D. K.T. E. Society's

Textile and Engineering Institute, Ichalkaranji
(An Autonomous Institute)

Syllabus

for

Second Year B.Tech.

of

Computer Science and Engineering (Artificial Intelligence)

(With effect from 2021-22)

DKTES Textile and Engineering Institute, Ichalkaranji

(An Autonomous Institute)

Teaching and evaluation Scheme for year 2021-22

Second Year B. Tech. (Semester – III) In Computer Science and Engineering (Artificial Intelligence)

Sr. No.	Course Code	Course Title	Course Category	Teaching scheme				Course Credits	Evaluation scheme					
									Theory			Practical		
				L	T	P	Contact Hrs/wk		CIE		SEE	CIE	SEE	TOTAL
									SE-I	SE-II				
1	AIL201	Probability and Statistics	BSC	3	1	-	4	4	25	25	50	-	-	100
2	AIL202	Data Structures	PCC	3		-	3	3	25	25	50	-	-	100
3	AIL203	Digital Systems and Microprocessors	PCC	3	-	-	3	3	25	25	50	-	-	100
4	AIL204	Data Communication and Networking	PCC	3	-	-	3	3	25	25	50	-	-	100
5	AIL205	Theory of Computation	PCC	3	1	-	4	4	25	25	50	-	-	100
6	AIP206	Problem Solving using C	PCC	2	-	4	6	4	-	-	-	50	50	100
7	AIP207	Data Communication and Networking Lab	PCC	-	-	2	2	1	-	-	-	50	50	100
8	AIP208	Digital Systems and Microprocessors Lab	PCC	-	-	2	2	1	-	-	-	50	50	100
9	AIL209-A	Environmental Studies	HSMC	2	-	-	2	-	-	-	-	-	-	-
		Total		19	02	08	29	23	125	125	250	150	150	800

L- Lecture
T-Tutorial
P-Practical

SE-I: Semester Examination-I
SE-II: Semester Examination-II

CIE – Continuous in Semester Evaluation
SEE- Semester End Examination

Course Category	HSMC (Hum. & Social Sc., Mgt)	BSC (Basic Sc.)	ESC Engg. Sc.)	PCC (Prof. Core Courses)	PEC (Prof. Elect. Courses)	OEC (Open Elct. Courses)	MC (Mandatory Courses)	PST (Project / Seminar / Ind. Training)
Credits	--	4	--	19	--	--	--	--
Cumulative Sum	3	15	22	--	--	--	--	--

Progressive Total Credits: 40+23 =63

DKTES Textile and Engineering Institute, Ichalkaranji

(An Autonomous Institute)

Teaching and evaluation Scheme for year 2021-22

Second Year B. Tech (Semester – IV) In Computer Science and Engineering (Artificial Intelligence)

Sr. No.	Course Code	Course Title	Course Category	Teaching scheme				Course Credits	Evaluation scheme					
									Theory			Practical		
				L	T	P	Contact Hrs/wk		CIE		SEE	CIE	SEE	TOTAL
									SE-I	SE-II				
1	AIL210	Advanced Microprocessors and Microcontroller	PCC	3	1	-	4	4	25	25	50	-	-	100
2	AIL211	Introduction to Artificial Intelligence	PCC	3	-	-	3	3	25	25	50	-	-	100
3	AIL212	Advanced Computer Networks	PCC	3	-	-	3	3	25	25	50	-	-	100
4	AIL213	Computer Algorithms	PCC	3	-	-	3	3	25	25	50	-	-	100
5	AIL214	Software Engineering	PCC	3	1		4	4	25	25	50	-	-	100
6	AIP215	Object Oriented Programming using C++	PCC	2	-	4	6	4	-	-	-	50	50	100
7	AIP216	Advanced Computer Networks Lab	PCC	-	-	2	2	1	-	-	-	50	50	100
8	AIP217	Computer Algorithms Lab	PCC	-	-	2	2	1	-	-	-	50	50	100
9	AIL209	Environmental Studies	HSMC	2	-	-	2	-	-	-	70	30	-	GRADE
10	AIL218	Presentation and Technical Report Writing using Latex	HSMC	1	-	-	1	-	-	-	-	-	-	GRADE
		Total		20	02	08	30	23	125	125	320	180	150	800

L- Lecture

T-Tutorial   SE-I: Semester Examination-I   CIE – Continuous in Semester Evaluation

P-Practical   SE-II: Semester Examination-II   SEE- Semester End Examination

Course Category	HSMC (Hum. & Social Sc., Mgt)	BSC (Basic Sc.)	ESC Engg. Sc.)	PCC (Prof. Core Courses)	PEC (Prof. Elect. Courses)	OEC (Open Elct. Courses)	MC (Mandatory Courses)	PST (Project / Seminar / Ind. Training)
Credits	--	--	--	23	--	--	--	--
Cumulative Sum	3	19	22	19	--	--	--	--

Progressive Total Credits: 63+23 =86

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. (Semester – III)
AIL201: Probability and Statistics

Teaching Scheme: Lectures: 03 Hrs./Week Tutorials: 01Hrs/Week Practicals: 00 Hrs./Week	Credits 04	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Remember the theory of counting, basic concepts of statistics.
- ☐ Use the knowledge to solve the examples of counting principle, correlation, regression, curve fitting
- ☐ Use the knowledge to study the data given w.r.t. dispersion.
- ☐ Apply the knowledge to test the correlation, to test hypothesis, to do sample tests.

Course Contents		
Unit I	**Introduction to statistics**	**06 Hours**

Definitions of Population, Variable, Attribute, Census   Survey, Sample Survey, Random sample. Raw statistical data, collection, classification, Frequency distribution, class limits & boundary, class width, mid-point. Histogram, Frequency polygon, Frequency curve. Measures of central tendency: Arithmetic Mean (A.M.), Median, Mode, Combined Mean.

Unit II	**Measures of dispersion**	**08 Hours**

Range, Quartile deviation, Mean deviation Standard deviation as Absolute measures of dispersion, Coefficient of range, quartile deviation, mean deviation, coefficient of variation as Relative measures of dispersion, coefficient of variation as Relative measures of dispersion, consistency of data.

Unit III	**Probability**	**06 Hours**

Counting Principle, Rule of Sum & Product, Random Experiments, Sample space, Events, Concept of Probability, Conditional Probability, Independent events, Random Variables, Probability Distribution Function, Bayes' Theorem.

Unit IV	**Testing of hypothesis and Large Sample Tests**	**06 Hours**

Introduction, Hypothesis, Statistic, Critical Region, Errors in testing, Level of Significance. Test for population mean, equality of population means population proportion & equality of population proportions.

Unit V	**Mathematical Logic**	**08 Hours**

Introduction, Statements and notations, Connectives, Statement formulas and truth tables, Well-formed formulas, Tautologies, Equivalence of formulas, Duality law, Tautological implications, Functionally complete sets of connectives, Normal Forms, Completely parenthesized infix and polish notations, Theory of Inference for statement calculus – validity using truth table, rules of inference, consistency of premises and indirect method of proof.

Unit VI	Combinatorial Analysis	06 Hours
First counting principle, second counting principle, permutation, combination, Pigeonhole principle.		

Text Books:

1. Discrete Mathematics and its Applications - Kenneth H. Rosen (AT&T Bell Labs)
2. Mathematical Statistics - J.Fruend.
3. Applied Statistics & Probability of Engineers - Montgomeri & Runger

References Books:

1. Discrete Mathematics - Semyour Lipschutz, MarcLipson (MGH), Schaum's outlines
2. Probability and Statistics- John Schiller, Murray R. Spigel (MGH), Schaum's outlines 3. Probability & Statistics for Engineers by Johnson

Useful Links:

1. **https://www.iith.ac.in/~aravind/Files-DM/LLM-MFCS-2004.pdf**

Teaching Scheme: Lectures: 03 Hrs./Week Tutorials: 00 Hrs./Week Practicals: 00 Hrs./Week	Credits 03	Evaluation Scheme: CIE: 50 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–
- ☐ Describe basic terminology of Data Structures.
- ☐ Apply data structures to solve given problem.
- ☐ Design algorithms to carry out different operations on data structures.
- ☐ Analyze performance of different data structures

Course Contents		
Unit I	**Linear List**	**10 Hours**

Abstract Data Types – model and implementation, Algorithm efficiency, General List – operations, List ADT, List implementations -Array-Algorithms and analysis. Linked List- Singly Linked List, Doubly Linked List, Circular Linked List.

Unit II	**Stacks and Queues**	**08 Hours**

Stacks ADT, Stack Implementation using linked list and array, applications of stack. Queues – operations ADT, implementations, applications, Circular queue, Priority queues

Unit III	**Sorting and Searching**	**06 Hours**

Sorting Techniques - Bubble Sort, Insertion Sort, Selection Sort,Quick Sort, Merge Sort, Radix Sort
Searching Techniques - Linear and binary search, Hashing – concept, hashing methods, hash collision, hash collision resolution methods.

Unit IV	**Trees**	**06 Hours**

Basic tree concepts, binary tree – properties, implementation, traversal, expression tree, Huffman code binary search tree - concept, implementation, traversal, Search, Insertion, deletion.

Unit V	**Balanced Trees**	**06 Hours**

AVL Tree - Concept, balancing tree, insertion, deletion, implementation. Heap –concept, operations:breheapup, reheapdown, build heap,insert and delete nodes, B and B++ tree

Unit VI	**Graph**	**08 Hours**

Definition and storage, traversal – depth first and breadth first algorithm, Shortest path Warshall's and Dijkshtra algorithm, spanning tree algorithms.

Text Books:

1. Data Structures: A Pseudocode Approach with C, Richard F. Gilberg & Behrouz A. Forouzan.
2. Data Structures using C – ISRD Group, TMH publication
3. Schaum's Outlines Data Structures – Seymour Lipschutz (MGH)

References Books:

1. Data Structures and Algorithm Analysis in C, 2 Edition, by Weiss, Pearson Education India.
2. Data Structures and Algorithms Made Easy: Data Structures and Algorithmic Puzzles, by Narasimha Karumanchi, Careermonk Publications

DKTES Textile and Engineering Institute, Ichalkaranji Second Year B. Tech. (Semester – III) AIL203: Digital Systems & Microprocessors		
Teaching Scheme: Lectures: 03 Hrs. /Week Tutorials: 00 Hrs./Week Practicals: 00 Hrs./Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Explain terminology in digital system and architecture, instructions and Functionality of 8085 Microprocessor.
- ☐ Design and Simplify Simple Logic Circuit using Basic gates.
- ☐ Design of Combination and sequential circuits.
- ☐ Design Memory and IO device interfacing with 8085 Microprocessor.
- ☐ Write assembly language programs using 8085 Instruction set.

Course Contents		
Unit I	**Fundamental Concepts**	**06 Hours**

Analog and digital systems, Digital and logic circuits, Basic logic operations and gates- OR, AND, NOT. Describing logic circuits algebraically, implementing circuit from Boolean expression. NOR and NAND gates. Boolean theorems, De Morgan's theorems, Universality of NAND & NOR gate, Minterm, Maxterm and Karnaugh Map.

Unit II	**Binary arithmetic**	**06 Hours**

Binary addition, Signed numbers, Addition and Subtraction in 2's Complement system, overflow, multiplication and division of binary numbers, BCD addition, Hexadecimal addition and subtraction, Design Full adder and Full sub tractor with state table and timing diagram.

Unit III	**Flip-Flops, Registers and counters**	**06 Hours**

Flip –flop using NOR and NAND gates, clocked flip flops, clocked S-R, J-K, D and T flip flops, Data storage and transfer, shift register, Counter- Asynchronous counter using Flip-flop, Synchronous counter Design- Johnson and Ring counter

Unit IV	**Microprocessor Architecture and Microcomputer System**	**06 Hours**

Microprocessor Architecture and its operation- Microprocessor initiated operations, internal operation, and Peripheral operation. memory map and addresses, memory and instruction fetch, Input and output devices, logic devices used for interfacing- Tri-State devices, buffer, decode, encoder.

Unit V	**8085 Microprocessor Architecture**	**06 Hours**

The 8085 MPU, Microprocessor communication and bus timing, De-multiplexing address and Data bus, Generating control signals, The 8085 Architecture, machine cycles and bus timing, op-code fetch machine cycle, Memory read and write machine cycle, IO read and Write machine cycle, Memory interfacing-memory structure, basic concepts in memory interfacing.

Unit VI	8085 Assembly Language Programming	08 Hours

The 8085 programming model, instruction Classification, instruction and data format, Writing and execution assembly language Program. The 8085 instruction-data transfer operations, addressing modes, Arithmetic Operation, Flag concept and cautions, Logic operations, Branch operations, Stack and interrupt.

Text Books:

1. Digital Systems, Principles and Applications-Ronal Tocci, Neal Widmer, Gregory Moss (Pearson Education) 9th Edition.
2. Microprocessor Architecture-Programming and applications with 8085-Ramesh Gaonkar (Penram International) 4th Edition.

References Books:

1. Modern Digital Electronics - R.P.Jain Tata McGraw-Hill Education
2. Microprocessors and Microcontrollers - N. Senthil Kumar, M. Saravanan, S.

Useful Links:

1. https://www.youtube.com/watch?v=I78iyzXQrP4 (Working of 8085 Microprocessor animation)

Teaching Scheme: Lectures: 03 Hrs./Week Tutorials: 00 Hrs./Week Practicals: 00 Hrs./Week	Credits 03	Evaluation Scheme: SE-I: 25Marks SE-II: 25Marks SEE: 50Marks

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Explain the basics of data communication.
- ☐ Students will be able to explain the responsibilities of different layers.
- ☐ Students will be able to apply the knowledge of different layer to solve the problems.
- ☐ Students will be able to analyze the working and functionality of protocols available in different layers.

Course Contents

Unit I	Communication Fundamentals, Protocols and Models	06 Hours

Introduction to data communications, data and signals, transmission impairment, Network Representations and Topologies, Common Types of Networks, Internet Connections, Reliable Networks, Rules for communication, protocol requirement in communication, Layered network model: OSI, TCP/IP, Data Encapsulation, Data Access.

Unit II	Physical layer, Ethernet Switching	05 Hours

Purpose of the Physical Layer, transmission media: - Guided and Unguided media, Network Hardware components, wireless media, Ethernet, Ethernet Frame

Unit III	Data link layer	09 Hours

Purpose of the Data Link Layer, Error detection & correction: cyclic codes, hamming code, Data Link Control: - Farming, Flow & error control, Protocol basics, Channel allocation Problem, MAC protocols, ALHOA, CSMA, CSMA/CD, CSMA/CA, Ethernet MAC Address, The MAC Address Table.

Unit IV	Network Layer and addressing	08 Hours

Network Layer Characteristics, IPv4 Address Structure, IPv4 Unicast, Broadcast, and Multicast, Types of IPv4 Addresses, Network Segmentation, Subnet an IPv4 Network, IPv4 Issues, IPv6 Address Representation, IPv6 Address Types, Dynamic Addressing for IPv6 GUAs, ICMP messages and message formats.

Unit V	Transport Layer	05 Hours

Transportation of Data, TCP Overview, UDP Overview, Port Numbers, TCP Communication Process, Reliability and Flow Control, UDP Communication

Unit VI	Application Layer and Network Security Fundamentals	05 Hours

Application, Presentation, and Session, Peer-to-Peer, NAME SPACE, DOMAIN NAME SPACE, Web and Email Protocols, IP Addressing Services, File Sharing Services,
Security Threats and Vulnerabilities, Network Attacks, Network Attack Mitigation, Device Security

Text Books:

1. Data communication and networking -Behrouz A Forouzan, The McGraw Hill, 4th Edition.

References Books:

1. Computer Networks- A. S. Tenenbaum, PHI, 3rd Edition.
2. Data and Computer communications - William Stallings, Pearson Education, 8th Edition.
3. Data communication and Computer Networks- Ajit Pal, PHI Learning, Eastern Economy Edition.

Useful Links:

1. https://www.netacad.com.
2. https://www.tutorialspoint.com/data_communication_computer_network

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. (Semester – III)
AIL205: Theory of Computation

Teaching Scheme: Lectures: 03 Hrs./Week Tutorials: 01 Hrs./Week Practicals: 00 Hrs./Week	Credits 04	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

☐ Prove statements using Mathematical Induction.

☐ Describe terminology related to Grammar, Languages, Finite Automata, Pushdown Automata and Turing Machine

☐ Design Regular Expression corresponding to Regular language

☐ Design Context Free Grammar corresponding to Context Free Language and Regular Language.

☐ Design Push Down Automata to solve a given problem

☐ Design Turing Machine to solve a given problem

Course Contents		
Unit I	**Proofs and Regular Languages**	**07 Hours**

Types of Proofs, Mathematical Induction and Recursive definitions, Regular expressions & Regular languages, Operations on Regular languages.

Unit II	**Finite Automata**	**07 Hours**

Finite automata definition and representation, union, intersection and complement of Regular Languages and their corresponding FA. Mealy and Moor machines.

Unit III	**Nondeterminism and Kleen's theorem**	**06 Hours**

Nondeterministic Finite Automata, Nondeterministic Finite Automata with Λ –transitions, Conversion of NFA-Λ to NFA and DFA. Kleen's theorm. Minimization of FA

Unit IV	**Context Free Languages and Grammar**	**06 Hours**

Examples and definition, Regular Grammar, Derivation and ambiguity, An Unambiguous CFG, Union, concatenation kleen * of CFL, Simplified forms and Normal Forms, Pumping Lemma for context free languages, Intersection and complements of context Free Languages

Unit V	**Push Down Automata**	**08 Hours**

Definition, examples, DPDA, Acceptance of string by PDA, PDA corresponding to CFG, Parsing

Unit VI	**Turing Machines**	**08 Hours**

Models of computation, definition of Turing Machine as Language acceptors, combining Turing Machines, Computing a function with a TM Variations in Turing Machines: Turing machines with doubly-infinite tapes, more than one tape, Non-deterministic TM and Universal TM.

Text Books:
1. Introduction to Languages & theory of computations—John C. Martin (MGH).

References Books:
1. An Introduction to Formal Languages and Automata- Fifth edition, Peter Linz. 2. Theory of Computer Science Automata, Languages, and Computation- Third edition

Useful Links:
1. https://www.javatpoint.com/ 2. https://www.tutorialspoint.com/

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. (Semester – III)
AIP206: Problem Solving using C

Teaching Scheme:	Credits	Evaluation Scheme:
Lectures: 02 Hrs./Week	04	CIE: 50 Marks
Tutorials: 00 Hrs./Week		SEE: 50 Marks
Practicals: 04 Hrs./Week		

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Explain terminology in C Language
- ☐ Design algorithm to solve the problem.
- ☐ Build a program for developed algorithm in C Language.
- ☐ Analyze a C program.
- ☐ Prepare documentation for the design

Course Contents		
Unit I	**Algorithm Design and Revision of C**	**04 Hours**

Solving problems using computer – Writing algorithm, representing it with flowcharts, Introduction to C, data types and Data representation, variables, operators and expressions, program analysis and complexity, Testing and debugging of code. Conditional compilation for debugging

Unit II	**File Handling**	**04 Hours**

Types of files, modes of opening files, reading and writing data from file using fgetc, fputc, fprintf and fscanf, random access files using fseek, ftell, rewind, fread and fwrite

Unit III	**Functions and Recursion**	**04 Hours**

Function declaration, definition, and calling, Scope, and lifetime of variables, passing arrays to function, Multifile Compilation, Creating Library of C Functions. Command line arguments and environmental variables. Recursive Functions.

Unit IV	**Bit Wise Operations**	**04 Hours**

Bitwise operators – and, or, not, xor, left shift, right shift.

Unit V	**Preprocessors**	**04 Hours**

Preprocessor, #include - how to make use of a header file, #define - simple and parameterized macros, the #undef directive, predefined preprocessor symbols, macrooperators: # and ##, conditional compilation: the #if and #ifdef directives, avoiding multiple compilations of the same header files

Unit VI	**Special keywords in C**	**04 Hours**

Extern. Volatile, static, enum, typecasting and typedef

Text Books:

1. Problem Solving And Program Design in C, by Jeri R. Hanly, Elliot B. Koffman
2. C Programming Language 2nd Edition, Brian W. Kernighan , Dennis Ritchie
3. C How to Program 7e, by Deitel

References Books:

1. Let Us C, 14 Edition, Yashavant Kanetkar, BPB Publication
2. C in Depth, 3rd Edition, S K Srivastava,, BPB Publication

Practical Work:

Student should perform Minimum 16 experiments based on problem analysis and solution design and Data structure. Problems will be from different domains such as data analytics, Mathematics, etc. Comment on the complexity of the algorithm in each experiment. The List of Experiments is as follows:

1. Write a C program to implement static list data structure.
2. Write a C Program to implement Singly Linked List.
3. Write a C Program to implement Doubly Linked List.
4. Write a C Program to add two polynomials using Linked List
5. Write a C Program to merge two linked lists.
6. Write a C Program to implement Stack and Queue using Array.
7. Write a C Program to implement Stack and Queue using Linked List.
8. Write a C Program to convert given infix expression into postfix expression.
9. Write a C Program to evaluate a postfix expression
10. Write a C Program to sort the data stored in an array using QuickSort.
11. Write a C Program to sort the data stored in an array using Merge Sort.
12. Write a C Program to search the data stored in an array using Binary Search.
13. Write a C Program to store and retrieve student data using Hash Table.
14. Write a C Program to Store a Binary Search Tree using Linked representation
15. Write a C Program to Find minimum, maximum value from binary search tree and Traverse the Binary search tree.
16. Write a C Program to store a graph using Adjacency Matrix and Print the Graph.
17. Write a C Program to Traverse the Graph using Depth First Traversal and Breadth First Traversal Techniques
18. Write a program to create text file and perform read and write operations on it
19. Write a program to create binary random access file and perform read and write operations on it

Useful Links:

1. https://nptel.ac.in/courses/106/102/106102064/

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. (Semester – III)
AIP207: Data Communication and Networking Lab

Lab Scheme: Practicals: 02Hrs/Week	Credits 01	Evaluation Scheme: CIE: 50 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Describe basic concepts of data communication and networking
- ☐ Analyze different techniques and protocols used for data communication
- ☐ Apply the knowledge of techniques for computer communication and will be able to write programs for Computer Communications.

List of Experiments

(It should consist of 10-12 experiments based on the following topics.)

1	Demonstration of different types of Network cables and practically implements the cross-wired cable and straight through cable using clamping tool.
2	Demonstration of different networking hardware components.
3	Study of basic network command and Network configuration commands
4	Performing an Initial Switch Configuration using cisco packet tracer.
5	Performing an Initial Router Configuration using cisco packet tracer.
6	Performing TELNET Configuration using cisco packet tracer.
7	Implementation of framing using one of different framing techniques.
8	Implementation of Error Detecting Code (CRC).
9	Implementation of Error Correcting Code (Hamming Code).
10	Write a program to find class if an IP address, Network id, Host id and Default mask
11	Implementation of a program to calculate first, last and total number of addresses in the block from one of the given IP address in the same block.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. (Semester – III)
AIP208: Digital Systems & Microprocessors Lab

Lab Scheme: Practicals: 02 Hrs./Week	Credits 01	Evaluation Scheme: CIE: 50 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Design and Implement Combinational Logic circuits.
- ☐ Design and Implement Sequential Logic circuits.
- ☐ Write assembly language programs using 8085 Instruction set.

List of Experiments
(It should consist of 10-12 experiments based on the following topics.)

1	Verification of De Morgan's Theorem using gates.
2	To realize NAND & NOR Gates are Universal Gates.
3	To realize Half adder and Full adder

4	To design and setup the following circuit using IC 7483.
	    I) 4-bit binary parallel adder
	       II) 4-bit binary parallel Sub-tractor.

5	Verify Truth table of Flip Flops
6	Verify Truth table of Decade counter
7	Assembly language program to move a block of data from source to destination.
8	Assembly language program for array addition.
9	Assembly Language program to alter the contents of flag register in 8085
10	To Find Number of one's in a given 8 bit number stored in memory location.
11	Assembly Language program to generate RST 7.5 Interrupt.
12	Assembly Language program to generate Square wave on SOD pin.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. (Semester – III)
AIP209-A: Environmental Studies

Teaching Scheme: Lectures: 02 Hrs./Week Tutorials: 00 Hrs./Week Practicals: 00 Hrs./Week	Credits --	Evaluation Scheme: SE-I: -- Marks SE-II: --- Marks SEE: -- Marks

Course Outcomes:

On completion of the course, student will be able to–

☐ Understand definition and importance of environment.

☐ Identify causes and effects of environmental pollution.

☐ Understand control measure of industrial pollution.

☐ Understand social issues and local Environmental problems (Group project)

Course Contents		

Unit I	Nature of Environmental Studies	06 Hours

Definition, scope and importance. Multidisciplinary nature of environmental studies. Need for public awareness.

Unit II	Natural Resources and Associated Problems	08 Hours

Forest resources: Use and over-exploitation, deforestation. Timber extraction, mining, dams and their effects on forests and tribal people.

Mineral resources: Usage and exploitation, environmental effects of extracting and using mineral resources.

Food resources: World food problem, changes caused by agriculture effects of modern agriculture, fertilizer-pesticide problems.

Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification. Role of an individual in conservation of natural resources.

Water resources: Global distribution, Use and over utilization of source and ground water, drought and flood, Dam benefits and problems.

Unit III	Ecosystems	06 Hours

Concept of an ecosystem, Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem, Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristics features, structure and function of the following ecosystem - Forest ecosystem. Grassland ecosystem.

Desert ecosystem. Aquatic ecosystems (Ponds, Lakes). Aquatic ecosystems (Lakes, Rivers).

Aquatic ecosystems (Streams, Oceans, Estuaries).

Text Books:

1. Environmental studies for Undergraduates publisher Shivaji university Kolhapur

References Books:

1. Agarwal, K.C.2001, Environmental Biology, Nidi Pub. Ltd., Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380013, India, Email:mapin@icenet.net (R)
3. Brunner R.C.,1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
4. Clank R.S. Marine Pollution, Clanderson Press Oxford (TB)
5. Cunningham, W.P. Cooper, T.H.Gorhani, E. & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Pub. Mumbai, 1196p
6. De A.K., Environmental Chemistry, Wiley Wastern Ltd.
7. Down to Earth , Centre for Science and Environment , New Delhi.(R)
8. Gleick, H.,1993, Water in crisis, Pacific Institute for studies in Dev., Environment &Security Stockholm Env Institute. Oxford Univ. Press 473p
9. Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H.& Watson, R.T.1995, Global Biodiversity Assessment, Cmbridge Univ. Press 1140p.
11. Jadhav, H.and Bhosale, V.M.1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi 284p.
12. Mickinney, M.L. and School. R.M.1196, Environmental Science Systems and Solutions, Web enhanced edition, 639p.
13. Miller T.G. Jr., Environmental Science. Wadsworth Publications Co. (TB).
14. Odum, E.P.1971, Fundamentals of Ecology, W.B. Saunders Co. USA,574p.
15. RaoM. N. and Datta, A.K.1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd., 345p
16. Sharma B.K., 2001, Environmental Chemistry, Gokel Publ. Hkouse, Meerut
17. Survey of the Environment, The Hindu (M)
18. Townsend C., Harper, J. and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
19. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, vol. I and II, Environmental Media (R)
20. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB)
21. Wagner K.D.,1998, Environmental management, W.B. Saunders Co. Philadelphia, USA 499p.
22. Paryavaranshastra – Gholap T.N.
23. ParyavaranSahastra – Gharapure

Useful Links:

1. https://nptel.ac.in/courses/120/108/120108004/

Teaching Scheme: Lectures: 03 Hrs./Week Tutorials: 01Hrs./Week practical: 00 Hrs./Week	Credits 04	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

☐ Explain architecture of microcontroller and its advantages over microprocessor.
☐ Write and execute Arduino programs using C language.
☐ Interface microcontroller with different peripherals.
☐ Describe advanced processors architecture.

Course Contents		
Unit I	**Introduction**	**06 Hours**

Introduction to microprocessor, block diagram of microprocessor, block diagram of microcontroller, comparison of microprocessor and microcontroller, Arduino Uno: A Microcontroller-Introduction, software, hardware, features of Microcontroller, Different types of microcontrollers, concept of interfacing.

Unit II	**Architecture : ATmega328 Microcontroller**	**06 Hours**

Introduction to ATmega328P Microcontroller, Features of ATmega328P Microcontroller, architecture of ATmega328P Microcontroller, pinout configuration and pin description, comparison of ATmega328 with ATmega2560 microcontroller.

Unit III	**Programming**	**06 Hours**

Learning Arduino code basics: Arduino C- Arduino Program Structure, variables, Using Mathematical Operators, using Arduino String Functionality, Repeating a Sequence of Statements

Unit IV	**Interfacing**	**06 Hours**

Interfacing digital inputs and outputs, Connecting and Using LED, interfacing 7-segment display, Interfacing keypad , Measuring Distance using IR sensor, Detecting Light using LDR

Unit V	**Interrupt ,timer and Communication**	**06 Hours**

Arduino interrupts – interrupt example , Internal Timer of Arduino, Detecting Light , ADC interfacing - Measuring Temperature, Arduino – Communication, Serial Communications-Introduction, Types of Serial Communications, Sending and Receiving Serial Data from/to Arduino.

Unit VI	Architecture of 8086 and 80286 Microprocessor	06 Hours

Introduction to 8086 microprocessor, comparison of 8085 with 8086 microprocessor, architecture of 8086 Microprocessor, Physical memory organization of 8086 Salient features of 80286 microprocessor, architecture of 80286 microprocessor Real Mode of 80286 memory addressing Protected Mode of 80286 memory addressing.

Text Books:

1. Arduino Cookbook -Michael Margolis, Oreilly
2. Advanced Microprocessors and Peripherals, K. M. Bhurchandi and A.K.Ray –Tata Mcgraw Hill.

References Books:

1. Arduino for Beginners Essential Skills Every Maker Needs - John Baichtal- Pearson Education, Inc
2. Arduino Development Cookbook – Cornel Amariei PACKT Publishing

Useful Links:

1. https://freevideolectures.com/course/4638/nptel-introduction-internet-things/22,23,24,25
2. https://www.tutorialspoint.com/arduino/arduino_board_description.htm
3. https://microcontrollerslab.com/use-arduino-interrupts-examples/

<table>
<tr><td colspan="3" align="center">DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. (Semester – IV)
AIL211: Introduction to Artificial Intelligence</td></tr>
</table>

Teaching Scheme: Lectures: 03 Hrs./Week Tutorials: 00Hrs./Week Practicals: 00 Hrs./Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

☐ Explain basic terms of artificial intelligence

☐ Describe different searching mechanism in solution space

☐ Describe constrain satisfaction problem.

Course Contents

Unit I	Basics of Artificial Intelligence	06 Hours

Artificial Intelligence, The foundation of Artificial Intelligence, History of Artificial Intelligence, The state of Art

Unit II	Intelligent Agents	08 Hours

Agents and environments, Good behavior: The concept of rationality, The nature of environments, The structure of agents

Unit III	Solving Problems by Searching	06 Hours

Problem-solving agents, Example problems, Searching for solutions, Uninformed search strategy, Informed search strategy, Heuristic Functions

Unit IV	Beyond Classical Search	06 Hours

Local search algorithms and optimization problems, Local search in continuous space, Searching with non-deterministic approach, Searching with partial observations, Online search agents and unknown environments.

Unit V	Adversarial Search	08 Hours

Games, Optimal decisions in games, Alpha-beta pruning, Imperfect real life decisions, Stochastic games, Partially observable games, Alternative approaches

Unit VI	Constraint Satisfaction Problems	04 Hours

Defining constraint satisfaction problems, Constraint propagation, Backtracking search for CSPs, Local search for CSPs, The structure of problem.

Text Books:

1. Artificial Intelligence: A modern approach by S. Russell, P. Norvig

References Books:

1. Introduction to Artificial Intelligence by Flasinski M., Springer

Useful Links:

1. https://mrcet.com/downloads/digital_notes/IT/(R17A1204)%20Artificial%20Intelligence.pdf

Teaching Scheme: Lectures: 03 Hrs./Week Tutorials: 00 Hrs./Week Practical: 00 Hrs./Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Explain the basic concepts of Computer networks.
- ☐ Explain the responsibilities of different layers.
- ☐ Apply the knowledge of different layer to solve the problems.
- ☐ Analyze the working and functionality of protocols available in different layers.

Course Contents

Unit I	**Internet Protocol, Routing concepts and Protocols**	**07 Hours**

IPv6 addressing, IPv6 Packet format, Transition from IPv4 to IPv6, ARP and RARP, ICMP and IGMP Routing concepts: Path Determination, Packet Forwarding,   IP Routing Table, Static and Dynamic Routing

	VLAN and Inter-VLAN Routing	**06 Hours**

Overview of VLANs, VLANs in a Multi-Switched Environment, VLAN Configuration, VLAN Trunks Dynamic Trunking Protocol, Inter-VLAN Routing Operation, Router-on-a-Stick Inter-VLAN Routing, Inter-VLAN Routing using Layer 3 Switches, Troubleshoot Inter-VLAN Routing.

Unit II	**Transport Layer**	**07 Hours**

The Transport service primitives UDP: Process to Process communication, User Datagram Format, Operation and uses of UDP.
TCP: TCP Services and Features, TCP segment format, TCP Connections, Flow and error control in TCP, TCP Timers.
Client Server Concept, Berkeley Sockets: Socket Addresses, Elementary Socket system calls byte ordering and address conversion routines, connectionless iterative server, Connection Oriented concurrent server.

Unit III	**DHCP, DNS**	**06 Hours**

DHCP: Introduction, Previous Protocols, DHCP operation, Packet Format.
DNS: Need, Name Space, Domain Name Space, Distribution of name space, and DNS in internet, Resolution, DNS massages, Types of records, Compression examples, encapsulation.

Unit V	**FTP, TFTP and HTTP**	**06 Hours**

FTP: Connections, Communication, Command processing, File Transfer Anonymous FTP, TFTP.
HTTP: Architecture, Web Documents, HTTP Transaction, Request & Response messages: header & examples, Persistent vs. non persistent HTTP, Proxy Servers.

	WLAN and FHRP	**05 Hours**

Introduction to Wireless, Components of WLANs, WLAN Operation, CAPWAP Operation, Channel Management, WLAN Threats, Secure WLANs

FHRP: - First Hop Redundancy Protocols, HSRP

Text Books:

1. TCP/IP Protocol Suite-Behrouz Forouzan. McGraw Hill, 4thEdition.

References Books:

1. Internetworking with TCP/IP: principles, protocols, and architectures Volume one - Douglas E. Comer, Prentice Hall, 4thEdition.

Useful Links:

1. https://www.netacad.com.
2. https://www.javatpoint.com/
3. https://www.tutorialspoint.com/

Teaching Scheme: Lectures: 03 Hrs./Week Tutorials: 00 Hrs./Week Practicals: 00 Hrs./Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Describe fundamentals of algorithms.
- ☐ Discover solution to problems using algorithm design paradigms like Divide and Conquer and Greedy Approach.
- ☐ Apply Dynamic Programming and Backtracking Approach to tackle the problems.
- ☐ Analyze performance of algorithms using asymptotic analysis.

Course Contents		
Unit I	**Fundamentals of Algorithms**	**06 Hours**

Introduction, Characteristics of algorithms, Pseudo code Conventions, Recursive Algorithms, Performance analysis, Asymptotic notations (O, Ω, Θ), Performance measurement, Randomized Algorithms, Recurrence relations, Sorting Techniques – Bubble Sort, Insertion Sort, Selection Sort, Radix Sort.

Unit II	**Divide and Conquer**	**06 Hours**

General method, Binary Search, Ternary Search, Finding the Maximum and Minimum, Merge Sort, Quick Sort, Selection, Convex Hull.

Unit III	**The Greedy Method**	**07 Hours**

General method, Knapsack Problem, Job Sequencing with Deadlines, Minimum-Cost Spanning Trees – Prim's and Kruskal's Algorithms, Optimal Storage on Tapes, Optimal Merge Patterns, Huffman codes, Single Source Shortest Paths.

Unit IV	**Dynamic Programming**	**08 Hours**

General method, Multistage Graphs, All Pairs Shortest Paths, Optimal Binary Search Trees, 0/1 Knapsack, Reliability Design, Traveling Salesperson Problem, Flow shop scheduling.

Unit V	**Backtracking**	**06 Hours**

General method, N-Queens Problem, Permutation Tree, Sum of Subsets, Graph Coloring, Hamiltonian Cycle, Knapsack Problem.

Unit VI	**NP Hard and NP Complete**	**06 Hours**

Basic Concepts, P, NP, NP Complete, NP Hard, Cook's Theorem, NP Hard Graph problems, NP Hard Scheduling problems, NP Hard Code Generation Problems.

Text Books:

1. Fundamentals of Computer Algorithms- Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, (2nd Edition), Universities Press.
2. Introduction to Algorithms-Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein (3rd Edition), The MIT Press.

References Books:

1. The Design and Analysis of Computer Algorithms- A. Aho, J. Hopcroft and J. Ullman, (1st Edition) Addison-Wesley.
2. Introduction to The Design and Analysis of Algorithms-Anany Levitin, (3rd Edition), Pearson.

Useful Links:

1. http://personal.kent.edu/~rmuhamma/Algorithms/algorithm.html
2. https://www.ics.uci.edu/~goodrich/teach/cs260P/notes/

Teaching Scheme: Lectures: 03 Hrs./Week Tutorials: 01 Hrs./Week Practicals: 00 Hrs./Week	Credits 04	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Explain different software engineering processes.
- ☐ Describe various concepts of software engineering problem domain.
- ☐ Describe basics concepts of software engineering solution domain.
- ☐ Apply the software engineering principles to the give problem

Course Contents

Unit I	Introduction to Software Engineering	08 Hours

The nature of Software, Defining the discipline, The Software Process, Software Engineering Practices, A Generic Process Model, Defining The Framework Activities, Identifying Task Set, Process Patterns, Process Assessment and Improvements, Prescriptive Process Model, Specialized Process Models, Unified Process, Personal and Team Process Model

Unit II	Requirements Engineering	07 Hours

Requirements Engineering, Establishing The Groupwork, Eliciting Requirements, Developing Use Cases, Building The Analysis Model, Negotiating Requirements, Requirements Monitoring, Validating Requirements. Requirement Analysis, Scenario Based Modelling, UML Models That Supplements Use Cases, Class Based Methods, Identifying Analysis Classes, Specifying Attributes, Defining Operations, Class Responsibility Collaboration Modeling, Association and Dependencies, Analysis packages, State Representations, Pattern for Requirement Modeling

Unit III	Design Concept	06 Hours

Design Within the Context of Software Engineering, The Design Process, Design Concepts, The Design Model.

Unit IV	Architectural Design	06 Hours

Software Architecture, Architectural Genres, Architectural Styles, Architectural Consideration, Architectural Design, Assessing Alternative Architectural Design, Pattern Based Architectural Review, Architectural Conformance Checking, Agility And Architecture.

Unit V	Software Component and Interface Design	06 Hours

Components, Designing Class-Based Components, Conducting Component-Level Design, Component-Based Development, The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps

Unit VI	Software Testing	07 Hours

A Strategic Approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Test Strategies for Object-Oriented Software, Validation Testing, System Testing, The Art of Debugging, Internal and External Views of Testing, White-Box Testing, Basis Path Testing, Control Structure Testing, Black-Box Testing

Text Books:

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill International Edition, (8th edition)

References Books:

1. Ian Sommerville, Software Engineering, Pearson Higher Education (10th Edition) 2016
2. Pankaj Jalote, An Integrated Approach to Software Engineering, Springer New York, (2nd Edition)
3. G. Booch, J. Rambaugh, and I. Jacobson, The Unified Modeling Language User Guide, Addison Wesley, (2nd Edition)

Useful Links:

1. **https://cse.iitkgp.ac.in/~dsamanta/courses/se/index.html**
2. **https://nptel.ac.in/courses/106/105/106105087/**

Teaching Scheme: Lectures: 02 Hrs./Week Practicals: 04 Hrs./Week	Credits 04	Evaluation Scheme: CIE: 50 Marks SEE : 50 Marks

Course Outcomes:

On completion of the course, student will be able to–
- ☐ Describe terminology of Object Oriented Programming using C++
- ☐ Develop programs employing features of C++.
- ☐ Design object oriented solutions using C++
- ☐ Analyze programs written in C++

Course Contents		
Unit I	**Introduction**	**08 Hours**

C++ Program Structure, variables, operators, control structure – if, if- else, switch, looping while, do-while, for, C++ keywords. Input/output – I/O streams and standard I/O devices, cin and associated functions, cout and formatted output.

User Defined function- declaration, definition & calling function, function call stack and activation records, storage classes, scope rules, function -default arguments. Reference and reference arguments to the function. Pointer variables, new and delete operator, dynamic arrays

Unit II	**Object Oriented Programming - Class and Object**	**07 Hours**

Object Oriented fundamentals , Class and object- concept and need, Class declaration, Class members- member variables and functions, access specifiers, UML notations for class, implementation of member functions.

Object Declaration, Accessing class members, class scope, accessor and mutator functions, order of public and private members of the class.

Constructors, invoking a constructor, constructors and default parameters, array of objects and constructor, destructor.

this pointer, static members, constant objects and member function, Data abstraction , structure and class, information hiding

Unit III	**Inheritance and Composition**	**06 Hours**

Inheritance – concept, implementation, base classes and derived classes, members in base classes and derived classes, overriding base class members, UML notations for inheritance, constructors of derived and base classes, destructor in derived class, Inheritance as public, protected and private

Composition (Aggregation) and association – concept, implementation and UML Notation

Unit IV	**Polymorphism**	**06 Hours**

Polymorphism – need, concept, implementation using function overloading, Multiple Inheritance, function overriding, virtual function, pure virtual function, abstract classes, Friend function and friend classes, accessing base class functions from derived class objects, accessing derived class functions from base classobjects.

Operator overloading: -fundamentals of operator overloading, overloading binary operators, overloading unary operator

Unit V	Exceptions Handling and File Processing	06 Hours

Exception handling: Introduction, Handling exceptions within program, C++ mechanism of exception handling, throwing an exception, order of catch blocks, creating exception classes, rethrowing exceptions, exception handling techniques, Standard Library Exception Hierarchy.

File Processing : Introduction, Files and streams, creating and opening a file, file opening modes, Reading data from file, updating file, Random access file – creating and opening a random access file, reading and writing to a random access file, object serialization.

Unit VI	Template and Standard Template Library (STL)	06 Hours

Template: Introduction, function template, class template,

STL – Introduction, STL containers, Common member functions in STL container, container headers, typedefs, iterators, iterator operations, STL Algorithms.

Text Books:

1. C++ Programming: From Problem Analysis To Program Design, (5th Edition), - D.S. MALIK, Cengage Learning.
2. C++ How To Program (8th Edition) by Paul deitel, Harvey deitel, Pearson Publication

References Books:

1. Object Oriented Programming in C++ (4th Edition) - Robert Lafore, SAMS Publication
2. Effective C++ 55 Specific Ways to Improve Your Programs and Designs, (3rd Edition) - Scott Meyers, Addison Wesley Publication.
3. The C++ Programming Language,(3rd edition) - Bjarne Stroustrup, Pearson Education India Publication.

Practical Work: Students have to carry out minimum 14 to 16 Practical based on features of C++, Object Oriented Design and data structure.

Sample List of Experiments

1. Write a program to implement complex numbers and provide basic arithmetic operations for them using structure (basic c++ program and class)
2. Write a program to implement Matrix class and provide basic arithmetic operations for them (basic c++ program and class)
3. Write a program to implement BMI calculator. (Class and Object)
4. Write a program to calculate mode for a given set of number. Numbers can be integers, floating point numbers and double precision numbers (function overloading)
5. Write a program to overload the basic arithmetic operators for the class complex numbers, also modify the show method to include I/O manipulators (Operator overloading)
6. Write a program to overload insertion and extraction operators for the complex class using friend function (friend function)
7. Write a program to implement hierarchy given in the figure. (simple inheritance)
8. Write a program to implement linear search using template function. Input can be a set of integers, a set of double precision numbers, and a set of strings (Function template)
9. Write a program to implement the given hierarchy (Multiple inheritance)
10. Write a program to implement the has-a-relationship between given entities. (composition)
11. Write a program to implement a class mySet as a template class and implement the following set operation union, intersection, difference and symmetric difference (Class template)
12. Write a program to read a C++ program and check for error, if any in the parenthesis.
13. The program should report the line numbers where error found (file handling).
14. Write a program to implement object serialization. (File handling)

15. Study of various containers available in Standard Template Library (STL)
16. Write a program to demonstrate various features of list container in STL

Useful Links:
1. C++ API Documentation **: https://devdocs.io/cpp/**
2. C++ API Reference **: https://en.cppreference.com/w/**

Lab Scheme: Practicals: 02 Hrs./Week	Credits 01	Evaluation Scheme: CIE: 50 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–
- ☐ Design client server-based application
- ☐ Do analysis of network protocols
- ☐ Configure different protocols and be able to implement programs using socket for communication.

List of Experiments

(It should consist of 10-12 experiments based on the following topics.)

1	Implementation of connection oriented (TCP) client-server socket program.
2	Implementation of connectionless (UDP) client-server socket program
3	Implementation of the Address Resolution Protocol using socket programming
4	Implementation of forward lookup method using Socket Programming
5	Implementation of Reverse lookup method using Socket Programming
6	Configuration of VLAN using CISCO Packet Tracer
7	Configuration of WLAN using CISCO Packet Tracer
8	Configuration of DHCP using CISCO Packet Tracer
9	Configuration of OSPF using CISCO Packet Tracer
10	Configuration of RIP using CISCO Packet Tracer
11	Configuration of DNS server on Linux and Windows

Lab Scheme: Practicals: 02 Hrs./Week	Credits 01	Evaluation Scheme: CIE: 50 Marks SEE: 50 Marks

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Describe fundamentals of algorithms.
- ☐ Discover solution to problems using algorithm design paradigms like Divide and Conquer and Greedy Approach.
- ☐ Apply Dynamic Programming and Backtracking Approach to tackle the problems.

List of Experiments
(It should consist of 10-12 experiments based on the following topics.)

1	Demonstrate use of profiler.
2	Write a program to search an element in the list using Binary Search Approach and Compute its analysis.
3	Write a program to sort elements using Bubble Sort, Insertion Sort, Selection Sort Techniques.
4	Write efficient algorithm to find repeated element in an array.
5	Write efficient algorithm to find minimum and maximum of given numbers.
6	Write a program to sort elements using Merge Sort Technique and Compute its complexity.
7	Write a program to sort elements using Quick Sort Technique and Compute its complexity.
8	Write program to find Optimal Merge Pattern for elements.
9	Write a program to find Minimum Cost Spanning Tree using Prim's algorithm.
10	Write a program to find Minimum Cost Spanning Tree using Kruskal's algorithm.
11	Write program to find Single Source Shortest Path.
12	Write a program to encode elements using Huffman Code.
13	Write a program to find solution to Knapsack Problem Instance.
14	Write a program to find solution to Job Sequencing with Deadlines Problem Instance.
15	Write a program to find solution to Multistage Graph Problem Instance.
16	Write a program to find All Pairs Shortest Path.
17	Write a program to find Optimal Binary Search Tree.
18	Write a program to find solution to Reliability Design Problem Instance.
19	Write a program to find solution to 0 / 1 Knapsack Problem Instance.
20	Write a program to find solution to N-Queens Problem.
21	Write a program to find solution to Sum of Subsets Problem.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. (Semester – IV)
AIL209: Environmental Studies

Teaching Scheme: Lectures: 02 Hrs./Week Tutorials: 00 Hrs./Week Practicals: 00 Hrs./Week	Credits --	Evaluation Scheme: CIE: 30 Marks SEE: 70 Marks

Course Outcomes:

On completion of the course, student will be able to–

- ☐ Understand definition and importance of environment.
- ☐ Identify causes and effects of environmental pollution.
- ☐ Understand control measure of industrial pollution.
- ☐ Understand social issues and local environmental problems (Group project)

Course Contents

Unit I	Biodiversity and its Conservation	06 Hours

Introduction - Definition: genetic, species and ecosystem diversity, Bio-geographical classification of India. Value of biodiversity: Consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega-diversity nation. Western Ghats as a bio-diversity region.

Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, mad wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit II	Environmental Pollution	08 Hours

Definition: Causes, effects and control measures of Air pollution. Water pollution. Soil pollution, Marine pollution. Noise pollution. Thermal pollution & Nuclear hazards.

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.

Unit III	Social Issues and Environmental protection	06 Hours

Disaster Management: Floods, earthquake, cyclone and landslides. Tsunami. Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental Ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act.

Text Books:

1. Environmental studies for Undergraduates publisher Shivaji university Kolhapur

References Books:

1. Agarwal, K.C.2001, Environmental Biology, Nidi Pub. Ltd., Bikaner.
2. BharuchaErach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380013, India, Email:mapin@icenet.net (R)
3. Brunner R.C.,1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
4. Clank R.S. Marine Pollution, Clanderson Press Oxford (TB)
5. Cunningham, W.P. Cooper, T.H.Gorhani, E. & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Pub. Mumbai, 1196p
6. De A.K., Environmental Chemistry, Wiley Wastern Ltd.
7. Down to Earth, Centre for Science and Environment, New Delhi. (R)
8. Gleick, H.,1993, Water in crisis, Pacific Institute for studies in Dev., Environment &Security.StockholmEnv.Institute. Oxford Univ. Press 473p
9. Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H.& Watson, R.T.1995, Global Biodiversity Assessment, Cmbridge Univ. Press 1140p.
11. Jadhav, H.and Bhosale, V.M.1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi 284p.
12. Mickinney, M.L. and School. R.M.1196, Environmental Science Systems and Solutions, Web enhanced edition, 639p.
13. Miller T.G. Jr., Environmental Science. Wadsworth Publications Co. (TB).
14. Odum, E.P.1971, Fundamentals of Ecology, W.B. Saunders Co. USA,574p.
15. RaoM. N. and Datta, A.K.1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd., 345p
16. Sharma B.K., 2001, Environmental Chemistry, Gokel Publ. Hkouse, Meerut
17. Survey of the Environment, The Hindu (M)
18. Townsend C., Harper, J. and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
19. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, vol. I and II, Environmental Media (R)
20. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB)
21. Wagner K.D.,1998, Environmental management, W.B. Saunders Co. Philadelphia, USA 499p.
22. Paryavaranshastra – Gholap T.N.
23. ParyavaranSahastra – Gharapure

Useful Links:

1. https://nptel.ac.in/courses/120/108/120108004/