Ref: UPL University /SRICT/BOS/CO/2021-22/01
Date: 12-03-2022

Proposed Teaching Scheme for Second Year Diploma in Computer Engineering

Semester-III (Computer Engineering) Proposed Structure

Sr. No	Category ofCourse	Code No.	Course Title	Hours per week			Total contact hrs/ week	Credits	E	M	I	V	Total
				L	T	P							
1	Program core course	CO1201	Object Oriented Programming	2	0	2	4	3	70	30	20	30	150
2	Program core course	CO1202	Operating System	3	0	2	5	4	70	30	20	30	150
3	Program core course	CO1203	Data Structure	3	0	2	5	4	70	30	20	30	150
4	Program corecourse	CO1204	Database Management System	3	0	2	5	4	70	30	20	30	150
5	Program core course	CO1205	Computer Organization	3	0	0	3	3	70	30	0	0	100
6	Humanities andSocial Science course	MH1201	Communication Skills in English	3	0	2	5	4	70	30	20	30	150
7	Audit course - Essence of Indian Traditional Knowledge	MH1202	Essence of IndianTraditional Knowledge	1	0	0	1	0	0	0	20	30	50
8	Inplant Training	MH1203	In Plant Training	0	0	0	0	1	0	0	50	0	50
	Total			**18**	**0**	**10**	**28**	**23**	**Total**				**950**

Semester-IV (Computer Engineering) Proposed Structure

Sr. No	Category of Course	Code No.	Course Title	Hours per week			Total contact hrs/ week	Credits	E	M	I	V	Total
				L	T	P							
1	Program core course	CO1206	Algorithm	2	0	2	4	3	70	30	20	30	150
2	Program core course	CO1207	Computer Networks	3	0	2	5	4	70	30	20	30	150
3	Program core course	CO1208	Web Technologies	3	0	2	5	4	70	30	20	30	150
4	Program core course	CO1209	JAVA Programming	3	0	2	5	4	70	30	20	30	150
5	Program Elective course		Program Elective 1	3	1	0	4	4	70	30	50	0	150
6	Open Elective		Open Elective 1	3	0	0	3	3	70	30	0	0	100
	Total			**17**	**1**	**8**	**26**	**22**	**Total**				**850**

Sr No	Program Elective 1	Open Elective 1
1	CO1210 - Software Engineering	CO1212 - Cyber Security
2	CO1211 -Information Security	CO1213 - Soft Computing

A. Course code and definition:

Course code	Definitions
L	Lecture
T	Tutorial
P	Practical
E	Theory External Examination Marks
M	Theory Internal Examination Marks
I	Practical Internal Examination Marks
V	Practical External Examination Marks

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1201
Subject Name: Object Oriented Programming

Semester: - III

Type of course: Engineering Core

Prerequisite: Knowledge of Computer.

Rationale: The OOP is all about creating objects that can interact with each other, this makes it easier to develop programs in OOP as we can understand the relationship between them.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
2	0	2	3	70	30	20	30	150

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Concepts of OOP** Introduction OOP, Procedural Vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP.	3
2	**C++ Basics** Overview, Program structure, namespace, identifiers, variables, constants, enum, operators, typecasting, control structures.	3
3	**C++ Functions** Simple functions Call and Return by reference, Inline functions, Macro Vs. Inline functions, Overloading of functions, default arguments, friend functions, and virtual functions.	5

Diploma of Engineering
Subject Code: CO1201
Subject Name: Object Oriented Programming

	SECTION-B	
4	**Inheritance** Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class.	**4**
5	**Polymorphism** Pointers in C++, Pointers and Objects, this pointer, virtual and pure virtual functions, Implementing polymorphism.	**4**
6	**Objects and Classes** Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading, type conversion.	**5**

Text Book:

1. The complete reference C – by Herbert shieldt Tata McGraw Hill Publication.
2. Object Oriented Programming in C++ Saurav Sahay Oxford University Press.
3. Object Oriented Programming in C++ R Rajaram New Age International Publishers 2nd .
4. OOPS C++ Big C++ Cay Horstmann Wiley Publication.

Reference Books:

1. Herbert Schildt C++: Complete Reference (TMH).
2. Bjarne Stroustrupe C++ Programming Language (Addison-Wesley).
3. Venugopal Mastering C++. (TMH).
4. Lipmann C++ Primer (Addison-Wesley).
5. Savitch: Problem Solving using C++ (AddisonWesley) Low- Priced Edition.

Practical List :

1. Write C++ program to display week day's index number.
2. Problems involving control structures
    a. Write C++ program to find addition of 1 to 20 numbers.

Diploma of Engineering
Subject Code: CO1201
Subject Name: Object Oriented Programming

   b. Write C++ program to calculate addition, subtraction, multiplication, division of two numbers .
3. Write C++ program for implementing friend function.
4. Write a C++ program to find out the payroll system using single inheritance.
5. Write a C++ program for multiplication of two numbers using multiple inheritances.
6. Write a C++ program for calculating students' total marks and percentage using multilevel inheritance.
7. Write a C++ program for implementing this pointer.
8. Write a C++ program to demonstrate the working of virtual base class.
9. Write a C++ program for following :
   a. Display person's id, name and salary using this pointer.
   b. Addition of 3 numbers using function overloading.
   c. Implement concept of virtual function –Take Parent class as animal and subclasses as dog and cat.
10. Write a C++ program to calculate prime number using default, copy and parameterized constructor of class

Course Outcomes:

Students will be able to:

Sr. No.	CO statement
CO-1	**Define** concept of object oriented programming with examples.
CO-2	**Explain** basic concept of object oriented programming using variables and operators.
CO-3	**Learn** various functions theoretically.
CO-4	**Implement** inheritance concept with the help of practical.
CO-5	**Design** concept of pointers and objects using polymorphism.
CO-6	**Illustrate** various types of constructors and destructors.

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1202
Subject Name: Operating System

Semester: - III

Type of course: Engineering Core

Prerequisite: Knowledge of Computer

Rationale:
A general introduction to various ideas in implementation of operating systems, particularly UNIX. Introduce to various options available so as to develop capacity to compare, contrast, and evaluate the key trade-offs between different design choices.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Overview** of Operating System, basic concepts, UNIX/LINUX Architecture, Kernel, services and systems calls, system programs.	**5**
2	**Process Management:** Process concepts, operations on processes, IPC, Process Scheduling, Multithreaded programming	**8**
3	**Memory management:** Memory allocation, Swapping, Paging, Segmentation, Virtual Memory, various faults.	**6**
	SECTION-B	
4	**File management:** Concept of a file, access methods, directory structure, file system mounting, file sharing and protection, file system structure and implementation, directory implementation, freespace management,	**7**

Diploma of Engineering
Subject Code: CO1202
Subject Name: Operating System

	efficiency and performance. Different types of file systems.	
5	**I/O System:** Mass storage structure - overview, disk structure, disk attachment, disk scheduling algorithms, swap space management, RAID types.	**6**
6	**OS Security:** Authentication, Access Control, Access Rights, System Logs.	**4**

Practical List:

1. Study of Basic commands of Linux/UNIX.
2. Study of Advance commands of Linux/UNIX.
3. Write shell scripts to perform several computations like add numbers, subtract numbers, find average, percentage.
4. Write shell scripts to find factorial of a given number.
5. Write a shell script which will accept a number b and display first n prime numbers as output.
6. Write a shell script which will generate first n Fibonacci numbers.
7. Write a menu driven shell script which will print the following menu and execute the given task.
   a. Display calendar of current month
   b. Display today's date and time
   c. Display usernames those are currently logged in the system
   d. Display your name at given x, y position
   e. Display your terminal number
8. Write a shell script to read n numbers as command arguments and sort them in descending order.
9. Write a shell script to display all executable files, directories and zero sized files from current directory
10. Write a program for process creation using C. (Use of gcc compiler).

Text Book :

1. Operating System Concepts – Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, 8th edition, Wiley-India, 2009.
2. Modern Operating Systems – Andrew S. Tanenbaum, 3rd Edition, PHI
3. Operating Systems: A Spiral Approach – Elmasri, Carrick, Levine, TMH Edition

Diploma of Engineering
Subject Code: CO1202
Subject Name: Operating System

Reference Book:

1. Operating System Concepts, Silberschatz and Galvin, Wiley India Limited.
2. UNIX Concepts and Applications, Sumitabha Das, McGraw-Hill Education.
3. Operating Systems, Internals and Design Principles, Stallings, PearsonEducation, India
4. Modern Operating Systems, Andrew S. Tanenbaum, Prentice Hall of India.
5. Operating systems, Deitel & Deitel, Pearson Education, India.

Sr. No.	CO statement
CO-1	**Define** concept of various operating system with their architecture.
CO-2	**Construct** process management, multithreading, memory management.
CO-3	**Understand** concept of memory and virtual memory.
CO-4	**Explain** the concept file management with architecture and free space.
CO-5	**Design** various disk scheduling algorithms and represent it by algorithm,
CO-6	**Prepare** the operating system security issues.

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1203
Subject Name: Data Structure

Semester: - III

Type of course: Engineering Science

Prerequisite: Knowledge of Computer

Rationale: To provide strong foundation for implementing programming language to formulate, analyze and develop solutions related to various data structure problems.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Introduction to Data Structures:** Basic Terminology, Classification of Data Structures, Operations on Data Structures.	4
2	**Linear Data Structures**: Stacks: Introduction to Stacks, Array Representation of Stacks, Operations on a Stack, Applications of Stacks-Infix-to-Postfix Transformation, evaluating Postfix Expressions.	7
3	**Queues:** Introduction to Queues, Array Representation of Queues, Operations on a Queue, Types of Queues-DeQueue, Circular Queue, Applications of Queues-Round Robin Algorithm.	7
	SECTION-B	

Diploma of Engineering
Subject Code: CO1203
Subject Name: Data Structure

4	**Linked Lists:** Singly Linked List, Representation in Memory, Operations on a Single Linked List, Circular Linked Lists, Doubly Linked Lists, Linked List Representation and Operations of Stack, Linked list representation and operations of queue.	**5**
5	**Non Linear Data Structures** - Trees: Basic Terminologies, Definition and Concepts of Binary Trees, Representations of a Binary Tree using Arrays and Linked Lists, Operations on a Binary Tree-Insertion, deletion, Type of Binary Tree. **Graphs:** Graph Terminologies, Representation of Graphs- Set, Linked, Matrix, Graph Traversals	**7**
6	**Binary tree -**Representation in memory Binary Search Trees: Searching, Inserting, Deletion and Traversals using Stacks. Balanced Binary Trees: AVL Search Trees.	**6**

Text Book:

1. Data Structures A Psedocode Approach with C, Richard F. Gilberg & Behrouz A. Forouzan, second edition, CENGAGE Learning.
2. Data Structures using C, Reema Thareja, Oxford University press.
3. Introduction to Data Structure and its Applications Jean-Paul Tremblay, P. G. Sorenson.

Reference Book:

1. William Stallings: Computer Organization & Architecture, 9th Edition, Pearson, 2015.
2. Computer Organization / Hamacher, Vranesic, Zaky / T.M.H
3. Computer Organization and Organization / B Ram / Tata McGraw-Hill.

Practical List :

1. Write a program to Implement Stack operations like push and pop using array and linked list
2. Write a program to implement infix to postfix transformation.

Diploma of Engineering
Subject Code: CO1203
Subject Name: Data Structure

3. Write a program to implement insertion and deletion of Queue operations using array and linked list.
4. Write a program to perform the following operations in singly linked list – Creation, Insertion, and Deletion.
5. Write a program to perform the following operations in doubly linked list – Creation, Insertion, and Deletion
6. Write a program to implement circular linked list
7. Write a program to implement Breadth First Search (BFS)
8. Write a program to implement Depth First Search (DFS)
9. Write a program to implement a binary search tree.
10. Write a program to find the minimum depth of a binary tree.

Course Outcomes:

Student will be able to:

Sr. No.	CO statement
CO-1	**Define** and classify various data structures, storage structures and common operations on them
CO-2	**Create** various linear data structures with their representation and perform different operations on them
CO-3	**Implement** different data structure
CO-4	**Create** various nonlinear data structures with their representation and perform different operations on them
CO-5	**Use** appropriate data structures for solving computing problem
CO-6	**Solve** the given a problem using an appropriate data structure to achieve optimal performance

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1204
Subject Name: Database Management System

Semester: - III

Type of course: Engineering Core.

Prerequisite: Knowledge of Computer.

Rationale: It covers the development of database-driven applications using the capabilities provided by modern database management system software. The concepts include conceptual modeling, relational database design and database query languages.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Introduction of Database :** What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management,	4
2	**Data models:** The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction.	4
3	**Database design and ER Model :**Overview, ER-Model, Constraints, ER-Diagrams, ERD Issues, weak entity sets, Codd's rules, Relational Schemas, Introduction to UML Relational database model: Logical view of data, keys, integrity rules. Relational Database design: features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF, BCNF).	8

Diploma of Engineering
Subject Code: CO1204
Subject Name: Database Management System

	SECTION-B	
4	**Relational Algebra:** introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison. Calculus: Tuple relational calculus, Domain relational Calculus, calculus vs algebra, computational capabilities.	**7**
5	**Constraints:** What is constraints, types of constraints, Integrity constraints, Views: Introduction to views, data independence, security, updates on views, comparison between tables and views SQL: data definition, aggregate function, Null Values, nested sub queries, Joined relations. Triggers.	**6**
6	**Transaction Management:** ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks),Time stamping methods, optimistic methods, database recovery management.	**7**

Text Book:

1. G. K. Gupta :"Database Management Systems", McGraw – Hill.
2. Korth, Slberchatz,Sudarshan, :"Database System Concepts", 6th Edition, McGraw – Hill
3. Elmasri and Navathe, " Fundamentals of Database Systems", 5thEdition, PEARSON Education.
4. Peter Rob and Carlos Coronel, " Database Systems Design, Implementation and Management", Thomson Learning, 5th Edition.

Reference Books :

1. Dr. P.S. Deshpande, SQL and PL/SQL for Oracle 10g,Black Book, Dreamtech Press Mark L.
2. Gillenson, Paulraj Ponniah, " Introduction to Database Management",Wiley.
3. Sharaman Shah ,"Oracle for Professional", SPD.
4. Raghu Ramkrishnan and Johannes Gehrke, "Database Management Systems",TMH

Diploma of Engineering
Subject Code: CO1204
Subject Name: Database Management System

5. Debabrata Sahoo "Database Management Systems" Tata McGraw Hill, Schaum's Outline.

Practical List:

1. Design a Database and create required tables. For e.g. Bank, College.
2. Apply the constraints like Primary Key , Foreign key, NOT NULL to the tables.
3. Write a SQL statement for implementing ALTER,UPDATE and DELETE.
4. Write the queries to implement the joins .
5. Write the query for implementing the following functions: MAX(),MIN(),AVG(),COUNT() .
6. Write the query to implement the concept of Integrity constrains
7. Write the query to create the views.
8. Perform the queries for triggers.
9. Perform the following operation for demonstrating the insertion, updation and deletion using the referential integrity constraints
10. Write the query for creating the users and their role.

Course Outcomes:

Students will be able to:

Sr. No.	CO statement
CO-1	**Define** database ,database management system with its architecture
CO-2	**Learn** various data models and its types.
CO-3	**Design** various ER diagram and represent it using concept of UML.
CO-4	**Explain** relational algebra and types of tuples by designing diagrams on real time examples.
CO-5	**Compare** tables and views of SQL by applying different different constraints on given data.
CO-6	**Write** ACID properties and concept of deadlock.

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1205
Subject Name: Computer Organization

Semester: - III

Type of course: Engineering Science

Prerequisite: Knowledge of Computer

Rationale: It begin with basic structure and operation of a digital computer, its architectures and computational designs.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Basic operational concepts** :Connection between processor and main memory Instruction formats - zero, one, two, three and One & half address instruction formats	4
2	**Machine Instructions and Programs:** Memory Location and Addresses, Memory Operations, Instructions and Instruction Sequencing, Addressing Modes, Assembly Language, Basic Input and Output Operations, Subroutines, Encoding of Machine Instructions	7
3	**Input/output Organization:** Accessing I/O Devices, Interrupts – Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Controlling Device Requests, Exceptions, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces – PCI	6

Diploma of Engineering
Subject Code: CO1205
Subject Name: Computer Organization

	Bus, SCSI Bus, USB.	
SECTION-B		
4	**Memory System:** Basic Concepts, Semiconductor RAM Memories, Read Only Memories, Speed, Size, and Cost, Cache Memories – Mapping Functions, Performance Considerations, Virtual Memories, And Secondary Storage.	**7**
5	**Basic Processing Unit:** Some Fundamental Concepts, Execution of a Complete Instruction, Multiple Bus Organization, Hard-wired Control, and Micro programmed Control. Embedded Systems and Large	**6**
6	**Computer Systems:** Examples of Embedded Systems, Processor chips for embedded applications, Simple Microcontroller. The structure of General-Purpose Multiprocessors.	**5**

Text Books:

1. Computer System Architecture – M. Moris Mano, Third Edition, Pearson/PHI.

Reference Books:

1. William Stallings: Computer Organization & Architecture, 9th Edition, Pearson, 2015.
2. Computer Organization / Hamacher, Vranesic, Zaky / T.M.H
3. Computer Organization and Architecture / William Stallings / Prentice Hall of India, Delhi.
4. Computer Fundamentals – Architecture and Organization / B Ram / Tata McGraw-Hill

Course Outcomes:

Student will be able to:

Sr. No.	CO statement
CO-1	**Understand** the basics of instructions sets and their impact on processor design
CO-2	**Demonstrate** an understanding of the design of the functional units of a digital computer system.
CO-3	**Learn** different different addressing modes, subroutines.
CO-4	**Evaluate** cost performance and design trade-offs in designing and constructing a

Diploma of Engineering
Subject Code: CO1205
Subject Name: Computer Organization

	computer processor including memory.
CO-5	**Examine** multiple bus organization and embedded system in brief.
CO-6	**Manipulate** structure of embedded system.

Diploma of Engineering
Subject Code: MH1201
Subject Name: Communication Skills in English

Shroff S.R. Rotary Institute of Chemical Technology

Semester: III

Type of course: Language and Communication

Prerequisite: Zeal to learn the Language

Rationale: The rationale of the curriculum is to help students to express their original ideas in English and also develop interest in language and literature with a focus on comprehension, and reading, speaking and writing skills.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No	Content	Total Hrs.
	SECTION-A	
1	**Prose:** 1) An Astrologer's Day by R. K. Narayan 2) The Portrait of a Lady by Khushwant Singh, 3) Sparrows by K.A. Abbas 4)The Night Train at Deoli by Ruskin Bond	**6**
2	**Poetry**:1) My Grandmother by Elizabeth Jennings, 2) My Papa's Waltz by Theodore Roethke, 3) The Road Not Taken by Robert Frost 4) The Tyger by William Blake.	**7**
3	**Fiction:** Robinson Crusoe by Daniel Defoe	**7**
	SECTION-B	
4	Listening Ability: Hearing & Listening, Types of Listening, Traits of an Effective Listener	**6**

Diploma of Engineering
Subject Code: MH1201
Subject Name: Communication Skills in English

5	Speaking Skills: Group Discussion, Interview, Presentation Strategies , Public Speaking	**6**
6	Writing :Mastering the final Skill: Paragraph Writing, Comprehension Passage Business Letters-Complaint, Enquiry, Sales, Order, Apology) Email Etiquettes	**7**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
15	15	15	15	5	5

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Reference Books:

1. Prism: Spoken and Written Communication, Prose & Poetry' published by Orient Longman
2. Robinson Crusoe, Daniel Defoe, Harper Collins, UK
3. Communication Skills by Sanjay Kumar& Pushp Lata, OUP.
4. The Most Anthologized Poems of the Last 25 Years - Literary ...

List of Practicals /Tutorials:

Language Laboratory Activities:

Sr. No.	Practical/ Exercise	Apprx. Hours required
1	Conversation at a Clinic	**2**
2	Seeking Information about various Engineering Programs at an Institute	**2**
3	At the cinema Hall	**2**

4	Letter Writing	**2**
5	Conversing with your colleagues/Co-workers	**2**
6	Comprehension Passage	**2**
7	Picture Description & Completion of a Story	**2**
8	Presentation.	**2**
9	Group Discussion	**2**
10	Interview	**2**

Course Outcomes:

After Learning this course, students will be able to:

Sr. No.	**CO statement**
CO-1	Use English in day-to-day communication
CO-2	Use various forms of vocabulary in varied situations in oral and written communication.
CO-3	Comprehend the dynamics of various rules of grammar and check its validation while they speak and write language correctly
CO-4	Use grammar effectively to make themselves competent Listener, Speaker, Reader and Writer by exposing to various set of situations
CO-5	Write various formal and informal documents of day to day life
CO-6	Prepare for lifelong learning and enjoyment of English Language and literature.

List of Open Source Software/learning website:

- http://www.free-english-study.com/
- http://www.english-online.org.uk/course.htm

(Established under Gujarat Private Universities Act, 2009)

Diploma of Engineering
Subject Code: MH1202
Subject Name: Essence of Indian Traditional Knowledge

Shroff S.R. Rotary Institute of Chemical Technology

Semester: III

Type of course: Audit Course

Prerequisite: Zeal to learn the subject.

Rationale: At the end of the course, students will become aware of certain knowledge traditions and practices of India that are being followed in their families and society around them.

Teaching and Examination Scheme:

Teaching Scheme				Examination Marks				Total Marks
L	T	P	C	Theory Marks				
				ESE (E)	PA (M)	ESE (V)	PA (I)	
1	-	-	0	-	-	30	20	50

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Introduction to Traditional Knowledge:** Definition of traditional knowledge, scope and importance, kinds of traditional knowledge, traditional knowledge Vs western knowledge.	03
2	**Protection of Traditional Knowledge:** Significance of protection of traditional knowledge,	02
3	**Role of Government:** Role of Government to harness traditional knowledge.	02
	SECTION-B	
4	**Education System in India**: Education in ancient, medieval and modern India, Aims of education, Different subjects of traditional education in India.	03
5	**Civilization and Culture:** Culture and Civilization, Cultural Heritage.	02

Diploma of Engineering
Subject Code: MH1202
Subject Name: Essence of Indian Traditional Knowledge

6	**Essence of Indian Culture:** Essence of Indian Traditional Culture.	**01**

Suggested Specification table with Marks (Practical):

Distribution of Practical Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	**10**	**5**	**5**	**10**	**10**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Reference Books:

1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002.
2. "Knowledge Traditions and Practices of India" Kapil Kapoor, Michel Danino.

Course Outcomes: After completing the course, students will be able to

Sr. No.	**CO statement**
CO-1	Understanding the concept of traditional knowledge and its importance
CO-2	Analyzing the need and importance of protecting traditional knowledge
CO-3	Understanding the traditional educational system in India
CO-4	Analyzing the Indian civilization and culture
CO-5	Understanding the basics and essence of traditional and western knowledge
CO-6	Analyzing the cultural heritage of traditional and modern India

List of Open Source Software/learning website:

- https://en.wikipedia.org/wiki/Traditional_knowledge
- https://oufastupdates.com/essence-of-indian-traditional-knowledgeeitk/

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1206
Subject Name: Algorithm

Semester: - IV

Type of course: Engineering Science

Prerequisite: Knowledge of Computer

Rationale: The objective of this course is to prepare the student with the algorithmic foundations of computing. A sound grasp of algorithms is essential for any computer science engineer. Almost all programming involves algorithms at some level.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
2	0	2	3	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Introduction:** Programming Models, Data Abstraction. Sets, Multisets, Stacks, Queues. Asymptotic and worst-case analysis of algorithms.	4
2	**Sorting:** The sorting problem, Bubble sort, Selection sort, Insertion sort, Merge sort, Quicksort.	5
3	**Strings:** String Sort, Tries. Substring Search. Regular Expressions, Elementary Data compression.	3
	SECTION-B	
4	**Searching**: Symbol Tables, Binary Search Trees, Balanced Search Trees. Hash Tables.	3

Diploma of Engineering
Subject Code: CO1206
Subject Name: Algorithm

5	**Graphs:** Definition of a directed and undirected graph. Paths, Cycles, spanning trees. Directed Acyclic Graphs. Topological Sorting. Minimum Spanning Tree algorithms. Shortest Path algorithms: Dijkstra's algorithm, Flow based algorithms.	**5**
6	**Backtracking and Branch and bound:** General Method, Backtracking: N-queen problem, Sum of subsets, Graph coloring, Branch and Bound: Travelling Salesperson Problem.	**4**

Text Book:

1. Ellis horowitz, sartaj Sahni, s. Rajsekaran. "Fundamentals of computer algorithms" University Press.
2. T.H.coreman, C.E. Leiserson,R.L. Rivest, and C. Stein, "Introduction to algorithms", 2nd edition , PHI publication 2005.
3. Alfred v. Aho, John E. Hopcroft , Jeffrey D. Ullman , "Data structures and Algorithm" .

Reference Books:

1. Algorithms, Sedgewick and Wayne, Pearson
2. Introduction to Algorithms, Cormen, Leiserson, Rivest and Stein. MIT Press
3. Introduction to Theory of Computation, Sipser Michael, Cengage Learning.
4. Design & Analysis of Algorithms, Gajendra Sharma, Khanna Publishing House.

Practical List:

1. Write a program to implement Merge Sort
2. Write a program to implement Insertion Sort.
3. Write a program to implement Bubble Sort
4. Write a program to implement Selection Sort.
5. Write a program to implement Quick Sort.
6. Write a program to implement Binary Search Trees
7. Write a program to implement Hash Tables.
8. Implementation of Graph and Searching (DFS and BFS).
9. Write a program to implement Dijkstra's algorithm.
10. Write a program to implement travelling salesman problem.

Diploma of Engineering
Subject Code: CO1206
Subject Name: Algorithm

Sr. No.	CO statement
CO-1	**Analyze** programming model also study worst case analysis.
CO-2	**Learn** various sorting strategies with number of examples
CO-3	**Prepare** string and generate sub string using regular expression from it.
CO-4	**Describe** searching trees and also study hash table.
CO-5	**Illustrate** directed and undirected graph through programming paradigm.
CO-6	**Understand** the concept backtracking and trace travelling salesman problem through it.

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1207
Subject Name: Computer Networks

Semester: - IV

Type of course: Engineering Core

Prerequisite: Knowledge of Computer

Rationale: Understand functioning of computer networks and popular networking protocols

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Introduction to computer networks:** Network Models- OSI Reference Model, TCP/IP Model	**6**
2	**Transmission Media** – principles, issues and examples; Wired Media – Coaxial, UTP, STP, Fiber Optic Cables; Wireless Media – HF, VHF, UHF, Microwave, Ku Band; Network topologies; Data Link Layer – design issues, example protocols (Ethernet, WLAN, Bluetooth); Switching Techniques	**7**
3	**Network Layer**: design issues, example protocols (IPv4); Routing - principles/issues, algorithms (Distance-vector, Link-state) and protocols (RIP, OSPF)	**5**
	SECTION-B	

Diploma of Engineering
Subject Code: CO1207
Subject Name: Computer Networks

4	**Transport Layer:** design issues, example protocols (TCP/UDP); Application Layer Protocols (SMTP, DNS).	**6**
5	**Functioning of Network Devices**: NIC, Hub, Switch, Router, WiFi Devices; Network Management System and example protocol (SNMP).	**6**
6	**Application Layer:** Principles of computer applications, Web and HTTP, E-mail, DNS, Socket programming with TCP and UDP.	**6**

Text Book:

1. S. Tanenbaum,"Computer Networks", 4th edition, Prentice Hall
2. F. Ferouzan,"Data and Computer Communication", Tata McGraw Hill

Reference Books:

1. Computer Networks, 4th Edition (or later), Andrew S. Tanenbaum, PHI
2. TCP/IP Illustrated, Volume-1, W. Richard Stevens, Addision Wesley
3. Data and Computer Communications, William Stallings, PHI
4. An Engineering Approach to Computer Networking, S. Keshav, Addision Wesley/Pearson
5. An Integrated Approach to Computer Networks, Bhavneet Sidhu, Khanna Publishing House.

Practical List:

1. Showing various types of networking cables and connectors, identifying them clearly
2. Looking at specifications of cables and connectors of various companies on Internet, find out differences.
3. Making patch cords using different types of cables and connectors - crimping, splicing, etc.
4. Demonstration of different type of cable testers, using them for testing patch cords. Prepared by the students in Lab and standard cables prepared by professionals
5. Configuring computing devices (PC, Laptop, Mobile, etc) for network, exploring different options and their impact – IP address, gateway, DNS, security options, etc

Diploma of Engineering
Subject Code: CO1207
Subject Name: Computer Networks

6. Showing various networking devices – NICs, Hub, Switch, Router, WiFi access point, etc.
7. Looking at specifications of various networking devices various companies on Internet, find out differences.
8. Network simulation tool (e.g. Cisco Packet Tracer).
9. Setting up a small wired LAN in the Lab.
10. Setting up a small wireless LAN in the Lab.

Course Outcomes:

Students will be able to:

Sr. No.	CO statement
CO-1	**Compare** OSI and TCP/IP model and study all layers in detail.
CO-2	**Explain** Guided and unguided media with real life example.
CO-3	**Understand** structure of routing by designing various protocols in details.
CO-4	**Learn** layers of OSI models and observe how they interact and share data with each other.
CO-5	**Examine** various networking devices and networking monitoring system with the help of protocols.
CO-6	**Write** principals of computer application .Design difference between protocols of Socket programming

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1208
Subject Name: Web Technologies

Semester: - IV

Type of course: Engineering Science

Prerequisite: Knowledge of Computer

Rationale:
To provide basic skills on tools, languages and technologies related to website development. Learnings from this course may be used in the Mini Project and summer internship

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Introduction**: Concept of WWW, Internet and WWW, HTTP Protocol Request and Response, Web browser and Web servers, Features of Web 2.	**4**
2	**Web Design:** Concepts of effective web design, Web design issues including Browser, Bandwidth and Cache, Display resolution, Look and Feel of the Website, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation	**6**
3	**HTML** : Basics of HTML, formatting and fonts, commenting code,	**8**

Diploma of Engineering
Subject Code: CO1208
Subject Name: Web Technologies

	color, hyperlink, lists, tables, images, forms, XHTML, Meta tags, Character entities, frames and frame sets, Browser architecture and Web site structure. Overview and features of HTML5.	
	SECTION-B	
4	**Style sheets** : Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2, Overview and features of CSS3	**6**
5	**JavaScript** : Client side scripting with JavaScript, variables, functions, conditions, loops and repetition, Pop up boxes PHP : Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, string	**6**
6	**XML**: Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Using XML with application. Transforming XML using XSL and XSLT	**6**

Text Book:

1. Web Technologies, Uttam K Roy, Oxford University Press
2. The Complete Reference PHP — Steven Holzner, Tata McGraw-Hill

Reference Books:

1. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
2. Web Technologies, Black Book, dreamtech Press
3. HTML 5, Black Book, dreamtech Press
4. Web Design, Joel Sklar, Cengage Learning
5. Developing Web Applications in PHP and AJAX, Harwani, McGrawHill
6. Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel, Pearson

Diploma of Engineering
Subject Code: CO1208
Subject Name: Web Technologies

Practical List:

1. Home page Development static pages (using Only HTML) of an online Book store.
2. Create a HTML page, which has properly aligned paragraphs with image using CSS.
3. Display a simple message "Welcome to my webpage !!!" on your demo webpage using javascript.
4. Validate the Registration, user login and payment by credit card pages using JavaScript.
5. Create your own style sheets and use them in your web page.
6. To write a program, which takes user id as input and displays the user details by taking the user information from the XML document
7. Write a program to store the form fields in a database, use any appropriate Server Slide Scripting.
8. To write a program, which takes user id as input and displays the user details by taking the user information from the XML document.
9. Write a PHP program for sending and receiving plain text message (e -mail).
10. Develop a simple program in PHP for array.

Course outcomes:
Student will be able

Sr. No.	CO statement
CO-1	**Describe** the concepts of WWW including browser and HTTP protocol.
CO-2	**Define** the CSS with its types and use them to provide the styles to the web pages at various levels.
CO-3	**Develop** the modern web pages using the HTML and CSS features with different layouts as per need of applications.
CO-4	**Use** the JavaScript to develop the dynamic web pages.
CO-5	**Create** server side scripting with PHP to generate the web pages

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1209
Subject Name: Java Programming

Semester: - IV

Type of course: Engineering Core

Prerequisite: Knowledge of Computer programming like C, C++.

Rationale: Java is a general-purpose computer programming language that is a class-based, object-oriented. It is intended to let application developers "write once, run anywhere" meaning that compiled Java code can run on all platforms that support Java without the need for recompilation.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Basics of Java:** Features of Java, Byte Code and Java Virtual Machine, JDK, Data types, Operator, Control Statements – If , else, nested if, if-else ladders, Switch, while, do-while, for, for-each, break, continue.	6
2	**Package:** Use of Package, CLASSPATH, Import statement, Static import, Access control.	5
3	**Exception Handling:** Exception and Error, Use of try, catch, throw, throws and finally, Built in Exception, Custom exception, Throwable Class.	6

Diploma of Engineering
Subject Code: CO1209
Subject Name: Java Programming

	SECTION-B	
4	**Inheritance and Interfaces:** Use of Inheritance, Inheriting Data members and Methods, constructor in inheritance, Multilevel Inheritance – method overriding Handle multilevel constructors – super keyword, Stop Inheritance - Final keywords, Creation and Implementation of an interface, Interface reference, instanceof operator, Interface inheritance, Dynamic method dispatch ,Understanding of Java Object Class, Comparison between Abstract Class and interface, Understanding of System.out.println – statement	**9**
5	**Collection Classes :** List, AbstractList, ArrayList, LinkedList, Enumeration, Vector, Properties, Introuduction to Java.util package	**4**
6	**Java Web Frameworks: Spring MVC** Overview of Spring, Spring Architecture, bean life cycle, XML Configuration on Spring, Aspect – oriented Spring, Managing Database, Managing Transaction	**6**

Text Book:

1. JAVA: The Complete Reference, Herbert Schildt, Ninth Edition, Oracle Press. 2 E. Balagurusamy, 'Programming with Java', McGraw Hill Education.

Reference Book:

1. Java Fundamentals A comprehensive introduction By Herbert Schildt, Dale Skrien, McGraw Hill Education.
2. Programming with Java A Primer – E.Balaguruswamy,Mc Grawhill
3. The Complete Reference, Java 2 (Fourth Edition),Herbert Schild, - TMH.
4. Core Java Volume-I Fundamentals Horstmann & Cornell, - Pearson Education. - Eight Edition

Practical List:

1. Install the JDK (Download the JDK and install it.)
   - Set path of the jdk/bin directory.
   - Create the java program Compile and run the java program

Diploma of Engineering
Subject Code: CO1209
Subject Name: Java Programming

Write a simple "Hello World" java program, compilation, debugging, executing using java compiler and interpreter.

2. Write a program to convert rupees to dollar. 60 rupees=1 dollar.
3. Write a program that calculate percentage marks of the student if marks of 6 subjects are given.
4. Write a program to find length of string and print second half of the string.
5. Write a java program which should display maximum number of given 4 numbers.
6. Write a program to accept a line and check how many consonants and vowels are there in line.
7. Write a program to count the number of words that start with capital letters.
8. Write a program to find that given number or string is palindrome or not.
9. Write a program in Java to demonstrate throw, throws, finally, multiple try block and multiple catch exception.
10. Write a program of XML using java framework.

Course Outcomes:

Student will be able to:

Sr. No.	CO statement
CO-1	**Understand** the differences between Android and other mobile development environments.
CO-2	**Learn** how Android applications work.
CO-3	**Use** life cycle, manifest, intents, and using external resources.
CO-4	**Design** and develop useful Android applications with compelling user interfaces by using,
CO-5	**Create** own layouts and views and using menus, data storage and other APIs.
CO-6	**Implement** java framework.

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1210
Subject Name: Software Engineering

Semester: - IV

Type of course: Engineering Science

Prerequisite: Knowledge of Computer

Rationale:
Inculcate essential technology and software engineering knowledge and skills essential to build a reasonably complex usable and maintainable software iteratively. 2) Emphasize on structured approach to handle software development. 3) Enhance communication skills.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	1	0	4	70	30	0	50	150

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Introduction to Software Engineering** Lifecycle, Process Models - Traditional v/s Agile processes.	**5**
2	**Development Activities** - Requirements Gathering and Analysis, Design Concepts, Software architecture and Architectural styles, Basic UI design, Effective Coding and Debugging techniques.	**6**
3	**Software Testing** Basics, Unit, Integration, System and Acceptance Testing, Introduction to various testing techniques (e.g. Stress testing), Writing and executing test cases, Quality Assurance.	**6**
	SECTION-B	

Diploma of Engineering
Subject Code: CO1210
Subject Name: Software Engineering

4	**Metrics for Process and Products:** Software measurement, metrics for software quality. **Risk management:** Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM, RMMM plan.	**6**
5	**Quality Management**: Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability, the ISO 9000 quality standards.	**6**
6	**Project Management** Project management concepts, Configuration and Release Management, Version Control and its tools (Git), Release Planning, Change Management, Software Maintenance, Project Metrics.	**7**

Text Book:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, Mc Graw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson Education.
3. The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education.

Reference Book:

1. Software Engineering – A Practitioner's Approach, 7th Edition, Roger Pressman.
2. Software engineering, Ian Sommerville, Pearson Education
3. An Integrated Approach to Software Engineering, Pankaj Jalote, Springer Verlag
4. Software Engineering, Nasib Singh Gill, Khanna Book Publishing Co. India.
5. Software Engineering, K. K. Agarval, Yogesh Singh, New Age International Publishers

Diploma of Engineering
Subject Code: CO1210
Subject Name: Software Engineering

Course outcomes:

Students will be able to:

Sr. No.	CO statement
CO-1	**Understand** life cycle of software engineering.
CO-2	**Describe** the architecture of software.
CO-3	**Apply** various testing techniques and test plan.
CO-4	**Identify** the software risks.
CO-5	**Evaluate** the standards of quality assurance
CO-6	**Explain** various tools for project management.

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1211
Subject Name: Information Security

Semester: - IV

Type of course: Engineering Science

Prerequisite: Knowledge of Computer

Rationale:
To learn how to evaluate and enhance information security of IT infrastructure and organizations.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	1	0	4	70	30	0	50	150

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Introduction – Security services**: security services, security mechanisms, Symmetric Cipher Model, Cryptography, Cryptanalysis and Attacks; Substitution and Transposition techniques	**5**
2	**Symmetric Encryption:** Stream ciphers and block ciphers, Block Cipher structure, Data Encryption standard (DES)	**6**
3	**Cipher Mode:** Electronic Code Book, Cipher Block Chaining Mode, Cipher Feedback mode, Output Feedback mode, Counter mode	**6**
	SECTION-B	

Diploma of Engineering
Subject Code: CO1211
Subject Name: Information Security

4	**Asymmetric Encryption:** Public Key Cryptosystems with Applications, Requirements and Cryptanalysis, RSA algorithm, its computational aspects and security, Diffie-Hillman Key Exchange algorithm, Man-in-Middle attack	**7**
5	**Key management and distribution**: Key management and distribution, symmetric key distribution using symmetric and asymmetric encryptions, distribution of public keys.	**6**
6	**Web Security:** Web Security threats and approaches, SSL architecture and protocol, Transport layer security, HTTPS and SSH	**6**

Text Book:

1. Cryptography And Network Security, Principles And Practice Sixth Edition, William Stallings, Pearson

Reference Books:

1. Information Security Principles and Practice By Mark Stamp, Willy India Edition
2. Cryptography & Network Security, Forouzan, Mukhopadhyay, McGrawHill

Course outcomes:

Students will be able to

Sr. No.	CO statement
CO-1	**Understand** the basics of Information security.
CO-2	**Identify** the principles of symmetric cryptography.
CO-3	**Analyze** information security modes.
CO-4	**Explain** the concept of Asymmetric cryptography.
CO-5	**Illustrate** use of various key management.
CO-6	**Describe** the standards of web security.

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1212
Subject Name: Cyber Security

Semester: - IV

Type of course: Engineering Science

Prerequisite: Knowledge of Computer

Rationale: Basic fundamental knowledge of computers, Internet and network.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Systems Vulnerability Scanning:** Overview of vulnerability scanning, Open Port / Service Identification, Banner / Version Check, Traffic Probe, Vulnerability Probe, Vulnerability Examples, OpenVAS, Metasploit. Networks Vulnerability Scanning - Netcat, Socat, understanding Port and Services tools - Datapipe, Fpipe, WinRelay. Network Sniffers and Injection tools – Tcpdump and Windump, Wireshark, Ettercap, Hping Kismet.	**6**
2	**Network Defense tools :** Firewalls and Packet Filters: Firewall Basics, Packet Filter Vs Firewall, How a Firewall Protects a Network, Packet Characteristic to Filter, Stateless Vs Stateful Firewalls, Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks, Linux Firewall, Windows Firewall.	**7**

Diploma of Engineering
Subject Code: CO1212
Subject Name: Cyber Security

3	**Web Application Tools:** Scanning for web vulnerabilities tools: Nikto, W3af, HTTP utilities - Curl, OpenSSL and Stunnel, Application Inspection tools – Zed Attack Proxy, Sqlmap. DVWA, Webgoat, Password Cracking and Brute-Force Tools –John the Ripper, L0htcrack, Pwdump, HTC-Hydra.	**6**
	SECTION-B	
4	**Introduction to Cyber Crime and law :**Cyber Crimes, Types of Cybercrime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, Clarification of Terms, Traditional Problems Associated with Computer Crime, Introduction to Incident Response, Digital Forensics.	**6**
5	**Computer Crime :** Computer Language, Network Language, Realms of the Cyber world, A Brief History of the Internet, Recognizing and Defining Computer Crime, Contemporary Crimes, Computers as Targets, Contaminants and Destruction of Data, Indian IT ACT 2000.	**5**
6	**Introduction to Cyber Crime Investigation :** Firewalls and Packet Filters, password Cracking, Keyloggers and Spyware, Virus and Warms, Trojan and backdoors, Steganography, DOS and DDOS attack, SQL injection, Buffer Overflow, Attack on wireless Networks.	**6**

Text Book:

1. Introduction to Cyber Security Author Dr. Jeetendra Pande, Assistant Professor School of CS & IT, Uttarakhand Open University, Haldwani .

Reference Book:

1. Anti-Hacker Tool Kit (Indian Edition) by Mike Shema, Publication Mc Graw Hill.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Nina Godbole and Sunit Belpure, Publication Wiley.

Diploma of Engineering
Subject Code: CO1212
Subject Name: Cyber Security

Course outcomes:
Student will be able

Sr. No.	CO statement
CO-1	**Understand** cyber-attack, types of cybercrimes, cyber laws and also how to protect them self and ultimately society from such attacks.
CO-2	**Learn** various network defense tools with number of examples.
CO-3	**Apply** various web application tools.
CO-4	**Explain** cyber-crime with real life examples.
CO-5	**Describe** computer crime with Indian IT ACT 2000.
CO-6	**Evaluate** attacks on wireless network.

Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering
Subject Code: CO1213
Subject Name: Soft Computing

Semester: - IV

Type of course: Emerging areas.

Prerequisite: Nil

Rationale: The conventional methods of computing relying on analytical or empirical relations become time consuming and labor intensive to solve some complex problem. Soft computing techniques like Genetic Algorithms, Fuzzy logic and Artificial Neural Network can be applied effectively to solve complex problem. This subject gives understanding of various soft computing techniques.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	**Introduction**: What is Soft computing? Necessity of Soft computing, Major Areas of Soft Computing, Applications of Soft Computing	**5**
2	**Evolutionary Computing Basic Concepts of Genetic Algorithms** (GA): Working Principle, Encoding methods, Fitness function, GA Operators- Reproduction; Crossover; Mutation, Convergence of GA, Multi-level Optimization, Real Life Problems.	**8**
3	**Fuzzy Systems**: Fuzzy Set theory, Fuzzy Relation, Fuzzification, Minmax Composition, Defuzzification, Fuzzy Logic, Fuzzy Rule based	**5**

Diploma of Engineering
Subject Code: CO1213
Subject Name: Soft Computing

	systems, Fuzzy Decision Making, Fuzzy Control Systems, Fuzzy Classification.	
	SECTION-B	
4	**Neural Networks**: Basic Concept of Neural Network, Overview of Learning rules and activation functions, Single layer Perceptrons and Learning, Back Propagation networks- Architecture of Back propagation (BP) Networks; Backpropagation Learning; Variation of Standard Backpropagation Neural Network, Introduction to Associative Memory, Adaptive Resonance Theory and Self Organizing Map, Recent Applications.	**8**
5	**Hybrid Systems**: Sequential Hybrid Systems, Auxiliary Hybrid Systems, Embedded Hybrid Systems, Neuro-Fuzzy Hybrid Systems, Neuro-Genetic Hybrid Systems, Fuzzy-Genetic Hybrid Systems Network.	**4**
6	**Fuzzy Neural Network**: Based Fuzzy Systems Neural Realization of Basic Fuzzy Logic Operators, Neural Network Based Fuzzy Logic Inference, Neural Network Driven Fuzzy Reasoning, Rule based Neural Fuzzy Modeling, Neural Fuzzy Relational Systems, NeuroFuzzy Controllers, Recent Applications	**6**

Text Book:

1. S.N. Sivanandam & S.N. Deepa, Principles of Soft Computing, Wiley Publications, 2nd Edition, 2011.
2. S, Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications, PHI Publication, 1st Edition, 2009.

Reference Books:

1. Principles of Soft Computing by S.N. Sivanandam, S.N. Deepa WILEY India Publication
2. Soft Computing with MATLAB Programming by N.P. Padhy & S. P. Simon by OXFORD

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Subject Code: CO1213
Subject Name: Soft Computing

3. Neuro-Fuzzy and Soft Computing: A Computational Approach to Learning and Machine Intelligence by Jyh-Shing Roger Jang Pearson
4. Genetic Algorithms: Search and Optimization, E. Goldberg. ADDISON-WESLEY PUBLISHING COMPANY, INC.
5. Fuzzy Logic and Engineering Application, Tomthy Ross, Wiley Publication

Course outcomes:
Student will be able

Sr. No.	CO statement
CO-1	**Identify** and describe soft computing techniques and their roles in building intelligent machines.
CO-2	**Evaluate** and compare solutions by various soft computing approaches for a given problem.
CO-3	**Understand** different soft computing techniques like Genetic Algorithms, Fuzzy Logic, Neural Networks and their combination.
CO-4	**Implement** algorithms based on soft computing.
CO-5	**Apply** soft computing techniques to solve engineering or real life problems.
CO-6	**Use** various tools to solve soft computing problems.