VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY HYDERABAD
B.TECH. II YEAR
COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY)

III SEMESTER **A19**

Course Code	Title of the Course	L	T	P/D	Contact Hours/ Week	Credits
A19PC1CS01	Digital Logic Design	2	1	0	3	3
A19PC1CS02	Mathematical Foundations for Computer Science	2	1	0	3	3
A19PC1IT01	Object Oriented Programming through C++	3	0	0	3	3
A19PC1CS03	Design and Analysis of Algorithms	3	0	0	3	3
A19PC1CS04	Database Management Systems	3	0	0	3	3
A19PC2IT01	Object Oriented Programming through C++ Laboratory	0	0	3	3	1.5
A19PC2CS01	Database Management Systems Laboratory	0	0	3	3	1.5
A19PC2IT02	Python Programming Laboratory	0	0	2	2	1
Total		**13**	**2**	**8**	**23**	**19**
A19MN6HS02	Environmental Science	2	0	0	2	**0**

IV SEMESTER **A19**

Course Code	Title of the Course	L	T	P/D	Contact Hours/ Week	Credits
A19BS1MT11	Probability, Statistics and Queuing Theory	3	0	0	3	3
A19HS1MG02	Engineering Economics and Accountancy	3	0	0	3	3
A19PC1CS07	Computer Networks	2	1	0	3	3
A19PC1IT02	Java Programming	2	1	0	3	3
A19PC1IT03	Computer Organization	3	0	0	3	3
A19PC1CS61	Introduction to Cyber Security	3	0	0	3	3
A19PC2IT03	Java Programming Laboratory	0	0	3	3	1.5
A19PC2CS61	Computer Networks Simulation Laboratory	0	0	3	3	1.5
Total		**16**	**2**	**6**	**24**	**21**

L – Lecture T – Tutorial P – Practical D – Drawing

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester – CSE & IT	**L**	**T/P/D**	**C**
	2	**1**	**3**

(A19PC1CS01) DIGITAL LOGIC DESIGN

COURSE OBJECTIVES:

- To analyze and explore uses of logic functions for building digital logic circuits
- To explore the combinational logic circuits
- To examine the operation of sequential (synchronous and asynchronous) circuits
- To understand the programming concepts of HDL for simulating any type of logic circuits

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Simplify the complex logic functions using k-maps and tabulation methods
CO-2: Build any type of combinational circuits that help in further designing memory elements
CO-3: Design Synchronous and Asynchronous sequential circuits using memory elements
CO-4: Apply the concepts of HDL for simulating the logic functions, combinational and sequential circuits

UNIT – I:
Numbers Systems and Codes: Review of number systems, number base conversion, binary arithmetic, binary weighted and non-weighted codes, Complements, Signed binary numbers, Error Detection and Correcting Codes, Binary Logic.

UNIT – II:
Boolean Algebra and Gate Level Minimization: Postulates and theorems, representation of switching functions, SOP and POS forms –Canonical forms, digital logic gates, Karnaugh Maps –minimization using three variable, four variable and five variable K-Maps, Don't Care Conditions, NAND and NOR implementation , Other Two-Level Implementation, Exclusive-OR function, Integrated Circuits, Hardware Description Language(HDL).

UNIT – III:
Design of Combinational Circuits: Combinational Circuits- Analysis and Design Procedure, Binary adder and subtractors, Binary multiplier, magnitude comparator, BCD adder, Decoders, Encoders, Multiplexers, Demultiplexers, HDL for Combinational Circuits.

UNIT – IV:
Design of Sequential Circuits: Combinational Vs Sequential Circuits, Latches, Flip Flops-RS flip flop, JK flip flop, T flip flop, D flip flop, Master-Slave Flip flop- Flip Flops excitation functions, Conversion of one flip flop to another flip flop, Asynchronous Vs Synchronous circuits, Analysis of clocked sequential circuits, State Table, State Diagram, State Reduction and State Assignment, Mealy and Moore Machines, HDL for Sequential circuits.

UNIT – V:

Counters and Registers: Design of synchronous counters, Ripple Counters, Asynchronous counters, Registers, Shift Registers, HDL for counters and registers.

Memory: Random Access Memory, Read Only Memory, Programmable Logic Array, Programmable Array Logic.

UNIT – VI:

Asynchronous Sequential Logic: Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and flow Tables, Race Free State Assignment, Hazards, Design examples.

TEXT BOOKS:

1. Digital Design, M. Morris Mano, 3rd Edition, Pearson Education/PHI
2. Switching and Finite Automata Theory, ZviKohavi, Tata McGraw-Hill

REFERENCES:

1. Fundamentals of Logic Design, Roth, 5th Edition, Thomson
2. Switching and Logic Design, C. V. S. Rao, Pearson Education
3. Digital Principles and Design, Donald D. Givone, Tata McGraw-Hill
4. Fundamentals of Digital Logic & Micro Computer Design, M. Rafiquzzaman, 5th Edition, John Wiley

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	2	**1**	**3**

(A19PC1CS02) MATHEMATICAL FOUNDATIONS FOR COMPUTER SCIENCE

COURSE OBJECTIVES:
- To apply logical reasoning to a variety of problems
- To understand the concepts on elementary combinatorics and permutations
- To analyze the properties of graphs and trees
- To evaluate various methods for solving the recurrence relations

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Demonstrate problems using statement calculus, predicate logic and set theory
CO-2: Apply and calculate permutations and combinations
CO-3: Understand the use of graphs and trees as models
CO-4: Solve various problems using recurrence relation techniques

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

UNIT – II:
Set Theory: notations, inclusion and equality sets, operations on sets, Venn diagrams.
Relations: Properties of binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Hasse diagram.
Functions: Types of Functions, Inverse Function, Composition of functions, recursive Functions.

UNIT – III:
Elementary Combinatorics: Basics of counting, Combinations & Permutations, with repetitions, Constrained repetitions, the principles of Inclusion – Exclusion, Pigeon hole principle.

UNIT – IV:
Graphs: Graphs and their Properties, Degree, Connectivity, Path, Cycle, Sub graph, Isomorphism, Eulerian and Hamiltonian Walks, Planar Graphs, Graph coloring, Chromatic Numbers.

UNIT – V:
Trees: Properties of trees – Distance and centers in tree – Rooted and binary trees. Spanning trees, BFS, DFS, Spanning trees in a weighted graph.

UNIT – VI:
Recurrence Relations: Generating Functions, Function of Sequences, Calculating Coefficients of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating functions, the method of Characteristic roots, solution of Inhomogeneous Recurrence Relations.

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science, J. P. Trembly and R. Manohar, Tata McGraw-Hill
2. Discrete Mathematics for Computer Scientists & Mathematicians, J. L. Mott, A. Kandel, T. P. Baker, 2nd Edition, PHI
3. Graph Theory: With Application to Engineering and Computer Science, Narsingh Deo, Prentice Hall of India, 2003

REFERENCES:

1. Elements of Discrete Mathematics, A Computer Oriented Approach, C. L. Liu and D. P. Mohapatra, 3rd Edition, Tata McGraw-Hill
2. Discrete Mathematics and its Applications, Kenneth H. Rosen, Tata McGraw-Hill
3. Discrete Mathematics, Norman L. Biggs, 2nd Edition, Oxford University Press

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B.Tech. III Semester – CSE & IT	**L**	**T/P/D**	**C**
	3	**0**	**3**

(A19PC1IT01) OBJECT ORIENTED PROGRAMMING THROUGH C++

COURSE OBJECTIVES:

- To understand the basics of OOPs and features of C++ supporting object-oriented programming
- To understand the dynamic allocation of objects and concept of friend
- To demonstrate the advanced object-oriented programming features like inheritance polymorphism etc.
- To understand the usage of exception handling, File I/O, Standard template library

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Relate the basic concepts of oops to solve real problems
CO-2: Demonstrate the creation of objects and access specifiers
CO-3: Classify the advanced OOPs features like inheritance polymorphism etc. in developing the solution for a given problem
CO-4: Demonstrate exception handling, Streams, STL in formulating the solution for a given problem

UNIT – I:
Programming Paradigms – Object-Oriented Paradigm: Elements of Object-Oriented Programming, benefits of object oriented programming. Moving from C to C++.Classes and Objects-Class specification, definition, inline functions, Access specifiers, Passing and returning objects – Array of objects - Static members. Example programs

UNIT – II:
Constructors - Parameterized constructors - Constructor overloading. Copy constructor, Destructors, Default arguments –dynamic memory allocation- new, delete operators - "this" pointer, friend classes and friend functions. Example programs

UNIT – III:
Function overloading – Operator overloading- unary operator overloading- binary operator overloading-, operator overloading with friend function, Generic programming with templates- Function templates, class templates. Example programs

UNIT – IV:
Inheritance-Base class and derived class relationship-derived class declaration-Forms of inheritance- inheritance and member accessibility- constructors in derived class, abstract class, virtual functions, and pure virtual function.

UNIT – V:
Exception Handling- Introduction, Principles of Exception Handling, The Keywords Try, Throw and Catch, Exception Handling Mechanism, Multiple Catch Statements, list of exceptions, catch All exceptions, Standard Template Libraries – Containers, Iterators, Functions

UNIT – VI:
Files and Streams-Opening and Closing a file- file modes- file pointers and their manipulation, sequential access to a file-random access to a file-Reading and Writing.

TEXT BOOKS:

1. Mastering C ++, Venugopal, Rajkumar, Ravi Kumar, TMH
2. Bjarne Stroustrup, The C++ Programming Language, Addison Wesley, 3rd Edition, 2008

REFERENCES:

1. The Complete Reference, C++, Herbert Schildt, 4th Edition, TMH

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B.Tech. III Semester – CSE & IT	**L**	**T/P/D**	**C**
	3	**0**	**3**

(A19PC1CS03) DESIGN AND ANALYSIS OF ALGORITHMS

COURSE OBJECTIVES:

- To reinforce algorithms analysis methods
- To analyse running time of an algorithm
- To understand different algorithm design strategies
- To familiarity with an assortment of important algorithms

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Apply algorithm design techniques and concepts to solve given engineering problem

CO-2: Analyze running times of algorithms using asymptotic analysis

CO-3: Develop efficient algorithms for computational tasks

CO-4: Computing complexity measures of algorithms

UNIT – I:

Introduction: Characteristics of algorithm. Analysis of algorithms: Asymptotic analysis of complexity bounds – best, average and worst-case behaviour; Performance measurements of Algorithm, Time and space trade-offs.

Divide and conquer General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication. Analysis of recursive algorithms through recurrence relations: Substitution method, Recursion tree method and Masters' theorem.

UNIT – II:

Fundamental Algorithmic Strategies: Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem, Huffman Codes.

UNIT – III:

Dynamic Programming: General method, Principle of optimality, applications-Multistage graphs, Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT – IV:

Backtracking General method, applications- N-Queen problem, Sum of subsets problem, Graph coloring, Hamiltonian cycles.

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

UNIT – V:

Graph and Pattern Matching Algorithms: Graph Traversal algorithms: Depth First Search (DFS) and Breadth First Search (BFS), connected and biconnected components, Topological Sorting.

Pattern Matching Algorithms: Brute Force method, Knuth-Morris-Pratt algorithms

UNIT – VI:

NP Hard and NP-Complete problems: P, NP, NP-complete and NP-hard. Cook's theorem

Randomized Algorithm: Hiring Problem, Randomized Quick Sort

TEXT BOOKS:

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

REFERENCES:

1. Algorithm Design, Jon Kleinberg and Eva Tardos, 1st Edition, Pearson
2. Algorithm Design: Foundations, Analysis, and Internet Examples, Michael T. Goodrich and Roberto Tamassia, 2nd Edition, Wiley
3. Algorithms – A Creative Approach, Udi Manber, 3rd Edition, Addison-Wesley, Reading, MA
4. Introduction to the Design and Analysis of Algorithms, Anany Levitin, 3rd Edition, Pearson Publications

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	3	**0**	**3**

(A19PC1CS04) DATABASE MANAGEMENT SYSTEMS

COURSE OBJECTIVES:

- To introduce the concepts of Data Base Management and to give the description of structure of Data Base systems
- To understand concepts of ER model and model the data base for the given scenarios and prepare the database through normalization
- To know the features of various models of data and query representations
- To introduce the concepts and protocols related to transaction management and understand the concepts of data storage

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Appreciate the underlying concepts of database system architecture and technologies
CO-2: Develop database schema for a given scenario
CO-3: Query the database using the relevant programming language
CO-4: Design schedules using multiple transactions

UNIT – I:
Introduction to Databases and Database Management System: Database system Applications, Advantages of DBMS over File System, Data Models, Instances and schema, View of Data, Database Languages –DDL, DML, DCL, Database Users and Administrator, Database System Architecture.

UNIT – II:
Database Design and ER Diagrams: Attributes and Entity Sets, Relationships and Relationship Sets, Constraints, Keys, Design Issues, Entity-Relationship Diagram, Extended E-R Features, Database Design with ER model, Database Design for a schema.

UNIT – III:
Introduction to the Relational Model: Structure of RDBMS, Integrity Constraints over Relations, Querying Relational Data, Relational Algebra and Relational Calculus.
Introduction to SQL: Data Definition commands, Data Manipulation Commands, Basic Structure, Set operations Aggregate Operations, Join Operations, Sub queries and correlated queries, views, Triggers, Cursors, Embedded SQL, Overview of NoSQL database.

UNIT – IV:
Functional Dependencies: Introduction, Basic Definitions, Trivial and Non trivial dependencies, closure of a set of dependencies, closure of attributes, irreducible set of dependencies.
Schema Refinement in Database Design: Problems Caused by Redundancy, Decompositions – Problem Related to Decomposition, Lossless Join Decomposition, Dependency Preserving Decomposition, FIRST, SECOND, THIRD Normal Forms, BCNF, Multivalued Dependencies, FOURTH Normal Form.

UNIT – V:

Transaction Management: Transaction state, Implementation of atomicity and Durability, Concurrent executions – Serializability, Recoverability.

Concurrency Control: Lock Based Protocols, Timestamp Based Protocols, Validation Based Protocols, Multiple Granularity, Dead Lock Handling

Recoverability: Failure Classification, Storage Structure, Recovery and Atomicity- Log Based recovery, Recovery with concurrent transactions, Checkpoints.

UNIT – VI:

File Organization: Organization of records in file, Data Dictionary Storage.

Indexing and Hashing: Basic Concepts, Ordered Indices+ Tree Index files, B tree index files – Static Hashing – Dynamic Hashing – Comparison of Indexing with Hashing.

TEXT BOOKS:

1. Database System Concepts, Silberschatz, Korth, Sudarshan, 7th Edition, McGraw-Hill
2. Introduction to Database Systems, C. J. Date, Pearson Education

REFERENCES:

1. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, Tata McGraw-Hill
2. Fundamentals of Database Systems, Elmasri Navathe Pearson Education
3. Database Systems Design, Implementation, and Management, Peter Rob & Carlos Coronel, 7th Edition, Cengage Learning

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B.Tech. III Semester – CSE & IT	**L**	**T/P/D**	**C**
	0	**3**	**1.5**

(A19PC2IT01) OBJECT ORIENTED PROGRAMMING THROUGH C++ LABORATORY

COURSE OBJECTIVES:

- To identify and practice the basic concepts of object-oriented programming
- To analyse the exception handling mechanism and dynamic allocation of objects
- To familiarize students with advanced concepts of object-oriented programming in C++
- To facilitate students with the skills required to solve problems using object oriented concepts

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Relate the basic concepts of oops for a given program using the features of C++

CO-2: Implement dynamic memory allocation of objects for effective memory usage

CO-3: Construct the programs using advanced OOP features like inheritance, Polymorphism and Generic programming

CO-4: Develop the programs using Exception Handling, STL and Streams

WEEK 1:

Moving towards C to C++ -- Sample programs using C++, Sample programs using classes

WEEK 2:

Programs on Parameter passing methods, Inline functions, Static members, Access specifiers

WEEK 3:

Programs on default arguments, constructors, Constructor overloading, destructors, 'this'pointers

WEEK 4:

Programs on Dynamic memory allocation, friend functions and classes

WEEK 5:

Programs on function overloading, Operator Overloading

WEEK 6:

Programs on function and class templates

WEEK 7:

Programs on Inheritance- Different forms of inheritance

WEEK 8:

Programs using abstract classes, polymorphism

WEEK 9:
Sample Programs on Exception handling – Basic constructs
Programs on multiple catch statement, Exceptions in Constructors and destructors

WEEK 10:
Programs using STL

WEEK 11:
Programs on different operations on files

WEEK 12:
Programs on random access to files

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B.Tech. III Semester – CSE & IT	**L**	**T/P/D**	**C**
	0	**3**	**1.5**

(A19PC2CS01) DATABASE MANAGEMENT SYSTEMS LABORATORY

COURSE OBJECTIVES:
- To provide the fundamental concepts of database creation
- To implement the concepts of Data manipulation
- To develop procedures for querying Multiple tables
- To understand the concepts of PL / SQL

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Apply Integrity constraints for creating consistent RDBMS environment
CO-2: Implement SQL functions using the DUAL table
CO-3: Create, maintain and Manipulate the Data through SQL commands
CO-4: Develop Triggers, query through PL /SQL structures

WEEK 1:

Implement the following using DUAL table:
a) Character functions,
b) Numeric functions
c) Date functions and
d) Conversion functions.

WEEK 2:

Practice DDL and DML commands on a basic table without integrity constraints.

WEEK 3:

Practice DDL and DML commands on a Relational Database, specifying the Integrity constraints.
(Primary Key, Foreign Key, CHECK, NOT NULL)

WEEK 4:

Apply the concepts of Joins, SET operations and SQL functions on any two relational schemas

WEEK 5-7:

Apply the concepts of Joins, SET operations and SQL functions on the following schema:

a) Employee:

Name	Datatype	width	Constraint	Description
Empno	Integer	4	Primary Key	Employee Number
Ename	Varchar	20		Employee Name
Job	Char	12		Designation
Mgr	Integer	4		Manager Number

Hiredate	Date			
Sal	Number	(8,2)		Salary
Comm	Number	(6,2)		Commission
Deptno	Integer	2	Foreign Key	Department Number

b) Dept:

Name	Datatype	width	Constraint	Description
Deptno	Integer	2	Primary Key	Department Number
Dname	Varchar	12		Department Name
Loc	Char	10		Location

c) Salgrade:

Name	Datatype	width	Constraint	Description
Grade	Integer	1		Grade
Hisal	Integer	4		Upper scale of salary
Losal	Integer	5		Lower scale of salary

WEEK 8 – 11:

End to end implementation of a schema for a specific system along with the illustrations of querying.

A system is described by specifying the functional and non-functional requirements. Based on this description, the major entities are identified and modelled. Further the relationships are modelled to form the initial schema. The schema is further refined by removing redundancies through normalization. Also based on the query requirements, the schema is remodelled to facilitate querying. Finally an illustration of various queries to extract required information from the system is shown using SQL / MYSQL.

The five major workflows to be implemented are:

1. System Specification
2. Design of Initial Schema
3. Schema refinement using functional dependencies and normalization
4. Schema refinement using query requirements
5. Illustration of querying the system using SQL / MYSQL.

WEEK 12:

Implementation of PL / SQL concepts

WEEK 13:

Creating and executing CURSORS.

WEEK 14:

Creation and application of TRIGGERS on a Relational schema.

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B.Tech. III Semester – CSE & IT	**L**	**T/P/D**	**C**
	0	**2**	**1**

(A19PC2IT02) PYTHON PROGRAMMING LABORATORY

COURSE OBJECTIVES:
- To install and run the Python interpreter
- To learn control structures
- To understand Lists, Dictionaries in python
- To handle Strings and Files in Python

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Develop the application specific codes using python
CO-2: Understand Strings, Lists, Tuples and Dictionaries in Python
CO-3: Verify programs using modular approach, file I/O, Python standard library
CO-4: Implement Digital Systems using Python

EXERCISE 1: Basics
Running instructions in Interactive interpreter and a Python Script
Write a program to purposefully raise Indentation Error and correct it

EXERCISE 2: Operations
Write a program to compute GCD of two numbers by taking input from the user
Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

EXERCISE 3: Control Flow
Write a Program for checking whether the given number is even number or not.
Write a program using for loop that loops over a sequence.
Python Program to Print the Fibonacci sequence using while loop
Python program to print all prime numbers in a given interval (use break)

EXERCISE 4: Lists
Find mean, median, mode for the given set of numbers in a list.
Write a program to convert a list and tuple into arrays.
Write a program to find common values between two arrays.

EXERCISE 5: Dictionary
Write a program to count the numbers of characters in the string and store them in a dictionary data structure
Write a program combine_lists into a dictionary.

EXERCISE 6: Strings
Write a program to check whether a string starts with specified characters.
Write a program to check whether a string is palindrome or not

EXERCISE 7: Strings Continued
Python program to split and join a string
Python Program to Sort Words in Alphabetic Order

EXERCISE 8: Files
Write a program to print each line of a file in reverse order.
Write a program to compute the number of characters, words and lines in a file.
Write a program to count frequency of characters in a given file.

EXERCISE 9: Functions
Simple Calculator program by making use of functions
Find the factorial of a number using recursion
Write a function dups to find all duplicates in the list.
Write a function unique to find all the unique elements of a list.

EXERCISE 10: Functions - Problem Solving
Write a function cumulative_ product to compute cumulative product of a list of numbers.
Write a function reverse to print the given list in the reverse order.
Write function to compute GCD, LCM of two numbers

EXERCISE 11: Multi-D Lists
Write a program that defines a matrix and prints
Write a program to perform addition of two square matrices
Write a program to perform multiplication of two square matrices

EXERCISE 12: Modules
Install NumPypackage with pip and explore it.

EXERCISE 13:
Write a program to implement Digital Logic Gates – AND, OR, NOT, EX-OR
Write a program to implement Half Adder, Full Adder, and Parallel Adder

TEXT BOOKS:
1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
2. Learning Python, Mark Lutz, Orielly

REFERENCES:
1. Think Python, Allen Downey, Green Tea Press
2. Core Python Programming, W. Chun, Pearson
3. Introduction to Python, Kenneth A. Lambert, Cengage

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B.Tech. III Semester	**L**	**T/P/D**	**C**
	0	**2**	**0**

(A19MN6HS02) ENVIRONMENTAL SCIENCE

COURSE PRE-REQUISITES: Basic knowledge of environmental issues

COURSE DESCRIPTION:
Environmental science is the study of patterns and processes in the natural world and their modification by human activity. We as human beings are not an entity, separate from the environment around us, rather we are a constituent seamlessly integrated and co-exist with the environment around us. To understand current environmental problems, we need to consider physical, biological and chemical processes that are often the basis of those problems. The course requires the students to identify and analyse natural and human- made environmental problems, evaluate the relative risks associated with these problems, and examine alternative solutions for resolving or preventing them. This course will survey some of the many environmental science topics at an introductory level, ultimately considering the sustainability of human activities on the planet. We are not an entity so separate from the environment that we can think of mastering and controlling it rather we must understand that each and every action of ours reflects on the environment and vice versa.

COURSE OBJECTIVES:
- To recognize the impacts of human interventions towards environment
- To list out the benefits in creating a sustainable environment
- To sketch out various activities in achieving a cleaner environment
- To emphasize the role of an individual for a better planet to live

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Gain a variety of experiences & acquire a basic knowledge about the environment & its allied problems
CO-2: Interpret the key components in safe guarding the environment
CO-3: Appraise the quality of environment in order to create a healthy atmosphere
CO-4: Familiarize with the individual responsibilities towards green revolution

MODULE 1: INTRODUCTION
Environmental Science: Introduction, Definition, scope and importance.

MODULE 2: AWARENESS ACTIVITIES
Small group meetings about:
- Water management
- Projects Vs Environment
- Generation of less waste
- Promotion of recycle use
- Impact of Science & Technology on Environment
- Avoiding electronic waste

MODULE 3: SLOGAN AND POSTER MAKING EVENT
- Food waste management

- Rain water harvesting
- Climate change
- Green Power
- Water conservation
- Green at work
- Role of IT in environment and human health
- Sustainable development

MODULE 4: EXPERT LECTURES ON ENVIRONMENTAL SCIENCE
- Environmental Impact Assessment
- Industrial waste treatment
- Organic farming/Vertical gardens/Hydroponics

MODULE 5: CLEANLINESS DRIVE
- Indoor air pollution
- Vehicular pollution
- VISUAL pollution
- Waste management at home
- Composting
- Plastic recycling

MODULE 6: CASE STUDIES
- HPCL disaster in Vizag
- Oleum gas leak in Delhi
- Mathura Refinery & Taj Mahal
- Conservation of Hussain Sagar lake
- The Cleanliest city of India-Surat
- Green Buildings in India
- KBR park in Hyderabad (Environmental protection Vs Development)
- Fluorosis
- Ecotourism & its impacts

TEXT BOOKS:
1. Environmental Studies for UG Courses, Erach Bharucha, UGC Publications, Delhi, 2004
2. Textbook of Environmental Studies, Deeksha Dave, S. S. Katewa, Cengage Delmar Learning India Pvt., 2012

REFERENCES:
1. Introduction to Environmental Science, Y. Anjaneyulu, BS Publications, 2004
2. Environmental Studies, Anubha Kaushik & C. P. Kaushik, 4th Edition, New Age International Publishers

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B.Tech. IV Semester – CSE & IT	**L**	**T/P/D**	**C**
	3	**0**	**3**

(A19BS1MT11) PROBABILITY, STATISTICS AND QUEUING THEORY

COURSE PRE-REQUISITES: Permutations and Combinations, Basic Statistics

COURSE OBJECTIVES:
- To learn elementary ideas in basic probability
- To learn different types of probability distribution functions
- To learn methods of calculating correlation and regression
- To learn various methods to test the hypothesis
- To learn understand the basic concepts of queuing theory

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Solve problems involving basic probability
CO-2: Evaluate statistical parameters of different probability distributions
CO-3: Calculate correlation, regression, rank correlation coefficients
CO-4: Apply the knowledge of different probability distributions to Test of Hypothesis
CO-5: Apply the knowledge of different probability distributions to solve problems in queuing theory

UNIT – I:
Basic Probability: Sample space and events, Probability- The axioms of probability, some elementary theorems, conditional probability, Baye's theorem. Random variables - discrete and continuous distributions - Expectation of Discrete Random Variables, Moments, Variance of a sum.

UNIT – II:
Probability Distributions: Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions –related properties. Box-Mueller Method, Transformation of Random Variables.

UNIT – III:
Testing of Hypothesis - Large Samples: Sampling distributions, Tests of hypothesis - null hypothesis, alternate hypothesis, type I, type II errors, critical region. Inferences concerning means and proportions- Large samples- test of hypothesis for single mean and difference between the means. Test of hypothesis for the proportions- single and difference between the proportions, confidence interval for the mean and proportions

UNIT – IV:
Tests of Significance - Small Samples: Tests of significance-t distributions, confidence interval for the t- distribution, F-distributions and Chi square distributions.

UNIT – V:
Correlation and Regression Analysis: Coefficient of correlation, Correlation Ratio, Logistic Regression, ANOVA Table, Multiple Regression model, Coefficient of Determination, Adjusted R2, Auto Correlation, Heteroskedasticity

UNIT – VI:

Queuing Theory: Queuing theory -Arrival process and service process- Pure birth and death process, M/M/1 model with finite and infinite capacities, M/M/C model with infinite capacity.

TEXT BOOKS:

1. Applied Probability, I. N. Blake, 9th Edition, John Wiley & Sons Inc., 1979
2. Introductory Statistics, Thomas H. Wonnacott & Ronald J. Wonnacot, John Wiley & Sons Inc., 1969
3. The Single Server Queue, J. W. Cohen, Wiley Interscience, 1969

REFERENCES:

1. Applied Statistics and Probability for Engineer, Douglas C. Montgomery, George C. Runger, 3rd Edition, John Wiley & Sons Inc., 2003
2. Probability and Statistics for Engineers, Richard A. Johanson, 5th Edition, Prentice-Hall, 1995
3. Applied Statistics for Engineers, Jay L. Devore, Nicholas R. Famum, Jimmy A. Doi, 3rd Edition, Cengage Learning
4. Some Problems in the Theory of Queues, D. G. Kendall, Journal of the Royal Statistical Society, Series B, 13, 151–185, 1951

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(A19HS1MG02) ENGINEERING ECONOMICS AND ACCOUNTANCY

(Common to EEE, EIE, CSE and IT)

COURSE OBJECTIVES:

- To explain the basic nature of pure economics and to analyse certain concepts of both Micro & Macro Economics and to know the role of managerial economics in solving problems of business enterprises
- To understand different forms of organizing private-sector and public-sector business enterprises and problems which have been encountered by public enterprises in India
- To describe each stage of product life cycle with the help of different costs and their role in maintaining optimum cost of production and overall profitability by considering different market competitions
- To analyse the process involved in preparation of project proposals, to estimate capital required to commerce and carryon business projects, to know the various sources of mobilizing required amount of capital and to evaluate investment opportunities
- To apply the basic accounting concepts & conventions and to analyse financial position of business enterprise

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Perform decision making function effectively in an uncertain framework by applying the concepts of economics, manage demand efficiently and plan future course of action

CO-2: Select suitable form of business organization which meets the requirements of business

CO-3: Fix the right price which can best meet the pre-determined objectives of the business under different market conditions

CO-4: Identify the best source of mobilising capital, select most profitable investment opportunity, carry out & evaluate benefit/cost, life cycle and Break-even analysis on one or more economic alternatives

CO-5: Analyze overall position of the business enterprise, therefore, take appropriate measures to improve the situation

UNIT – I:

Introduction to Economics & Managerial Economics: Introduction to Economics: Definition, nature, scope and types of Economics. Concepts of Macro-Economics: Gross Domestic Product (GDP), Gross National Product (GNP), National Income (NI) & Rate of Inflation.

Managerial Economics: Definition, nature, scope & significance.

Elements of Managerial Economics: Demand Analysis, Law of Demand, Elasticity of Demand and Demand Forecasting.

UNIT – II:

Forms of organizing Private and Public-Sector Business Enterprises:

Private Sector Business Enterprises:

(i) Sole Proprietorship - Definition, features, merits, limitations & suitability.
(ii) Partnership - Definition, Partnership Act, features, types, merits, limitations, suitability.
(iii) Joint-Stock Company - Definition, Companies Act, features, types, merits, limitations, suitability.
Public Sector Business Enterprises: Definition, features, objectives, merits, problems.

UNIT – III:
Market Structures, Product Life-Cycle (PLC), Pricing and Financial Accounting: Market Structures: Definition & common features of market and classifications of markets. Evaluation of market structures-Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly.
Product Life-Cycle and Pricing: Definition, various stages of PLC, and Life-Cycle Costs; objectives and methods of pricing.
Introduction to Financial Accounting: Definition, basic principles and double-entry book- keeping, practice of accounting process-Journal, ledger, trial balance and final accounts (simple problems)

UNIT – IV:
Financial Analysis through Ratios: Meaning, computation of ratios
- **(i) Liquidity Ratios:** Current Ratio and Quick Ratio,
- **(ii) Solvency Ratios:** Interest Coverage Ratio and Debt- Equity Ratio,
- **(iii) Activity Ratios:** Stock/Inventory Turnover Ratio and Debt Turnover Ratio,
- **(iv) Profitability Ratios:** Gross Profit Ratio, Net Profit Ratio & Earning Per Share(EPS) Ratio.

UNIT – V:
Management Accounting: Definition & nature of Management Accounting.
Capital: Types of capital, factors influencing capital requirements, sources of mobilising Fixed and Working Capital.

UNIT – VI:
Cost Accounting: Cost Accounting: Definition, Types of costs – Opportunity cost, Explicit/Out-of-Pocket cost, Implicit/Imputed cost, Fixed cost, Variable cost, Semi-Variable cost, Differential cost, Sunk cost, Total cost, Average cost & Marginal cost. Break- Even/Cost-Volume-Profit (CVP) Analysis (Simple Problems).

TEXT BOOKS:

1. Managerial Economics and Financial Analysis, Aryasri, Tata McGraw-Hill, 2009
2. Managerial Economics, Varshney & Maheswari, Sultan Chand, 2009
3. Principles of Marketing: A South Asian Perspective, Kotler Philip, Gary Armstrong, Prafulla Y. Agnihotri and Eshan ul Haque, 13th Edition, Pearson Education/ Prentice Hall of India, 2010

REFERENCES:

1. Indian Economy, Misra S. K. and Puri, Himalaya Publishers
2. Textbook of Business Economics, Pareek Saroj, Sunrise Publishers
3. Financial Accounting for Management: An Analytical Perspective, Ambrish Gupta, Pearson Education
4. Managerial Economics, H. Craig Peterson & W. Cris Lewis, Prentice Hall of India

Guide to Proposal Writing, Jane C. Geever & Patricia McNeill, Foundation Centre

Website:
https://www.amazon.com/exec/obidos/tg/detail/-/0879547030/ref=ase_learnerassoci-20/102-4728473-7056968?v=glance&s=books

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester – CSE & IT	**L**	**T/P/D**	**C**
	2	**1**	**3**

(A19PC1CS07) COMPUTER NETWORKS

COURSE OBJECTIVES:

- To develop an understanding of modern network architectures from a design and performance perspective
- To introduce the student to the major concepts, principles involved in Data Link Layer and Network Layer
- To provide an opportunity to learn how to maintain QoS in Network & maintaining of Congestion Control
- To get an idea of Application Layer functionalities and importance of Security in the Network

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Understand modern network architectures from a design and performance perspective

CO-2: Learn major concepts, principals involved in Data Link Layer and Network Layer

CO-3: Analyze how to maintain QoS in Network and maintaining of Congestion Control

CO-4: Get an idea of Application Layer functionalities and importance of Security in the Network

UNIT – I:

Data Communication Components: Representation of data and its flow Networks, Various Connection Topology, Protocols and Standards, OSI model, Transmission Media, Overview of LAN: Wired LAN, Wireless LANs, Connecting LAN and Virtual LAN, Techniques for Band width utilization: Multiplexing - Frequency division, Time division and Wave division, Conceptson spread spectrum.

UNIT – II:

Data Link Layer and Medium Access Sub Layer: Error Detection and Error Correction - Fundamentals, Block coding, Hamming Distance, CRC; Flow Control and Error control protocols - Stop and Wait, Go back – N ARQ, Selective Repeat ARQ, Sliding Window, Piggybacking, Random Access, Multiple access protocols -Pure ALOHA,
Slotted ALOHA, CSMA/CD, CDMA/CA

UNIT – III:

Network Layer: Switching, Logical addressing – IPV4, IPV6; Address mapping – ARP, RARP, BOOTP and DHCP–Delivery, Forwarding and Unicast Routing protocols.

UNIT – IV:

Transport Layer: Process to Process Communication, User Datagram Protocol (UDP), Transmission Control Protocol (TCP), SCTP Congestion Control; Quality of Service, QoS improving techniques: Leaky Bucket and Token Bucket algorithm.

UNIT – V:

Application Layer: Domain Name Space (DNS), DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Firewalls.

UNIT – VI:

Security: Cryptography- Symmetric-Key Cryptography, Asymmetric-Key Cryptography, Network Security- Security Services, Message Confidentiality, Message Integrity, Message Authentication, Digital Signature, Entity Authentication, Key Management.

TEXT BOOKS:

1. Data Communication and Networking, Behrouz A. Forouzan, 4th Edition, Tata McGraw- Hill
2. Computer Networks, Andrew S. Tanenbaum, 8th Edition, Pearson New International Edition

REFERENCES:

1. Data and Computer Communication, William Stallings, 8th Edition, Pearson Prentice Hall India
2. Internetworking with TCP/IP, Volume 1, Douglas Comer, 6th Edition, Prentice Hall of India
3. TCP/IP Illustrated, Volume 1, W. Richard Stevens, Addison-Wesley

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B.Tech. IV Semester – CSE & IT	**L**	**T/P/D**	**C**
	2	**1**	**3**

(A19PC1IT02) JAVA PROGRAMMING

COURSE OBJECTIVES:
- To understand fundamental concepts and constructs of Java
- To implement Different object-oriented Concepts in Java
- To develop the concepts of Multi-Threading and IO-Streams
- To establish connection to the databases

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Write Java programs using various programming constructs using Java
CO-2: Solve different mathematical problems using OOP Paradigm
CO-3: Understand and use Java Collection Framework
CO-4: Design and analyze the solutions for Thread and database connectivity concepts

UNIT – I:
Java Evolution: Java Features - How Java differs from C and C++ - Java and Internet - Java and World Wide Web - Web Browsers - Hardware and Software Requirements - Java Environment. Overview of Java Language: Simple Java Program - Java Program Structure - Java Tokens- Java Statements - Implementing a Java Program - Java Virtual Machine - Constants - Variables - Data types - Scope of Variables-Symbolic Constants-Type Casting and type promotions – Operators, Operator Precedence and Associativity - Control Statements – break - continue- Arrays-Multi dimensional arrays, Wrapper Classes - Simple examples.

UNIT – II:
Classes and Objects - Constructors – methods - this keyword – garbage collection-finalize - Overloading methods and constructors - Access Control- Static members – nested and inner classes – command line arguments - variable length arguments.
Inheritance: types of inheritance, benefits of inheritance. super keyword, Polymorphism, dynamic method dispatch –abstract classes – exploring String class.

UNIT – III:
Packages and Interfaces: Defining and accessing a package – understanding CLASSPATH – access protection importing packages – Interfaces - Defining and implementing an interface, Applying interfaces
Exception Handling-Fundamentals, usage of try, catch, multiple catch clauses, throw, throws and finally. Java built in Exceptions and creating user defined exceptions.

UNIT – IV:
The Collection Framework: Collection Objects – Sets, Lists, Queues, Maps – ArrayList-LinkedList - Vector– HashSet– LinkedHashSet– TreeSet– HashMap– Hashtable. Retrieving Elements from Collections – Enumeration, Iterator, List Iterator – String Tokenizer and Arrays Class – Sorting using Comparable and Comparator.

UNIT – V:

Multithreaded Programming: Java Thread life cycle model – Thread creation - Thread Exceptions - Thread Priority – Synchronization - Runnable Interface - Interthread Communication - Deadlock - Suspending, Resuming and stopping threads.

I/O Streams: File – Streams – Advantages - The stream classes – Byte streams – Character streams, Serialization, File Class and Methods.

UNIT – VI:

JDBC: JDBC Architecture, JDBC – ODBC Connectivity Steps, Connectivity steps with mysql database, Statement, PreparedStatement, CallableStatement, ResultSet, ResultSetMetaData, DatabaseMetaData, Transaction Management, Batch Processing, RowSet Interface. REST API's.

TEXT BOOKS:

1. The Complete Reference Java J2SE, Herbert Schildt, 5th Edition, TMH Publishing Company Ltd., New Delhi
2. Big Java, Cay Horstmann, 2nd Edition, John Wiley and Sons

REFERENCES:

1. Java How to Program, H. M. Dietel and P. J. Dietel, 6th Edition, Pearson Education/PHI
2. Core Java 2, Vol. 1, Fundamentals, Cay S. Horstmann and Gary Cornell, 7th Edition, Pearson Education
3. Core Java 2, Vol. 2, Advanced Features, Cay S. Horstmann and Gary Cornell, 7th Edition, Pearson Education

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(A19PC1IT03) COMPUTER ORGANIZATION

COURSE OBJECTIVES:

- To describe the functional blocks of a computer to interpret the instructions and various addressing modes for the execution of instruction cycle
- To perform Arithmetic micro operations on integers and floating-point numbers
- To analyze the cost performance and design trade-offs in designing and constructing a computer processor including memory
- To discuss the different ways of communicating with I/O devices & interfaces and the design techniques to enhance the performance using pipelining, parallelism

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Interpret the functional architecture of computing systems
CO-2: Explore memory, control and I/O functions
CO-3: Impart the knowledge on micro programming
CO-4: Analyze instruction level parallelism, Concepts of advanced pipeline techniques

UNIT – I:
Functional Blocks of a Computer: CPU, memory, input-output subsystem, control unit. Instruction set architecture of a CPU – registers, instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set.
Case study – Instruction set of some common CPUs

UNIT – II:
Data Representation: Signed number representation, fixed and floating point representations, character representation.
Computer Arithmetic: Integer Addition and Subtraction - Ripple carry adder, carry look- ahead adder. Multiplication – Shift-and add, Booth multiplier, carry save multiplier. Division – Restoring and non-restoring techniques, floating point arithmetic.

UNIT – III:
Microprogrammed Control: Control memory, address sequencing, micro program example, and design of control unit, hardwired control, and micro programmed control.

UNIT – IV:
Memory System Design: Semiconductor memory technologies. SRAM vs DRAM.
Memory Organization: Memory interleaving, concepts of hierarchical memory organization, cache memory, cache size vs block size, mapping functions, replacement algorithms, write policies, virtual memory, secondary storage.

UNIT – V:
Peripheral Devices and their Characteristics: Input-output subsystems, I/O device interface, I/O transfers, - program controlled, Interrupt driven and DMA, privileged and non –privileged instructions, software interrupts and exceptions. Programs and

processes – role of interrupts in process state transitions, I/O device interfaces – SCSI, USB.

UNIT – VI:

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction pipe line, RISC pipeline Vector Processing, Array Processors

TEXT BOOKS:

1. Computer Organization and Design: The Hardware/Software Interfaces, David A. Patterson and John L. Hennessy, 5th Edition, Elsevier
2. Computer Organization and Embedded Systems, Carl Hamacher, 6th Edition, McGraw Hill Higher Education

REFERENCES:

1. Computer System Architecture, M. Morris Mano, 3rd Edition
2. Computer Architecture and Organization, John P. Hayes, 3rd Edition, WCB/McGraw-Hill
3. Computer Organization and Architecture: Designing for Performance, William Stallings, 10th Edition, Pearson Education
4. Computer System Design and Architecture, Vincent P. Heuring and Harry F. Jordan, 2nd Edition, Pearson Education

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B.Tech. IV Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(A19PC1CS61) INTRODUCTION TO CYBER SECURITY

COURSE OBJECTIVES:

- To identify the key components of cyber security in network
- To define types of attacks, cyber offenses and corresponding preventive acts
- To describe Risk management processes and practices
- To access additional external resources to supplement knowledge of cyber laws and acts

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Categorize cyber-crimes and an understanding of social, political, ethical and psychological dimensions of cyber security

CO-2: Demonstrate cyber offenses tools, methods used in cyber crime

CO-3: Document an appropriate procedure of Risk Management and Security Standards

CO-4: Understand cyber laws and Indian Information Technology Act

UNIT – I:

Introduction to Cyber Crime and Security: Introduction Cybercrime: Definition and Origins of the word, Cybercrime and Information Security, CIA Triad, Who are Cybercriminals, Classifications of Cybercrimes, E-mail Spoofing, Spamming, Cyber defamation, Internet Time Theft, Salami Attack/ Salami Technique, Data Diddling, Forgery, Web Jacking, Newsgroup Spam/ Crimes Emanating from Usenet Newsgroup, Industrial Spying/Industrial Espionage, Hacking, Online Frauds, Pornographic Offenses, Software Piracy, Computer Sabotage, E-Mail Bombing/Mail Bombs, Usenet Newsgroup as the Source of Cybercrimes, Computer Network Intrusions, Password Sniffing, Credit Card Frauds, Identity Theft.

UNIT – II:

Cyber Offenses: How Criminals Plan Them: Introduction, Categories of Cybercrime, How Criminals Plan the Attacks, Reconnaissance, Passive Attacks, Active Attacks, Scamming and Scrutinizing Gathered Information, Attack (Gaining and Maintaining the System Access), Social Engineering, Classification of Social Engineering,
Cyber stalking, Types of Stalkers, Cases Reported on Cyber stalking, How Stalking Works?, Real-Life Incident of Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The fuel for Cybercrime, Botnet, Attack Vector, Cloud Computing, Why Cloud Computing?, Types of Services, Cybercrime and Cloud Computing.

UNIT – III:

Tools and Methods Used in Cyber Crime and Security Measures – I: Introduction, Proxy Servers and Anonymizers, Phishing, How Phishing Works, Password Cracking, Online Attacks, Offline Attacks, Strong, Weak and Random Passwords, Random Passwords, Keyloggers and Spywares, Software Keyloggers, Hardware Keyloggers, Antikeylogger, Spywares, Virus and Worms, Types of Viruses, Trojan Horses and Backdoors, Backdoor, How to Protect from Trojan and Backdoors, Steganography, Steganalysis.

UNIT – IV:

Tools And Methods Used In Cyber Crime and Security Measures – II: DoS and DDoS Attacks, DoS Attacks, Classification of DoS Attacks, Types of Levels of DoS Attack, Tools Used to Launch DoS Attacks, DDoS Attacks, How to protect from DoS/DDoS Attacks, SQL Injection, Steps for SQL Injection Attack, How to Prevent SQL Injection Attacks, Buffer Overflow, Types of Buffer Overflow, How to minimize Buffer Overflow, Attacks on Wireless Networks, Traditional techniques of attacks on wireless networks ,Theft of Internet Hours and Wifi-based Frauds and Misuses, How to secure the wireless Networks, Real time case studies on Cyber Crimes.

UNIT – V:

Cybercrime and Cyberterrorism:

Social, Political, Ethical and Psychological Dimensions: Introduction, Intellectual Property in the Cyberspace, Copyright, Patent, Trademarks, Trade Secret, Trade Name, Domain Name, The Ethical Dimension of Cybercrimes, Ethical Hackers: Good Guys in Bad Land, The Psychology, Mindset and Skills of Hackers and Other Cybercriminals, Inside the Minds and Shoes of Hackers and Cybercriminals, Hackers and Cybercriminals: Evolution of Technical prowess and Skills, Ethical Hackers, Sociology of Cybercriminals, Personality Traits of Cybercriminals and Younger Generation's views about Hacking, Information Warfare: Perception or An Eminent Reality?, Cyberwar Ground is HOT, Cyber Jihadist on the Rise.

UNIT – VI:

Cyber Law in India: THE LEGAL PERSPECTIVES, Cybercrimes: An Indian Perspective, Cybercrime and the Indian ITA 2000, Hacking and the Indian Law(s), A Global Perspective on Cybercrimes, Cybercrime and the Extended Enterprise. Why do we need Cyberlaws: The Indian context, The Indian IT Act, Admissibility of Electronic Records, Positive aspects of the ITA 2000, Weak Areas of the ITA 2000, Challenges to Indian Law and Cybercrime Scenario in India, Consequences of Not addressing the Weakness in Information Technology Act, Amendments to the Indian IT Act, Overview of Changes made to the Indian IT Act.

TEXT BOOKS:

1. Cyber Security- Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunit Belpure, Wiley
2. Cyber Law & Cyber Crimes, Advocate Prashant Mali; Snow White Publications

REFERENCES:

1. Management of Information Security, M. E. Whitman, H. J. Mattord, Nelson Education, 3rd Edition, Cengage Learning, 2011
2. Guide to Computer Forensics and Investigations, B. Nelson, A. Phillips, F. Enfinger, C. Steuart, 4th Edition, Nelson Education / Cengage Learning, 2010
3. Information Technology Law and Practice, Vakul Sharma; Universal Law Publishing Co. Pvt. Ltd.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester – CSE & IT	**L**	**T/P/D**	**C**
	0	**3**	**1.5**

(A19PC2IT03) JAVA PROGRAMMING LABORATORY

COURSE OBJECTIVES:

- To write the Java Programs related to classes and methods
- To build Solutions for exceptions and basic I/O streams
- To develop solid Java programming skills and the ability to design simple case studies
- To implement the concepts of object oriented to develop a real world application

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Analyze and design a computer program to solve real world problems based on object- oriented principles

CO-2: Implement concurrent programming using Multithreading concepts

CO-3: Identify appropriate Collection classes in problem solving

CO-4: Establish connection to the database using Java

WEEK 1:

1. Write a Java program to print all the twin primes below 1000. (A twin prime is a prime number that differs from another prime number by two. (3, 5), (5, 7), (11, 13), (17, 19), (29, 31), (41, 43), .821, 823), etc. .
2. Write a Java program to implement matrix multiplication. (Take the input from keyboard).
3. Write a Java program for sorting a given list of names in ascending order.

WEEK 2:

4. The Fibonacci sequence is defined by the following rule. The first two values in the sequence are 1 and 1. Every subsequent value is the run of the two values preceding it. Write a Java program that uses both recursive and non-recursive functions to print the nth value in the Fibonacci sequence.
5. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.

WEEK 3:

6. Write a Java program that checks whether a given string is a palindrome or not from command line. Ex: MALAYALAM is a palindrome.
7. Write a Java program that prints all real solutions to the quadratic equation ax2 + bx + c = 0. Read in a, b, c and use the quadratic formula. If the discriminant b2 - 4ac is negative, display a message stating that there are no real solutions.
8. Write a Java program to implement constructor overloading.

WEEK 4:

9. Write a Java program to implement variable length arguments
10. Write a Java program to implement the use of inner classes.

WEEK 5:

11. Write a Java program to implement dynamic method dispatch.

12. Write a Java program that illustrates how run time polymorphism is achieved.

WEEK 6:

13. Write a Java program that illustrates the following
    a) Creation of simple package.
    b) Accessing a package.
    c) Implementing interfaces.
14. Write a Java program that illustrates built in exceptions.
15. Write a Java program to throw an exception "Insufficient Funds" while withdrawing the amount in the user account.

WEEK 7:

16. Write a Java program for creating multiple threads
    a. Using Thread class b. Using Runnable interface
17. Write a Java program for creating multiple threads. The main method sleeps for 10 seconds at the end of which all the threads should be terminated.

WEEK 8:

18. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

WEEK 9:

19. Write a Java program to create a file and write data into the file using Character Stream.
20. Write a Java program that reads on file name from the user then displays information about whether the file exists, whether the file is readable, whether the file is writable, the contents of file and the length of the file in bytes.

WEEK 10:

21. Write a Java program to perform the following operations on ArrayList, LinkedList, HashSet.
    a) Insertion
    b) Deletion
    c) Retrieval

WEEK 11:

22. Write a program to store Employee objects in a TreeSet and sort the objects based on employee salary using Comparator/Comparable.

WEEK 12:

23. Write a Java program to establish the connection to the database and perform the following operations.
    a) Retrieval
    b) Insertion
    c) Deletion
24. Write a Java program to call the stored procedure from a database.

WEEK 13:

25. Explore REST APIs.

TEXT BOOKS:

1. The Complete Reference Java J2SE, Herbert Schildt, 5th Edition, TMH Publishing Company Ltd., New Delhi
2. Big Java, Cay Horstmann, 2nd Edition, John Wiley and Sons

REFERENCES:

1. Java How to Program, H. M. Dietel and P. J. Dietel, 6th Edition, Pearson Education/PHI
2. Core Java 2, Vol. 1, Fundamentals, Cay S. Horstmann and Gary Cornell, 7th Edition, Pearson Education
3. Core Java 2, Vol. 2, Advanced Features, Cay S. Horstmann and Gary Cornell, 7th Edition, Pearson Education

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B.Tech. IV Semester	**L**	**T/P/D**	**C**
	0	**3**	**1.5**

(A19PC2CS61) COMPUTER NETWORKS SIMULATION LABORATORY

COURSE OBJECTIVES:

- To understand the layer wise importance, NS3 simulation tool and its usage
- To inculcate working knowledge among Node-to-Node communication in networks
- To analyze and implement various networking topologies and routing protocols
- To demonstrate installation and configuration of NetAnim, an animator tool

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Acquire the required skills to Install NS3 and its supporting packages in Linux environment
CO-2: Implement various network topologies and simulate data transmission
CO-3: Utilize variety of routing protocols for the transmission of TCP/UDP data
CO-4: Develop the simulation scenarios and able to analyze an XML trace file collected during simulation using NetAnim tool

LIST OF EXPERIMENTS:

WEEK 1: Introduction about discrete events simulation and its tools.
WEEK 2: Installation and configuration of NS3 in Linux Operating System.
WEEK 3: Write a program in NS3 to connect two nodes.
WEEK 4: Write a program in NS3 for connecting three nodes considering one node as a central node.
WEEK 5: Implement physical star topology and simulate using NS3.
WEEK 6 Implement physical bus topology and simulate using NS3.
WEEK 7: Build a hybrid topology for connecting multiple routers and nodes
WEEK 8: Installation and configuration of NetAnim, an animator tool..
WEEK 9: Implementation of FTP using TCP bulk data transfer
WEEK 10: Implementation of AODV Routing Protocol
WEEK 11: Implementation of DSDV Routing Protocol.
WEEK 12: Implementation of DSR Routing Protocol.
WEEK 13: Analyze network traces using Wireshark software.

TEXT BOOKS:

1. Computer Networks, Andrew S. Tanenbaum, David J. Wetherall, 5th Edition, Pearson Education
2. Computer Networking: A Top Down Approach, Kurose, Ross, 6th Edition, Pearson Education, India, 2010

REFERENCES:

1. Data Communication and Networking, Behrouz A. Forouzan, 4th Edition, Mc Graw-Hill, India
2. Computer Networks: A Systems Approach Larry L. Peterson, Bruce S. Davie, M. K. Publishers
3. https://www.nsnam.org/