Faculty of Engineering &Technology
KAKATIYA UNIVERSITY, WARANGAL -506009
Department of Computer Science & Engineering
Department of Information Technology

B.TECH IN ENGINEERING
CSE/IT
IV SEMESTER

Sl. No	Category / Code	Course Title	L	T	P	Credits
1	MC-220	Constitution of Indian	2	0	0	0
2	ESC-401	Digital Electronics	2	1	0	3
3	PCS-401	Mathematical Foundations in Computer Science	3	1	-	4
4	PCS-402	Design and Analysis of Algorithms	3	1	-	4
5	PCS-403	Operating Systems	3	1	-	4
6	PCS-404	OOP Through JAVA	3	1	0	4
7	PCS-403L	Operating Systems Lab.	-	-	3	1.5
8	PCS-404L	OOP Through JAVA Lab	-	-	3	1.5
		Total Contact Hours	27			22

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B. Tech. (CSE/IT) IV SEMESTER
MC-220
CONSTITUTION OF INDIA

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
2	0	0	0	External Marks: 70

UNIT -1

1. Making of Indian Constitution - Constituent Assembly
2. Historical Perspective of the Constitution of India
3. Salient Features and characteristics of the Constitution of India

UNIT -2

1. The Fundamental Rights
2. The Fundamental Duties and their Legal Status
3. The Directive Principles of State Policy – Their Importance and Implementation

UNIT -3

1. Federal Structure and Distribution of Administrative, Legislative and Financial Powers between the Union and the States
2. Parliamentary Form of Government in India – The Constitutional Powers and Status of the President of India
3. Amendment of the Constitutional Provisions and Procedure

UNIT -4

1. The Judiciary
2. Constitutional and Legal Frame Work for Protection of Environmental in Global and National Level
3. Corporate Social Responsibility (CSR) International and National Scenario.

Text books:

1. D.D. Basu: An Introduction of Indian Constitution
2. Greanvile Austin: The Indian Constitution
3. Paras Diwan: Studies on Environmental cases

References books:

1. KhannnaJustice.H.R: Making of India's Constitution, Eastern Book Companies.
2. Rajani Kothari: Indian Politics
3. Ghosh Pratap Kumar: The Constitution of India. How it has been Formed, World Press.
4. A.Agrawal (Ed): Legal Control of Environmental Pollution.

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B. Tech. (CSE/IT) IV SEMESTER
ESC-401
DIGITAL ELECTRONICS

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
2	1	-	3	External Marks: 70

UNIT-I

Number System and Boolean algebra And Switching Functions: Number Systems, Base Conversion Methods, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code and its Properties, Unit Distance Codes, Alphanumeric Codes, Error Detecting and Correcting Codes.

Boolean Algebra: Basic Theorems and Properties, Switching Functions, Canonical and Standard Form, Algebraic Simplification, Digital Logic Gates, Universal Gates, NAND/NOR realizations.

UNIT-II

Minimization of Boolean logic: Introduction, the Karnaugh Map Method, four Variable Maps, Prime and Essential Implications, Don't Care Map Entries, Tabular Method, Minimization and Combinational Design

Basic Combinational circuits: Half adder, Full adder, half subtractor, full subtractor, serial and parallel adder, carry look ahead adder, adder/subtractor

UNIT-III

Combinational logic circuits: Decoder, implementation of Boolean equations using decoder of suitable size, Multiplexer, Logic implementation using multiplexer, Encoder, priority encoder, demultiplexer, comparator

UNIT-IV

Sequential Circuits: SR Flip flop, edge and level triggered clock pulse, direct and indirect inputs of flip flop, JK, D and T flip flops. Race around condition, Master slave JK flip flop

Application of Flip flop as shift register, Asynchronous counter, synchronous counter and ring counter. (Qualitative treatment only)

UNIT-V

Logic Families: Characteristics of logic families, RTL, DTL, HTL, ECL, TTL and CMOS logic family circuits and its operation.

TEXT BOOKS:

1) Switching and Finite Automata Theory- ZviKohavi&Niraj K. Jha, 3rd Edition, Cambridge.
2) Digital Design- Morris Mano, PHI, 3rd Edition.
3) R. P. Jain, Modern Digital Electronics, McGraw Hill Publishers'.

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B. Tech. (CSE/IT) IV SEMESTER
PCS 401
MATHEMATICAL FOUNDATIONS IN COMPUTER SCIENCE

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
3	1	-	4	External Marks: 70

UNIT – I

Set theory: Introduction, Basic Concepts of Set Theory, Representation of Discrete Structures, Relations and Ordering, Functions. Algebraic Structures: Introduction, Algebraic Systems, Semi groups and Monoids, Groups, Lattices as Partially Ordered Sets, Boolean algebra

UNIT -- II

Mathematical logic: Introduction, Statements and Notation, Connectives, Normal Forms, Theory of Inference for the Statement Calculus, The Predicate Calculus, Inference Theory of the Predicate Calculus.

UNIT - III

Propositional logic: Syntax, semantics, validity of formulas, satisfiable and unsatisfiable formulas, encoding and examining the validity of some logical arguments

Proof techniques: Proof by Induction, proof by contradiction, contra positive proofs, proof of necessity and sufficiency; first order Logic: Brief introduction; Basics of soundness and completeness;

UNIT – IV

Recurrence Relations: Generating Functions of Sequences, Calculating Coefficients of generating functions, Recurrence relations, Solving recurrence relations by substitution and Generating functions, The method of Characteristic roots, Solutions of Inhomogeneous Recurrence Relations.

UNIT – V

Graphs: Basic Concepts, Isomorphism's and Sub graphs, Trees and their Properties, Spanning Trees, Directed Trees, Binary Trees, Planar Graphs, Euler's Formula, Multigraphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

Text Books:

1. Discrete Mathematical Structures with Applications to Computer Science, J.P. Tremblay, R. Manohar, McGraw Hill education (India) Private Limited. (UNITS - I, II)
2. Discrete Mathematics for Computer Scientists & Mathematicians, Joe L. Mott, Abraham Kandel, Theodore P. Baker, Pearson , 2nd ed. (Units - IV, V)

Reference Books:

1. Discrete Mathematics by N Ch SN Iyengar, VM Chandrasekaran.
2. Discrete Mathematics and Graph Theory(Cengage Learning) by Sartha
3. Discrete Mathematics and its Applications. Kenneth H Rosen.(McGraw Hill)
4. Elements of Discrete Mathematics, C. L. Liu and D. P. Mohapatra, 4th edition, McGraw Hill education (India) Private Limited
5. Norman L. Biggs, Discrete Mathematics, Oxford University Press, 2nd edition, 2002.

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B. Tech. (CSE/IT) IV SEMESTER
PCS 402
DESIGN AND ANALYSIS OF ALGORITHMS

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
3	1	-	4	External Marks: 70

UNIT - I

Introduction: Algorithm, Performance Analysis-Space complexity, Time complexity, Asymptotic Notations- Big oh notation, Omega notation, Theta notation and little oh notation. Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

UNIT - II

Disjoint Sets: Disjoint set operations, union and find algorithms

Backtracking: General method, applications, n-queen's problem, sum of subsets problem, graph coloring

UNIT - III

Dynamic Programming: General method, applications- Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Traveling sales person problem, Reliability design.

UNIT - IV

Greedy method: General method, applications-Job sequencing with deadlines, knapsack Problem,

Minimum cost spanning trees, Single source shortest path problem.

UNIT - V

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack Problem - LC Branch and Bound solution, FIFO Branch and Bound solution.

NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Cook's theorem

Text Books

1. Introduction to Algorithms, second edition, T.H. Cormen, C.E.Leiserson, R.L.Rivest, and C.Stein, PHI Pvt. Ltd./ Pearson Education.

2. .Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahni and Rajasekharan, University Press.

References

1. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.

2. Algorithm Design: Foundations, Analysis and Internet Examples, M.T. Goodrich and R. Tamassia, John Wiley and sons.

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B. Tech. (CSE/IT) IV SEMESTER
PCS 403
OPERATING SYSTEMS

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
3	1	-	4	External Marks: 70

UNIT - I

Overview – Introduction-Operating System objectives, User view, System view, Operating system definition, Computer System Organization, Computer Systems Architecture, OS Structure, OS Operations, Process Management, Memory Management, Storage Management, Protection and Security, Computing Environments.

Operating System services, User and OS interface, system calls, types of system calls, system programs, operating system design and implementation, OS structure. General Structure of MSDOS, Windows 2000, Linux.

UNIT – II

Process and CPU Scheduling- Process Concepts – The Process, Process State, Process Control Block, Threads – Process Scheduling – Schedulers - Context Switch, Operations on Processes, System calls – fork(), exec(), wait(), exit(), Inter Process Communications - Process Management in UNIX.

Process Scheduling- Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real Time Scheduling, Thread Scheduling,

UNIT -III

Process Synchronization, Background, Critical Section Problem – Two process solution, Synchronization Hardware, Semaphores – classic problems of synchronization, Monitors
Case study of Linux and Unix.

Deadlocks – System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock prevention, avoidance, detection, recovery, Starvation, Critical Regions,

UNIT- IV

Memory Management- Memory Management Strategies- Background, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of Page Table,

Virtual Memory Management- Background, Demand Paging – Page Interrupt Fault, Page Replacement Algorithms, Allocation of Frames, Thrashing, Memory Management in UNIX, Windows.

Storage Management – File System- Concept of a File, System calls for file operations, Access Methods, Directory and Disk Structure – File System Mounting, File Sharing Protection.

UNIT -V

File System Implementation – File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free Space Management, Efficiency and Performance.

Mass Storage Structure- Over of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Swap space management.

Protection - System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation Access Rights, Capability Based Systems, Language Based Protection.

Text Books

1. Operating Systems Concepts – Abraham Silberschatz, Peter Galvin, Greg Gagne, 9th Edition, 2016, Wiley India Publications

References

1. Operating Systems – Internals and Design Principles, William Stallings, 7th Edition Pearson Education Asia Publications.

2. Modern Operating Systems – Andrew S. Tenenbaum,3rd Edition, PHI Publications.

3. Operating Systems – Deitel & Deitel, Pearson Education Asia.

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B. Tech. (CSE/IT) III SEMESTER
PCS – 404
OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
3	1	-	4	External Marks: 70

UNIT-I

Programming Paradigms: Procedural Programming, Modular Programming, Object Oriented Programming and Generic Programming, Object Oriented Programming Concepts.

Java basics: Creation of Java, Java buzzwords, Data types, Variables and Arrays, Operators, Control statements, introductions to classes and simple programs.

UNIT-II

Classes and objects: Creating classes and objects , visibility modes, constructors, Overloading methods, Passing and returning objects, Recursion, Variable length arguments, Nested and inner classes, static - variables, Blocks and methods.

String: Exploring String, StringBuffer, StringBuilder and StringTokenizer classes.

UNIT-III

Inheritance: Basic concepts, Types of inheritance, Using super, Creating multilevel inheritance, Method Overriding, Runtime polymorphism, Dynamic method dispatch, Using abstract classes, Using final with inheritance, The Object class.

Packages and interfaces: Packages, Access Protection, Importing packages, Interfaces –Defining an interface, Implementing interfaces, Nested interfaces, Applying interfaces,Variables in interfaces, Interfaces can be extended.

UNIT-IV

Exception handling: Fundamentals of exception handling, exception type, using try and catch, multiple catch clauses, nested try statements, throw, throws and finally, built in exceptions, creating own exceptions

Using I/O: The Predefined Streams, Using byte streams, Reading and writing Files using byte streams, Using Java's Character-based streams, Using Java's type wrappers to Convert Numeric Strings

UNIT-V

Applets: Applet basics, applet skeleton, Applet initialization and termination, Requesting repainting, Using the status window, Passing parameters to Applets.

AWT: AWT classes, Window Fundamentals, Working with Frame Windows, Creating a Frame Window in an applet AWT Controls: Control Fundamentals, Labels, Using Buttons, Check Boxes, Choice Controls, Lists, Scroll Bars, Text Field, Text Area, Understanding Layout Managers, Menu Bars and Menus, Dialog Boxes.

Text Books:

1. Herbert Schildt,"JAVA The Complete Reference", *9th Edition*, *McGraw-Hill EducationIndia Pvt.Ltd* ,ISBN: 9781259002465, 2011.
2. Herbert Schildt, Dale Skrien, "Java Fundamentals (A Comprehensive Introduction)",

   1st Edition, McGraw Hill Education, ISBN-13: 978-1-25-900659-3, 2013. (Chapters: 11, 15,17, 18).

Reference Books:

1. Sachin Malhotra, Saurabh Choudhary, "Programming in JAVA", *2ndEdition, OxfordPublications,* ISBN-13: 978-0-19-809485-2, 2013. (Chapters: 1 to 8, 12 to 15)
2. Kathy Sierra, Bert Bates, "Head First Java", *2nd Edition, O'Reilly Publictions,* ISBN-13: 978-0596009205, 2013.
3. UttamK.Roy, "Advanced JAVA Programming", *1stedition*, *Oxford Publications;* ISBN-13: 978-0199455508, 2013.

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B. Tech. (CSE/IT) IV SEMESTER
PCS 403L
OPERATING SYSTEMS - LAB

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 25
-	-	3	1.5	External Marks: 50

LIST OF EXPERIMENTS

1. Unix Commands, File permissions, VI editor, UNIX shell programming fundamentals.
2. Programs on Process creation using fork(), exec() and wait() system calls.
3. Programs on Implementation of pipes and FIFOs
4. Programs on CPU Scheduling algorithms like FCFS, LRU etc.
5. Programs on semaphores, readers and writers problem.
6. Programs on Implementation of Bankers' Algorithm.
7. Programs on Implementation of paging table.
8. Programs on Implementation of Page Replacement Algorithms,
9. Programs on Implementation of File Access Methods.
10. Programs on Implementation of Access Matrix.
11. Programs on Implementation of File Allocation Methods.

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B. Tech. (CSE/IT) III SEMESTER
PCS – 404L
OBJECT ORIENTED PROGRAMMING THROUGH JAVA - LAB

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 25
-	-	3	1.5	External Marks: 50

List of Experiments

Experiment-I

1. Write a program to demonstrate control structures using sample of displaying prime numbers within a givenrange.
2. Write a program to read an array and display them using for-each control. Finally display the sum of arrayelements.
3. Write a program to read a matrix and display whether it is an identity matrix or not. Use civilized form of *break*statement.
4. Write a program to define a two dimensional array where each row contains different number of columns. Display the 2D-array usingfor-each.

Experiment-II

1. Write a program to demonstrate creating classes and objects with different visibility modes.
2. Write a program to demonstrate passing objects tomethods.
3. Write a program to demonstrate constructors.
4. Write a program to demonstrate static variables.

Experiment-III

1. Read at least ***5*** strings from command line argument and display them in sortedorder.
2. Accept the string, count number of vowels and remove all vowels using*StringBuffer class.*
3. Accept a line of text, tokenize the line using *StringTokenizer*class and print the tokens in reverseorder.

Experiment-IV

1. Write program to demonstrate single inheritance.
2. Write program to demonstratemultilevel-inheritance.
3. Write program to demonstrate run time polymorphismjava.
4. Write a program to demonstrate use of abstractclass.
5. Write a program to demonstrate the use of overriding *equals()* method of an Objectclass.

Experiment-V

1. Write a program to create a package, and demonstrate to import a package into ourfile.
2. Write a program to implement multiple interfaces into singleclass.

Experiment-VI

1. Write a program to demonstrate exceptions using try and catch.
2. Handle *Array Index Of Bounds Exception*, *Number Format Exception* and *Arithmetic Exception* using multiple catch blocks.
3. Write a program to demonstrate re-throw of exception, and finallyblock.

Experiment-VII

1. Write a program to demonstrate wrapper class using sample of reading two integer numbers from command line and display theirquotient.
2. Write a program to demonstrate Character-basedstreams.
3. Write a program to show the content of the specifiedfile.
4. Write a program to copy the content of one file toanother.

Experiment-VIII

1. Develop an applet to display “Good Morning” if current time is between 6AM and 12PM and “Good Afternoon” if the current time is between 12PM and 6PM, and “Good Evening” if the current time is between 6PM and12AM.
2. Develop an applet which draws different geometric shapes and fill them with different colors.
3. Implement an applet program to display movingbanner.

Experiment-X

1. Design a registration form using java frame window with AWT controls
2. Write a program to create frame windows to include different controls with different layouts.

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