Faculty of Engineering and Technology
P. K. University Shivpuri (MP)

Evaluation Scheme & Syllabus for

Department of Computer Science Engineering & IT

Diploma CS II Year

(III Semester)

(Effective from session 2025-26)

THIRD SEMESTER (COMPUTER SCIENCE AND ENGINEERING)

Sr. No.	CODE	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
							INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
			L	T	P		*Th*	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
3.1	DAPPLCO301	*Applied Mathematics-III	4	-	-	4	30		30	70	3			70	100
3.2	DINTECO302	Internet and Web Technology	3	-		3	30		30	70	3			70	100
3.3	DENVICO303	*Environmental Studies	3	-		3	30		30	70	3			70	100
3.4	DDATACO304	Data Communication and Computer Networks	3	-		3	30		30	70	3			70	100
3.5	DDATACO305	Data Structure Using C	4	-		3	30		30	70	3			70	100
3.6	DDIGICO306	**Digital Electronics	3	-		3	30		30	70	3			70	100
3.7	DINTECO307	Internet and Web Technology LAB			4	1		25	25			25		25	50
3.8	DENVICO308	*Environmental Studies LAB			2	1		25	25			25		25	50
3.9	DDATACO309	Data Communication and Computer Networks LAB			2	1		25	25			25		25	50
3.10	DDATACO310	Data Structure Using C LAB			4	2		25	25			25		25	50
3.11	DDIGICO311	**Digital Electronics LAB			4	1		25	25			25		25	50
		Total	20		16	25	180	125	305	420	18	125		545	850

DAPPLCO301 APPLIED MATHEMATICS –III

L	T	P
4	-	-

RATIONALE

Contents of this course provide understanding of some elementary and advanced mathematics algorithms and their applications of solving engineering problems. Content of this course will enable students to use some advanced techniques like Beta-Gamma function, Fourier series, Laplace transform and probability distributions in solving complex engineering problems.

LEARNING OUTCOMES

After undergoing this course, the students will be able to:

- Understand matrix operations and uses of matrix in different problems.
- Apply elementary row and column operations in finding inverse of a matrix.
- Find Eigen values, Eigen vectors of a matrix and their different properties.
- Understand degree/order of differential equations and their solution techniques.
- Use differential equations in engineering problems of different areas.
- Find Fourier series expansion of a function
- Apply Laplace transform and their applications in solving engineering problems.
- Understand concept of probability distribution and their applications.

DETAILED CONTENTS

1. Matrices (16 Periods)

1.1 Algebra of Matrices, Inverse

Addition, Multiplication of matrices, Null matrix and a unit matrix, Square matrix, Symmetric, Skew symmetric, Hermitian, Skew hermition, Orthagonal, Unitary, diagonal and Triangular matrix, Determinant of a matrix.

Definition and Computation of inverse of a matrix.

1.2 Elementry Row/Column Transformation

Meaning and use in computing inverse and rank of a matrix.

1.3 Linear Dependence, Rank of a Matrix

Linear dependence/independence of vectors, Definition and computation of rank of matrix. Computing rank through determinants, Elementary row transformation and through the concept of a set of independent vectors,

Consistency of equations.

1.4 Eigen Pairs, Cayley-Hamilton Theorem

Definition and evaluation of eign values and eign vectors of a matrix of order two and three, Cayley-Hamilton theorem (without Proof)and its verification, Use in finding inverse and powers of a matrix.

2. Differential Calculus (15 Periods)

2.1 Function of two variables, identification of surfaces in space, conicoids 2.2 Partial Differentiation

Directional derivative, Gradient, Use of gradient f, Partial derivatives, Chain rule, Higher order derivatives, Euler's theorem for homogeneous

functions, Jacobians. 2.3 Vector Calculus

Vector function, Introduction todouble and triple integral,differentiation and integration of vector functions, differential derivatives.

gradient, divergence and curl,

3. Differential Equation (15 Periods)

3.1 Formation, Order, Degree, Types, Solution

Formation of differential equations through physical, geometrical, mechanical and electrical considerations, Order, Degree of a differential equation, Linear, nonlinear equation. 3.2 First Order Equations

Variable seperable, equations reducible to seperable forms, Homogeneous equtions, equations reducible to homogeneous forms, Linear and Bernoulli form exact equation and their solutions. 3.3 Higher Order Linear Equation :

Property of solution, Linear differential equation with constant coefficients

(PI for X= $_{ax,}$ Sinax, Cosax, X^n, $_{ax}$V, XV

3.4 Simple Applications

LCR circuit, Motion under gravity, Newton's law of cooling, radioactive decay, Population growth, Force vibration of a mass point attached to spring with and without damping mechanical system effect. Equivalence of electrical and

4. Integral Calculus-II (12 Periods)

Beta and Gamma Functions

Definition, Use, Relation between the two, their use in evaluating integrals.

Fourier Series

Fourier series of f(x),-n<x<n, Odd and even function,Half range series. Laplace Transform

Definition, Basic theorem and properties, Unit step and Periodic functions, inverse laplace transform, Solution of ordinary differential equations

5. Probability and Statistics (12 Periods)

Probability

Introduction, Addition and Multiplication theorem and simple problem.

Distribution

Discrete and continuous distribution, Bionimal Distribution, Poisson distribution, Normal Distribution.

INSTRUCTONAL STRATEGY

The content of this course is to be taught on conceptual basis with plenty of real world examples. The basic elements of Laplace transform, Differential equations and Applications of differential equations can be taught with engineering applications of relevant branch.

MEANS OF ASSESSMENT

Assignments and Quiz/Class Tests Mid-term and End-term Written Tests Model/Prototype Making

RECOMMENDED BOOKS

Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi

Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,
Applied Mathematics-III by Chauhan and Chauhan, Krishna Publications, Meerut**.**

Applied Mathematics-II by Kailash Sinha and Varun Kumar; Aarti Publication, Meerut.
E-books/e-tools/relevant software to be used as recommended by AICTE/
NITTTR, Chandigarh.

SUGGESTED DISTRIBUTION OF MARKS

Topic	Time Allotted (Periods)	Marks Allotted (%)
1.	16	24
2.	15	20
3.	15	20
4	12	18
5	12	18
Total	**70**	**100**

DINTECO302 INTERNET AND WEB TECHNOLOGY

L	T	P
3	-	-

RATIONALE

The diploma holders in Computer Science and Engineering needs to understand about Internet, Web Space and how to develop static website. They should be able to develop basic static websites by using different front-end Technologies subject.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to: . Hence this

- understand working of Internet/ Websites, Client Server Model and Internet Tools.
- understand and develop HTML Web pages.
- provide logics on the web pages by using JavaScript
- use Bootstrapto develop responsive website
- control the Look and feel of web pages by using CSS
- use JQuery for developing the Web Pages
- develop Static webpage/web portal

DETAILED CONTENTS

1. Web Development Introduction (06 Periods)

   Internet, WWW, Browser, Search engine Client Server Model, URL, Web Pages, Website and Web Services, Types of Websites (Static, Dynamic and Responsive), Developer options of Browser (View page source, Developer Tools, Inspect Element etc) ,Need of cyber security & IT Laws

2. HTML (10 Periods)

   Basics:

   HTML Document, Basic Structure of HTML, Syntax, HTML Tags and Attributes, Types of HTML Tags, Rules of nesting, Basic Tags (HTML Tag. Head Tag, Title Tag, Body Tags).

   Page Formatting:

   Adding a new Paragraph, Adding a line break, Inserting a blank space , changing page background , Div and Span tags

   Text Formatting:

   Html Headings, Formatting elements (<b> Bold text , Important text ,<i> Italic text , Emphasized text , <mark> Marked text, <small> Small text, <del> Deleted text, <ins> Inserted text, <sub> Subscript text, <sup> Superscript text), Comments, Horizontal Lines

   Creating Lists:Ordered List, Unordered Lists, Definition Lists

   Others:

   Images, Text Links, Image Links, opening a page in New Window or Tab, Linking to an area of same page, Introduction to Table Tags, Advantages and limitations of tables, Frames &IFrame, HTML Forms , XHTML

3. Cascading Style Sheets (08 Periods)

   Introduction, Benefits of CSS, CSS Syntax, CSS Implementation (inline, internal and external), CSS Selectors (ID Selectors, Class Selectors, Grouping Selectors, Universal Selectors, CSS Pseudo-classes), CSS properties (background-color, background-image, border-style, height, width, color, text-align, font-family, font-style, font-size, font-weight), Box Model in CSS(margin, border, padding)

4. Java Scripts (08Periods)

Java Script Introduction , variables , data types , operators, control flow (if-else, for loop , while loop , do-while loop) , Declaring Functions , Calling functions with parameters, Adding JavaScript to Web Documents, JavaScript Objects , Document Object Models, HTML Events and calling Java Script functions on Events.

5. JQUERY (09 Periods)

JQuery Concept, Adding Jquery to Web Page, Jquery Selectors, Jquery Event Methods, Jquery Effects (Hide/Show, Fade, Slide), Insertion of header /footer in HTML Pages using Jquery

6. Bootstrap (09 Periods)

Color Management, Buttons, Table, drop-down, navigation-bar, images, pagination,

jumbotron, alerts, forms, progress bar, grid, utilities & filters

7. XML & JSON (06 Periods)

Introduction and use of XML, Difference between XML and HTML, XML Elements, Attribute, Name space, Syntax Rules, XML DTD and XML Schema, RSS FEED, JSON

Introduction and uses, JSON v/s XML, JSON Syntax.

RECOMMENDED BOOKS

1. Head First HTML and CSS: A Learner's Guide to Creating Standards-Based Web Pages , O Reilly Publications by Elisabeth Robson Eric Freeman
2. Head First JavaScriptProgramming, O Reilly Publications by Eric FREEMAN
3. Head First jQuery, O Reilly by Ryan Benedetti, Ronan Cranley
4. Web Technologies, Black Book ,Kogent Learning Solutions Inc
5. Developing Web Applications, 2ed ,WileyPublications, M.T.Savaliya
6. Mastering Bootstrap 4 ,by Benjamin Jakobus and Jason Marah,Packt Publishing
7. e-books/e-tools/relevant software to be used as recommended by AICTE/UPBTE/NITTTR, Chandigarh.

Websites for Reference:

1. http://swayam.gov.in
2. http://spoken-tutorial.org

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	06	10
2	10	18
3	08	15
4	08	15
5	09	16
6	09	16
7	06	10
Total	**56**	**100**

DENVICO303 ENVIRONMENTAL STUDIES

L	T	P
3	-	-

RATIONALE

A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the ecosystem and controlling pollution by various control measures. He should also be aware of environmental laws related to the control of pollution. He should know how to manage the waste. Energy conservation is the need of hour. He should know the concept of energy management and its conservation.

LEARNING OUTCOMES

After undergoing the subject, the student will be able to:

- Comprehend the importance of ecosystem and sustainable
- Demonstrate interdisciplinary nature of environmental issues
- Identify different types of environmental pollution and control measures.
- Take corrective measures for the abatement of pollution.
- Explain environmental legislation acts.
- Define energy management, energy conservation and energy efficiency
- Demonstrate positive attitude towards judicious use of energy and environmental protection
- Practice energy efficient techniques in day-to-day life and industrial processes.
- Adopt cleaner productive technologies
- Identify the role of non-conventional energy resources in environmental protection.
- Analyze the impact of human activities on the environment

DETAILED CONTENTS

1. Introduction (04 Periods)

1.1 Basics of ecology, eco system- concept, and sustainable development,

Resources renewable and non renewable.

2. Air Pollution (04 Periods)

2.1 Source of air pollution. Effect of air pollution on human health, economy, plant,

animals. Air pollution control methods.

3. Water Pollution (08 Periods)

3.1 Impurities in water, Cause of water pollution, Source of water pollution. Effect

of water pollution on human health, Concept of dissolved O_2, BOD, COD. Prevention of water pollution- Water treatment processes, Sewage treatment. Water quality standard.

4. Soil Pollution (06 Periods)

Sources of soil pollution

Types of Solid waste- House hold, Hospital, From Agriculture, Biomedical, Animal and human, excreta, sediments and E-waste Effect of Solid waste Disposal of Solid Waste- Solid Waste Management

5. Noise pollution (06 Periods)

Source of noise pollution, Unit of noise, Effect of noise pollution, Acceptable noise level, Different method of minimize noise pollution.

6. Environmental Legislation (08 Periods)

Introduction to Water (Prevention and Control of Pollution) Act 1974, Introduction to Air (Prevention and Control of Pollution) Act 1981 and Environmental Protection Act 1986, Role and Function of State Pollution Control Board and National Green Tribunal (NGT), Environmental Impact Assessment (EIA).

7. Impact of Energy Usage on Environment (06 Periods)

Global Warming, Green House Effect, Depletion of Ozone Layer, Acid Rain. Eco-friendly Material, Recycling of Material, Concept of Green Buildings.

RECOMMENDED BOOKS

Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, New Delhi. Environmental Protection Law and Policy in India by Thakur Kailash; Deep and Deep Publications, New Delhi.

Environmental Pollution by Dr. RK Khitoliya; S Chand Publishing, New Delhi

Environmental Science by Deswal and Deswal; Dhanpat Rai and Co. (P) Ltd. Delhi. Engineering Chemistry by Jain and Jain; Dhanpat Rai and Co. (P) Ltd. Delhi. Environmental Studies by Erach Bharucha; University Press (India) Private Ltd., Hyderabad.

Environmental Engineering and Management by Suresh K Dhamija; S K Kataria and

Sons, New Delhi.

E-books/e-tools/relevant software to be used as recommended by AICTE/ NITTTR, Chandigarh.

Websites for Reference:

http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	04	10
2	04	10
3	08	20
4	06	14
5	06	14
6	08	20
7	06	12
Total	**42**	**100**

DDATACO304 DATA COMMUNICATION AND COMPUTER NETWORKS

L	T	P
3	-	-

RATIONALE

The future of computer technology is in Data Communication and Computer Networks. Global connectivity can be achieved through computer networks. A diploma holder in Computer Science and Engineering should therefore understand the function of networks and get exposure to different existing and upcoming communication technologies. Knowledge about hardware and software requirements of networks is essential.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- know about signal types, transmission media
- know about different communication methodologies
- setup computer networks
- setup basic wireless network
- diagnose & solve network problems
- diagnose & solve network problems remotely
- provide security to networks
- manage & handle wan
- prevent external network attacks
- identify network troubleshooting methods.

DETAILED CONTENTS

1. Introduction to Data Communication (07 Periods)

Basics of the Communications

Direction of the Data flow(simplex, half-duplex, full-duplex)

Network Topologies, signals and transmission (analog and digital) Transmission media (guided and unguided)

Concept of digital signals, Bit rate, Bit length, Transmission impairment (attenuation, distortion, noise.

2. Communication Methodologies (10 Periods)

Need for modulation in communication system

Concepts AM, FM, PM, FSK, TSK, PCM (No Mathematical model)

Concept of bandwidth and channel capacity of different communication systems such as radio, microwave etc.

Multiplexing techniques (TDM, FDM, WDM,CDMA)

3. Networks Basics (14 Periods)

Concept of network

Models of network computing Networking models

Peer-to –peer Network

Client-Server Network

LAN, MAN and WAN

Network Services

Switching Techniques

4. Networking Models (05 Periods)

OSI model: Definition, Layered Architecture

Functions of various layers

TCP/IP Model: Definition, Functions of various layers Comparison between OSI and TCP/IP model

5. TCP/IP Addressing (10 Periods)

5.1 Concept of physical and logical addressing

5.2 IPV4 addresses – Address space, Notations

5.3 Classful Addressing- Different IP address classes, Classes & Blocks, Net-id & Host-Id, Masks, Address depletion

5.4 Classless Addressing – Address blocks, Masks

5.5 Special IP Addresses

5.6 Subnetting and Supernetting

5.7 Loop back concept

5.8 Network Address Translation

5.9 IPV4 Header

5.10 IPV6 Header

5.11 Comparison between IPV4 and IPV6

6. Network Architecture (04 Periods)

Ethernet specification and standardization: 10 Mbps (Traditional Ethernet), 10 Mbps (Fast Ethernet) and 1000 Mbps (Gigabit Ethernet)

Network Connectivity (05 Periods)

7 Network connectivity Devices NICs Hubs, Switches, Routers, Repeaters, Modem, Gateway Configuration of Routers & Switches

8 Network Administration (10 Periods)

Network Security Principles, Cryptography, using secure protocols

Trouble Shooting Tools: PING,IPCONFIG, IFCONFIG, NETSTAT, TRACEROOT,

Wireshark, Nmap, TCPDUMP, ROUTEPRINT

DHCP Server

Workgroup/Domain Networking

9. Introduction to Wireless Networks. (05 Periods)

9.1 Introduction to wireless LAN IEEE 802.11, WiMax and Li-Fi 9.2 Wireless Security

9.3 Introduction to bluetooth - architecture, application

9.4 Comparison between bluetooth and Wifi

RECOMMENDED BOOKS

Computer Networks by Tanenbaum, Prentice Hall of India, New Delhi

Data Communications and Networking by Forouzan, (Edition 2nd and 4th), Tata McGraw Hill Education Pvt Ltd , New Delhi

Data and Computer Communication by William Stallings, Pearson Education, New Delhi

Local Area Networks by Peter Hudson

Network+ Lab manual,- BPB Publications -by Tami Evanson

Networking Essentials – BPB Publications New Delhi

Computer Network and Communications By V.K. Jain and Narija Bajaj, Cyber Tech Publications, New Delhi.

Cloud Computing Bible by Berrie Sarinby

E-books/e-tools/relevant software to be used as recommended by AICTE/NITTTR, Chandigarh.

Websites for Reference:

http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1.	07	10
2.	10	15
3.	14	20
4.	05	07
5.	10	15
6.	04	05
7	05	06
8.	10	15
9.	05	07
Total	**70**	**100**

DDATACO305 DATA STRUCTURES USING C

L	T	P
4	-	-

RATIONALE

Data structures are the techniques of designing the basic algorithms for real-life projects. Understanding of data structures is essential and this facilitates the understanding of the language. The practice and assimilation of data structure techniques is essential for programming. The knowledge of 'C' language and data structures will be reinforced by practical exercises during the course of study. The course will help students to develop the capability of selecting a particular data structure.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Identify the problem and formulate an algorithm for it.
- Identify the best data structures to solve the problem
- Store data, process data using appropriate data structures
- Sort the data in ascending or descending order.
- Implement trees and various traversing techniques.
- Implement various searching and sorting algorithms and to compare them for checking efficiency.

DETAILED CONTENTS

1. Fundamental Notations (08 Periods)

Problem solving concept top down and bottom up design, structured programming

Concept of data types, variables and constants

Concept of pointer variables and constants

Categories of Data structure

2. Arrays (08 Periods)

Concept of Arrays

Storage representation of multi-dimensional arrays.

Operations on arrays with Algorithms (searching, traversing, inserting, deleting)

3. Linked Lists (12 Periods)

Introduction to linked list

Representation of linked lists in Memory

Operations on linked list (Insertion, deletion and traversals) Application of linked lists

Doubly linked lists

Operations on doubly linked lists (Insertion, deletion and traversals)

4. Stacks, Queues and Recursion (12 Periods)

Introduction to stacks Representation of stacks Implementation of stacks Applications of stacks Introduction to queues Implementation of queues Circular Queues De-queues

Application of Queues

Recursion

5. Trees (12 Periods)

Concept of Trees

Representation of Binary tree in memory

Traversing Binary Trees (Pre order, Post order and In order) Searching, inserting and deleting binary search trees Introduction to Heap

Application of Trees

6. Sorting and Searching (12 Periods)

Introduction to sorting and searching

Search algorithm (Linear and Binary)

7. Graph Sorting algorithms (Bubble Sort, Insertion Sort, Quick Sort, Selection Sort,

Merge Sort, Heap Sort (06 Periods)

7.1 Introduction to Graph

7.2 Basic Operations

7.3 Depth First Search

7.4 Breadth First Search

RECOMMENDED BOOKS

Data Structure using C by Robert Kruse; Prentice Hall of India

Data Structure through C by Yashwant Kanekar; BPB Publications

Data structures – Schaum's Outline Series by Lipschutz; McGraw Hill Education Pvt Ltd , New Delhi

Data Structure using C by ISRD Group ; Tata McGraw Hills Education Pvt Ltd , New

Delhi

Expert Data Structures with C by R.B. Patel ; Khanna Publishers, New Delhi.

Data Structures and Algorithm Using C by RS Salaria; Khanna Book Publishing Co. (P) Ltd. New Delhi

Data Structure through C in depth by SK Srivastava, Deepali Srivastava; BPB

Publications

Data Structure through "C" Language by Sameeran Chattopadhyay, MatanginiChottopadhyay; BPB Publications

Data Structure through "C" Language by DOEACC; BPB Publications

Data Structure using "C" Lab Workbook by Shukla; BPB Publications E-books/e-tools/relevant software to be used as recommended by AICTE/NITTTR, Chandigarh.

Websites for Reference:

http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	08	10
2	08	15
3	12	15
4	12	15
5	12	15
6	12	15
7	06	15
Total	**70**	**100**

DDIGICO306 DIGITAL ELECTRONICS

L	T	P
3	-	-

RATIONALE

This course has been designed to make the students know about the fundamental principles of digital electronics and gain familiarity with the available IC chips. This subject aims to give a background in the broad field of digital systems design and microprocessors.

LEARNING OUTCOMES

After undergoing the subject, student will be able to:

- explain the importance of digitization.
- verify and interpret truth tables for all logic gates.
- realize all logic functions with NAND and NOR gates
- design and demonstrate adder and subtractor circuits
- verify and interpret truth tables of multiplexer, demultiplexer, encoder and decoder ICs
- design and realize different sequential circuit(Flip flops, counters and shift registers)
- verify performance of different A/D and D/A converters.
- explain the features and applications of different memories

DETAILED CONTENTS

1. Introduction (03 Periods)

Distinction between analog and digital signal. Applications and advantages of digital signals.

2. Number System (03 Periods)

Binary, octal and hexadecimal number system: conversion from decimal and hexadecimal to binary and vice-versa.

Binary addition and subtraction including binary points. 1's and 2's

complement method of addition/subtraction.

3. Codes and Parity (04 Periods)

Concept of code, weighted and non-weighted codes, examples of 8421,

BCD, excess-3 and Gray code.

Concept of parity, single and double parity and error detection

4. Logic Gates and Families (06 Periods)

Concept of negative and positive logic

Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates, NAND and NOR as universal gates.

SSI, MSI, LSI, VLSI (Definition)

Propagation delay, Noise Margin, Fan in, Fan out, Power dissipation. Comparison between TTL, CMOS, ECL, MOS on basis of diff parameter. Introduction to Bipolar logic, MOS, ECL, TTL and CMOS logic families Basic logic gate using NMOS, PMOS, CMOS

5. Logic Simplification (06 Periods)

Postulates of Boolean algebra, De Morgan's Theorems. Implementation of Boolean (logic) equation with gates

Karnaugh map (upto 4 variables) and simple application in developing

combinational logic circuits

6. Arithmetic circuits (03 Periods)

Half adder and Full adder circuit, design and implementation.

Half subtractor and Full subtractor or Circuit, design and implementation.

7. Combinational Circuit (06 Periods)

Introduction to combinational circuit

Multiplexer, De-multiplexer, Encoder, Decoder block diagram and Circuit. 7 segment decoder

BCD Encoder Circuit

8. Introduction to Sequential circuit (06 Periods)

Introduction to Sequential

Copmparison between combinational and sequential circuit

Concept and types of latch with their working and applications

Operation using waveforms and truth tables of RS, T, D, Master/Slave JK flip flops.

Difference between a latch and a flip flop

9. Counters (06 Periods)

Introduction to Asynchronous and Synchronous counters

Binary counters

Divide by N ripple counters, Decade counter, Ring counter and twisted Ring counter.

10. Shift Register (05 Periods)

Introduction and basic concepts including shift left and shift right.

a) Serial in parallel out, serial in serial out, parallel in serial out, parallel in parallel out.

b) Universal shift register

11. A/D and D/A Converters (04 Periods)

Working principle of A/D and D/A converters

Brief idea about different techniques of A/D conversion and study of :

- Stair step Ramp A/D converter
- Dual Slope A/D converter
- Successive Approximation A/D Converter

Brief idea of :

- Binary Weighted D/A converter
- R/2R ladder D/A converter

Applications of A/D and D/A converter.

12. Semiconductor Memories (04 periods)

Memory organization, classification of semiconductor memories (RAM, ROM, PROM, EPROM, EEPROM), static and dynamic RAM.

RECOMMENDED BOOKS

Digital Logic Designs by Morris Mano, Prentice Hall of India, New Delhi

Digital Electronics by RP Jain, Tata McGraw Hill Education Pvt Ltd, New Delhi Digital Electronics by BR Gupta, Dhanpat Rai & Co., New Delhi

Digital Systems: Principles and Applications by RJ Tocci, Prentice Hall of India,

New Delhi

E-books/e-tools/relevant software to be used as recommended by AICTE/NITTTR, Chandigarh.

Websites for Reference:

http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allocation (%)
1.	03	07
2.	03	07
3.	04	07
4.	06	09
5.	06	11
6.	03	11
7.	06	11
8.	06	05
9	06	11
10.	05	11
11.	04	07
12	04	07
Total	**56**	**100**

DINTECO307 Internet and Web Technology LAB

L	T	P
-	-	4

LIST OF PRACTICALS

1. Install, configure and start using developer tools /Code Editor/Browser
2. Creating Web Pages using different HTML tags
3. Control the look and feel of Web Page Styling by using CSS.
4. Write JavaScript functions and control the different companonets of Web page by
5. predefined JavaScript objects
6. Validation of Form fields using Java Script
7. Use jQuery library to apply different features on web pages.
8. Use Bootstrap library and icons to develop a responsive websites

INSTRUCTIONAL STRATEGY

Since this subject is practice oriented, the teacher should demonstrate the capabilities of websites/WebPages to students while doing practical exercises. The students should be made familiar with developing web pages by code editor/browsers, working on internet. The student should be made capable of developing static websites by using

HTML, JavaScript, CSS and jQuery

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-term and end-term written tests Actual laboratory and practical work, exercises and viva-voce

Software installation, operation, development and viva-voce

DENVICO308 *Environmental Studies LAB

LIST OF PRACTICALS

L	T	P
-	-	2

1. Determination of pH of drinking water Determination of TDS in drinking water Determination of TSS in drinking water Determination of hardness in drinking water Determination of oil & grease in drinking water Determination of alkalinity in drinking water
2. Determination of acidity in drinking water
3. Determination of organic/inorganic solid in drinking water
4. Determination of pH of soil
5. Determination of N&P (Nitrogen & Phosphorus) of soil
6. To measure the noise level in classroom and industry.
7. To segregate the various types of solid waste in a locality.
8. To study the waste management plan of different solid waste
9. To study the effect of melting of floating ice in water due to global warming

INSTRUCTIONAL STRATEGY

In addition to theoretical instructions, different activities pertaining to Environmental Studies like expert lectures, seminars, visits to green house, effluent treatment plant of any industry, rain water harvesting plant etc. may also be organized.

MEANS OF ASSESSMENT

Assignments and quiz/class tests, Mid-term and end-term written tests

DDATACO309 Data Communication and Computer Networks LAB

LIST OF PRACTICALS

L	T	P
-	-	2

1. Recognize the physical topology and cabling (coaxial, OFC, UTP, STP) of a network. Recognition and use of various types of connectors RJ-45, RJ-11,BNC and SCST Making of cross cable and straight cable
2. Install and configure a network interface card in a workstation.
3. Identify the IP address of a workstation and the class of the address and configure the IP Address on a workstation
4. Managing user accounts in windows and LINUX
5. Sharing of Hardware resources in the network.
6. Use of Netstat and its options.
7. Connectivity troubleshooting using PING, IPCONFIG, IFCONFIG
8. Installation of Network Operating System(NOS)
9. Visit to nearby industry for latest networking techniques
10. Create a network of at least 6 computers.

Required Software

Windows Server/Linux Server

Required Tools and Supplies

Crimping tool, Cable tester,

1) RJ 45 connectors, RJ-11, BNC, SCST
2) Coaxial Cable, UTP, STP, OFC cable
3) Screw Driver Kit
4) Switch/Hub
5) Manageable Switch

INSTRUCTIONAL STRATEGY

Since the facilities are not available in the polytechnic, students need exposure to various security systems and software available in some organisations, universities and engineering colleges. For this, visits may be organized for students. The teachers should also be exposed in this area. Some practical can be conducted in the laboratory.

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-term and end-term written tests Actual laboratory and practical work exercises and viva-voce Software installation, operation, development and viva-voce

DDATACO310 Data Structure Using C LAB

LIST OF PRACTICALS

L	T	P
-	-	4

Write programmes in C to implement

1. Addition of two matrices using functions
2. Multiplication of two matrices
3. Push and pop operation in stack
4. Inserting and deleting elements in queue
5. Inserting and deleting elements in circular queue
6. Insertion and deletion of elements in linked list
7. Insertion and deletion of elements in doubly linked list
8. Factorial of a given number with recursion and without recursion
9. Fibonacii series with recursion and without recursion
10. Program for pre-order, post order and in order traversal of binary tree.
11. The selection sort technique
12. The bubble sort technique
13. The quick sort technique
14. The merge sort technique
15. The binary search procedures to search an element in a given list
16. The linear search procedures to search an element in a given list

INSTRUCTIONAL STRATEGY

This subject clears all fundamentals of programming techniques. Teachers should stress on explaining all the techniques and algorithms in detail in theory sessions. The students should be asked to convert their ideas about a problem into an algorithm in theory class and implement it in practical class. This willhelp the students to have clear concepts of programming.

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-term and end-term written tests Actual laboratory and practical work, exercises and viva-voce Software installation, operation, development and viva-voce

DDIGICO311 **Digital Electronics LAB

LIST OF PRACTICALS

L	T	P
-	-	4

1 Verification and interpretation of truth tables for AND, OR, NOT NAND, NOR and Exclusive OR (EXOR) and Exclusive NOR(EXNOR) gates

2. Realisation of logic functions with the help of NAND or NOR gates

3. Design of a half adder using XOR and NAND gates and verification of its Operation - Construction of a full adder circuit using XOR and NAND gates and verify its operation

4. Verification of truth table for positive edge triggered, negative edge triggered, level triggered IC flip-flops (At least one IC each of D latch , D flip-flop, JK flip-flops).

5 Verification of truth table for encoder and decoder ICs, Mux and DeMux

6.To design a 4 bit SISO, SIPO, PISO, PIPO shift registers using JK/D flip flops and verification of their operation.

7.To design a 4 bit ring counter and verify its operation. Use of Asynchronous Counter ICs (7490 or 7493)

Note: Above experiments may preferably be done on Bread Boards.

INSTRUCTIONAL STRATEGY

The digital systems in microprocessors have significant importance in the area of electronics. Adequate competency needs to be developed by giving sufficient practical knowledge in microprocessors (programming as well as interfacing), A/D, D/A Converters and other topics. Help may be taken in the form of charts, simulation packages to develop clear concepts of the subject. Programming exercises other than the tested in circulation may be given to the students.

MEANS OF ASSESSMENT

Class test/quizzes Home assignments Attendance Sessional Test Practical Tasks