CGI, J2EE Servlet 2.x Specification, Writing small Servlet Programs, Deployment Descriptor, Inter Servlet Collaboration, Session: Definition, State on web, Different ways to track sessions,

UNIT-5

J2SE: Concepts and Prerequisites: Data Types, Arrays, Dynamic Arrays, Type Casting, Classes and Objects, Inheritance, Interfaces, Exception Handling, Multi-Threading,

J2EE Architecture: J2EE as a framework, Client Server Traditional model, Comparison amongst 2-tier, 3-tier and N-tier architectures, Thin and Thick Clients

TEXT BOOKS:

1. Elliotte Rusty Harold, " Java Network Programming", O'Reilly publishers, 2000
2. Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons Inc., 1999.
3. Hortsmann & Cornell, "Core Java 2 Advanced Features, Vol II", Pearson Education, 2002.

REFERENCES:

1. Web reference: http://java.sun.com.
2. Patrick Naughton, "COMPLETE REFERENCE: JAVA2", Tata McGraw-Hill, 2003.

MODELING AND SIMULATION (TCS-506)

UNIT-I

Introduction: Systems, models, discrete event simulation and continuous simulation.
Discrete Event Simulation: Time-advance mechanisms, event modeling of discrete dynamic systems, single-server single queue model, event graphs, Monte Carlo simulation.

UNIT-II

GPSS: Model structure, entities and transactions, blocks in GPSS, process oriented programming, user defined functions, SNA, logic switches, save locations, user chains, tabulation of result, programming examples.

Random Number Generation: Congruence generators, long period generators, uniformity and independence testing

UNIT-III

Random Variate Generation: Location, scale and shape parameters, discrete and continuous probability distributions; Inverse transform method, composition and acceptance-rejection methods

UNIT-IV

Queuing Models: Little's theorem, analytical results for M/M/1, M/M/1/N, M/M/c, M/G/1 and other queuing models.

Books:

1. Karian, Z.A. and Dudewicz, E.J., "Modern Statistical Systems and GPSS Simulation", 2nd Ed., CRC Press. 1999
2. Banks, J., Carson, L.S., Nelson, B.L. and Nicol, D.M., "Discrete Event System Simulation", 3rd Ed., Pearson Education. 2002
3. Law, A.M. and Kelton, W.D., "Simulation, Modeling and Analysis", 3rd Ed., Tata McGraw-Hill. 2003

COMPUTER GRAPHICS LAB (PCS-551)

1. Implementation of line generation using slope's method, DDA and Bresenham's algorithms.
2. Implementation of circle generation using Mid-point method and Bresenham's algorithm.
3. Implementation of ellipse generation using Mid-point method.
4. Implementation of polygon filling using Flood-fill, Boundary-fill and Scan-line algorithms.
5. Implementation of 2D transformation: Translation, Scaling, Rotation, Mirror Reflection and Shearing (write a menu driven program).
6. Implementation of Line Clipping using Cohen-Sutherland algorithm and Bisection Method.
7. Implementation of Polygon Clipping using Sutherland-Hodgman algorithm.
8. Implementation of 3D geometric transformations: Translation, Scalind and rotation.
9. Implementation of Curve generation using Interpolation methods.
10. Implementation of Curve generation using B-spline and Bezier curves.
11. Implementation of any one of Back face removal algorithms such as Depth-Buffer algorithm, Painter's algorithm, Warnock's algorithm, Scanline algorithm).

COMPUTER NETWORKS LAB (PCS-552)

1. Implementation of the Data Link Layer framing method such as character stuffing and bit stuffing.
2. Implementation of CRC algorithm.
3. Implementation of a Hamming (7,4) code to limit the nois e. We have to code the 4 bit data in to 7 bit data by adding 3 parity bits.
4. Implementation of LZW compression algorithm.
5. Write a socket program to implement a listener and a talker.
6. Simulation of a network of 3 nodes and measure the performance on the same network.
7. Write a program to encrypt 64-bit text using DES algorithm.

ALGORITHMS LABORATORY (PCS-553)

Programming assignments on each algorithmic strategy:

1. Divide and conquer method (quick sort, merge sort, Strassen's matrix multiplication),
2. Greedy method (knapsack problem, job sequencing, optimal merge patterns, minimal spanning trees).
3. Dynamic programming (multistage graphs, OBST, 0/1 knapsack, traveling sales person problem).
4. Back tracking (n-queens problem, graph coloring problem, Hamiltonian cycles).
5. Sorting: Insertion sort, Heap sort, Bubble sort
6. Searching: Sequential and Binary Search
7. Selection: Minimum/ Maximum, Kth smallest element

ADVANCE JAVA LAB (PCS-555)

At least following must be completed

1. Development of dynamic website of an online Departmental Store. The website should be user friendly and should have the following pages:
    - Home page
    - Registration and user login
    - User profile page
    - Items catalog
    - Shopping cart
    - Payment by credit card
    - Order confirmation
2. Add validations to the above site for registration, user login, user profile and payment by credit card using Java Script.
1. Creation of a JavaBean which gives the converted value of Temperature (in degree celcius) into equivalent Fahrenheit
2. Creation of a simple Bean with a label – which is a "count" of number of clicks. Then create a BeanInfo class such that only the "count" is visible in the Property Window.
3. Creation of two Beans a) Keypad b) Display pad. After that integrate the two beans to make it work as a calculator.
4. Do the assignment 2 using JSP by converting the static web pages of assignment 2 into dynamic web pages. Create database with User Information and Item information. The Item catalog should be dynamically loaded from the database.
5. Implementation of currency converter program using JSP Struts Framework.

OPERATING SYSTEMS (TCS-601)

Unit -I

Introduction: Operating System and Function, Evolution of Operating System, Batch, Interactive, Time Sharing and Real Time System, System Protection. Operating System Structure: System Components, System Structure, Operating System Services.

Unit - II

Concurrent Processes: Process Concept, Principle of Concurrency, Producer / Consumer Problem, Critical Section Problem, Semaphores, Classical Problems in Concurrency, Inter Processes Communication, Process Generation, Process Scheduling, Threads.

CPU Scheduling: Scheduling Concept, Performance Criteria, Scheduling Algorithm Evolution, Multiprocessor Scheduling.

Unit - III

Deadlock: System Model, Deadlock Characterization, Prevention, Avoidance and Detection, Recovery from Deadlock, Combined Approach.

Memory Management: Basic Machine, Resident Monitor, Multiprogramming with Fixed Partition, Multiprogramming with Variable Partition, Multiple Base Register, Paging, Segmentation, Paged Segmentation, Virtual' Memory Concept, Demand Paging, Performance, Paged Replaced Algorithm, Allocation of Frames, Thrashing, Cache Memory Organization, Impact on Performance.

Unit - IV

File Concept: Access Methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free space Management, Kernel I/O Subsystems, Disk Structure, Disk Scheduling, Disk Management, Swap, Space Management.

UNIT V

Linux overview: Kernel Architecture, Process, memory, file and I/O management, Interprocess communication and synchronization, Security.

Windows XP: System architecture, system management mechanisms, process, thread, memory and file management, I/O subsystem, Interprocess communication, Security.

Suggested Books and References:

1. Milenekovie , "Operating System Concept", McGraw Hill.
2. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, John Wiley & Sons (ASIA) Pvt. Ltd, Seventh edition, 2005
3. Harvey M. Deitel, Paul J. Deitel, and David R. Choffnes, “Operating Systems”, Prentice Hall, Third edition, 2003
4. Petersons, "Operating Systems", Addision Wesley.
5. Tannenbaum, "Operating System Design and Implementation", PHI.
6. Stalling, Willium, "Operating System", Maxwell Macmillan
7. Gary Nutt, "Operating System, A Modern Perspective", Addision Wesley.

COMPILER DESIGN (TCS-602)

Unit-I

Introduction to Compiler, Phases and passes, Bootstrapping, Finite state machines and regular expressions and their applications to lexical analysis, Implementation of lexical analyzers, lexical-analyzer generator, LEXcompiler,

Formal grammars and their application to syntax analysis, BNF notation, ambiguity, YACC. The syntactic specification of programming languages : Context free grammars, derivation and parse trees, capabilities of CFG.

Unit-II

Basic Parsing Techniques: Parsers, Shift reduce parsing, operator precedence

parsing, top down parsing, predictive parsers Automatic Construction of efficient Parsers : LR parsers, the canonical Collection of LR(0) items, constructing SLR parsing tables, constructing Canonical LR parsing tables, Constructing LALR parsing tables, using ambiguous grammars, an automatic parser generator, implementation of LR parsing tables, constructing LALR sets of items.

Unit-III

Syntax-directed Translation: Syntax-directed Translation schemes,

Implementation of Syntax- directed Translators, Intermediate code, postfix notation, Parse trees & syntax trees, three address code, quadruple & triples, translation of assignment statements, Boolean expressions, statements that alter the flow of control, postfix translation, translation with a top down parser.

More about translation: Array references in arithmetic expressions, procedures call, declarations, case statements.

Unit-IV

Symbol Tables: Data structure for symbols tables, representing scope information. Run-Time Administration: Implementation of simple stack allocation scheme, storage allocation in block structured language. Error Detection & Recovery: Lexical Phase errors, syntactic phase errors semantic errors.

Unit-V

Introduction to code optimization: Loop optimization, the DAG representation of basic blocks, value numbers and algebraic laws, Global Data-Flow analysis.

Implementation of a subset of C using YACC.

References:

1. Aho, Sethi & Ullman, "Compiler Design", Addision Wesley/ Pearson.
2. O. G. Kakde; Compiler Design,4/e; Universities Press (2008)
3. Chattopadhyay Santanu; Compiler Design; Phi Learning (2009)

ARTIFICIAL INTELLIGENCE (TCS-603)

UNIT I

Introduction: History of AI, Intelligent agents – Structure of agents and its functions, Problem spaces and search - Heuristic Search techniques – Best-first search, Problem reduction - Constraint satisfaction - Means Ends Analysis.

UNIT II

Knowledge Representation: Approaches and issues in knowledge representation, Knowledge Based Agent, Propositional Logic, Predicate logic – Unification – Resolution, Weak slot – filler structure, Strong slot - filler structure.

UNIT III

Reasoning under uncertainty: Logics of non-monotonic reasoning, Implementation, Basic probability notation, Bayes rule, Certainty factors and rule based systems, Bayesian networks, Dempster - Shafer Theory, Fuzzy Logic.

UNIT IV

Planning and Learning: Planning with state space search, conditional planning, continuous planning, Multi-Agent planning. Forms of learning - inductive learning - Reinforcement Learning - learning decision trees - Neural Net learning and Genetic learning

UNIT V

Advanced Topics: Game Playing: Minimax search procedure - Adding alpha-beta cutoffs.
Expert System: Representation - Expert System shells - Knowledge Acquisition.
Swarm Intelligent Systems – Ant Colony System, Development, Application and Working of Ant Colony System.

TEXT BOOKS

1. Elaine Rich, Kevin Knight and Shivashankar B.Nair, "Artificial Intelligence", Tata McGraw-Hill, Third edition, 2009. (UNITs I, II, III & V)
2. Stuart J. Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", Pearson Education Asia, Second edition, 2003. (UNIT IV)
3. N. P. Padhy, "Artificial Intelligence and Intelligent System", Oxford University Press, Second edition, 2005. (UNIT V)

REFERENCES

1. Rajendra Akerkar, "Introduction to Artificial Intelligence", Prentice-Hall of India, 2005.
2. Patrick Henry Winston, "Artificial Intelligence", Pearson Education Inc., Third edition, 2001.
3. Eugene Charniak and Drew Mc Dermott, "Introduction to Artificial Intelligence", Addison-Wesley, ISE Reprint, 1998.
4. Nils J.Nilsson, "Artificial Intelligence - A New Synthesis", Harcourt Asia Pvt. Ltd., Morgan Kaufmann, 1988.

GRAPH THEORY (TCS 604)

Graph theoretic algorithms must be provided wherever required to solve the problems.

Unit- I

Graphs, Sub graphs, some basic properties, various example of graphs & their sub graphs, walks, trails, path & circuits, connected graphs, disconnected graphs and component, various operation on graphs, Euler graphs, Hamiltonian paths and circuits, the traveling salesman problem, directed graphs, some types of directed graphs, directed paths and connectedness, Hamiltonian and Euler digraphs.

Unit- II

Trees and fundamental circuits, distance diameters, radius and pendent vertices, rooted and binary trees, on counting trees, spanning trees, fundamental circuits, finding all spanning trees of a graph and a weighted graph, trees with directed edges, fundamental circuits in digraph, algorithms of Prim, Kruskal and Dijkstra.

Unit -III

Cuts sets and cut vertices, some properties, all cut sets in a graph, fundamental circuits and cut sets, connectivity and separability, network flows, planer graphs, Euler's formula and its corollaries, Kuratowski's theorem and its application to planarity detection of graphs, combinatorial and geometric dual, some more criterion of planarity, thickness and crossings.

Unit -IV

Incidence matrix of graph, sub matrices of A(G), circuit matrix, cut set matrix, fundamental circuit matrix and rank of B, path matrix and relationships among $A_f, B_f, \& C_f$, adjacency matrices, adjacency matrix of a digraph, matrices A, B and C of digraphs, rank- nullity theorem, coloring and covering and partitioning of a graph, chromatic number, chromatic partitioning, chromatic polynomials, matching, covering, enumeration, types of enumeration, counting of labeled and unlabeled trees.

References:

1. *Deo, N: Graph theory, PHI*
2. *Bondy and Murthy: Graph theory and application. Addison Wesley.*
3. *John M. Aldous and Robin J. Wilson: Graphs and Applications-An Introductory Approach, Springer*
4. *Robin J, Wilson: Introduction to Graph Theory, Addison Wesley.*

Visual Programming & DotNet Technologies (TCS-605)

UNIT 1 The Philosophy of .NET

Understanding the previous states affair, The .NET Solution, The building Block of the .NET platform (CLR,CTS,CLS), the role of the .NET base class libraries, C# characteristics, additional .NET Aware programming Languages, An overview of .NET binaries (assemblies), The role of the common intermediate language, The role of .NET type metadata, The role of the assembly manifest, Compiling CIL to platform specific instruction, Understanding the common type system, Intrinsic CTS data types, Understanding the common languages specification, Understanding the common languages runtime, A tour of the .NET namespace, increasing your namespace nomenclature, Deploying the .NET runtime.

UNIT 2 Building C# Applications

The role of the command line compiler (CSC.exe), Building application using csc.exe, Working with csc.exe response file, generating bug reports, C# compiler option, The command line debugger, using the visual studio .Net IDE, Other key aspects of the VS.Net IDE, Documenting source code via XML, C# preprocessor directives, An interesting Aside: The System. Environment class.

C# Language Fundamentals : An Anatomy of a basic class, Creating objects: Constructor basic, the composition of an application, Default Assignment and variable scope, member initialization syntax, Basic input and output with the console class, Understanding value types and reference types, The master node: System. Objects, The system Data type (And C# aliases), Converting between value type and reference type: Boxing and Unboxing, Defining program constraints, Iterations constructs, control flow constructs, The complete set operator, Defining Custom class methods, Understanding static methods, Method parameter modifiers, Array manipulation, String manipulation, Enumerations, Defining structures, Defining custom namespaces.

UNIT 3 Object Oriented Programming with C#

Formal definition of the class, Definition the "Default public interface" of a type, Recapping the pillars of OOP, The first pillar: Encapsulation services, Pseudo Encapsulation: Creating read only field, The second pillar: Inheritance supports keeping family secrets: The "Protected" keyword, The Nested type definitions, The third pillar: Polymorphic support casting between types, Generating class definitions using Visual Studio.

Net. Exceptions and Objects Life Time Ode to errors, Bugs and exceptions, The role of .NET exceptions handling, The system. Exception base class throwing a generic exception catching exception, CLR system level exception (System. system exception),Custom application level exception (System. application exception), Handling multiple exception, The finally block The last chance exception, dynamically identify application and system level exception, Debugging system exception using VS.Net, Understanding Object life time, The CIT of new, The basic of garbage collection, Finalizing a type, Finalization process, building and Ad hoc destruction method, garbage collection optimization, The system .GC type.

UNIT 4 Interfaces and Collections

Defining interfaces using C#, Invoking interface member at the object level, Exercising the shape hierarchy, Understanding explicit interface implementation, Interfaces as Polymorphic agents, Building interface hierarchies, Implementing interface using VS.Net, Understanding the Iconvertible interface, Building a custom enumerator, Building cloneable objects, Building comparable objects, Exploring the system the collection namespace, Building a custom container (Retrofitting the cars type).

UNIT 5

Understanding .Net Assembles Problems with classic COM Binaries, An overview of .Net assembly, Building a simple file test assembly, A C# Client Application, A Visual Basic .Net Client application, Cross Language Inheritance, Exploring the Carlibrary's manifest, Exploring the Carlibrary's Types, Building the multi file assembly, Using the multi file assembly, Understanding private assemblies, Probing for private assemblies (The Basics), Private assemblies and XML Configuration files, Probing for private assemblies (The details),Understanding Shared assembly, Understanding Shared Names, Building a Shared assembly, Understanding delay Signing, Installing/Removing shared assemblies, Using a Shared assembly.

Text Book:

1. Andrew Troelsen; Pro C# 2008 And The . Net 3. 5 Platform, 4Th Ed**; D**reamtech Press
2. Bill Evjen, Christian Nagel, Karli Watson, Jay Glynn, Morgan Skinner; Proffessional C# 2008
3. Joel Murach; Murach's C# 2008; Shroff/murachs (2008)

PRINCIPLES OF MANAGEMENT (THU-608)

UNIT 1
INTRODUCTION TO MANAGEMENT: Theories of management: Traditional behavioral, contingency and systems approach. Organization as a system.

UNIT 2
MANAGEMENT INFORMATION: Interaction with external environment. Managerial decision making and MIS.

UNIT 3
PLANNING APPROACH TO ORGANIZATIONAL ANALYSIS: design of organization structure; job design and enrichment; job evaluation and merit rating.

UNIT 4
MOTIVATION AND PRODUCTIVITY: Theories of motivation, leadership styles and managerial grid. Co-ordination, monitoring and control in organizations. Techniques of control. Japanese management techniques. Case studies.

TEXT BOOK:

1. Peter Drucker, Harper and Row: The Practice of Management.
2. Koontz: Essentials of Management, PHI Learning.
3. Staner: Management, PHI Learning.
4. Daft: Principles of Management, Cengage Learning.
5. T. N. Chhabra: Principle and Practice of Management, Dhanpat Rai, New Delhi.
6. Hirschey: Managerial Economics, Cengage Learning.
7. T. R. Banga and S.C. Sharma: Industrial Organisation and Engineering Economics, Khanna Publishers.
8. O.P. Khanna: Industrial Engineering and Management, Dhanpat Rai.
9. Joel Dean: Managerial Economics, PHI learning.
10. V. L. Mote, Samuel Paul and G.S. Gupta: Managerial Economics Concepts & Cases, TMH, New Delhi.

OPERATING SYSTEMS LAB (PCS-651)

1. Simulation of the CPU scheduling algorithms a) Round Robin b) SJF c) FCFS d) Priority
2. Simulation of MUTEX and SEMAPHORES.
3. Simulation of Bankers Deadlock Avoidance and Prevention algorithms.
4. Implementation of Process Synchronization (Reader-Writer, Sleeping Barber and Dining Philosopher's Problem)
5. Simulation of page Replacement Algorithms a) FIFO b) LRU c) LFU
6. Simulation of paging techniques of memory management.
7. Simulation of file allocation Strategies a) Sequential b) Indexed c) Linked
8. Simulation of file organization techniques a) Single Level Directory b) Two Level c) Hierarchical d) DAG

COMPILER DESIGN LAB (PCS-652)

1. Simulation of a Finite state Automata to recognize the tokens of various control statements.
2. Simulation of a Finite state machine to distinguish among Integers, Real Numbers & Numbers with Exponents.
3. Program in LEX tool to recognize the tokens and to return the token found for a C like Language
4. Parsing of arithmetic and algebraic expressions and equations.
5. Use of YACC tool to parse the statements of C like Language.

ARTIFICIAL INTELLIGENCE LAB (PCS-653)

1. Write a LISP Program to solve the water-jug problem using heuristic function.
2. Create a compound object using Turbo Prolog.
3. Write a Prolog Program to show the advantage and disadvantage of green and red cuts.
4. Write a prolog program to use of BEST-FIRST SEARCH applied to the eight puzzle problem.
5. Implementation of the problem solving strategies: Forward Chaining, Backward Chaining, Problem Reduction.
6. Write a Lisp Program to implement the STEEPEST-ASCENT HILL CLIMB ING.
7. Write a Prolog Program to implement COUNTE PROPAGATION NETWORK.

Visual Programming Lab. (PCS-655)

At least following should be covered

Starting with simple exercise given in the text book regarding C# language constructs (flow control structures, data types, file I/O and local libraries) the lab must graduate to a full project using GUI forms for data entry (with validation) processing, querying and reporting on .Net platform with database connectivity.