COURSE STRUCTURE AND DETAILED SYLLABUS

for

II B.TECH

INFORMATION TECHNOLOGY

(Applicable for the batches admitted from 2021-22)

GURU NANAK INSTITUTIONS
TECHNICAL CAMPUS
(An Autonomous Institution)
Campus: Ibrahimpatnam, R.R. District - 501506 (T.S).

GNITC is now NAAC A+ Accredited Institute

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

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II YEAR I SEMESTER

II YEAR II SEMESTER

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS
(AUTONOMOUS)
School of Engineering and Technology
II B. Tech. Information Technology
COURSE STRUCTURE
(Applicable for the batch admitted from 2021-22)
R21 REGULATION

II Year I Semester **III Semester**

Sl.No	Subject Code	Subject	L	T	P	Credits
1	21PC0IT01	Computer Architecture	3	0	0	3
2	21PC0IT02	Data Structures through C++	3	1	0	4
3	21PC0IT03	Discrete Mathematical Structures	3	1	0	4
4	21ES0EC24	Analog and Digital Electronics	3	0	0	3
5	21HS0EN03	Effective Technical Communication	3	0	0	3
6	21PC0IT04	Data Structures through C++ Lab	0	0	4	2
7	21PC0IT05	IT Workshop & Office Suite Lab	0	0	3	1.5
8	21ES0EC25	Analog and Digital Electronics Laboratory	0	0	3	1.5
					Total Credits	**22**

II Year II Semester **IV Semester**

Sl.No	Subject Code	Subject	L	T	P	Credits
1	21PC0IT06	Data Base Management Systems	3	0	0	3
2	21PC0IT07	Design and Analysis of Algorithms	3	0	0	3
3	21PC0IT08	Object Oriented Programming Through Java	3	0	0	3
4	21BS0MA05	Probability and Statistics	3	0	0	3
5	21SSMB03	Organizational Behavior	3	0	0	3
6	21PC0IT09	Data Base Management Systems Lab	0	0	3	1.5
7	21PC0IT10	Design and Analysis of Algorithms Lab	0	0	4	2
8	21PC0IT11	Object Oriented Programming Through Java Lab	0	0	3	1.5
9	21MC0CH01	Environmental Science	3	0	0	0
					Total Credits	**20**

II Year B. Tech. IT I Sem

L	T	P	C
3	0	0	3

(21PC0IT01) COMPUTER ARCHITECTURE

COURSE PREREQUISITES
No prerequisites

COURSE COREQUISITES
A course on Digital Logic Design and Microprocessors.

COURSE OBJECTIVES
- The purpose of the course is to introduce the principles of computer organization and the basic architectural concepts of digital computers (CPU, memory, I/O, software).

COURSE OUTCOMES
CO1: Describe the basics structure and organization of a digital computer.
CO2: Demonstrate various methods of number representation stored in digital computer system.
CO3: Evaluate the performance of the control unit and I/O organization.
CO4: Design a memory organization and its impact on the processor.
CO5: Examine different ways of communicating with I/O devices and standard I/O interfaces.

SYLLABUS
UNIT-I: Basic Structure of Computers: Computer types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations.
Data Representation: Binary Numbers, Fixed Point Representation, Floating Point Representation.

UNIT-II: Register Transfer Language and Microoperations: Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit. Basic Computer Organization and Design: Instruction codes, Computer Register Computer instructions, Timing and control, Instruction cycle, Memory-Reference Instructions, Input-Output and Interrupt.

UNIT-III: Computer Arithmetic: Algorithms for fixed point and floating point addition, subtraction, multiplication and division operations, Hardware Implementation of arithmetic and logic operations.
Instruction Set & Addressing: Memory Locations and Addresses, Machine addresses and sequencing, Various Addressing Modes, Instruction Formats, Basic Machine Instructions.

UNIT-IV: Processor Organization: Introduction to CPU, Register Transfers, Execution of Instructions, Multiple Bus Organization, Hardwired Control, Microprogrammed Control. Memory Organization: Concept of Memory, RAM, ROM memories, memory hierarchy, cache memories, virtual memory, secondary storage, memory management requirements.

UNIT-V: Input-Output Organization: Introduction to I/O Interrupts - Hardware, Enabling and disabling Interrupts, Device Control, Direct memory access, buses, interface circuits, standard I/O Interfaces.

TEXT BOOK

1. Computer System Architecture - M. Moris Mano, 3rd Edition, Pearson/PHI.

REFERENCES

1. Computer Organization - Car Hamacher, Zvonks Vranesic, SafeaZaky, 5th Edition, McGraw Hill.
2. Computer Organization and Architecture - William Stallings, 6th Edition, Pearson/PHI.
3. Structured Computer Organization - Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.

II Year B. Tech. IT I Sem

L	T	P	C
3	1	0	4

(21PC0IT02) DATA STRUCTURES THROUGH C++

COURSE PREREQUISITES

A course on Programming for Problem Solving.

COURSE OBJECTIVES

- This course provides a comprehensive study of basic data structures, solve the problems using different data structures and design techniques, compare their performance and tradeoffs.

COURSE OUTCOMES

CO1: List the various data structures.
CO2: Summarize a variety of advanced abstract data types (ADTs).
CO3: Choose the data structures and illustrate along with their implementations.
CO4: Calculate various algorithm design techniques i.e., brute-force, divide and conquer, greedy etc.
CO5: Analyze algorithm correctness and time efficiency.

SYLLABUS

UNIT-I: C++ Class Overview, Basic OOP concepts, Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and Destructors, parameter passing methods, this pointer, Dynamic memory allocation and de-allocation (new and delete), Inheritance, Polymorphism, Abstract classes.
Data Structures: The list ADT, Stack ADT, Queue ADT, array and linked list Implementations, array and linked representations.

UNIT-II: Dictionaries: linear list representation, skip list representation, operations - insertion, deletion and searching.
Hash table representation: Hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

UNIT-III: Search Trees: Binary Search Trees, Definition, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching, Red-Black, Splay Trees.

UNIT-IV: Graphs: Graph Implementation Methods, Graph Traversal Methods.
Sorting: Heap Sort, External Sorting - Model for external sorting, Merge Sort.

UNIT-V: Pattern matching and Tries: Pattern matching algorithms-Brute force, The Boyer-Moore algorithm, the Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, Suffix tries.

TEXT BOOKS

1. Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, 2nd Edition, Pearson Education.
2. Data Structures, Algorithms and Applications in C++, S.Sahni, 2nd Edition, University Press (India) Pvt. Ltd.

REFERENCES

1. Data Structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley Student Edition, John Wiley and Sons.
2. Data Structures and Algorithms in C++, Third Edition, Adam Drozdek, Thomson.
3. Data Structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Advanced Data Structures and Algorithms in C++, V.V. Muniswamy, Jaaico Publishing House.

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II Year B. Tech. IT I Sem

L	T	P	C
3	1	0	4

(21PC0IT03) DISCRETE MATHEMATICAL STRUCTURES

COURSE PREREQUISITES

A course on Mathematics and Data Structures.

COURSE OBJECTIVES

- This course is intended to acquire the ability to work with concepts of discrete structures that includes areas such as set theory, logic, graph theory and combinatory.

COURSE OUTCOMES

CO1: Identify the validity of argument by using propositional and predicate calculus.
CO2: Employ sets, relational and digraphs to solve applied problem.
CO3: Compare and contrast the algebraic structure and lattices.
CO4: Describe the basic counting techniques to solve the combinatorial problems.
CO5: Apply the basic concepts of graph theory to related theoretical problems.

SYLLABUS

UNIT-I: Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, Tautology, Equivalence implication, Normal forms, Quantifiers, Universal quantifiers. Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, Proof of contradiction, Automatic Theorem Proving.

UNIT-II: Relations: Composition of Binary Relation and Partial Ordering Relations, Hasse Diagram. **Functions:** Inverse Function, Composition of Functions, Recursive Functions, Lattice and its Properties.

UNIT-III: Algebraic Structures: Algebraic Systems Examples and General Properties, Semi Groups and Monoids, Groups, Sub Groups and Homomorphism.

UNIT-IV: Combinatorics: Basis of counting, Combinations & Permutations, With repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, The principles of Inclusion - Exclusion, Pigeon - hole principles and its applications.

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's Circuits, Hamiltonian graphs, Chromatic Numbers.

TEXT BOOKS

1. Discrete Mathematical Structures with Applications to Computer Science, J.P Tremblay and R. Manohar, Tata McGraw-Hill, 1997.
2. Discrete Mathematics for Computer Scientists and Mathematicians, J.L. Mott, A.Kandel and T.P. Baker, 2nd Edition, Prentice Hall of India, 1986.

REFERENCES

1. Discrete and Combinatorial Mathematics - An applied introduction, Ralph P. Grimaldi and B.V.Ramana, 5th Edition, Pearson Education, 2006.
2. Discrete Mathematics and its Applications, Kenneth H.Rosen, 5th Edition, Tata McGraw-Hill, 2003.

II Year B. Tech. IT I Sem

L	T	P	C
3	0	0	3

(21ES0EC24) ANALOG & DIGITAL ELECTRONICS

COURSE OBJECTIVES

1. To give an understanding of various devices like Diodes, BJTs, FETs and types of amplifier circuits
2. To understand the design of digital circuits using combinational logic circuits and sequential logic circuits.

COURSE OUTCOMES

Upon completion of the course, the students will be able to:

CO1: Know the diode characteristics and its applications.
CO2: Understand the characteristics of BJT and amplifier circuits.
CO3: Have an understanding of various logic families.
CO4: Design and analyze combinational logic circuits.
CO5: Design and analyze sequential logic circuits.

SYLLABUS

UNIT-I: Diodes and applications

Junction diode characteristics: Open circuited p-n junction, V-I characteristics, effect of temperature, diode resistance, diffusion capacitance, diode switching times, breakdown mechanism in diodes, Tunnel diode, photo diode, LED. Diode Applications - clipping circuits, comparators, half wave rectifier, Full wave rectifier, rectifier with capacitor filter.

UNIT-II: BJTs

Transistor characteristics: The junction transistor, transistor as an amplifier, CB, CE, CC configurations, comparison of transistor configurations, the operating point, self-bias or Emitter bias, bias compensation, thermal runaway and stability.

UNIT-III: FETs and Digital Circuits

FETs: JFET, V-I characteristics, MOSFET, CS and CD amplifiers. Digital Circuits: Digital (binary) operations of a system, OR gate, AND gate, NOT, EXCLUSIVE OR gate, De Morgan Laws, NAND and NOR DTL gates, modified DTL gates, HTL and TTL gates, output stages, RTL and DCTL, CMOS, Comparison of logic families.

UNIT-IV: Combinational logic circuits

Basic Theorems and Properties of Boolean Algebra, Canonical and Standard Forms, Digital Logic Gates, The Map Method, Product-of-Sums Simplification, Don't-Care Conditions, NAND and NOR Implementation, Exclusive-OR Function, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

UNIT-V: Sequential logic circuits

Sequential Circuits, Storage Elements: Latches and flip flops, State Reduction and Assignment, Shift Registers, Ripple Counters, Synchronous Counters, Random-Access Memory, Read-Only Memory.

TEXT BOOKS

1. Integrated Electronics: Analog and Digital Circuits and Systems, 2/e, Jaccob Millman, Christos Halkias and Chethan D. Parikh, Tata McGraw-Hill Education, India, 2010.
2. Digital Design, 5/e, Morris Mano and Michael D. Cilette, Pearson, 2011.

REFERENCES

1. Electronic Devices and Circuits, Jimmy J Cathey, Schaum's outline series, 1988.
2. Digital Principles, 3/e, Roger L. Tokheim, Schaum's outline series, McGraw-Hill, 1994.

II Year B. Tech. IT I Sem

L	T	P	C
3	0	0	3

(21HS0EN03) EFFECTIVE TECHNICAL COMMUNICATION

COURSE OBJECTIVES

The main objective of this course is to impart advance technical communication skills to students in terms of research, writing, editing, and design principles of technical and professional communication. Further, the course prepares students to design effective technical documentation such as Planning, drafting, revising, editing, researching, analyzing, synthesizing and applying information to create technical reports and professional documents through individual and collaborative writing to articulate complex ideas appropriate for target audiences. Moreover, the course inculcates business and professional ethics.

COURSE OUTCOMES

At the end the course students will be able to:

CO1: Understand the ethical, international, social, and professional constraints of audience, style, and content for writing situations and communicate effectively
a) among managers or co-workers and colleagues of an organization
b) between organizations, or between an organization and the public.

CO2: Understand professional writing by studying management communication contexts and genres, researching contemporary business topics, analyzing quantifiable data discovered by researching, and constructing finished professional workplace documents.

CO3: Practice the unique qualities of professional rhetoric and writing style, such as sentence conciseness, clarity, accuracy, honesty, avoiding wordiness or ambiguity, using direct order organization, readability, coherence and transitional devices and to present technical material orally with confidence and poise.

CO4: Develop employability skills like time management, values and beliefs, self-esteem, perception and attitude, problem-solving skills and creativity.

SYLLABUS

Module 1: Information Design and Development- Different kinds of technical documents, Information development life cycle, Organization structures, factors affecting information and document design, Strategies for organization, Information design and writing for print and for online media.

Module 2: Technical Writing, Grammar and Editing- Technical writing process, forms of discourse, Writing drafts and revising, Collaborative writing, creating indexes, technical writing style and language. Basics of grammar, study of advanced grammar, editing strategies to achieve appropriate technical style. Introduction to advanced technical communication, Usability, Human factors, Managing technical communication projects, time estimation, Single sourcing, Localization.

Module 3: Self Development and Assessment-Self assessment, Awareness, Perception and Attitudes, Values and belief, Personal goal setting, career planning, Self-esteem. Managing Time; Personal memory, Rapid reading, Taking notes; Complex problem solving; Creativity

Module 4: Communication and Technical Writing- Public speaking, Group discussion, Oral; presentation, Interviews, Graphic presentation, Presentation aids, Personality Development. Writing reports, project proposals, brochures, newsletters, technical articles, manuals, official notes, business letters, memos, progress reports, minutes of meetings, event report.

Module 5: Ethics- Business ethics, Etiquettes in social and office settings, Email etiquettes, Telephone Etiquettes, Engineering ethics, Managing time, Role and responsibility of engineer, Work culture in jobs, Personal memory, Rapid reading, Taking notes, Complex problem solving, Creativity.

TEXT / REFERENCE BOOKS

1. David F. Beer, David McMurrey, Guide to writing as an Engineer, John Willey, New York, 2004
2. Diane Hacker, Pocket Style Manual, Bedford Publication, New York, 2003. (ISBN 0312406843)
3. Shiv Khera, You Can Win, Macmillan Books, New York, 2003.
4. Raman Sharma, Technical Communications, Oxford Publication, London, 2004.
5. Dale Jungk, Applied Writing for Technicians, McGraw Hill, New York, 2004. (ISBN: 07828357-4)
6. Sharma, R, Mohan, K, Business Correspondence and Report Writing, TMH New Delhi 2002.
7. Xebec, Presentation Book, TMH New Delhi, 2000. (ISBN 0402213)

II Year B. Tech. IT I Sem **L T P C**
0 0 4 2

(21PC0IT04) DATA STRUCTURES THROUGH C++ LAB

COURSE PREREQUISITES
A course on Programming for Problem Solving.

COURSE OBJECTIVES
- This lab course is intended to write and execute programs in C++ to solve problems using data structures such as linked lists, stacks, queues, trees, graphs, hash tables search trees, pattern matching techniques and implement various searching and sorting methods.

COURSE OUTCOMES
1. Identify the appropriate data structure for given problem.
2. Analyze the time and space complexity of algorithm or program.
3. Effectively use compilers including library functions, debuggers and trouble shooting.
4. Implement the various searching and sorting techniques.
5. Compare and contrast the abstract data types and pattern matching algorithms.

LIST OF EXPERIMENTS
Week 1: Write C++ programs to implement the following using an array. a) Stack ADT b) Queue ADT
Week 2: Write C++ programs to implement the following using as singly linked list. a) Stack ADT b) Queue ADT
Week 3: Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list.
Week 4: Write a C++ program to perform the following operations: a) Insert an element into a binary search tree. b) Delete an element from a binary search tree. c) Search for a key element in a binary search tree.
Week 5: Write C++ programs that use recursive functions to traverse the given binary tree in a) Preorder b) Inorder and c) Postorder.
Week 6: Write C++ programs for the implementation of BFS and DFS for a given graph.
Week 7: Write C++ programs for implementing the following sorting methods. a) Merge Sort b) Heap Sort
Week 8: Write a C++ program to perform the following operation a) Insertion into an AVL Tree b) Deletion from AVL Tree.
Week 9: Write a C++ program for implementing Knuth-Morris-Pratt pattern matching algorithm.

TEXT BOOKS
1. Data Structures A Pseudocode Approach with C++, Indian edition, R.F.Gilberg and B.A.Forouzan, Cengage Learning.
2. Programming Principles and Practice using C++, B.Stroustrup, Addition-Wisely (Pearson Education).
3. Data Structures and STL, W.J.Collins, Mc Graw Hill International edition.

4. Data Structures and algorithms with OO Design patterns in C++, B.R.Priess, John Wiley &sons.
5. C++ for Programmers, P.J.Deitel and H.M.Deitel, PHI/Pearson.

II Year B. Tech. IT I Sem

L	T	P	C
0	0	3	1.5

(21PC0IT05) IT WORKSHOP & OFFICE SUITE LAB

COURSE OBJECTIVES

- The IT Workshop for engineers is a training lab course and it includes the modules such as training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel and Power Point.

COURSE OUTCOMES

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible. Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, and power point presentations.

PC Hardware

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Task 5: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Task 6: Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Internet & World Wide Web

Task1: **Orientation & Connectivity Boot Camp:** Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Task 3: **Search Engines & Netiquette:** Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Word

Task 1: Word Orientation: The mentor needs to give an overview of Microsoft (MS) office 2007 and its importance of word as word Processors, Details of the four tasks and features that would be covered in each using word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 2: Using Word to create project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option.

Task 3: Creating project: Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 4: Creating a Newsletter: Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Excel

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text.

Task 2: Calculating GPA - Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function.

Task 3: Performance Analysis - Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting.

Power Point

Task1: Students will be working on basic power point utilities and tools which help them create basic power point presentation. PPT Orientation, Slide Layouts,

Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Powerpoint. Students will be given model power point presentation which needs to be replicated.

Task 2: Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting Images, Clip Art, Audio, Video, Objects, Tables and Charts.

REFERENCES

1. Comdex Information Technology course tool kit Vikas Gupta, Wiley Dreamtech.
2. The Complete Computer upgrade and repair book, 3rd edition, Cheryl A Schmidt, Wiley Dreamtech.
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. PC Hardware and A+ Handbook - Kate J. Chase PHI (Microsoft).

II Year B. Tech. IT I Sem

L	T	P	C
0	0	3	1.5

(21ES0EC25) ANALOG & DIGITAL ELECTRONICS LABORATORY

LIST OF EXPERIMENTS

1. Full Wave Rectifier with filters
2. Bridge Rectifier with filter
3. Common Emitter Amplifier Characteristics
4. Common Base Amplifier Characteristics
5. Common Source amplifier Characteristics
6. Measurement of h-parameters of transistor in CE configurations
7. Input and Output characteristics of FET in CS configuration
8. Design and realization logic gates using universal gates
9. Design a 4-bit Adder
10. Design a 4-bit Subtractor
11. Design and realization a synchronous and asynchronous counters using flip-flops
12. Realization of logic gates using DTL, TTL, ECL, etc.,

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II Year B. Tech. IT II Sem

L	T	P	C
3	0	0	3

(21PC0IT06) DATA BASE MANAGEMENT SYSTEMS

COURSE PREREQUISITES
A course on Data Structures.

COURSE OBJECTIVES
This course is introduced to describe the basic concepts of SQL, build queries using SQL commands and generate applications of database systems.

COURSE OUTCOMES
By the end of the course, students will be able to:
CO1: Describe the basic fundamentals of DBMS and database design.
CO2: Identify the appropriate SQL commands for retrieval and management of data.
CO3: Analyze the schema refinement and normal forms.
CO4: Identify data models for relevant problems.
CO5: Model database storage structures and access techniques.

SYLLABUS
UNIT I

Database System Applications: Database system Vs. file system, view of data, data abstraction, instances and schemas, data models, the ER model, relational mode. database languages, DDL, DML, database access for application programs, database users and administrator, transaction management, database system structure, history of data base systems, data base design and ER diagrams, beyond ER design entities, attributes and entity sets, relationships and relationship sets, additional features of ER model, concept design with the ER Model.

UNIT II

Introduction to the Relational Model: Integrity constraint over relations, enforcing integrity constraints, querying relational data, logical data base design, introduction to views, destroying/altering tables and views, form of basic SQL query, introduction to nested queries, correlated nested queries, set comparison operators, aggregation operators, NULL values, comparison using null values, logical connectivity's, AND, OR and NOT, outer joins, disallowing NULL values, complex integrity constraints in SQL, triggers and active data bases.

UNIT III

Relational Algebra: Selection and projection, set operations, renaming, Joins, Division, Examples of Algebra overviews, Relational calculus.

Schema refinement: Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, FIRST, SECOND, THIRD normal forms, BCNF, lossless join decomposition, dependency preserving decomposition, multi valued dependencies, FOURTH normal form, FIFTH normal form.

UNIT IV

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, Lock Based Protocols, Timestamp Based Protocols, Validation-Based Protocols, Multiple Granularity.

Recovery and Atomicity, Log–Based Recovery, Recovery with Concurrent Transactions,

Buffer Management, Failure with loss of nonvolatile storage, ARIES Recovery, Remote Backup systems.

UNIT V

Data on External Storage, File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes, Index data Structures, Hash Based Indexing, Tree base Indexing, Comparison of File Organizations, Indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic Index Structure.

TEXT BOOKS

1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill 3rd Edition.
2. Database System Concepts, Silberschatz, Korth, Mc Graw hill, V edition.

REFERENCE BOOKS

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel, 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate, Pearson Education.
3. Introduction to Database Systems, C.J.Date, Pearson Education.
4. Oracle for Professionals, The X Team, S.Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.

II Year B. Tech. IT II Sem

L	T	P	C
3	0	0	3

(21PC0IT07) DESIGN AND ANALYSIS OF ALGORITHMS

COURSE PREREQUISITES
A course on Programming for problem solving and Data Structures.

COURSE OBJECTIVES
The objective of the course is to solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound.

COURSE OUTCOMES
By the end of the course, students will be able to:

CO1: Describe algorithms dealing with various techniques along with the efficiency of algorithms.
CO2: Select the data structures and algorithm design methods that impact the performance of programs.
CO3: Identify the various searching and graph traversal techniques.
CO4: Distinguish designing methods for development of algorithms to realistic problems, such as divide and conquer, greedy and etc.
CO5: Estimate the performance of algorithms.

SYLLABUS
UNIT I

Introduction: Characteristics of algorithm. Analysis of algorithm: Asymptotic analysis of complexity bounds - best, average and worst-case behavior; Performance measurements of Algorithm, Time and space trade-offs, Analysis of recursive algorithms through recurrence relations: Substitution method, Recursion tree method and Masters' theorem.

UNIT II

Fundamental Algorithmic Strategies: Brute-Force, Greedy, Dynamic Programming, Branch-and-Bound and Backtracking methodologies for the design of algorithms; Illustrations of these techniques for Problem-Solving , Bin Packing, Knap Sack TSP. Heuristics - characteristics and their application domains.

UNIT III

Graph and Tree Algorithms: Traversal algorithms: Depth First Search (DFS) and Breadth First Search (BFS); Shortest path algorithms, Transitive closure, Minimum Spanning Tree, Topological sorting, Network Flow Algorithm.

UNIT IV

Tractable and Intractable Problems: Computability of Algorithms, Computability classes-P, NP, NP-complete and NP-hard. Cook's theorem, Standard NP-complete problems and Reduction techniques.

UNIT V

Advanced Topics: Approximation algorithms, Randomized algorithms, Class of problems beyond NP-P SPACE.

TEXT BOOKS

1. Introduction to Algorithms, 4th Edition, Thomas H Cormen, Charles E Lieserson, Ronald L Rivest and Clifford Stein, MIT Press/McGraw-Hill.
2. Fundamentals of Algorithms, E. Horowitz.

REFERENCE BOOKS

1. Algorithm Design, 1st Edition, Jon Kleinberg and EvaTardos, Pearson.
2. Algorithm Design: Foundations, Analysis, and Internet Examples, Second Edition, Michael T Goodrich and Roberto Tamassia, Wiley.
3. Algorithms-A Creative Approach, 3rd Edition, UdiManber, Addison-Wesley, Reading, MA.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

II Year B. Tech. IT II Sem **L T P C**

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(21PC0IT08) OBJECT ORIENTED PROGRAMMING THROUGH JAVA

COURSE PREREQUISITES
A course on Programming for problem solving.

COURSE OBJECTIVES
The aim of this course is to comprehend object oriented programming concepts and apply them in problem solving.

COURSE OUTCOMES
By the end of the course, students will be able to:

CO1: Describe the concepts of OOP and basics of java programming.
CO2: Express the programming skills in problem solving.
CO 3: Solve the exceptions and handle the exceptions in programming.
CO4: Outline the GUI based applications.
CO5: Extend their knowledge of java programming further on their own.

SYLLABUS
UNIT I

OOP concepts: Classes and objects, data abstraction, encapsulation, inheritance, benefits of inheritance, polymorphism, procedural and object oriented programming paradigm; Java programming: History of java, comments data types, variables, constants, scope and life time of variables, operators, operator hierarchy, expressions, type conversion and casting, enumerated types, control flow statements, jump statements, simple java stand alone programs, arrays, console input and output, formatting output, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and constructors, recursion, garbage collection, exploring string class.

UNIT II

Inheritance: Inheritance hierarchies, super and subclasses, member access rules, super keyword, preventing inheritance: final classes and methods, the object class and its methods; Polymorphism: Dynamic binding, method overriding, abstract classes and methods; Interface: Interfaces vs Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface; Packages: Defining, creating and accessing a package, understanding CLASSPATH, importing packages.

UNIT III

Exception Handling: Benefits of exception handling, the classification of exceptions, exception hierarchy, checked and unchecked exceptions, usage of try, catch, throw, throws and finally, re-throwing exceptions, exception specification, built in exceptions, creating own exception sub classes. Multithreading: Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.

UNIT IV

Files: Streams, byte streams, character stream, text input/output, binary input/output, random access file operations, file management using file class; Connecting to Database: Connecting to a database, querying a database and processing the results, updating data

with JDBC.

UNIT V

GUI programming with Java: The AWT class hierarchy, introduction to swing, swing Vs AWT, hierarchy for swing components, containers, JFrame, JApplet, JDialog, JPanel; Overview of some swing components: JButton, JLabel, JTextField, JTextArea, simple applications; Layout management: Layout manager types: Border, grid and flow; Applets: Inheritance hierarchy for applets, differences between applets and applications, life cycle of an applet, passing parameters to applets.

TEXT BOOKS

1. Herbert Schildt, Dale Skrien, Java Fundamentals: A Comprehensive Introduction, McGraw Hill, 1st Edition, 2013.
2. Herbert Schildt, Java the Complete Reference, McGraw Hill, Osborne, 8th Edition, 2011.
3. T. Budd, Understanding Object Oriented Programming with Java, Pearson Education, Updated Edition, 1999.

REFERENCE BOOKS

1. P.J. Deitel, H. M. Deitel, Java: How to Program, Prentice Hall, 6th Edition, 2005.
2. P. Radha Krishna, Object Oriented Programming through Java, Universities Press, CRC Press, 2007.
3. Bruce Eckel, Thinking in Java, Prentice Hall, 4th Edition, 2006.
4. Sachin Malhotra, Saurabh Chaudhary, Programming in Java, Oxford University Press, 2nd Edition, 2014.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

II Year B. Tech. IT II Sem

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(21BS0MA05) PROBABILITY AND STATISTICS
(Common for IT, CE)

Course Objectives: To learn

- Various measures of central tendency in basic statistics
- Discrete distributions & Poisson distributions
- Distribution functions Normal Exponential Beta & Gamma functions
- The testing of hypothesis Large & Small samples
- Select and produce the appropriate tabular and graphical formulas for displaying bivariate data sets and carry out correlation, regression and chi-square analysis.

Course Outcomes

At the end of the course the students will able to

CO1. Identify the random variables involved in the probability models
CO2. Discuss the Mean, Variance of the discrete distributions.
CO3. Discuss the characteristics of Normal, Exponential, Beta & Gamma distributions.
CO4. Use statistical tests in testing of hypotheses on the given data.
CO5. Calculate the correlation and linear regression for a given data set.

SYLLABUS

UNT-I: Basic Statistics: (6 lectures)
Measures of Central tendency: Moments, skewness and Kurtosis - Probability spaces, conditional probability, independence; Discrete & Continuous random variables, Independent random variables.

UNIT-II: Discrete Probability Distributions: (8 lectures)
Probability Mass function, Probability density function, Moment generating function, Mathematical expectation, Covariance and Correlation coefficient, Distributions: Binomial, Poisson, Properties. Chebyshev's inequality (Without proof).

UNIT-III: Continuous Probability Distributions: (12 lectures)
Distribution functions and Properties, Normal, Exponential, Beta and Gamma.

UNIT-IV: Bivariate Distributions-I: (12 lectures)
Tests of hypothesis: Null hypothesis- Alternative hypothesis, Type-1 and Type2 errors-critical region confidence interval, Level of significance. One sided test, Two sided test, Test of significance: single mean, difference of means, and difference of standard deviations.

UNIT-V: Bivariate Distributions-II & Correlation and regression: (12 lectures)
Student t-distribution, its properties; Test of significance of difference between sample mean and population mean; difference between means and paired test. Test of equality of two population variances, Chi-square distribution, it's properties, Chi-square test of goodness of fit. Curve fitting-fitting of Straight line and Parabola by the method of least square

Suggested Text/Reference Books

1. Fundamentals of Mathematical Statistics, S.C Gupta, V.K Kapoor, Sultan Chand Publication.

2. Probability & Statistics for engineers & scientists: Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, 9th ed. Pearson pub.
3. Fundamentals of Statistics, S.C. Gupta, HPH,2009
4. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.
5. W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley, 1968.
6. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
7. Probability and Statistics for Engineering and the Sciences Jay L. Devore, Cenage Learning, 8th edition.
8. Statistical Methods, Dr. P.N.Arora , S. Chand Publication.
9. Probability & Statistics for engineers & scientists: Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, 9th ed. Pearson pub.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

II Year B. Tech. IT II Sem

L	T	P	C
3	0	0	3

(21SSMB03) ORGANIZATIONAL BEHAVIOUR

COURSE OBJECTIVES

To understand the Fundamentals of Behavioral aspects of individual and groups in an organization.

COURSE OUTCOMES

Students will be able to understand

CO1: Organization and managers roles
CO2: Understanding the individual behaviour
CO3: Interpersonal Behaviour
CO4: Group behaviour
CO5: Organisation policies and practices

SYLLABUS

Unit - I

Introduction to Organization Behaviour: Introduction to organization, organization and managers, manager roles and skills, behaviour at work, introduction to organization behaviour, major behavioural science disciplines contributing to OB, challenges and opportunities managers have in applying OB concepts, OB model (including motivation models) and levels of OB model

Unit - II

Individual behaviour: Introduction to individual behaviour, values, attitudes, job satisfaction, personality, perception and individual decision making, learning, motivation at work, managing emotions and stress (Meaning-Definition Stress and job performance relationship Approaches to stress management (Coping with stress)

Unit - III

Interpersonal behaviour: Interpersonal Behaviour, Johari Window, Transactional Analysis - ego states, types of transactions, life positions, applications of T.A., managerial interpersonal styles.

Unit - IV

Group behaviour: Introduction to group behaviour, foundations of group behaviour, concept of group and group dynamics, types of groups, formal and informal groups, theories of group formation, group norms, group cohesiveness, group decision making, inter group behaviour, concept of team vs. group, types of teams, building and managing effective teams, leadership theories and styles, power and politics, conflict and negotiation.

Unit - V

Organizational behaviour: Foundations of organization structure, organization design, organization culture, organization change, managing across cultures, human resource management policies and practices, diversity at work.

Suggested Readings

1. Robbins, S. P. Judge, T. A. Sanghi, S., Organizational Behavior, Pearson Publication
2. Aswathappa, K., Organisational Behaviour - Text and Problem, Himalaya Publication
3. Pardeshi, P. C., Organizational Behaviour & Principles & Practice of Management, Nirali publication

II Year B. Tech. IT II Sem

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(21PC0IT09) DATA BASE MANAGEMENT SYSTEMS LAB

COURSE PREREQUISITES
A course on Data Base Management Systems.

COURSE OBJECTIVES
This lab course is intended to describe the SQL basics for data definition, data manipulation and introduce ER data model, database design and normalization.

COURSE OUTCOMES
Upon successful completion of this lab, students will be able to:

CO1: Design the ER diagram.
CO2: Analyzing the business requirements and producing a viable model for the implementation of the database.
CO3: Converting the entity-relationship diagrams into relational tables.
CO4: Develop appropriate databases to a given problem that integrates ethical, social, legal, and economic concerns.
CO5: Implement queries using SQL commands.

SOFTWARE REQUIREMENTS
Oracle / MySql

LIST OF TASKS
1. Concept design with E-R Model
2. Relational Model
3. Normalization
4. Practicing DDL commands
5. Practicing DML commands
6. Querying (using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.)
7. Queries using Aggregate functions, GROUP BY, HAVING and Creation and dropping of Views.
8. Triggers (Creation of insert trigger, delete trigger, update trigger)
9. Procedures
10. Usage of Cursors

TEXT BOOKS
1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill, 3rd Edition.
2. Database System Concepts, Silberschatz, Korth, Mc Graw hill, 5th Edition.

REFERENCE BOOKS
1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel, 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education.
3. Introduction to Database Systems, C.J.Date, Pearson Education.
4. Oracle for Professionals, The X Team, S.Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.

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II Year B. Tech. IT II Sem

L	T	P	C
0	0	4	2

(21PC0IT10) DESIGN AND ANALYSIS OF ALGORITHMS LAB

COURSE PREREQUISITES
A course on Design and Analysis of Algorithms.

COURSE OBJECTIVES
This lab course is introduced to write and execute programs in order to solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound

COURSE OUTCOMES
Upon successful completion of this lab, students will be able to:

CO1: Describe time complexities of various algorithms based on asymptotic analysis.
CO2: Work with randomized algorithms.
CO3: Develop the feasible and optimal solutions by using Greedy and dynamic programming.
CO4: Implement the various searching and graph traversal techniques.
CO5: Find solutions for the realistic problems using backtracking & branch and bound.

SOFTWARE REQUIREMENTS
Turbo C / Linux

LIST OF PROGRAMS
1. Write a program to implement and analyze worst case running times based on asymptotic analysis.
2. Write a program to implement to sort a given set of elements using randomized algorithms and determine the expected running time and probability of error.
3. Write a program to implement greedy algorithm for job sequence with deadlines.
4. Write a program to implement divide-and–conquer for sorting of N-numbers.
5. Write a program to implement 0/1 knapsack problem using Dynamic programming.
6. Write a program to implement to find minimum cost spanning tree using DFS and BFS.
7. Write a program to obtain the topological ordering of vertices in a given digraph.
8. Write a program to compute the transitive closure of a given directed graph using Warshall's algorithm.
9. Write a program for a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm.
10. Write a program to implement any scheme to find the optimal solution for the Traveling Sales person problem and then solve the same problem instance using any approximation algorithm and determine the error in the approximation.
11. Write a program to implement N Queen's problem using back tracking.
12. Write a program to implement N Queen's problem using branch and bound.

TEXT BOOKS
1. Introduction to Algorithms, 4th Edition, Thomas H Cormen, Charles E Lieserson, Ronald L Rivest and Clifford Stein, MIT Press/McGraw-Hill.
2. Fundamentals of Algorithms, E. Horowitz.

REFERENCE BOOKS

1. Algorithm Design, 1st Edition, Jon Kleinberg and EvaTardos, Pearson.
2. Algorithm Design: Foundations, Analysis, and Internet Examples, Second Edition, Michael T Goodrich and Roberto Tamassia, Wiley.
3. Algorithms - A Creative Approach, 3rd Edition, UdiManber, Addison-Wesley, Reading, MA.

II Year B.Tech. IT II Sem **L T P C**

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(21PC0IT11) OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

COURSE PREREQUISITES
A course on Object Oriented Programming.

COURSE OBJECTIVES
This lab course is introduced to create the Graphical User Interface using Applets, AWT Components and Swing Components.

COURSE OUTCOMES
Upon successful completion of this lab, students will be able to:
CO1: Work with java compiler and eclipse platform to write and execute java programs.
CO2: Apply object oriented features in java programming for problem solving.
CO3: Access data from database with java programs.
CO4: Describe exception handling mechanism.
CO5: Develop applications using Console I/O and File I/O, GUI applications.

SOFTWARE REQUIREMENTS
Java / Eclipse / Netbeans

LIST OF PROGRAMS
Week 1:

a) Write a Java program that prints all real solutions to the quadratic equation.

b) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.

Week 2:

a) Write a Java program to multiply two given matrices.

b) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers.

Week 3:

a) Write a Java program that checks whether a given string is a palindrome or not.

b) Write a Java program for sorting list of names. Read input from command line.

Week 4:

a) Write a Java program to create a Student class with following fields

i. Hall ticket number ii. Student Name iii. Department

Create n number of Student objects where n value is passed as input to constructor.

b) Write a Java program to demonstrate String comparison using == and equals method.

Week 5:

Write a java program to create an abstract class named Shape that contains an empty method named number of sides( ). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method number of sides( ) that shows the number of sides in the given geometrical figures.

Week 6:

Write a Java program to read copy content of one file to other by handling all file related exceptions.

Week 7:

a) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.

b) Write a Java program that displays the number of characters, lines and words in a text file.

Week 8:

Write a Java program that creates three threads. First thread displays “Good Morning” every one second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.

Week 9:

Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.

Week 10:

a) Write a Java program for handling mouse events.

b) Develop an applet that displays a simple message in center of the screen.

TEXT BOOKS

1. Java Fundamentals - A comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.

REFERENCE BOOKS

1. Java for Programmers, P.J.Deitel and H.M.Deitel, Pearson education (OR) Java: How to Program, P.J.Deitel and H.M.Deitel, PHI.
2. Object Oriented Programming through Java, P. Radha Krishna, University Press.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

II Year B.Tech. IT II Sem

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(21MC0CH01) ENVIRONMENTAL SCIENCE (Mandatory Course)
Common to All Branches

COURSE OBJECTIVES

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding the environmental policies and regulations.

COURSE OUTCOMES

Based on this course, the Engineering graduate will understand /evaluate/develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

SYLLABUS

UNIT-I

Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnifications, ecosystem value, services and carrying capacity, Field visits.

UNIT-II

Natural Resources: Classification of Resources: Living and Non-Living resources, **water resources:** use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. **Mineral resources:** use and exploitation, environmental effects of extracting and using mineral resources, **Land resources:** Forest resources, **Energy resources:** growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

UNIT-III

Biodiversity And Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT-IV

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, **Air Pollution:** Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. **Water pollution:** Sources and types of pollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards,

Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary, and Tertiary. Overview of air pollution control technologies;

Concepts of bioremediation. **Global Environmental Issues and Global Efforts: C**limate change and impacts on human environment. Ozone depletion and Ozone depleting substances

(ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. NAPCC-GoI Initiatives.

UNIT-V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP).

Towards Sustainable Future: Concept of Sustainable Development Goals, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

TEXT BOOKS

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE BOOKS

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
6. Introduction to Environmental Science by Y. Anjaneyulu, BS Publications.