

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

III SEMESTER

R22

Course Code	Title of the Course	L	T	P/D	CH	C
22PC1EC211	Digital Logic Design	3	0	0	3	3
22PC1DS201	Mathematical Foundations for Computer Science	3	0	0	3	3
22PC1CS202	Design and Analysis of Algorithms	3	1	0	4	4
22PC1CY201	Computer Networks and Ethical Hacking	3	0	0	3	3
22PC1AM201	Database Management systems	3	0	0	3	3
22PC2CY201	Computer Networks and Ethical Hacking Laboratory	0	0	2	2	1
22PC2AM201	Database Management systems Laboratory	0	0	2	2	1
22ES2DS101	Python Programming Laboratory	0	0	2	2	1
22SD5CY202	Field Project	0	0	2	2	1
22MN6HS102	Environmental Science	2	0	0	2	0
Total		17	1	8	26	20

IV SEMESTER

R22

Course Code	Title of the Course	L	T	P/D	CH	C
22BS1MT205	Statistical Inference and Multivariate Analysis	2	1	0	3	3
22HS1MG201	Engineering Economics and Accountancy	3	0	0	3	3
22PC1CS203	Computer Organization	3	0	0	3	3
22PC1CY202	Advanced Ethical Hacking	3	0	0	3	3
22PC1IT201	Object Oriented Programming Through Java	3	0	0	3	3
22PC2CY202	Advanced Ethical Hacking Laboratory	0	0	2	2	1
22PC2IT201	Object Oriented Programming Through Java Laboratory	0	0	2	2	1
22SD5CY201	Cyber Forensics	0	0	2	2	1
22PW4CY201	Design Thinking	1	0	2	3	2
22MN6HS201	Intellectual Property Rights	2	0	0	2	0
Total		17	1	8	26	20

L – Lecture T – Tutorial P – Practical D – Drawing
C – Credits SE – Sessional Examination CA – Class Assessment
SEE – Semester End Examination D-D – Day to Day Evaluation
CP – Course Project PE – Practical Examination

CH – Contact Hours/Week
ELA – Experiential Learning Assessment
LR – Lab Record

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester

(22PC1EC211) DIGITAL LOGIC DESIGN

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To analyze and explore uses of number conversions for building digital circuits
- To explore uses logic functions for building digital logic circuits
- To explore the combinational logic circuits
- To implement PLDs and examine the operation of sequential circuits
- To analyze counters, registers and clocked sequential circuits

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

CO-1: Represent numbers, base conversions and error detection and correction codes

CO-2: Simplify the complex logic functions using postulates, theorems and k-maps

CO-3: Design combinational circuits for various digital applications

CO-4: Implement PLD's and design sequential circuits

CO-5: Apply the sequential circuit concepts in designing counters, registers and state machines

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	3	1	2	1	-	-	-	-	-	1	1	3	3
CO-2	3	2	2	1	2	1	-	-	-	-	-	1	1	2	3
CO-3	2	3	3	1	2	1	-	-	-	-	-	1	2	3	3
CO-4	3	2	1	2	1	1	-	-	-	-	-	1	1	3	3
CO-5	3	3	1	1	1	-	-	-	-	-	--	-	2	1	-

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.

UNIT-II:

Boolean Algebra and Gate Level Minimization: Binary Logic, Postulates and theorems, representation of switching functions, SOP and POS forms –Canonical forms, digital logic gates, Karnaugh Maps –minimization using two variable, three variable, four variable K-Maps, Don't Care Conditions, NAND and NOR implementation, Other Two-Level Implementation, Exclusive-OR function. Tabulation method

UNIT-III:

Design of Combinational Circuits: Combinational Circuits - Analysis and Design Procedure, Binary adders, Binary subtractors, adder/subtractor, CLA, 1-bit and 2-bit magnitude comparator, Decoders, Encoders, 4 to 2 priority encoder, Multiplexers, function implementation using Multiplexers, Demultiplexers, Code Converters, 2-bit Binary multiplier, BCD adder.

UNIT-IV:

Programmable Logic Devices: Programmable Read Only Memory, Programmable Logic Array, Programmable Array Logic.

Design of Sequential Circuits: Combinational Vs Sequential Circuits, Latches, Flip Flops- RS flip flop, D flip flop, JK flip flop, T flip flop, Master-Slave Flip flop, Flip Flops excitation functions, Conversion of one flip flop to another flip flop.

UNIT-V:

Counters and Registers: Design of synchronous counters, Asynchronous counters, Registers, Shift Registers-SISO, SIPO, PISO, PIPO, universal shift register, Synchronous Vs Asynchronous sequential circuits, Analysis of clocked sequential circuits, State Table, State Diagram, State Reduction and State Assignment, Sequence detector, FSM, Mealy and Moore Machines.

TEXT BOOKS:

1. Digital Design, 3rd Edition, M. Morris Mano, Pearson Education/PHI
2. Fundamentals of Logic Design, Roth, 5th Edition, Thomson
3. Logic Design Theory, Nripendra N. Biswas, PHI

REFERENCES:

1. Switching and Finite Automata Theory, Zvi Kohavi, Tata McGraw-Hill
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

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester

(22PC1DS201) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To apply logical reasoning to 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: Analyze sets, relations, functions, and discrete structures

CO-3: Apply and calculate permutations and combinations

CO-4: Understand the use of graphs and trees as models

CO-5: Solve various problems using recurrence relation techniques

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	3	1	2	1	2	-	-	-	-	-	1	-	-	-
CO-2	3	3	1	2	1	2	-	-	-	-	-	1	2	-	-
CO-3	3	3	1	2	1	2	-	-	-	-	-	1	3	1	-
CO-4	3	3	1	2	1	2	-	-	-	-	-	1	3	1	-
CO-5	3	-	2	-	2	-	-	-	-	-	-	-	-	-	-

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, Binomial Coefficients.

UNIT-IV:

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

UNIT-V:

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, 2019
2. Discrete Mathematics for Computer Scientists & Mathematicians, J. L. Mott, A. Kandel, T. P. Baker, 2nd Edition, PHI, 1986
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, 2017
2. Discrete Mathematics and its Applications, Kenneth H. Rosen, Tata McGraw-Hill, 2003
3. Discrete Mathematics, Norman L. Biggs, 2nd Edition, Oxford University Press, 1989

ONLINE RESOURCES:

1. IIT Discrete Mathematics Lectures – YouTube

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester

(22PC1CS202) DESIGN AND ANALYSIS OF ALGORITHMS

TEACHING SCHEME		
L	T/P	C
3	1	4

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: Programming, Data Structures, Discrete Mathematics

COURSE OBJECTIVES:

- To reinforce algorithms analysis methods
- To analyse running time of an algorithm
- To understand different algorithm design strategies
- To apply algorithms design techniques to solve computational problems

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

CO-1: Analyse running time of an algorithm using asymptotic analysis

CO-2: Apply appropriate algorithm design techniques to develop efficient algorithms for solving computational problems

CO-3: Compare different algorithms for their efficiency and choose an appropriate data structure

CO-4: Employ graphs to model engineering problems, when appropriate and analyse time complexity

CO-5: Describe and identify the classes P, NP, NP-Hard and NP Complete problems and formulate solutions using standard approaches

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

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	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	2	2	2	3	-	-	-	2	-	-	-	2	3	-	-
CO-2	3	2	3	3	3	2	2	3	2	1	3	3	3	-	3
CO-3	2	2	2	3	-	-	-	2	-	-	-	2	-	3	-
CO-4	3	3	2	3	1	1	1	2	1	1	1	3	-	3	3
CO-5	3	3	3	3	-	-	-	1	1	1	2	2	-	3	-

UNIT-I:

Performance Analysis: Characteristics of Algorithm. Analysis of Algorithm: Best, Average and Worst-Case behaviour, Asymptotic Analysis– Big oh, Omega, Theta notations and Little oh, Little omega notations, 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: Divide and conquer General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication. Greedy method: General method, applications- Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem, Huffman Codes.
Brute force, KMP Pattern Matching Algorithms.

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 Method: Applications- N-Queen problem, Sum of subsets problem, Graph coloring, Hamiltonian cycles. Branch and Bound Method: Applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution

UNIT-V:

Graph Algorithms: Depth First Search (DFS) and Breadth First Search (BFS), Topological sorting, Connected and Bi Connected Components, Network Flow Algorithm. Tractable and Intractable Problems: P, NP, NP-complete and NP-hard. Cook's theorem, Randomized Algorithms.

TEXT BOOKS:

1. Fundamental of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, 2nd Edition, 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 EvaTardos, 1st Edition, Pearson
2. Algorithm Design: Foundations, Analysis, and Internet Examples, Michael T. Goodrich and Roberto Tamassia, 2nd Edition, Wiley
3. Introduction to the Design and Analysis of Algorithms, Anany Levitin, 3rd Edition, Pearson Publications
4. The Design and Analysis of Computer Algorithms, A. Aho, J. Hopcroft and J. Ullman

ONLINE RESOURCES:

1. <http://nptel.ac.in/courses/106101060/>
2. <https://www.cmi.ac.in/~madhavan/teaching.html>
3. <https://www.ics.uci.edu/~eppstein/161/960312.html>
4. <https://ocw.mit.edu/courses/6-006-introduction-to-algorithms-spring-2020/>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester

(22PC1CY201) COMPUTER NETWORKS AND ETHICAL HACKING

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: Introduction to Cyber Security

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 network layer
- To get an idea of application layer functionalities and importance of security in the network
- To understand the basic concepts of foot printing in ethical hacking
- To be familiar with vulnerability analysis

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

CO-1: Understand modern network architectures and analyze link layer access control

CO-2: Implement protocols involved in network layer

CO-3: Analyze various transport and application layer protocols and maintenance of QoS

CO-4: Understand ethical hacking, foot printing and scanning networks

CO-5: Apply techniques related to enumeration and vulnerability analysis

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	-	-	1	-	-	-	-	-	-	-	2	3	1	1
CO-2	2	-	-	2	2	-	-	1	2	2	2	2	3	2	1
CO-3	3	2	2	2	3	2	1	2	2	1	3	3	2	3	2
CO-4	2	3	1	1	3	2	1	3	2	2	3	3	2	2	3
CO-5	2	2	2	2	2	3	1	3	1	1	2	3	3	2	3

UNIT-I:

Data Communication: Components, Data representation, Data flow, Network Topology, Protocols and Standards, Reference models: OSI, TCP/IP.

Physical Layer: Guided Transmission media & Wireless Transmission.

Data Link Layer: Design issues, framing, Error detection and correction, Flow Control and Error control protocols, Multiple access protocols -ALOHA, CSMA/CD, CDMA/CA, Wireless LANs, Data link layer switching.

UNIT-II:

Network Layer: Switching, Logical addressing – IPV4, IPV6; Address mapping – ARP, RARP, BOOTP and DHCP–Delivery, Interior and Exterior routing protocols: Routing information Protocol (RIP), Open Shortest Path First (OSPF) routing protocol, Border Gateway Protocol (BGP).

UNIT-III:

Transport Layer: Process to Process Communication, User Datagram Protocol (UDP), Transmission Control Protocol (TCP), SCTP Congestion Control; Quality of Service.

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

UNIT-IV:

Foot Printing and Reconnaissance: Phases of ethical hacking, foot printing concepts, Who is foot printing, foot printing through search engines (shodan, Netcraft, etc) foot printing through advanced google search and google hacking database, email foot printing, Foot printing countermeasures.

Scanning: Introduction to Network Mapper (NMAP), Host discovery using NMAP, Port scanning using NMAP, additional features of NMAP.

UNIT-V:

Enumeration: DNS enumeration, mail server enumeration, DNS Zone transfer.

Vulnerability Scanning: Vulnerability scanning using NMAP, Vulnerability scoring **systems and Databases:** CVE, CVSS, NVD, CWE, vulnerability management life cycle, Proxy server Preparation.

TEXT BOOKS:

1. Computer Networks, Andrew S. Tanenbaum, 8th Edition, Pearson, 2014
2. The Basics of Hacking and Penetration Testing, Patrick Engebretson, Elsevier, 2013
3. Network Security and Ethical Hacking, Rajat Khare, Luniver Press, 2006

REFERENCES:

1. Data and Computer Communication, William Stallings, 8th Edition, Pearson Prentice Hall India, 2007
2. Internetworking with TCP/IP, Volume 1, Douglas Comer, 6th Edition, Prentice Hall of India, 2006
3. TCP/IP Illustrated, Volume 1, W. Richard Stevens, Addison-Wesley, 2011
4. Network Intrusion Alert: An Ethical Hacking Guide to Intrusion Detection, Ankit Fadia, Manu Zacharia, Thomson Course Technology PTR, 2007

ONLINE RESOURCES:

1. <https://youtu.be/VwN91x5i25g> (computer networks by NESO Academy)
2. <https://www.youtube.com/live/Xv-O2HizYCY?feature=share> (Ethical Hacking by Simplilearn)

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester

(22PC1AM201) DATABASE MANAGEMENT SYSTEMS

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: Basic Computer Programming Skills

COURSE OBJECTIVES:

- To introduction of data base management concepts 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 design E-R models to represent simple database application scenarios

CO-2: Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data

CO-3: Improve the database design by normalization

CO-4: Apply and relate the concept of transaction, concurrency control and recovery in database

CO-5: Familiar with basic database storage structures and access techniques using Indexing, hashing including B tree methods

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	1	3	2	3	2	2	-	1	-	-	-	1	2	2
CO-2	2	2	3	3	3	2	3	-	1	-	-	-	1	2	3
CO-3	2	3	1	3	1	-	2	-	1	-	-	-	1	2	2
CO-4	3	2	1	1	1	-	3	-	-	-	-	-	2	3	3
CO-5	2	2	1	1	1	-	3	-	-	-	-	-	2	3	3

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.

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 – II:

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

UNIT – III:

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 – IV:

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 – V:

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

Indexing and Hashing: Basic Concepts, Ordered Indices, B 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

ONLINE RESOURCES:

1. <https://www.w3schools.com/sql/default.asp>
2. <https://www.javatpoint.com/dbms-tutorial>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester

(22PC2CY201) COMPUTER NETWORKS AND ETHICAL HACKING LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To learn and understand various error correction and detection mechanisms
- To inculcate working knowledge among Node-to-Node communication in networks
- To introduce the methodologies framework tools of ethical hacking to get awareness in enhancing the security
- To gain knowledge on passive and active scanning

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

CO-1: Apply error correction and error detection mechanisms

CO-2: Acquire the required skill to configure FTP

CO-3: Implement basic networking commands and routing algorithms

CO-4: Apply modern tools in ethical hacking

CO-5: Evaluate security in various web applications

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	-	1	1	-	-	-	1	-	-	-	2	2	1	-
CO-2	2	-	2	-	2	-	-	1	1	2	2	1	-	-	3
CO-3	2	2	1	2	2	1	1	3	-	-	3	3	1	-	-
CO-4	2	3	3	3	3	2	1	3	2	1	3	3	2	3	3
CO-5	3	3	3	3	3	3	1	3	2	1	2	3	-	3	3

LIST OF PROGRAMS / EXPERIMENTS / EXERCISES

WEEK 1:

Implement the data link layer framing methods such as character, character stuffing and bit stuffing.

WEEK 2:

Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP

WEEK 3:

Implementation of distance vector routing algorithm

WEEK 4:

Study of the basic networking commands.

WEEK 5:

Configuring FTP Server for file sharing.

WEEK 6:

Establishing a network between computers.

WEEK 7:

Installation of Virtual box and Kali Linux and basic commands of kali Linux.

WEEK 8:

Demonstrate the following information gathering techniques:

- a) Whois
- b) Netcraft
- c) Get History of a website using archive.org
- d) Search operators
- e) Find IP Geo location information of server.

WEEK 9:

Perform DNS and Mail server enumeration using Nslookup, host and dig tools.

WEEK 10:

Perform the following network scanning techniques using NMAP:

- a) Live Host discovery
- b) Port scanning

WEEK 11:

- a) Detect Service, version and OS using NMAP
- b) Scanning using NMAP scripts.

WEEK 12:

Find vulnerabilities in a website using Vulnerability scanning tool.

WEEK 13:

Implement secure hacking environment using Proxy Server

TEXT BOOKS:

1. Data Communications and Networking, Behrouz A. Forouzan, 4th Edition, TMH, 2006
2. Computer Networking: A Topdown Approach, Kurose, Ross, 6th Edition, Pearson Education, 2010
3. The Basics of Hacking and Penetration Testing, Patrick Engebretson, Elsevier, 2013

REFERENCES:

1. Data and Computer Communication, William Stallings, 8th Edition, Pearson Prentice Hall India, 2007
2. Internetworking with TCP/IP, Volume 1, Douglas Comer, 6th Edition, Prentice Hall of India, 2006
3. Data Communication and Networking, Behrouz A. Forouzan, 4th Edition, McGraw-Hill, India, 2006
4. Computer Networks: A Systems Approach, Larry L. Peterson, Bruce S. Davie, , MK Publishers, 2011
5. Network Intrusion Alert: An Ethical Hacking Guide to Intrusion Detection, Ankit Fadia, Manu Zacharia, Thomson Course Technology PTR, 2007

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester

(22PC2AM201) DATABASE MANAGEMENT SYSTEMS LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE PRE-REQUISITES: Basic Computer Programming Skills

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: Understand the given scenario, design it through ER model and normalize the schema

CO-2: Use the basics of SQL and construct queries using SQL in database creation and interaction

CO-3: Apply integrity constraints for creating consistent RDBMS environment

CO-4: Applying PL/SQL for processing database

CO-5: Develop solutions using database concepts for real time requirements

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	1	3	3	2	1	2	-	-	2	2	-	1	2	2
CO-2	3	1	3	3	1	1	2	-	-	-	-	-	2	2	2
CO-3	2	1	2	3	1	1	2	-	-	2	-	-	3	2	3
CO-4	3	2	2	3	1	1	2	-	-	-	-	-	3	2	3
CO-5	3	2	3	3	1	1	3	-	-	3	-	2	3	3	3

LIST OF PROGRAMS / EXPERIMENTS / EXERCISES:

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
Losal	Integer	5		Lower

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 remodeled 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.

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

ONLINE RESOURCES:

1. <https://www.w3schools.com/sql/default.asp>
2. <https://www.javatpoint.com/dbms-tutorial>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester

(22ES2DS101) PYTHON PROGRAMMING LABORATORY

TEACHING SCHEME		
L	T/P	C
1	2	2

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

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
- To acquire programming skills in core 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

CO-5: Develop the skill of designing Graphical User Interfaces in Python

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	2	3	3	2	3	2	2	1	2	2	2	3	3	2	3
CO-2	3	2	3	3	2	3	3	2	1	2	3	3	2	3	3
CO-3	3	2	3	1	2	3	2	3	2	1	2	3	2	1	2
CO-4	3	2	3	2	3	2	3	2	2	2	3	3	3	2	1
CO-5	3	2	3	3	3	3	3	2	3	3	2	3	1	2	3

LIST OF PROGRAMS / EXERCISES:

WEEK-1: Basics

1. i) Use a web browser to go to the Python website <http://python.org>. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.
ii) Start the Python interpreter and type `help()` to start the online help utility.
2. Start a Python interpreter and use it as a Calculator.
3. Write a program to purposefully raise Indentation Error and correct it
4. i) Write a program to calculate compound interest when principal, rate and number of periods are given.
ii) Given coordinates (x_1, y_1) , (x_2, y_2) find the distance between two points

5. Read name, address, email and phone number of a person through keyboard and print the details.

WEEK-2: Operations

1. Print the below triangle using for loop.

```
5
4 4
3 3 3
2 2 2 2
1 1 1 1 1
```

2. Write a program to check whether the given input is digit or lowercase character or uppercase

character or a special character (use 'if-else-if' ladder)

3. Python Program to Print the Fibonacci sequence using while loop

4. Python program to print all prime numbers in a given interval (use break)

5. Write a program to compute LCM of two numbers by taking input from the user

6. Write a program add.py that takes 2 numbers as command line arguments and prints its sum

WEEK-3: Lists & Tuples

1. i) Write a program to convert a list and tuple into arrays.

ii) Write a program to find common values between two arrays.

2. Write a function called gcd that takes parameters a and b and returns their greatest common divisor.

3. Write a function called palindrome that takes a string argument and returns True if it is a palindrome and False otherwise. Remember that you can use the built-in function len to check the length of a string.

4. Find mean, median, mode for the given set of numbers in a list.

5. Write a Python program to create a tuple.

6. Write a Python program to create a tuple with different data types.

7. Write a Python program to check whether an element exists within a tuple.

WEEK-4: Sets, Dictionaries and Strings

1. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.

2. Write a function called has_duplicates that takes a list and returns True if there is any element that appears more than once. It should not modify the original list.

i). Write a function called remove_duplicates that takes a list and returns a new list with only the

unique elements from the original. Hint: they don't have to be in the same order.

ii). The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to add

"l", "a", and the empty string.

iii). Write a python code to read dictionary values from the user. Construct a function to invert its

content. i.e., keys should be values and values should be keys.

3. i) Add a comma between the characters. If the given word is 'Apple', it should become 'A,p,p,l,e'
- ii) Remove the given word in all the places in a string?
- iii) Write a function that takes a sentence as an input parameter and replaces the first letter of every word with the corresponding upper case letter and the rest of the letters in the word by corresponding letters in lower case without using a built-in function?
4. Write a recursive function that generates all binary strings of n-bit length
5. Write a Python program to implement all set operations
6. Write a program to check whether a string is palindrome or not

WEEK-5: Functions and Multi-D Lists

1. i) Write a python program that defines a matrix and prints
- ii) Write a python program to perform addition of two square matrices
- iii) Write a python program to perform multiplication of two square matrices
2. Simple Calculator program by making use of functions
3. Find the factorial of a number using recursion
4. Write a function cumulative_product to compute cumulative product of a list of numbers.
5. Write a function reverse to print the given list in the reverse order.

WEEK-6: Exceptions in Python

1. Write a program that detects an Exception
2. Write a program that raise an Exception (divide by zero error,voter's age validity)
3. Write a program that raise an Exception as string(), student mark range validation)
4. Use the structure of exception handling all general purpose exceptions.
5. Write a python code to read a phone number and email-id from the user and validate it for correctness.

WEEK-7: Modules and Inheritance

1. How do you make a module? Give an example of construction of a module using different geometrical shapes and operations on them as its functions.
2. a. Write a function called draw_rectangle that takes a Canvas and a Rectangle as arguments and draws a representation of the Rectangle on the Canvas.
- b. Add an attribute named color to your Rectangle objects and modify draw_rectangle so that it uses the color attribute as the fill color.
- c. Write a function called draw_point that takes a Canvas and a Point as arguments and draws a representation of the Point on the Canvas.
- d. Define a new class called Circle with appropriate attributes and instantiate a few Circle objects. Write a function called draw_circle that draws circles on the canvas.
3. Write a Python program to demonstrate the usage of Method Resolution Order (MRO) in multiple levels of Inheritance.

WEEK-8: Files

1. Write a Python code to merge two given file contents into a third file.
2. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.
3. Write a Python code to Read text from a text file, find the word with most number of occurrences
4. Write a function that reads a file file1 and displays the number of words, number of vowels, blank spaces, lower case letters and uppercase letters.
5. Write a program to print each line of a file in reverse order.

WEEK-9: Exploration of NumPy Package

1. Import numpy, and explore their functionalities.
2. a) Install NumPy package with pip and explore it.
3. Write a program for slicing arrays using numpy
4. Write a program for Math operations on array using numpy
5. Write a program for searching
6. Write a program for sorting

WEEK-10: Exploration of Pandas Package

1. Import Pandas and Plotpy and explore their functionalities
2. Python Data Frame
3. Python series

WEEK-11: Exploration of SciPy and GUI

1. Import SciPy and explore their functionalities
2. Write a GUI program to create a window wizard having two text labels, two text fields and two buttons as Submit and Reset.

WEEK-12: Digital Logic Systems

1. Write a program to implement Digital Logic Gates – AND, OR, NOT, EX-OR
2. Write a program to implement Half Adder, Full Adder, and Parallel Adder

TEXT BOOKS:

1. Supercharged Python: Take Your Code To The Next Level, Overland
2. Learning Python, Mark Lutz, O'Reilly
3. Python for Data Analysis, 2nd Edition, Wes McKinney, O'Reilly

REFERENCES:

1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
2. Python Programming A Modular Approach with Graphics, Database, Mobile, and Web Applications, Sheetal Taneja, Naveen Kumar, Pearson
3. Programming with Python, A User's Book, Michael Dawson, Cengage Learning
4. Think Python, Allen Downey, Green Tea Press
5. Core Python Programming, W. Chun, Pearson

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester

(22SD5CY202) FIELD PROJECT

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME		
CIE	SEE	TOTAL
50	-	50

COURSE OBJECTIVES:

- To identify, analyze and solve industry / technical / societal problems creatively through sustained critical investigation
- To practice the skills, elegance and commitment to excellence needed to engage in lifelong learning
- To demonstrate an awareness and application of appropriate personal, social and professional ethical standards

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

CO-1: Understand the formulated industry / technical / societal problems

CO-2: Apply fundamental and disciplinary concepts and methods in ways appropriate to their principal areas of study

CO-3: Demonstrate skills and knowledge of current information, technological tools and techniques specific to the professional field of study

CO-4: Analyze and / or develop models for providing solution to industry / technical / societal problems

CO-5: Use effectively oral, written and visual communication

COURSE ARTICULATION MATRIX:

(Define Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	2	-	-	-	-	3	3	-	3	-	1	3	-	-	-
CO-2	3	3	2	2	3	2	-	-	3	-	2	3	-	-	-
CO-3	-	-	3	-	3	2	-	2	3	3	3	3	-	-	-
CO-4	2	3	3	3	3	3	3	3	3	-	3	3	-	-	-
CO-5	-	-	-	-	2	-	-	3	3	3	-	3	-	-	-

COURSE OUTLINE:

Filed project-based learning offers students real world opportunities to research issues, think critically, gain new perspectives, solve problems and develop written and oral communication skills all within the framework of a team environment and guided by engaged and involved faculty

- A student shall undergo a one credit Field Project course in II year.

- It shall be a project based course involving the student to undertake issues for industries, companies, and any organizations which they encounter in their day-to-day work.
- Evaluation of the field project shall consist of Continuous Internal Evaluation (CIE) only for 50 marks.
- CIE shall be done by a Project Review Committee (PRC) consisting of the Head of the Department, faculty supervisor and a senior faculty member of the specialization / department.
- The internal evaluation shall be on the basis of two seminars for 50 marks one before SE-I and the other before SE-II as per the calendar dates and evaluation format.
- CIE shall be carried out for 50 marks on the basis of review presentation as per the calendar dates and evaluation format.
- The field project report shall be accepted for submission to the PRC only upon meeting the prescribed similarity index of less than 25%.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester

(22MN6HS102) ENVIRONMENTAL SCIENCE

TEACHING SCHEME		
L	T/P	C
2	0	0

EVALUATION SCHEME			
SE-I	SE-II	SEE	TOTAL
50	50	-	100

COURSE PRE-REQUISITES: Basic knowledge of Environmental Issues

COURSE OBJECTIVES:

- To recognize the impacts of human interventions towards environment
- To list out the benefits in creating a sustainable world
- To sketch out various activities in achieving a cleaner environment
- To emphasize the role of frontier technologies 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 safeguarding the environment

CO-3: Appraise the quality of environment in order to create a healthy atmosphere

CO-4: Familiarize with the importance of emerging technologies towards green revolution

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	1	-	-	1	1	-	2	1	-	2	-	-	3
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-	3
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-	3
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-	3

MODULE 1:

Introduction to Environmental Science: Importance of Environmental Science, Overview of the environment & its components, Human intervention in destruction or sustenance of environment. Relationship between environmental science & society - Influence of Industry, Innovation & infrastructure on environment

MODULE 2:

Synergy With Environment: Health & Well Being-ensuring healthy lives and promoting wellbeing at all ages. Reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. Life under water and on land-conservation & sustainable usage, measures to protect marine & coastal ecosystems from various impacts. Protect and restore terrestrial ecosystems, sustainably managing forests, combat desertification. Biodiversity a valuable

resource- biological diversity as a support for food, water, medicine, shelter, cleaning of air and water and other material goods for sustaining life and increase resilience

MODULE 3:

Climate Change: Science behind climate change-factors responsible for climate change, Scientific evidence about past climate and present. Expected consequences of climate change- Impacts of climate change on growth and development. Role of greenhouse gases- Global temperature rise & its impact on environment & human health. Carbon footprint-Briefing on Paris agreement, Identify key sectors for low carbon footprint. Climate change mitigation & adaptation strategies

MODULE 4:

Moving Towards Sustainability: Eco-Audit and its importance. Sustainable agriculture- Organic farming and hydroponics. Role of AI & IOT for efficient management of environmental issues-Health, air, water, and soil. Sustainable living practices- minimizing waste, limited use of earth's natural resources, wise use of environment and ensuring quality working/living environments

MODULE 5:

Innovations in Environmental Science: Sustainable cities and communities-case study, Responsible consumption & production- Refuse, Reduce, Reuse and Recycle with examples. Innovative approaches to waste management-smart waste management, Plastic recycling-innovative ideas.

TEXT BOOKS:

1. Environmental Studies for UG Courses, Erach Bharucha, UGC Publications, 2004
2. Environmental Studies, Rajagopalan, Oxford University Press
3. Introduction to Climate Change, Andreas Schmittner, Oregon State University, 2018

REFERENCES:

1. Green Development: Environment and Sustainability in a Developing World, Bill Adams, 4th Edition, Routledge Publishers, 2021
2. Fixing Climate, Robert Kunzig & Wallace S. Broecker, Main Edition, Profile Books Publisher, 2009
3. Plastic Waste and Recycling-Environmental Impact, Societal Issues, Prevention and Solutions, 1st Edition, Academic Press, 2020

ONLINE RESOURCES:

1. <https://www.coursera.org/learn/beyond-the-sustainable-development-goals-addressing-sustainability-and-development>
2. <https://www.coursera.org/specializations/climatechangeandsustainableinvesting>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester

(22BS1MT205) STATISTICAL INFERENCE AND MULTIVARIATE ANALYSIS

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: Statistical Methods for Data Analysis

COURSE OBJECTIVES:

- To learn the concept of sampling distribution
- To learn the various methods to test the hypothesis for large sample
- To learn the various methods to test the hypothesis for small sample
- To learn the linear and polynomial relationship between the given data set
- To learn the concepts of multivariable linear regression model

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

CO-1: Evaluate sampling distribution of means, variance and confidence interval

CO-2: Apply the knowledge to test the hypothesis for large sample

CO-3: Apply the knowledge about small sample tests based on Chi-square, t and F distributions

CO-4: Use and fit a linear and polynomial regression model to data and use it for prediction

CO-5: Model the linear relationship between the explanatory (independent) Variables and response(dependent)variables

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	1	1	1	-	-	-	-	-	-	-	-	2	-
CO-2	3	3	2	2	2	-	-	-	-	-	-	-	1	2	-
CO-3	3	2	1	1	-	-	-	-	-	-	-	-	-	1	-
CO-4	3	3	2	2	2	-	-	-	-	-	-	-	1	2	-
CO-5	3	2	-	-	-	-	-	-	-	-	-	-	1	1	-

UNIT-I:

Sampling Distributions: Definition of population, sampling, statistic, parameter, Types of sampling, sample mean and Variance, sampling distribution, standard error, sampling distributions of means and variance, Estimation, interval estimation, point estimation and confidence interval for the mean and proportions.

UNIT-II:

Testing of Hypothesis - Large Samples: Central limit theorem, 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.

UNIT-III:

Testing of Hypothesis - Small Samples: Test of significance-t distribution, confidence interval for the t- distribution, F-distribution and Chi square distribution, Analysis of variance (ANOVA).

UNIT- IV:

Correlation and Regression: Correlation, Correlation coefficient and its properties, rank correlation coefficient, Multiple and partial correlation, Introduction to Simple Linear Regression, Estimation of parameters of β_0 and β_1 , Linear regression, Inferences for Linear Regression, Regression of second degree polynomial by least square method.

UNIT-V:

Multivariate Analysis: Multivariate Normal Distribution Function, Properties of Multivariate Normal Distribution, Conditional Distribution and its relation to regression model, Linear Regression Analysis-Step up, Step down (Forward/ Backward), Subset and Best Model (Step-wise) , Tenfold Validation, One -Off technique, (Leave-Out), Multi Collinearity, Variation Inflation Factors, Principal Component Analysis (PCA) based regression analysis.

TEXT BOOKS:

1. Applied Probability, I. N. Blake, 9th Edition, John Wiley & Sons, 1979
2. Introductory Statistics, Thomas H. Wonnacott & Ronald J. Wonnacot, John Wiley & Sons, 1969
3. An Introduction to Multivariate Statistical Analysis, T. W. Anderson, John Wiley & Sons, 2003

REFERENCES:

1. Applied Statistics and Probability for Engineers, Douglas C. Montgomery, George C. Runger, 3rd Edition, John Wiley & Sons, 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. Introduction to Linear Regression Analysis, Douglas C. Montgomery, Elizabeth A. Peck, G. Geoffrey Vining, 6th Edition, Wiley Series, 2006

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester

(22HS1MG201) ENGINEERING ECONOMICS AND ACCOUNTANCY

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To understand the basic concepts of economics and different forms of business organizations
- To create awareness on basics of business economics and to analyse the concepts of demand and supply
- To describe each stage of product life cycle with the help different costs and their role in maintaining optimum cost of production and overall profitability by considering different market competitions
- To acquaint with the basic accounting knowledge and financial accounting process
- To evaluate the performance of the organization using various ratios

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 based concepts of economics and select suitable form of business organization which meets the requirements of business

CO-2: Take the right decisions towards buying and selling of goods and services based on the demand and supply dynamics in the markets

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

CO-4: Prepare book of accounts and understand overall position of the business

CO-5: Interpret the firm's financial performance using various ratios

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	-	-	-	-	-	-	-	1	2	1	3	1	-	-	-
CO-2	-	-	-	-	-	-	-	1	2	1	3	1	-	-	-
CO-3	-	-	-	-	-	-	-	1	2	1	3	1	-	-	-
CO-4	-	-	-	-	-	-	-	1	2	1	3	1	-	-	-
CO-5	-	-	-	-	-	-	-	1	2	1	3	1	-	-	-

UNIT-I:

Introduction to Economics: Definition, nature, scope and types of Economics. National Income (NI) & types of Inflation.

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-II:

Business Economics: Definition, nature and scope, linkages with other disciplines.

Demand Analysis: Law of Demand, Factors affecting demand; Elasticity of Demand-Types Measurement, Factors affecting and Significance,

Demand Forecasting: Characteristics of Good Demand Forecasting, Steps in Demand Forecasting, Methods of Demand Forecasting.

Supply Analysis: Determinants of Supply, Supply function and Law of Supply.

UNIT-III:

Production, Cost, Market Structures & Pricing:

Production Analysis: Factors of Production, Production Function, Production Function with one variable input, two variable inputs, Returns to Scale, Different Types of Production Functions - Cobb-Douglas.

Cost Analysis: Types of Costs, Short run and long run Cost Functions.

Market Structures: Nature of Competition, Features of Perfect competition, Monopoly, Oligopoly, Monopolistic Competition.

Pricing: Types of Pricing, Product Life Cycle based Pricing, Break Even Analysis (Simple problems)

UNIT-IV:

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-V:

Ratio Analysis: 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

TEXT BOOKS:

1. Managerial Economics, D.M. Mithani, 9th Edition, Himalaya Publishing House, 2022
2. Managerial Economics, Satya P. Das & J. K. Goyal, 2nd Edition, Sage Publications, 2022
3. Financial Accounting, S. N. Maheswari, 6th Edition, Vikas Publications, 2018

REFERENCES:

1. Managerial Economics, Dominick Salvatore, Siddhartha K. Rastogi, 9th Edition, Oxford Publications, 2020
2. Financial Accounting for Management: An Analytical Perspective, Ambrish Gupta, 6th Edition, Pearson Education, 2018
3. Business Economics, H. L. Ahuja, 13th Edition, S. Chand, 2019
4. 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

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester

(22PC1CS203) COMPUTER ORGANIZATION

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To understand the functional blocks of computer and instruction set architecture
- To describe micro programming and addressing modes of Central Processing Unit
- To perform arithmetic micro operations on integers and floating-point numbers
- To discuss the different ways of communicating with I/O devices
- To design techniques to enhance the performance using pipelining, parallelism

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

CO-1: Understand the basic components and the design of CPU, instruction set

CO-2: Understand the micro programming, instruction formats and addressing modes

CO-3: Implement arithmetic operations on integer and floating type values

CO-4: Analyze and understand the input organization and memory organization

CO-5: Explore pipeline processing, vector processing and array processing

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	2	3	-	-	-	2	-	-	-	-	-	2	1	2	3
CO-2	2	3	2	3	2	2	-	-	-	-	2	3	1	3	3
CO-3	3	3	-	3	-	-	-	-	-	-	-	3	1	3	3
CO-4	2	3	-	2	3	2	2	-	-	-	-	3	1	2	3
CO-5	2	3	-	2	3	2	2	-	-	-	3	3	1	3	3

UNIT-I:

Functional Blocks of a Computer: Introduction, Block Diagram, Definition of Computer Organization, Computer Design and Computer Architecture

Instruction Set Architecture: Register Transfer language, Register Transfer, Arithmetic Micro operations, logic micro-operations, shift micro-operations, Arithmetic logic shift unit. Instruction codes, Computer Registers Computer instructions, Timing and Control, Instruction cycle, Memory Reference Instructions, Register Reference and Input – Output.

UNIT-II:

Central Processing Unit: General Register Organization, Instruction Formats, Addressing modes, Data Transfer and Manipulation.

Microprogrammed Control: Control memory, Address sequencing, micro program example, design of control unit.

UNIT-III:

Data Representation: Data types, Complements, Fixed Point Representation, Floating Point Representation.

Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Division Algorithms, Restoring and Non-restoring, floating – point Arithmetic operations.

UNIT-IV:

Input-Output Organization: Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Program Controlled, Priority, Interrupt, Direct memory Access. Privileged and Non-Privileged Instructions.

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate memory, Cache Memory, Mapping Techniques, Replacement Algorithms, Write Policies, Memory interleaving.

UNIT-V:

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processor.

TEXT BOOKS:

1. Computer System Architecture, M. Morris Mano, 3rd Edition
2. Computer Organization and Embedded Systems, Carl Hamacher, 6th Edition, McGraw-Hill Higher Education

REFERENCES:

1. Computer Organization and Design: The Hardware/Software Interfaces, David A. Patterson and John L. Hennessy, 5th Edition, Elsevier
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

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester

(22PC1CY202) ADVANCED ETHICAL HACKING

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: Computer Networks and Ethical Hacking

COURSE OBJECTIVES:

- To understand system hacking methodology and malwares
- To get insights on Steganography and various attacks on websites
- To apply session hijacking and wireless hacking techniques
- To gain knowledge on various hardware attacks
- To perform hacking into the database and websites

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

CO-1: Analyze methods related to system hacking, password cracking and malware threats

CO-2: Evaluate security in various web applications

CO-3: Evaluate techniques related to sniffing, social engineering, session hijacking

CO-4: Analyze various attacks on the hardware and its countermeasures

CO-5: Examine cross site scripting and SQL injection tools and techniques

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	2	3	2	1	2	3	-	3	2	-	1	3	3	3	3
CO-2	2	2	3	2	3	3	-	3	-	-	2	3	3	3	3
CO-3	1	2	2	1	2	3	-	3	3	2	1	3	3	2	3
CO-4	3	3	3	3	3	3	-	3	-	-	1	3	3	2	3
CO-5	2	2	2	2	2	2	-	3	-	-	1	3	3	3	3

UNIT-I:

System Hacking: Goals and overview of methodology, Password cracking, Escalating Privileges, Application execution and file hiding, Countermeasures.

Malware: Introduction, Types of malwares, Types of virus, Types of trojan horse, Securing from the malwares.Social engineering, types of social engineering.

UNIT-II:

Domain Name System: Introduction, DNS Poisoning Attacks. DOS, DDOS, Types of DDOS attacks, fixing DDOS attacks.

Steganography: Introduction, Steganography in image files, methods: least significant bit insertion, masking and filtering, algorithms and transformations

UNIT-III:

Session Hijacking: Understanding Session Hijacking Concepts, Application-Level Session Hijacking, Network Level Session Hijacking, Countermeasures.

WIFI Hacking: Introduction, Types of Wi-Fi password securities: Wired Equivalent Privacy (WEP), Wi-Fi protected Access (WPA), Wi-Fi Protected Setup (WPS), Mitigation against attacks.

UNIT-IV:

Hardware security: Introduction, Attacks on hardware, Types of attacks on hardware, counter measures to prevent hardware attacks.

Side-Channel Attacks: Introduction, Importance, Various side channels, Timing Analysis, Power analysis attack, Simple and differential power analysis, Counter measures.

UNIT-V:

SQL Injection: SQL Injection Concepts, Types of SQL Injection, SQL Injection using SQLMAP, Evasion Techniques and Countermeasure.

Cross site Scripting: Introduction, Types of cross site scripting.

TEXT BOOKS:

1. The Basics of Hacking and Penetration Testing, Patrick Engebretson, Elsevier, 2013
2. Network Security and Ethical Hacking, Rajat Khare, Luniver Press, 2006
3. Introduction to Computer Networks and Cyber Security, Wu and J. D. Irwin, CRC Press, 2013

REFERENCES:

1. Network Intrusion Alert: An Ethical Hacking Guide to Intrusion Detection, Ankit Fadia, Manu Zacharia, Thomson Course Technology PTR, 2007
2. Ethical Hacking, Thomas Mathew, OSB Publisher, 2003
3. Hacking Exposed: Network Security Secrets & Solutions, Stuart McClure, Joel Scambray and George Kurtz, McGraw-Hill, 2005
4. Hands-On Ethical Hacking and Network Defense, Michael Simpson, Kent Backman, James Corley, Cengage Learning, 2010

ONLINE RESOURCES:

1. Ethical Hacking - Course (nptel.ac.in)
2. <https://www.youtube.com/live/Xv-O2HizYCY?feature=share> (Ethical Hacking by Simplilearn)

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester

(22PC1IT201) OBJECT ORIENTED PROGRAMMING THROUGH JAVA

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To understand object oriented concepts and problem solving techniques
- To obtain knowledge about the principles of inheritance and polymorphism
- To implement the concept of packages, interfaces, exception handling and concurrency mechanism
- To understand the Java database connectivity architecture

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

CO-1: Solve real-world problems using Object Oriented Programming paradigm

CO-2: Apply code reusability through inheritance, packages and interfaces

CO-3: Solve problems using Java collection framework and I/O classes

CO-4: Develop applications by generics for better performance use multithreading

CO-5: Build applications using the JDBC API to access the database

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	3	3	2	2	2	2	2	-	1	3	3	2	1
CO-2	3	2	2	2	2	-	-	2	1	1	1	2	2	1	2
CO-3	3	2	3	2	2	-	-	-	-	-	-	2	2	2	2
CO-4	3	3	2	2	2	2	-	1	1	1	-	2	3	2	1
CO-5	3	3	2	2	3	-	2	1	-	-	1	2	3	2	2

UNIT-I:

Object Oriented Programming Paradigm: Introduction to OOP Paradigm, Evolution of Java, Difference between JDK, JRE, and JVM, Classes, Objects, Data Types, Variables, Comments, Type Conversion and Casting, Operators, Symbolic Constants, Control Statements, Scope of Variables, Constructors, this keyword, Overloading, Command line Arguments, Arrays, String Class, Wrapper classes.

UNIT-II:

Inheritance, Packages, Interfaces and Other Topics: Understanding static, Introducing Nested and Inner classes, Access Modifiers,

Varargs: variable-Length Arguments, Lambda Expressions, garbage collection-finalize.

Inheritance: Basics, Using super, creating a multi level hierarchy, when constructors are executed, method overriding, polymorphism - dynamic method dispatch, using abstract class, final with Inheritance, object class.

Packages and Interfaces: Packages, Access protection, Importing Packages, Interfaces, Default Interfaces, Default interface methods, Use static methods in an Interface,

UNIT-III:

Exception Handling: Exception handling Fundamentals, Exception Types, Using try and catch, throw, throws, finally, Java Custom Exception, Catch Multiple Exceptions, Try-with Resources, Exceptions propagation, Chained Exceptions.

I/O, Generics and Other Topics: The Streams (Byte, Character, and Standard), Output Stream and InputStream classes, Reading and Writing Files, Random access file operations, Generics: The general form of a generics class, creating a generic method, generics interfaces, Serialization, Annotations,, Auto Boxing.

UNIT-IV:

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

Java AWT: AWT Hierarchy, Event Delegation Model, Adapter classes, Listeners, Layout management, AWT Components, Simple UI for Email registration.

UNIT-V:

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.

Java Database Connectivity: Introduction to JDBC, Types of Drivers, Basic steps in developing JDBC applications, JDBC classes and Interfaces, CRUD operations with JDBC, Transaction Management, Stored Procedures.

TEXT BOOKS:

1. Java The Complete Reference, Herbert Schildt, 9th Edition, McGraw-Hill Education
2. Java How to Program, Paul Dietel, Harvey Dietel, 10th Edition, Pearson Education

REFERENCES:

1. Core Java Volume-1 Fundamentals, Cay S. Horstmann, Pearson Education
2. Java Programming for Core and Advanced Learners, Sagayaraj, Dennis, Karthik and Gajalakshmi, University Press
3. Introduction to Java Programming, Y. Daniel Liang, Pearson Education
4. Object Oriented Programming through Java, P. Radha Krishna, University Press

ONLINE RESOURCES:

1. https://www.w3schools.com/java/java_oop.asp
2. <http://peterindia.net/JavaFiles.html>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester

(22PC2CY202) ADVANCED ETHICAL HACKING LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To get knowledge on various attacks and their detection
- To perform penetration testing and understanding tools
- To apply Investigate web-based hacking methods
- To get knowledge on various wireless attacks

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

CO-1: Evaluate various system hacking techniques in different situations

CO-2: Apply various techniques to hack into web applications

CO-3: Analyze wireless attacks and protect against them

CO-4: Examine cross site scripting and SQL Injection tools and techniques

CO-5: Demonstrate the firewall evasion techniques

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	2	3	2	1	2	3	-	3	2	-	1	3	3	3	3
CO-2	2	2	3	2	3	3	-	3	-	-	2	3	3	3	3
CO-3	2	2	3	3	3	3	-	3	-	-	2	3	3	3	3
CO-4	2	2	2	2	2	2	-	3	-	-	1	3	3	3	3
CO-5	2	2	3	3	3	3	-	3	-	-	2	3	3	2	3

LIST OF PROGRAMS / EXPERIMENTS / EXERCISES:

WEEK 1:

Demonstrate Social Engineering Attack.

WEEK 2:

Penetrate into windows system using Metasploit framework

WEEK 3:

Demonstrate Password cracking for system Hacking

a) Escalating Privileges b) Application execution and file hiding.

WEEK 4:

Implement the following for system Hacking techniques

WEEK 5:

Perform Man in middle attack using the concept of sniffing via ARP Poisoning

WEEK 6:

Demonstration of Malware Scanning, Virus and Trojan

WEEK 7:

Demonstration of DOS and DDOS attacks.

WEEK 8:

- a) Demonstrate session hijacking for stealing session Id and cookies.
- b) Tamper the data using BurpSuite.

WEEK 9:

Demonstrate WIFI Hacking techniques.

WEEK 10:

- a) SQL Injection Authentication Bypass
- b) SQL injection error based

WEEK 11:

Implement SQL Injection using SQLMAP

WEEK 12:

Implement reflected and stored Cross site Scripting techniques

WEEK 13:

Setup a honey pot and monitor the honey pot on network.

TEXT BOOKS:

1. The Basics of Hacking and Penetration Testing, Patrick Egebreton, Elsevier, 2013
2. Network Security and Ethical Hacking, Rajat Khare, Luniver Press, 2006
3. Introduction to Computer Networks and Cyber security, Wu and J. D. Irwin, CRC Press, 2013

REFERENCES:

1. Network Intrusion Alert: An Ethical Hacking Guide to Intrusion Detection, Ankit Fadia, Manu Zacharia, Thomson Course Technology PTR, 2007
2. Ethical Hacking, Thomas Mathew, OSB Publisher, 2003
3. Hacking Exposed: Network Security Secrets & Solutions, Stuart McClure, Joel Scambray and George Kurtz, McGraw-Hill, 2005
4. Hands-On Ethical Hacking and Network Defense, Michael Simpson, Kent Backman, James Corley, Cengage Learning, 2010

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester

(22PC2IT201) OBJECT ORIENTED PROGRAMMING THROUGH JAVA LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To understand OOP principles
- To understand the Exception Handling mechanism
- To understand Java collection framework
- To understand multithreaded programming
- To understand Java database connectivity in Java

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

CO-1: Write the programs for solving real world problems using Java OOP principles

CO-2: Write programs using Exceptional Handling approach

CO-3: Write multithreaded applications

CO-4: Build application using Java collection framework

CO-5: Develop java application connect database using JDBC

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	3	2	3	-	2		-	2	-	1	2	3	3	2
CO-2	3	2	3	2	-	-	-	-	2	1	-	2	3	3	2
CO-3	3	3	2	3	-	-	-	-	2	-	2	2	2	2	2
CO-4	2	2	3	2	2	2	2	-	2	1	2	2	3	3	2
CO-5	2	2	2	2	2	3	2	1	2	1	1	2	3	3	3

LIST OF PROGRAMS / EXPERIMENTS / EXERCISES:

WEEK 1:

- a. Installation of Java software, study of any integrated development environment, Use Eclipse or Netbean platform and acquaint with the various menus. Create a test project, add a test class and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods and classes. Try debug step by step with java program to find prime numbers between 1 to n.
- b. Write a Java program that prints all real solutions to the quadratic equation ax^2+bx+c . Read in a, b, c and use the quadratic formula.
- c. Write a Java program to multiply two given matrices.

WEEK 2:

- a. Write Java program on use of inheritance, preventing inheritance using final, abstract classes.
- b. Write Java program on dynamic binding, differentiating method overloading and overriding.
- c. Develop a java application to implement currency converter (Dollar to INR. EURO to INR, Yen) using Interfaces.

WEEK 3:

- a. Write a Java program to create a package named "com.mycompany.math" that contains a class named "Calculator" with methods to add, subtract, multiply and divide two numbers. Write a test program to use this package.
- b. Create a package named "com.mycompany.util" that contains a class named "StringUtils" with a method named "reverseString" that takes a string as input and returns the reverse of the input string. Write a test program to use this package.

WEEK 4:

- a. Write a Java program to implement user defined exception handling.
- b. Write a Java program to throw an exception "Insufficient Funds" while withdrawing the amount in the user account.
- c. Write a Java program to implement Try-with Resources, Multi-catch Exceptions, and Exception Propagation Concepts?

WEEK 5:

- a. Write a java program to split a given text file into n parts. Name each part as the name of the original file followed by .part where n is the sequence number of the part file.
- b. Write a Java program that reads a file name from the user, displays information about whether the file exists, whether the file is readable, or writable. The type of file and the length of the file in bytes.

WEEK 6:

- a. Write a Java program on Random Access File class to perform different read and write operations.
- b. Create a class called Employee with properties name(String), dateofbirth (java.util.Date), department(String), designation(String) and Salary(double). Create respective getter and setter methods and constructors (no-argument constructor and parameterized constructor) for the same. Create an object of the Employee class and save this object in a file called "data" using serialization. Later using deserialization read this object and prints the properties of this object.

WEEK 7:

- a. Create a generic class called Box that can hold any type of object. Implement the following methods: 1) void set(T obj): sets the object stored in the box 2) T get(): retrieves the object stored in the box 3) boolean isEmpty(): returns true if the box is empty, false otherwise
- b. Implement a generic Stack class that can hold any type of object. Implement the following methods: 1) void push(T obj): pushes an object onto the top of the stack ,2) T pop(): removes and returns the object at the top of the stack 3) boolean isEmpty(): returns true if the stack is empty, false otherwise

WEEK 8:

- a. Write a Java program to implement Autoboxing and Unboxing?
- b. Write a Java program to implement Built-In Java Annotations?

WEEK 9:

- a. 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.
- b. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
- c. Create a Email registration Form using Java AWT. The UI should have fields such as name, address, sex, age, email, contact number, etc.,
- d. Demonstrate various Layout Managers in Java AWT. Display the output in card layout wheareas each card exhibits different layout.

WEEK 10:

- a. Write a Java program to create a Vector and add some elements to it. Then get the element at a specific index and print it.
- b. Write a Java program to create a BitSet and set some bits in it. Then perform some bitwise operations on the BitSet and print the result.
- c. Write a Java program to read the time intervals (HH:MM) and to compare system time if the system Time between your time intervals print correct time and exit else try again to repute the same thing. By using String Tokenizer class.

WEEK 11:

- a. Write a Java program to demonstrate the working of different collection classes. [Use package structure to store multiple classes].
- b. Write a Java program to create a TreeMap and add some elements to it. Then get the value associated with a specific key and print it.
- c. Write a Java program to create a PriorityQueue and add some elements to it. Then remove the highest priority element from the PriorityQueue and print the remaining elements.

WEEK 12:

- a. Deve1op a Java application to establish a JDBC connection, create a table student with properties name, register number, mark 1, mark2, mark3. Insert the values into the table by using the java and display the information of the students at font end.
- b. Write a program to perform CRUD operations on the student table in a database using JDBC

TEXT BOOKS:

1. Java for Programmers, P. J. Deitel and H. M. Deitel, 10th Edition, Pearson Education
2. Thinking in Java, Bruce Eckel, Pearson Education
3. Understanding Object-Oriented Programming with Java, T. Budd, Pearson Education

REFERENCES:

1. Java Programming, D. S. Malik and P. S. Nair, Cengage Learning
2. Core Java, Volume 1, Cay S. Horstmann and G. Cornell, 9th Edition, Pearson
3. Programming in Java, S. Malhotra, S. Choudhary, 2nd Edition, Oxford Univ. Press

4. Java Programming and Object-Oriented Application Development, R. A. Johnson, Cengage Learning

ONLINE RESOURCES:

1. https://www.w3schools.com/java/java_oop.asp
2. <http://peterindia.net/JavaFiles.html>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester

(22SD5CY201) CYBER FORENSICS

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To provide a comprehensive overview of collecting, investigating, preserving, and presenting evidence of cybercrime left in digital storage devices, emails, browsers, mobile devices using different forensics tools
- To understand file system basics and where hidden files may lie on the disk, as well as how to extract the data and preserve it for analysis
- To understand some of the tools of e-discovery
- To understand the network analysis, Registry analysis and analyze attacks using different forensics tools
- To identify digital evidence that can be used in a legal or criminal investigation

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

CO-1: Analyze the importance of a systematic procedure for investigation of data found on digital storage media

CO-2: Use the file system storage mechanisms and retrieve files in hidden format

CO-3: Apply the computer forensics tools used in data analysis

CO-4: Examine how to find data that may be clear or hidden on a computer disk, find out the open ports for the attackers through network analysis and registry analysis

CO-5: Apply Autopsy tool and Live RAM capture tools

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	2	3	2	2	1	2	2	1	3	2	3	3	1
CO-2	3	2	2	3	2	2	-	2	3	1	2	2	3	2	1
CO-3	2	2	2	3	2	2	-	2	3	2	3	2	3	3	2
CO-4	2	2	3	3	2	2	1	2	3	1	2	2	3	2	2
CO-5	2	2	2	3	2	3	-	2	2	2	3	2	3	2	1

LIST OF PROGRAMS / EXERCISES:

WEEK 1:

Perform email analysis using the tools like Exchange EDB viewer and View user mailboxes and public folders, Filter the mailbox data based on various criteria, Search for particular items in user mailboxes and public folders.

WEEK 2:

Perform browser history analysis and get the downloaded content, history, saved logins, searches, websites visited etc. using Dumpzilla.

WEEK 3, 4:

Perform mobile analysis in the form of retrieving call logs, SMS log, all contacts list using the forensics tool like SAFT.

WEEK 5:

Perform registry analysis and get boot time logging using process monitor tool

WEEK 6:

Perform disk imaging and cloning using the X-way Forensics tools.

WEEK 7, 8:

Perform data analysis i.e history about open file and folder, and view folder actions using Last view activity tool.

WEEK 9:

Perform network analysis using the Network Miner Wireshark tool.

WEEK 10:

Perform information for incident response using the crowd Response tool.

WEEK 11, 12:

Perform file type detection using Autopsy tool.

WEEK 13:

Perform memory capture and analysis using the Live RAM capture tools.

TEXT BOOKS:

1. Real Digital Forensics for Handheld Devices, E. P. Dorothy, Auerback Publications, 2013
2. The Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics, J. Sammons, Syngress Publishing, 2012

REFERENCES:

1. Handbook of Digital Forensics and Investigation, E. Casey, Academic Press, 2010
2. Malware Forensics Field Guide for Windows Systems: Digital Forensics Field Guides, C. H. Malin, E. Casey and J. M. Aquilina, Syngress, 2012
3. The Best Damn Cybercrime and Digital Forensics Book Period, J. Wiles and A. Reyes, Syngress, 2007

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester

(22PW4CY201) DESIGN THINKING

TEACHING SCHEME		
L	T/P	C
1	2	2

EVALUATION SCHEME		
CIE	SEE	TOTAL
40	60	100

COURSE OBJECTIVES:

- To instill a sense of significance towards applying creativity to product and service design
- To teach a systematic approach to identifying and defining a problem before brainstorming for a solution
- To inculcate core design principles and applied creativity to develop innovative strategies that better connect engineers and technologies with their end users
- To build a mindset leading to flow of creative ideas, validating those ideas and prioritizing the best ones among them
- To motivate students to apply design thinking while implementing projects focusing on local, regional or global societal problems

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

CO-1: Demonstrate the understanding of design principles from a technology perspective

CO-2: Validate problem statements through user empathisation with societal, cultural, global and environmental consciousness

CO-3: Use specific and relevant ideation and brainstorming techniques to find innovative solutions

CO-4: Prototype a solution to address user challenges

CO-5: Investigate the cultural, emotional, environmental, technological and business factors relevant to developing new product or service design concept

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	-	-	2	-	-	2	-	-	3	3	1	1	-	2	1
CO-2	-	-	3	2	1	3	-	-	3	2	1	1	2	1	3
CO-3	-	-	2	-	-	2	-	-	2	2	3	-	-	-	2
CO-4	-	-	3	-	2	-	-	-	2	3	1	-	-	1	2
CO-5	-	-	-	3	-	3	1	-	1	-	1	-	-	-	2

UNIT-I:

Design Overview and Doing Design: Various perspectives of design; Good and Bad Design; Introduction to the Design Double Diamond: Discover-Define-Develop-Deliver; Discover Phase- Looking for problems; Identifying Stakeholders and Defining User Personas; User Empathization; Data collection, creating and conducting surveys

and Empathy Tools – What/How/Why, Five Why method, Empathy Maps, AEIOU method, Story Share and Capture

UNIT-II:

Need Analysis: Types of Users, Types of Needs; Market Size; Value Proposition to the Users; Identifying Addressable Needs and Touch points; Structuring Need Statements; Customer Experience (CX) Design; Service Design and Development Process; Customer Journey Map (CJM), Service Experience Cycle.

UNIT-III:

Ideation Process: Introduction to creativity and closed-world solutions, Idea generation techniques: Brainstorming, Mind Maps, SCAMPER, Systematic Inventive Thinking methods (Subtraction, Multiplication, Division, Task Unification and Attribute Dependency);

Strategic Innovation for Competition in Future: Linear Innovation vs. Non-linear innovation, Understanding and identifying weak signals, 3-box thinking, 3-Box framework and Box-3 ideation, Four-Action Framework (Eliminate-Reduce-Raise-Create, or ERRC Matrix).

UNIT -IV:

Building Prototypes: Building Conceptual model of product/service using various prototype methods, test a business model or business case to support the viability of the solution using MVP.

Design for Sustainability: Concern for Environment and Sustainability in Design, Case Studies to understand good Design For Environment (DFE) Decisions; Sustainable Design Approaches in the five stages of the Product Life Cycle.

UNIT -V:

Capstone Project (Interdisciplinary): Applying design thinking principles and methods for problem definition, ideation, prototyping, testing, refining and taking the solution to the users, using visual representation tools to indicate problem, User persona, needs, empathisation, ideas and prototype that leads to chosen solution, creating presentation.

TEXT BOOKS:

1. Change by Design, Tim Brown, Harper Business, 2012
2. The Design of Everyday Things, Donald A. Norman, MIT Press, 2013

REFERENCES:

1. The Art of Innovation, Tom Kelly, Jonathan Littman, Harper Collins Business, 2002
2. Design Thinking: Integrating Innovation, Customer Experience, and Brand Value, Thomas Lockwood, Allworth Press, 2009
3. Design Thinking for Start-ups: A Handbook for Readers and Workbook for Practitioners, Jimmy Jain, Notion Press, 2018

ONLINE RESOURCES:

1. <https://www.ideo.com/pages/design-thinking>
2. <https://www.ibm.com/design/thinking/page/framework>
3. https://onlinecourses.nptel.ac.in/noc20_mg38/preview
4. <https://nptel.ac.in/courses/110106124>

5. <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester

(22MN6HS201) INTELLECTUAL PROPERTY RIGHTS

TEACHING SCHEME

L	T/P	C
2	0	0

EVALUATION SCHEME

SE-I	SE-II	SEE	TOTAL
50	50	-	100

COURSE OBJECTIVES:

- To familiarize students with the nuances of Intellectual Property Rights (IPR) to help them integrate the IPR process in their research activities
- To make the students capable of identifying their own protectable innovations and realizing the process of taking it from bench to market

COURSE OUTCOMES: After completing this course the student should be able to

CO-1: Get an adequate knowledge on patent and copyright for their innovative research works and academic projects

CO-2: Understand and acquire the knowledge of trademarks and registration aspects

CO-3: Interpret various forms of Intellectual Property on Design, Geographical Indication (GI), Plant Variety and Layout Design Protection and their registration aspects

CO-4: Obtain useful insights from the information in patent documents, especially on novelty of their idea from state-of-the art search, during their research career. This provides further way for developing their idea or innovations

CO-5: Get awareness about current trends in IPR and Govt. steps in fostering IPR

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	-	-	-	-	-	2	-	3	-	-	-	2	-	-	-
CO-2	-	-	-	-	-	2	-	3	-	-	-	2	-	-	-
CO-3	-	-	--	-	-	2	-	3	-	-	-	2	-	-	-
CO-4	-	-	-	-	-	2	-	3	-	-	-	2	-	-	-
CO-5	-	-	-	-	-	2	-	3	-	-	-	2	-	-	-

UNIT – I:

Overview of Intellectual Property: Introduction and the need for Intellectual Property Right (IPR) - Kinds of Intellectual Property Rights: Patent, Copyright, Trade Mark, Design, Geographical Indication, Plant Varieties and Layout Design – Genetic Resources and Traditional Knowledge – Trade Secret - IPR in India : Genesis and development – IPR in abroad - Major International Instruments concerning Intellectual Property Rights: Paris Convention, 1883, the Berne Convention, 1886, the Universal Copyright Convention, 1952, the WIPO Convention, 1967, the Patent Co-operation Treaty, 1970, the TRIPS Agreement, 1994

UNIT – II:

Patents: Patents - Elements of Patentability: Novelty, Non-Obviousness (Inventive Steps), Industrial Application - Non - Patentable Subject Matter - Registration Procedure, Rights and Duties of Patentee, Assignment and licence, Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties - Patent office and Appellate Board

UNIT – III:

Copyrights: Nature of Copyright - Subject matter of copyright: original literary, dramatic, musical, artistic works; cinematograph films and sound recordings - Registration Procedure, Term of protection, Ownership of copyright, Assignment and licence of copyright - Infringement, Remedies & Penalties – Related Rights - Distinction between related rights and copyrights

UNIT – IV:

Trademarks:

Concept of Trademarks - Different kinds of marks (brand names, logos, signatures, symbols, well known marks, certification marks and service marks) - Non Registrable Trademarks - Registration of Trademarks - Rights of holder and assignment and licensing of marks - Infringement, Remedies & Penalties - Trademarks registry and appellate board

UNIT – V:

Design: meaning and concept of novel and original - Procedure for registration, effect of registration and term of protection

Geographical Indication (GI): meaning, and difference between GI and trademarks - Procedure for registration, effect of registration and term of protection

Plant Variety Protection: meaning and benefit sharing and farmers' rights – Procedure for registration, effect of registration and term of protection

Layout Design Protection: meaning – Procedure for registration, effect of registration and term of protection

Current Contour: India's New National IP Policy, 2016 – Govt. of India step towards promoting IPR – Govt. Schemes in IPR – Career Opportunities in IP - IPR in current scenario with case studies

TEXTBOOKS:

1. Intellectual Property Rights: Protection and Management Nithyananda, K V, India, IN: Cengage Learning India Private Limited, 2019
2. Intellectual Property Rights, Neeraj, P., & Khusdeep, D, India, IN: PHI learning Private Limited, 2014
3. Intellectual property right, Deborah, E. Bouchoux, 4th Edition, Cengage learning

REFERENCE:

1. Law relating to Intellectual Property Rights, Ahuja, V K, India, IN: Lexis Nexis, 2017

ONLINE RESOURCES:

1. Intellectual Property Rights – An Overview, Subramanian, N., & Sundararaman, M. Retrieved from <http://www.bdu.ac.in/cells/ipr/docs/ipr-eng-ebook.pdf>, 2018
2. WIPO Intellectual property Handbook, World Intellectual Property Organisation, Retrieved from https://www.wipo.int/edocs/pubdocs/en/intproperty/489/wipo_pub_489.pdf, 2004