Scheme and Syllabus

of

Diploma

Computer Science and Engineering

By

Skill Department of Computer Science/IT

Under

Skill Faculty of Engineering and Technology

(w.e.f. 2024-2025 onwards)

SVSU

Shri Vishwakarma Skill University

Dudhola, Palwal-121102, Haryana

It is certified that this Scheme and syllabus is developed and checked by us, is completed in all respect.

Developed By:

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1.1 VISION AND MISSION

VISION OF THE UNIVERSITY

To emerge as one of the foremost institutions of quality in skill education acknowledges by industry, nationally and internationally.

MISSION OF UNIVERSITY

To focus on quality of skill education, aspired by students and admired by industry, nationally and internationally.

Vision of the Department

To build highly skilled and competent professionals with a futuristic outlook for research and innovation who can also generate sustainable employment with virtuous professional values.

Mission of the Department

1. To impart skill education and training as per industry needs in the domain of Computer Science & Engineering.
2. To develop and maintain the state of art infrastructure for building sustainable skilled IT ecosystem in the domain.
3. To cultivate the environment for fostering new ideas, research and innovations leading to emergence of skilled entrepreneurs, leaders, innovators and professionals.

1.2 Program Objective

This program is aimed at skilling the students for the jobs in IT industry at diploma level and aims at building the following key competencies amongst the learner.

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, naturalsciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Assistance in Design/development of solutions: Assist Engineers or seniors to design for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO5: Higher Education: To provide a sufficient level of knowledge and skill that enables them to pursue the bachelor degree in the same field.

PO6: Modern tool usage: Identify, select and apply appropriate techniques, resources, and modern

engineering and IT tools to solve engineering problems.

PO7: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO8: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO9: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO10: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO11: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

1.3 Program Specific Outcomes

PSO1: Solve problems analytically and logically via programming.

PSO2: Apply acquired knowledge and practical skills to develop computer applications and start new business ventures.

PSO3: Communicate effectively in oral or written.

PSO4: Work under closed supervision with some responsibility defined within limits.

1.4 Program Educational Objectives

PEO1: To impart science-based engineering education in addition with professional and entrepreneurship skills that will prepare the students for immediate employment or employer in IT sector and to pursue higher education in the field.

PEO2: To develop an ability to work in teams, innovate, design and project implementation. Communicate effectively, work under closed supervision, assist seniors and to prepare reports as per requirement.

PEO3: To understand the responsibility towards society, environment, and sustainability and remember professional ethics.

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The PO and PSO mapping, PO and PEO mapping are given in table 1 and table 2.

The mapping is defined such as 0: no mapping; 1: Low mapping; 2: Average mapping; 3: Complete mapping.

Table 1. PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PSO1	1	0	3	0	2	0	0	0	0	0	0	0
PSO2	1	2	0	0	3	0	0	0	0	0	2	0
PSO3	0	0	0	0	0	0	0	0	2	3	0	0
PSO4	0	0	0	0	0	1	1	1	3	0	0	2

Table 2. PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO1	3	2	3	1	3	0	0	0	0	0	0	0
PEO2	0	0	0	0	0	0	0	3	3	3	0	1
PEO3	0	0	0	0	0	1	2	0	0	0	0	0

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1.5 Program Structure

Sr. No.	Category	AICTE Suggested Breakup of Credits	SVSU Diploma Program Credits
1	Humanities & Social Sciences courses	8	10
2	Basic Science courses	19	16
3	Engineering Science courses	15	18
4	Program Core courses (Branch specific)	45	39
5	Program Elective courses (Branch specific)	12	16
6	Open Elective courses (from other technical and /or emerging subjects)	9	9
7	Project work, seminar and internship in industry or elsewhere	12	13
8	Audit Courses [Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Traditional Knowledge etc.]	(non-credit)	(non-credit)
	Total	**120**	**128**

1.6 Course Coding Scheme

Digit (s)	1st	2nd	3rd	4th	5th	6th	7th	8th
Nomenclature	Year		D	CSE			Course no. (01 to 99)	

1.7 Semester-wise Scheme

SEMESTER - I

Subject Code	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
24DENG001	English Language and Communication skills	1	0	0	1	HS
24DGEN01	English and Communication Skills Lab	0	0	4	2	HS
24DGEN02	Applied Mathematics - I	3	0	0	3	BS
24DGEN03	Applied Physics - I	3	0	0	3	BS
24DGEN04	Applied Physics -I Lab	0	0	2	1	BS
24DGEN05	Fundamentals of IT	3	0	0	3	ES
24DGEN06	Fundamentals of IT Lab	0	0	2	1	ES
24DGEN07	Computer Workshop	0	0	6	3	ES
24DGEN08	Electronics Workshop	0	0	4	2	ES
24DYHS01	Yoga and Health Skills-I	2	0	0	2	HS
24DGEN09	Basics of Prompt Engineering	2	0	0	2	ES

Total Credits	13	0	18	23	
Total Hours	31				

SEMESTER II

Subject Code	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
24DGEN10	Advances in IT	3	0	0	3	ES
24DGEN11	Advances in IT Lab	0	0	2	1	ES
24DGEN12	Applied Mathematics-II	4	0	0	4	BS
24DGEN13	Applied Physics - II	4	0	0	4	BS
24DGEN14	Applied Physics - II Lab	0	0	2	1	BS
24DGEN15	Engineering Graphics	0	0	6	3	ES
24DGEN16	Multimedia Applications	4	0	0	4	PC
24DGEN17	Multimedia Applications Lab	0	0	2	1	PC
24DEVS01	EVS	2	0	0	2	AU
24DCSE66	Human Values and Ethics	2	0	0	2	
Total Credits		**19**	**0**	**12**	**25**	
Total Duration		**31**				

SEMESTER III

Subject Code	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
24DCSE18	Programming in C	3	0	0	3	PC
24DCSE19	Programming in C Lab	0	0	4	2	PC
^^^	Program Elective -I	3	0	0	3	PE
^^^	Program Elective-I Lab	0	0	2	1	PE
24DCSE26	Basics of Computer Network	3	0	0	3	PC
24DCSE27	Basics of Computer Network Lab	0	0	2	1	PC
24DCSE28	Introduction to Operating system	3	0	0	3	PC
24DCSE65	Indian Constitution	2	0	0	2	AU
24DCSE29	Summer Internship - I (3 weeks)	-	-	-	2	Project
Total Credits		**14**	**0**	**8**	**20**	

Total Hours	22

SEMESTER IV

Subject Code	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
^^^	Program Elective- II	3	0	0	3	PE
^^^	Program Elective- II Lab	0	0	2	1	PE
24DCSE36	Python Programming Fundamentals	3	0	0	3	PC
24DCSE37	Python Programming Fundamentals Lab	0	0	4	2	PC
	Open Elective I	3	0	0	3	OE
24DCSE38	Entrepreneurship	2	0	0	2	HS
24DCSE39	Minor Project	0	0	4	2	Project
24DCSE40	Data Structure	3	0	0	3	PC
24DCSE41	Data Structure Lab	0	0	4	2	PC
24DCSE67	Essence of Indian Knowledge and Tradition	2	0	0	2	AU
Total Credits		**16**	**0**	**14**	**23**	
Total Duration		**30**				

SEMESTER V

Subject Code	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
^^^	Program elective III	3	0	0	3	PE
^^^	Program elective - III lab	0	0	2	1	PE
24DCSE48	Introduction to Database Management	3	0	0	2	PC
24DCSE49	Introduction to Database Management Lab	0	0	4	2	PC
	Open Elective II	3	0	0	3	OE
24DCSE50	Basics of Data Analytics	3	0	0	3	PC
24DCSE51	Basics of Data Analytics Lab	0	0	4	2	PC
24DCSE52	Summer Internship (4 weeks)	-	-	-	3	Project

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24DCSE53	Major Project (01 credit will be counted in semester VI)	0	0	2	0	Project
Total		**12**	**0**	**16**	**19**	
Total Hours		**28**				

SEMESTER VI

SUBJECT CODE	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
24DCSE55	Open Elective III (MooC)	3	0	0	3	OE
24DCSE56	Seminar	2	0	0	2	Project
^^^	Program Elective IV	3	0	0	3	PE
^^^	Program Elective IV Lab	0	0	2	1	PE
24DCSE63	Introduction to e-governance	3	0	0	3	PC
24DCSE64	Major Project (1 credit from sem V)	0	0	6	4	Project
24DCSE68	Employability	2	0	0	2	HS
Total Credits		**13**		**8**	**18**	
Total Hours		**21**				
EXIT	**Diploma**	Level 4.5				

It is mandatory to conduct a One-week workshop during the winter break after fifth semester on professional/ industry/ entrepreneurial orientation.

It is mandatory to organize at least one expert lecture per semester for each branch by inviting resource persons from domain specific industry.

^^^codes are mentioned in section 1.8(List of Electives)

1.8 List of Electives*

COURSE CODE	COURSE NAME
24DCSE20	Foundations of Artificial Intelligence
24DCSE21	Foundations of Artificial Intelligence
24DCSE22	Data Mining and Data Warehousing
24DCSE23	Data Mining and Data Warehousing Lab
24DCSE24	Cloud Computing
24DCSE25	Cloud Computing Lab
24DCSE30	Server Configuration and Security
24DCSE31	Server Configuration and Security Lab
24DCSE32	Web Programming using Python
24DCSE33	Web Programming using Python Lab
24DCSE34	Java Programming
24DCSE35	Java Programming Lab
24DCSE42	Cryptography and Network Security
24DCSE43	Cryptography and Network Security Lab
24DCSE44	Network Administration and Management

24DCSE45	Network Administration and Management Lab
24DCSE46	Software Engineering
24DCSE47	Software Engineering Lab

The Syllabus of Electives is attached at Appendix A

*Open Electives and More Program elective courses may also be added to the list at the time of offering of courses by the Department, Open electives may be selected from other departments or online platforms.

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1.7 SEMESTER WISE SYLLABUS

24DGEN01: English and Communication SkillsLab							
Diploma in Computer Science and Engineering Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	**0**	**4**	**2**		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:			23-07-24				
Prerequisite							

Course Objectives

The course aims to inculcate skills among students with following objectives:

- Ability to be comfortable with English in use while reading or listening.
- Ability to use receptive skills through reading and listening to acquire good exposure to languageand literature.
- Ability to write and speak good English in all situations.
- The course should provide exposure to the learners in Good Prose texts and Poems and exposethe learners to value based ideas.
- Students should enhance their language skills especially in the areas of grammar andpronunciation.

Course Learning Outcomes:

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

CO1: Define the nuances of Communication, both Oral and Written.

CO2: Apply knowledge to practice communication, communication process and speaking skills.

CO3: Use understanding of Grammatical Structures in the communication.

CO4: Apply knowledge to practice oral and written communication.

CO5: Perform the techniques to improve non-verbal communication.

Practical Exercises

1 Reading

1.1 Reading Practice of lessons in the Lab Activity classes.

1.2 Comprehension exercises of unseen passages along with the lessons prescribed.

1.3 Vocabulary enrichment and grammar exercises based on the selected readings.

1.4 Reading aloud Newspaper headlines and important articles.

2 Fundamentals of Communication

2.1 Introducing oneself, others and leave- taking (talking about yourself)

2.2 Just a minute (JAM) sessions: Speaking extempore for one minute on given topics

2.3 Situational Conversation: Offering-Responding to offers; Congratulating; Apologising and Forgiving; Complaining; Talking about likes and dislikes, Self-introduction Mock Interviews.

3 Grammar and Usage

3.1 Written and Oral Drills will be undertaken in the class to facilitate holistic linguistic competency among learners.

3.2 Exercises on the prescribed grammar topics.

4 Writing Skills

4.1 Students should be given Written Practice in groups so as to inculcate team-spirit and collaborative learning.

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4.2 Group exercises on writing paragraphs on given topics.

24DGEN02: Applied Mathematics -I							
Diploma in Computer Science and Engineering Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	0	0	3		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23-07-24	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Acquire understanding of the geometric shapes, Co-ordinate Geometry and Trigonometryfor engineering problems.
- Define problems into mathematical formats.
- Applybinomial and other theorems to solve engineering problems.
- Explore relationship among different variables.
- Use software tools for basic mathematical calculations.

Course Outcomes:

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

CO1: Understand the geometric shapes used in engineering problems by Co-ordinateGeometry and Trigonometry.
CO2: Formulate engineering problems into mathematical formats with the use matrices, co-ordinate geometry and trigonometry
CO3: Solve the approximate value of roots of certain expressions in engineering problems byapplication of binomial theorem.
CO4: Explain the idea of location, graph, and linear relationships between two variables.
CO5: Understand basic fundamentals about MATLAB/ SciLab and mathematical calculationwith MATLAB/ SciLab software.

Detailed Contents:

UNIT I: Number Theory

1.1 Number Theory

1.2 Logarithms and its basic properties

1.3 Application of Number Theory

UNIT II: Linear Algebra

2.1 Matrices, its types and operations

2.2 Determinants and Matrices – Evaluation of determinants

2.3 Solutions of equations

UNIT III: Trigonometry

3.1 Concept of angle, measurement of angle in degrees, grades, radians and their conversions.

3.2 T-Ratios of Allied angles (without proof), Sum, Difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa

3.3 Applications of Trigonometric terms in engineering problems such as to find an angle of elevation, height, distance etc.

UNIT IV: Co-ordinate Geometry

4.1 Cartesian and Polar co-ordinates (two dimensional), Distance between two points, mid- point, centroid of vertices of a triangle.

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4.2 Slope of a line, equation of straight line in various standards forms (without proof); (slope intercept form, intercept form, one-point form, two-point form, symmetric form, normal form, general form), intersection of two straight lines, concurrency of lines, parallel and perpendicular lines, perpendicular distance formula

UNIT V: Geometry of Circle and Software Circle

5.1 General equation of a circle and its characteristics. To find the equation of a circle, given:

- Centre and radius
- Three points lying on it
- Coordinates of end points of a diameter

Software

- **MATLAB Or SciLab software** – Theoretical Introduction, MATLAB or Scilab as Simple Calculator (Addition and subtraction of values –Trigonometric and Inverse Trigonometric functions) – General Practice

Text Books:

1. R. D. Sharma, "Applied Mathematics – I & II for Diploma Courses", Dhanpat RaiPublications.

Recommended Books:

2. "Mathematics for Class XI", NCERT Publication, New Delhi.
3. "Mathematics for Class XII", NCERT Publication, New Delhi.
4. H. K Dass, "Applied Mathematics for Polytechnics", CBS Publishers & Distributers.
5. A Ganesh and G Balasubramanian, "Textbook of Engineering Mathematics – I", CBS Publisher, New Delhi.
6. A Ganesh and G Balasubramanian, "Textbook of Engineering Mathematics –II", CBS Publisher, New Delhi.
7. G. B. Thomas, R. L. Finney, "Calculus and Analytic Geometry", Addison Wesley, Ninth Edition.
8. B S Grewal, "Elementary Engineering Mathematics", Khanna Publishers, Delhi, Thirty- fifth edition.
9. R.K. Jain and S.R.K. Iyengar, "Advanced Engineering Mathematics", Narosa Publishing House, New Delhi, Second Edition, 2003.
10. SS Sabharwal & Dr Sunita Jain, "Applied Mathematics Vol. I & II", Eagle Parkashan, Jalandhar.
11. S Kohli, "Engineering Mathematics Vol. I & II", IPH, Jalandhar.
12. Reena Garg & Chandrika Prasad, "Advanced Engineering Mathematics", Khanna Publishing House, New Delhi
13. R. Pratap, "Getting Started with MATLAB 7", Oxford University Press, Seventh Edition.
14. E-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/NITTTR.

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24DGEN03: Applied Physics -I							
Diploma in Computer Science and Engineering Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	**0**	**0**	**3**		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23-07-24	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Identify and measure physical quantities with accuracy.
- Represent physical quantities, understand the concepts of energy conservation and itsapplications.
- Acquire scientific skills to solve problems.
- Comprehend matter and environmental effects on it.
- Apply physical principles in different fields.

Course Learning Outcomes:

After completing this subject, student should be able to:

CO1. Describe physical quantities, select their units and make measurements with accuracy.

CO2. List physical quantities as scalar and vector and identify type of motions, various forms of energy, their conversion and applications.

CO3. Solve problems related to scientific work, energy and power, norms of friction.

CO4. Explain properties of matter and effect of temperature on various matter and phenomenon.

CO5. Demonstrate the use of physical principles and analysis in various technical fields.

Detailed Contents:

UNIT I: Unit and Dimensions

1.1 Definition of Physics, physical quantities- fundamental and derived
1.2 Units: fundamental and derived
1.3 System of units: CGS, FPS, MKS, SI

UNIT II: Force and Motion

2.1 Scalar and vector quantities– definition and examples, representation of vector, types of vector (unit vector, position vector, co-initial vector, collinear vector, co-planar vector)
2.2 Vector algebra- addition of vectors, Triangle & Parallelogram law (statement and formula only),
2.3 Scalar and vector product (statement and formula only)
2.4 Force and its units, resolution of force (statement and formula only)
2.5 Newton's laws of motion (statement and examples)

UNIT III: Work, Power and Energy

3.1 Work- definition, symbol, formula and SI unit, types of work (zero work, positive work and negative work) with example
3.2 Friction– definition and its simple daily life applications
3.3 Power- definition, formula and units
3.4 Energy- definition and its SI unit, examples of transformation of energy.

UNIT IV: Properties of Matter

4.1 Elasticity and plasticity
4.2 Definition of stress and strain
4.3 Pressure- definition, atmospheric pressure, gauge pressure, absolute pressure
4.4 Surface tension

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4.5 Viscosity

UNIT V: Heat and Temperature

5.1 Definition of heat and temperature (on the basis of kinetic theory)
5.2 Difference between heat and temperature
5.3 Principle and working of mercury thermometer

Text Books:

1. "Text Book of Physics for Class XI (Part-I, Part-II)", N.C.E.R.T., Delhi.

Recommended Books:

1. Dr. HH Lal, "Applied Physics, Vol. I and Vol. II", TTTI Publications, Tata McGraw Hill, Delhi.
2. AS Vasudeva, "Applied Physics – I", Modern Publishers, Jalandhar.
3. R A Banwait, "Applied Physics – I", Eagle Prakashan, Jalandhar.
4. E-books/e-tools/relevant software to be used as recommended by AICTE/ HSBTE/ NITTTR.
5. C. L. Arora, "Practical Physics", S Chand Publication.

Suggested Websites:

1. http://swayam.gov.in
2. The Physics Classroom
3. https://www.khanacademy.org/science/physics

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24DGEN04: Applied Physics Lab-I							
Diploma in Computer Science and Engineering Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	60
0	**0**	**2**	**1**		**External Examination**	:	40
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23-07-24			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- to be familiarized with the physical property measuring tools.
- reading values and understanding their parts.
- to read values from the measuring tools.
- to compute physical properties of objects.
- to verify the laws of force.
- to compute atmospheric properties.
- to apply physical principles in different fields.

Course Outcomes:

After completing this subject, student should be able to:

CO1: Recognize the tool to measure the physical properties of the objects.

CO2: Use tools such as Vernier calliper, screw gauge, spherometer, etc. to measure physicalproperties of objects.

CO3: Investigate parallelogram law of force.

CO4: Investigate the force constant, atmospheric pressure, room temperature, etc.

CO5: Solve problems to convert temperature into different scales.

PRACTICAL EXERCISES

1. Familiarization of measurement instruments and their parts (for example - vernier calliper, screw gauge, spherometer, travelling microscope etc.), and taking a reading. (compulsory to all students)
2. To find diameter of solid cylinder using a vernier calliper
3. To find internal diameter and depth of a beaker using a vernier calliper and hence find its volume.
4. To find the diameter of wire using screw gauge
5. To find thickness of paper using screw gauge.
6. To determine the thickness of glass strip using a spherometer
7. To determine radius of curvature of a given spherical surface by a spherometer.
8. To verify parallelogram law of force.To determine the atmospheric pressure at a place using Fortin's Barometer
9. To determine force constant of spring using Hooke's law
10. Measuring room temperature with the help of thermometer and its conversion in differentscale.

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24DGEN05: Fundamentals of IT							
Diploma in Computer Science and Engineering Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	0	0	3		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23-07-24	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Acquire the basic knowledge of computer system, internet and WWW.
- Handlingof input/ output devices and installing Operating System.
- Connecting and configuring external devices to the computer.
- Use MS office applications for different jobs.
- Work with spreadsheets and prepare presentations.

Course Outcomes:

At the end of the course student will be able to

CO1: Explain the basic components of Computers, Internet and issues of abuses/ attacks oninformation and computers.

CO2: Describe handling of the Computer / Laptop / Mobiles / Internet Utilities and Install/ConfigureOS.

CO3: List steps to assemble a PC and connect it to external devices.

CO4: Explain features of Office practiced Automation Tools.

CO5: Understand Office tools to develop worksheets and Prepare presentations.

Detailed Contents:

UNIT I: Basics of Computer

1.1 Brief history of development of computers

1.2 Definition of Computer, Block diagram of a Computer, Hardware, Software,

1.3 Booting: Cold and Hot Booting

1.4 Interaction between the CPU and Memory with Input / Output devices

1.5 Function of CPU and major functional parts of CPU.

1.6 Memory, Bit, Nibble, Byte, KB, MB, GB, TB, PB , Functions of memory

1.7 use of storage devices in a Computer, List types of memory used in a Computer, Importance of cache memory, CPU speed and CPU word length.

UNIT II: Basic Internet Skills

2.1 Understanding browser, Introduction to WWW, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals.

2.2 Advantages of Email, Various email service providers, Creation of email id, sending and receiving emails, attaching documents with email and drive.

2.3 Effective use of Gmail, G-Drive, Google Calendar, Google Sites, Google Sheets, Online mode of communication using Google Meet & WebEx.

Unit III: Basic Logic building

3.1 Introduction to Programming

3.2 Steps involved in problem solving

3.3 Definition of Algorithm, Definition of Flowchart, Steps involved in algorithm development, differentiate algorithm

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and flowchart, symbols used in flowcharts, algorithms for simple problems, flowcharts for simple problems,

3.4 Practice logic building using flowchart/algorithms

Unit IV: Office Tools

4.1 Importance, methods and procedure of data entry

4.2 Office Tools like MSOffice.

4.3 MS Word-Typesetting Text and Basic Formatting ,Inserting Images, Hyperlinks, Bookmarks, Tablesand Table Properties in Writer

4.4 MS Excel :Working with Cells, Sheets, data, tables, usingformulae and functions, using charts and graphics.

4.5 MS Power Point – Creating and Viewing Presentations, Inserting Pictures and Tables, Slide Master and Slide Design, Custom Animation.

Unit V: Social Media and Digital Marketing

5.1 Introduction to Digital Marketing – Why Digital Marketing, Characteristics of Digital Marketing, Tools for Digital Marketing

5.2 Effective use of Social Media like LinkedIn, Google+, Facebook, Twitter, etc.

5.3 Features of Social media, Advantages and Disadvantages of Social Media.

Text Books:

1. R.S. Salaria, "Computer Fundamentals" Khanna Publishing House
2. Ramesh Bangia, "PC Software Made Easy – The PC Course Kit" Khanna Publishing House

RECOMMENDED BOOKS

1. Online Resources, Linux man pages, Wikipedia
2. Mastering Linux Shell Scripting: A practical guide to Linux command-line, Bash scripting, and Shell programming, by Mokhtar Ebrahim, Andrew MallettVikas Gupta, "Comdex Hardware and Networking Course Kit" Dream Tech press, New Delhi, 2008
3. Sumitabha Das,"UNIX concepts and applications" Tata McGraw Hill, New Delhi, 4th Edition, 2008

24DGEN06: Fundamentals of IT Lab							
Diploma in Computer Science and Engineering Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	60
0	0	2	1		**External Examination**	:	40
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23-07-24			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Acquire the basic knowledge of computer system, internet and WWW.
- Handlingof input/ output devices and installing Operating System.
- Connecting and configuring external devices to the computer.
- Use MS office applications for different jobs.
- Work with spreadsheets and prepare presentations.

Course Outcomes:

At the end of the course student will be able to

CO1: Explain the basic components of Computers, Internet and issues of abuses/ attacks oninformation and computers.

CO2: Execute handling of the Computer / Laptop / Mobiles / Internet Utilities and Install/ConfigureOS.

CO3: Assemble a PC and connect it to external devices.

CO4: Use and Manage Office practiced Automation Tools.

CO5: Apply knowledge of Office tools to develop worksheets and Prepare presentations.

Practical Exercises:

1. Browser features, browsing, using various search engines, writing search queries
2. Visit various e-governance/Digital India portals, understand their features, services offered.
3. Read Wikipedia pages on computer hardware components, look at those components inlab, identify them, recognize various ports/interfaces and related cables, etc.
4. Using Administrative Tools/Control Panel Settings of Operating Systems
5. Connect various peripherals (printer, scanner, etc.) to computer, explore various features of peripheral and theirdevice driver software.
6. Explore features of Open Office tools and MS-Office, create documents, create presentation, create spread sheet,using these features, do it multiple times
7. Working with Conversion Software like pdf To Word, Word To PPT, etc.
8. Working with Mobile Applications – Searching for Authentic Mobile app, Installation and Settings, Govt. of India Mobile Applications
9. Creating email id, sending and receiving mails with attachments.
10. Using Google drive, Google calendar

24DGEN07: Computer Workshop							
Diploma in Computer Science and Engineering Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	60
0	0	6	3		**External Examination**	:	40
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23-07-24			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Handling of computer devices and assembling of devices.
- Identify requirement of software.
- Configuring and installing required software.
- Troubleshooting for problems.
- maintaining laptops

Course Outcomes:

At the end of the course student will be able to

CO1: Describe and Handle various hardware components.

CO2: Apply knowledge to install different types of software and use them appropriately.

CO3: Assemble computer components

CO4: Execute interfacing of various devices to PC/Laptop

CO5: Execute Troubleshooting and Maintenance of PC/Laptop

Practical Exercises

UNIT I: Introduction

1.1 Anatomy of a Computer, Foundations of Modern Information Technology, The Central Processing Unit, How Microprocessors and Memory Chips are Made, Memory, Buses for Input and Output, communication With Peripherals.

1.2 Desktop: Identification of desktop and its parts, Hardware, Software andFirmware

1.3 Introduction to Mother board, IO and memory expansion slots, Drives, front panel and rearpanel Processors& Bus: Introduction and types of Processor, Introduction to BUS

1.4 Laptop: Introduction to Laptop, advantages overDesktops

1.5 Laptop components: Adapter – types, Battery – types, Laptop Keyboard andTouchpad

1.6 Power Supply: Introduction to online and offline UPS, Difference between online and offline UPS

1.7 SMPS: Introduction to SMPS, Study of SMPS Connectors

UNIT II: Memory Storage Devices

2.1 Primary Memory: Introduction and types of primary memory (SDRAM, DDRRAM)

2.2 Secondary Storage: Hard Disk –Working Principle of IDE, HDD Partition –

2.3 Formatting, Introduction to SATA and Solid-State Drives (SSD)

2.4 Removable Storage: Introduction to CD, DVD, reading & writing operations; Introductionto Blue-ray devices

2.5 Flash memory: Flash drives (pen drives), Memory cards and itstypes

UNIT III: I/O Devices and Interfacing

5.1 Inputting Text and Graphics, State of the Art, Input and Output, Pointing Devices

Mouka

5.2 Foundations of Modern Output, Display Screens, Printers, Foundations of Modern Storage,Storage Media, Increasing Data Storage Capacity, Backing up your Data, The Smart Card

5.3 Keyboard: Types of keyboards (wired and wireless Keyboard), keyboards connectors, troubleshooting

5.4 Mouse: types, connectors, operation of Optical mouse and Troubleshooting.

5.5 Printers: Introduction – Types of printers- Dot Matrix, Inkjet, LaserJet, MFP (Multi-Function Printer), advantages, disadvantages, cables and connectors, Troubleshooting.

5.6 I/O Ports: Introduction and identification of Serial, Parallel, USB,HDMI.

5.7 Displays: Introduction to LED, LCD and TFT Displays, cables and connectors

5.8 Graphic Cards: Introduction to different types of Graphics cards

UNIT IV: Maintenance and Trouble Shooting of Desktop and Laptops

4.1 Bios-setup: Standard CMOS setup, Advanced BIOS setup, advanced chipset features, PC Bioscommunication, upgrading BIOS, Flash BIOS -setup.

4.2 POST and BOOTING: Definition, POST Test sequence – beepcodes.

4.3 Diagnostic Software and Viruses: Computer Viruses, Precautions, Anti-virus Software,Working of Antivirus software's

4.4 General troubleshooting of various peripheral devices (printer, pc, laptop, keyboard,mouse, monitor, hard disk)

UNIT V: Assembling and Installation of Hardware/Software

5.1 Assembling and Disassembling of PC

5.2 Installation and Troubleshooting: Formatting, Partitioning and Installation of OS: Windows and Linux

5.3 Installation of peripheral devices: Printers, scanner

5.4 Installation of software's: application software, systems software

Text Books:

1. Stephen J, Bigelow, "Trouble shooting, maintaining and repairing PCs", Tata McGraw-Hill, New Delhi, 2005.

Recommended Books:

1. Stanley & Hall, "PC Data Handbook, BPB Publications, New Delhi, 2007.
2. Govindarajulu, "IBM PC and clones Hardware trouble shooting and maintenance, TataMcGraw-Hill, New Delhi, 2007.
3. Scott Muller, "Upgrading and Repairing PCs", Microtech Publications, Dubai, 2006.
4. Ronald L.Krutz, "Interfacing Techniques in Digital Design with Emphasis on Microprocessors", John Wiley & Sons New York, 2004.

Suggested Websites:

1. PC Hardware — Open & Free – OLI (cmu.edu)
2. https://www.classcentral.com/course/build-a-computer-3234 : Free Online Course: Build a Modern Computer from First Principles: From Nand to Tetris (Project-Centered Course) from Coursera/Class Central

24DGEN08: Electronic Workshop							
Diploma in Computer Science and Engineering Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	4	2		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23-07-24			
Prerequisite							

COURSE OBJECTIVE

The course aims to inculcate skills among students with following objectives

- Verification of logic gates practically.
- Designing gates using universal gates.
- Verify Demorgan's theorem of logic gates.
- Designing different sequential and digital circuits.
- Verifying Digital circuits.

COURSE LEARNING OUTCOME

After completion of the course, the student will be able to

CO1: Verify logic gates.

CO2: Apply knowledge to realize the all logic gates using NAND and NOR gate.

CO3: VerifyDemorgan's theorem.

CO4: Design Adders and subtractors.

CO5: Verify designed logic circuits.

LIST OF EXPERIMENTS

1. Verify Truth Table of Logic Gates (AND, OR, NOT, NAND & NOR Gates)
2. Design Basic Gates Using NAND gates
3. Design Basic Gates Using NOR gates
4. Verify Demorgan's theorem.
5. Design Half Adder. (a) Using AND/OR/NOT Gates. (b) Using NAND/NOR Gates.
6. Design full Adder
7. Design full subtractor
8. Verify the Truth Table of RS Flip-flop, JK F/F, D F/F & T type F/F
9. Design shift Register & verify truth table. used as a serial/parallel shift Resistor
10. Design 3/4 bit Counter & verify truth table

Suggested Websites:

1. www.electronics.wisc-online.com
2. www.electronicsforu.com
3. https://www.electronics-tutorials.ws/design

24DGEN09 Basics Prompt Engineering							
Diploma in Computer Science and Engineering Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
2	**0**	**0**	**2**		**External Examination**	:	70
Effective from Session:				w.e.f. 2023-2024	**Total**	:	100
Date of BoS approval:				23-07-24	**Duration of Exam**	:	3 Hrs.
Prerequisite							

COURSE OBJECTIVES:

- Basic understanding of artificial intelligence and machine learning concepts.
- Familiarity with the concept of large language models (LLMs) such as GPT-3 or GPT-3.5.
- Comfort with basic computer usage and navigating online platforms.
- Ability to read and comprehend technical English language.
- Interest in learning how to interact with AI systems effectively.
- Some exposure to any programming or scripting language is beneficial but not mandatory.
- Willingness to experiment and explore new technological tools and applications.

COURSE LEARNING OUTCOME

After completion of the course, the student will be able to

CO1: defining Prompt's role, give context/input data, then provide the instruction.
CO2: Use specific, varied examples to help the model narrow its focus and generate more accurate results.
CO3: Use constraints to limit the scope of the model's output. This can help avoid meandering away from the instructionsinto factual inaccuracies.
CO4: Break down complex tasks into a sequence of simpler prompts.
CO5: Instruct the model to evaluate or check its own responses before producing them.

COURSE CONTENT:

Unit I

LARGE LANGUAGE MODELS

1.1 Introduction to Large Language Models (LLMs)
1.2 Introduction to ChatGPT
1.3 Overview of GPT 4 Architecture
1.4 Common Use cases and applications of ChatGPT
1.5 Limitations and ethical considerations
1.6 Comparative study of ChatGPT and recent LLMs

Monika

Unit II

INTRODUCTION TO PROMPTING

2.1 Basics of Prompting and Prompt Elements
2.2 Types of Prompts
2.3 Examples of Prompting
2.4 Benefits and Challenges of Prompt Engineering
2.5 Natural Language Processing and Prompting
2.6 Introduction: AI, Gen AI and Prompts for Gen AI
2.7 Case Studies and Roles of Prompting in different sectors

Unit III

THE ART OF WELL-CRAFTED PROMPTS

3.1 The principles of Prompting
3.2 The 5Ws: What, Where, When, Why and Who?
3.3 The art of open-ended Questions
3.4 The Role of Active Listening and Paraphrasing
3.5 Leveraging Context and Background Information
3.6 General Mistakes: Mistakes related to Book Writing, Mistakes related to SEO, Mistakes related to Copywriting Task.

Unit IV

PROMPTING TECHNIQUES

4.1 Systematic Review Process: The Pipeline
4.2 Text Based Prompting
4.3 Multilingual Prompting
4.4 Multimodal Prompting

Unit-V

RISK AND MISUSES

5.1 Prompting Issues: Security and Alignment
5.2 Addressing Prompt Misuses
5.3 Factuality and Verbosity
5.4 Biases
5.5 Mitigating Biases
5.6 Making adjustments and tailoring Prompts for different Use Cases
5.7 Future of Prompting

RECOMMENDED READINGS

1. Schulhoff, S., Ilie, M., Balepur, N., Kahadze, K., Liu, A., Si, C., ... & Resnik, P. (2024). The Prompt Report: ASystematic Survey of Prompting Techniques. *arXiv preprint arXiv:2406.06608*.
2. Getting Great Answers Chat GPT's The art of Prompting.
3. Prompting mistakes that are killing your productivity.
4. The Prompt Engineers handbook.

24DGEN10 Advances in IT							
Diploma in Computer Science and Engineering Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	0	0	3		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs.
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- The course aims to inculcate skills among students with following objectives acquire skills to develop webapplications using HTML.
- Developing interactive internet applications.
- Learning syntax and structure of XML languages.
- Designing XML codes.
- Developing and testing web codes.

Course Outcomes:

At the end of the course student will be able to

CO1: Describe the need of HTML
CO2: Understand its applications in Web Development
CO3: Design and Develop Websites using HTML
CO3: Apply acquired knowledge to develop interactive Internet applications
CO5: Design XML web Pages

Detailed Contents

UNIT I: HTML Introduction

1.1 Introduction to HTML

1.2 Characteristics of HTML language

1.3 Structure of a HTML page.

1.4 Describing Tags.

1.5 How to create a HTML document? Viewing HTML document

UNIT II: HTML Syntax

2.1 Using tags, Heading, Paragraph

2.2 Changing appearance of text (bold, italics, underline, and subscript, superscript); Changing font size, text color and background

2.3 Changing the background color and background of HTML page

2.4 Top marging, left margin, & nbsp,<hr> and its attributes.

2.5 Marquee

UNIT III: HTML Lists and Links

3.1 Using list and images: Unordered lists: type attribute. Ordered lists: start attribute, type attribute, value attribute.

3.2 Nested lists. Inserting images, aligning an image, centering image, adding border to a image, alternate text, setting height and width, adding space around the image.

Mamta

3.3 Working with links: Anchor elements, creating hyperlink to a document. Internal linking and external linking.

UNIT IV: HTML Tables and Frames

4.1 Creating tables: Creating a table, attributes of table tag (BORDER, BORDERCOLOR,BGCOLOR, ALIGN, CELLSPACING, CELLPADING, WIDTH) Attributes of table row <tr> and table data <td> tag (BORDERCOLOR, BGCOLOR, ALIGN, VALIGN,HEIGHT). Row span and Colspan.

4.2 Working with Frames. Use and creating frames. Introduction to FormsSteps for developing a Website.

UNIT V: XML

5.1 Introduction to XML

5.2 Creating XML pages

5.3 HTML vs XML

Text Books:

1. Thomas A.Powell, "HTML&XHTML –The Complete Reference", Tata McGraw Hill,2006

Suggested Websites:

1. https://nptel.ac.in/courses/117/106/117106113/
2. https://nptel.ac.in/courses/106/105/106105084/

Mounika.

24DGEN11: Advances in IT Lab							
Diploma in Computer Science and Engineering Semester – II							
L	T	P	Credits	Core Course	Internal Examination	:	70
0	0	2	1		External Examination	:	30
Effective from Session:				w.e.f. 2024-2025	Total	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Understanding syntax and structure of mark-up languages for web development.
- Applying knowledge to tags to create different types of web pages.
- Creating interlinking of web documents to navigate across webpages.
- Incorporating multimedia content in web pages.
- Developing online forms.

Course Learning Outcomes:

At the end of the course student will be able to:

CO1: Develop basic HTML document.
CO2: Apply knowledge of different HTML tags to format web document.
CO3: Implement heading, paragraphs, tables, lists, frames, etc. in the web document.
CO4: Create web page that contains inter and intra hyperlinks.
CO5: Create forms and controls using web development applications or languages.

Practical Exercises

1. Creating an HTML document
2. Working with Mark up Tags
3. Working with Heading-Paragraphs
4. Working with Text
5. Working with Lists
6. Working with Tables
7. Working with Frames
8. Working with Hyperlinks
9. Working with Images and Multimedia
10. Designing Marquee and changing its colors

24DGEN12: Applied Mathematics-II							
Diploma in Computer Science and Engineering Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
4		**0**	**4**		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Objective:

The course aims to inculcate skills among students with following objectives

- acquire ability to formulate engineering problems using differential equations.
- apply the knowledge of differentiation and integration to solve problems.
- apply the acquired knowledge of integrals to approximate area under curve.
- analysing and describing data using methods of central tendency and mean/median/mode.
- use of mathematical software tools.

Course Outcomes:

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

CO1. Formulate the engineering problems into mathematical format with the use of differential equations and differential.

CO2. Use the differentiation and Integration in solving various Mathematical and Engineering problems.

CO3. Solve the approximate area under a curve by applying integration andnumerical methods.

CO4. Understand the purposes of measures of central tendency and calculate themeasures of central tendency (mode, median, mean) for a set of data.

CO5. Understand the MATLAB/ SciLab and mathematical calculation with MATLAB/SciLab software.

Detailed Contents:

UNIT I: Limit

1.1 Definition of function

1.2 Concept of limits (Introduction only)

1.3 problems related to four standard limits only.

UNIT II: Differentiation

2.1 Definition of Differentiation

2.2 Its application in Engineering

2.3 Basic differentiation practices

UNIT III: Integration

2.1 Definition of Integration

2.2 Its application in Engineering

2.3 Basic Integration practices

UNIT IV: Statistics and Software Statistics

5.1 Measures of Central Tendency: Mean, Median, Mode

5.2 Measures of Dispersion: Mean deviation, Standard deviation

Monika.

UNIT V: Softwares

5.3 SciLab software – Theoretical Introduction.

5.4 Basic difference between MATLAB and SciLab software.

5.5 Calculations with MATLAB or SciLab - (a) Representation of matrix (2×2 order),Addition, Subtraction of matrices (2×2 order) in MATLAB or SciLab

Recommended Books:

1. R. D. Sharma, "Applied Mathematics – I & II for Diploma Courses",Dhanpat Rai Publications.

Reference Books:

2. "Mathematics for Class XI", NCERT Publication, New Delhi.
3. "Mathematics for Class XII", NCERT Publication, New Delhi.
4. H. K Dass, "Applied Mathematics for Polytechnics", CBS Publishers & Distributers.
5. A Ganesh and G Balasubramanian, "Textbook of Engineering Mathematics –I", CBS Publisher, New Delhi.

Mamta

24DGEN13: Applied Physics II							
Diploma in Computer Science and Engineering Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
4	0	0	4		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives

- Understanding different types of wave forms.
- Learn laws of reflection and refraction of light.
- Demonstrating electrostatics and electricity phenomena.
- Categorizing properties of materials and create new materials.
- Apply knowledge of Modern Physics for different technical applications.

Course Outcomes

At the end of this course, the students will be able to:

CO1: Differentiate between types of waves and their motion.

CO2: State laws of reflection and refraction of light.

CO3: Demonstrate competency in phenomena of electrostatics and electricity.

CO4: Classify properties of material to prepare new materials for various technicalapplications.

CO5: Demonstrate a strong foundation on Modern Physics to use at various technicalapplications.

Detailed Contents:

UNIT I: Wave Motion and its Applications

1.1 Waves: definition, types (mechanical and electromagnetic wave)

1.2 Wave motion- transverse and longitudinal with examples, terms used in wave motionlike displacement, amplitude, time period, frequency, wavelength, wave velocity; relationship among wave velocity, frequency and wave length

1.3 Sound waves: types (infrasonic, audible, ultrasonic) on the basis of frequency, noise,coefficient of absorption of sound, echo

UNIT II: Optics

2.1 Reflection and refraction of light with laws, refractive index

2.2 Lens: introduction, lens formulae (no derivation), power of lens

2.3 Introduction to Microscope, Telescope and their applications

UNIT III: Electrostatics and Electricity

3.1 Electric charge, unit of charge, conservation of charge

3.2 Coulomb's law of electrostatics

3.3 Definition of electric flux, Gauss law (statement and formula)

3.4 Capacitor and capacitance (with formula and unit)

3.5 Electric current and its SI Unit, direct and alternating current

3.6 Resistance, conductance (definition and unit)

3.7 Series and parallel combination of resistances

3.8 Ohm's law (statement and formula)

UNIT IV: Classification of Materials and their Properties

4.1 Definition of energy level, energy bands

4.2 Types of materials (conductor, semiconductor, insulator and

dielectric) with examples, intrinsic and extrinsic semiconductors (introduction only)

UNIT V: Magnetic Fields

5.1 Introduction to magnetism, type of magnetic materials: diamagnetic, paramagnetic and ferromagnetic materials with examples

5.2 Magnetic field, magnetic lines of force, magnetic flux

5.3 Electromagnetic induction (definition)

Text Books

1. "Text Book of Physics for Class XII (Part-I, Part-II)", N.C.E.R.T., Delhi

Recommended Books:

1. Dr. HH Lal, "Applied Physics, Vol. I & II", TTTI Publications, Tata McGraw Hill,Delhi.
2. AS Vasudeva, "Applied Physics –II", Modern Publishers, Jalandhar.
3. R A Banwait, "Applied Physics – II", Eagle Prakashan, Jalandhar.
4. N Subrahmanyam, Brij Lal and Avadhanulu, "A text book of OPTICS", SChand Publishing, New Delhi. E-books/e-tools/relevant software to be used as recommended by AICTE/ HSBTE/NITTTR.
5. M H Fulekar, "Nanotechnology: Importance and Applications", IK International Publishing House (P) Ltd., New Delhi.
6. C. L. Arora, "Practical Physics", S Chand Publication.

24DGEN14: Applied Physics Lab II							
Diploma in Computer Science and Engineering Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	2	1		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE OBJECTIVES

The course aims to inculcate skills among students with following objectives

- Identifying different types of apparatus/ instruments for measuring properties.
- Analyzing time and time variations of varying different objects.
- Demonstrating elctrostatics and electricity phenomena.
- Plot voltage, current and study colour coding scheme of resistance.
- Verify different laws and phenomena of physics.

COURSE LEARNING OUTCOMES

At the end of this course, the students will be able to:

CO1: Identify the apparatus to be used and understand their components.

CO2: Analyse time variations of pendulum and cantilever.

CO3: Test laws of reflection, refraction, ohms law and laws of resistance.

CO4: Examine physical properties of objects.

CO5: Examine focal length of concave and convex lens.

PRACTICAL EXERCISES

1. Familiarization with apparatus (resistor, rheostat, key, ammeter, voltmeter,telescope, microscope etc.)
2. To find the time period of a simple pendulum.
3. To study variation of time period of a simple pendulum with change in lengthof pendulum.
4. To determine and verify the time period of Cantilever.
5. To verify Ohm's laws by plotting a graph between voltage and current.
6. To study colour coding scheme of resistance.
7. To verify laws of resistances in series combination.
8. To verify laws of resistance in parallel combination.
9. To find resistance of galvanometer by half deflection method.
10. To verify laws of reflection of light using mirror.
11. To verify laws of refraction using glass slab.
12. To find the focal length of a concave lens, using a convex lens.

Manika

24DGEN15: Engineering Graphics							
Diploma in Computer Science and Engineering Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	6	3		**External Examination**	:	30
Effective from Session:				w.e.f. 2023-2024	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE OBJECTIVES

The course aims to inculcate skills among students with following objectives

- Creating orthographic views of objects from different angles.
- Creating sectional views of objects.
- Creating isomorphic of solids.
- Identification of conventions for different engineering materials, symbols, etc. inengineering applications.
- Apply knowledge of AutoCAD for orthographic views.

COURSE OUTCOMES

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

CO1: Sketch Orthographic views of different objects viewed from different angles.

CO2: Sketch and interpret sectional views of an object which are otherwise not visible innormal view.

CO3: Sketch Isometric views of different solids and develop their surfaces.

CO4: Identify conventions for different engineering Materials, symbols, sections of regularobjects and general fittings used in Civil and Electrical household appliances /fittings.

CO5: Sketch orthographic views of different objects by using basic commands of AutoCAD.

DETAILED CONTENTS

UNIT I

Introduction to Engineering Drawing and Graphics, Technical writing

1.1 Introduction to use and care of drawing instruments, drawing materials, layout and sizesof drawing sheets and drawing boards.

1.2 Symbols and conventions-Conventions of Engineering Materials, Sectional Breaks and Conventional lines. Civil Engineering Sanitary fitting symbols, Electrical fitting symbols for domestic interior installations.

1.3 Geometrical construction-geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagons, pentagons bisecting a line and arc , division of line and circle with the help of drawing instruments.

1.4 Definition and classification of lettering

1.5 Free hand (of height of 5,8,12 mm) and instrumental lettering (of height 20 to 35 mm):upper case and lower case, single and double stroke, vertical and inclined (Gothic lettering) at 75 degree to horizontal and with suitable height to width ratio 7:4.

UNIT II

Orthographic Projections and Sectioning

2.1 Theory of orthographic projections (Elaborate theoretical instructions).

2.2 Three views of orthographic projections of different objects of given pictorial view ofa block in 1st and 3rd angle.

2.3 Projection of Points in different quadrant

2.4 Projection of Straight Line (1st angle)

2.5 Line parallel to both the planes.

2.6 Line perpendicular to any one of the reference planes and parallel to others

2.7 Line inclined to any one of the references and parallel to another plane.

Mamta

2.8 Projection of Plane – Different lamina like square rectangular, triangular, circleand Hexagonal pentagon. Trace of planes (HT and VT).

2.9 Identification of surfaces.

2.10 Importance and salient features

2.11 Drawing of full section, half section, partial or broken out sections, Offset sections,revolved sections and removed sections (theoretical only).

2.12 Orthographic sectional views of different objects.

UNIT III

3.1 Introduction of projection of right solids such as prism & pyramid (square, Pentagon,Hexagonal) cube, cone & cylinder (Axes perpendicular to H.P and parallel to V.P.)

3.2 Introduction of sections of right solids - Section planes, Sections of Hexagonal prism,

3.3 pentagon pyramid, cylinder and cone (Section plane parallel to anyone reference planesand perpendicular to V.P. and inclined to H.P.)

3.4 Development of Surfaces – Development of lateral surfaces of right solids like cone,cylinder, pentagonal prism, pyramid and hexagonal pyramid (Simple problems)

UNIT IV

Isometric Views

4.1 Fundamentals of isometric projections and isometric scale.

4.2 Isometric views of different laminas like circle, pentagon and hexagon.

4.3 Isometric views of different regular solids like cylinder, cone, cube, cuboid, pyramidand prism.

4.4 Isometric views from given different orthographic projections(front, side and topview)

UNIT V

Introduction to AutoCAD

5.1 Basic introduction and operational instructions of various commands in AutoCAD.

5.2 At least two sheets of different objects on AutoCAD (given pictorial/isometric view ofa block

5.3 AutoCAD skill of student is evaluated in internal assessment only not in external exam.

Text Books

A Text Book of Engineering Drawing by Surjit Singh; Dhanpat Rai & Co.,Delhi

RECOMMENDED BOOKS

1. Engineering Drawing by PS Gill; SK Kataria & Sons, New Delhi

2. Elementary Engineering Drawing in First Angle Projection by ND Bhatt;Charotar Publishing House Pvt. Ltd.,Anands

3. Engineering Drawing and Graphics using AutoCAD by T. Jeyapoovan,VikasPublishing House Pvt, Ltd Noida.

4. A Text Book of Engineering Drawing by S.R.Singhal and O.P.Saxena, AsianPublisher, Delhi

5. Engineering Drawing by RB Gupta, Satya Prakashan, New Delhi

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24DGEN16: Multimedia Applications							
Diploma in Computer Science and Engineering Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
4	0	0	4		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

COURSE OBJECTIVES

The course aims to inculcate skills among students with following objectives

- Developing interactive websites.
- Applying multimedia tools knowledge to create applications.
- Determine the appropriate use of interactive verses standalone Web applications
- identifying use of interactive and standalone applications.
- Identifying challenges during deploying web based applications.

COURSE OUTCOMES

At the end of the course student will be able to

CO1: Develop a well-designed, interactive Web site with respect to current standards andpractices

CO2: Demonstrate in-depth knowledge in an industry-standard multimedia developmenttool and its associated scripting language

CO3: Recognize the appropriate use of interactive verses standalone Web applications

CO4:Design time-based and interactive multimedia components

CO5: Identify issues and obstacles encountered by Web authors in deploying Web-basedapplication

DETAILED CONTENTS

UNIT I

Definitions and Classification

1.1 Multimedia Hardware
1.2 Multimedia Software
1.3 Meetings the analog signals
1.4 Search of Digital recording
1.5 CD ROMs.

UNIT II

Digital Audio Technologies

2.1 Sound Cards
2.2 Playback and Recording
2.3 MIDI – working with MIDI.

UNIT III

Multimedia texts

3.1 Coloring
3.2 Digital Imaging Fundamentals
3.3 Digital Image Development and Editing.

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UNIT IV

Animation fundamentals

4.1 Animation Software tools
4.2 Animation Techniques
4.3 Digital video fundamentals
4.4 Digital video production techniques.

UNIT V

M/M Project Design Concepts

5.1 Authoring
5.2 Project Planning and Costing
5.3 Multimedia team.

TEXT BOOKS

1. Multimedia Magic – S.Gokul - BPB Publications, 2008.

RECOMMENDED BOOKS

2. Multimedia – Making it work – T. Vaughan – Osborne McGraw Hill - 2005.
3. Fundamentals of Multimedia – Drew – Pearson Education – 2006.
4. Multimedia Systems – Buford – Pearson Education – 2007.

SUGGESTED WEBSITES

1. https://nptel.ac.in/courses/117/105/117105083/
2. https://nptel.ac.in/courses/106/106/106106200/

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24DGEN17: Multimedia Applications lab							
Diploma in Computer Science and Engineering Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	2	1		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE OBJECTIVES

The course aims to inculcate skills among students with following objectives

- Understanding Multimedia tools.
- Applying knowledge of flash tools for the multimedia operations.
- Understanding action scripts for basic operations and event handling.
- Understanding animation techniques
- Apply tools and techniques for the image and video editing.

COURSE OUTCOMES

At the end of the course student will be able to

CO1: Identify capabilities of Multimedia

CO2: Apply to perform multimedia operations.

CO3: Develop animations

CO4: Understand audio, video, text editing

CO5: Apply latest tools to perform image editing operations.

PRACTICAL EXERCISES

1. Introduction to Multimedia tools
2. Performing Image Editing & Graphic Design Techniques
3. Performing Audio Editing Techniques
4. 2D Animation Principles & Techniques
5. Performing Video editing and special effects
6. 3D Animation Techniques
7. Practice Web Page Design & Development
8. Creating artwork to be used in video games
9. Visual Effects in Multimedia Design
10. Visual Design Elements and its methodologies

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24DCSE18 Programming in C							
Diploma in Computer Science and Engineering Semester – III							
Hours per week							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0	0	3	Program Core	External Examination	:	70
Effective from Session:				w.e.f. 2024-2025	Total	:	100
Date of BoS approval:				23.07.24	Duration of Exam	:	3 Hrs
Prerequisite							

COURSE OBJECTIVES:

- To have understanding of Programming Language Standards, Problem Solving Techniques, IDEand Compilers for C Programming.
- To have in depth knowledge of Writing, Compiling and Running Programs.
- To understand and Practice Programming Construct: Variable, Operators, Control Structures, Loop, Functions with C Programming.
- To understand and Practice basics of arrays, pointers, preprocessor, Structure and Union
- To learn difference in procedural and object oriented programming language with understanding of OOPs features and Practice beginner level of Pointers, Preprocessor, Programming

COURSE LEARNING OUTCOMES

At the end of the course student will be able to

CO1: List and Demonstrate Basic Terminology Used in Computer Programming Write, Compile andDebug Programs in C Language.

CO2: Understand and Apply Variable, Conditional Statements, Loops, Functions in C.

CO3: Practice Pointers, Structure, Union and Class in Programming.

CO4: Explain and Differentiate the Process of Problem Solving

CO5: Understand and Practice in C Programming.

DETAILED CONTENTS

UNIT I

Fundamentals of C: Identifier and keywords - data types - constants - Variables - Declarations - Expressions - Statements - Arithmetic, Unary, Relational and logical , Assignment and Conditional Operators - Library functions. Simple C programs - Flow of control - if, if-else, while, do-while, for loop, Nested control structures - Switch, break and continue, go to statements - Comma operator. Functions -Definition - prototypes - Passing arguments – Recursion- Storage Classes - Automatic, External, Static, Register Variables .

UNIT II

Arrays - Defining and Processing - Passing arrays to functions - Multi-dimension arrays -Arrays and Strings.

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UNIT III

Structures and unions - User defined data types - Passing structures to functions - Self-referentialstructures - Unions - Bit wise operations.

UNIT IV

Pointers - Declarations - Passing pointers to Functions - Operation on Pointers - Pointer and Arrays - Arrays of Pointers - Structures and Pointers - Files: Creating, Processing ,Opening and Closing adata file.

UNIT V

Files: File Handling in C Using File Pointers, Open a file using the function fopen ( ), Close a fileusing the function fclose ( ), Input and Output using file pointers, Character Input and Output in Files, String Input / Output Functions, Formatted Input / Output Functions, Block Input / Output Functions, Sequential Vs Random Access Files, Positioning the File Pointer.

Text Book:

1. E. Balaguru Swamy - ANSI C Programming Language, 2nd Edition, PHI, 1988.
2. H. Schildt, C: The Complete Reference, 4th Edition, TMH Edition, 2000.
3. Kanetkar Y., Let us C, BPB Pub., New Delhi, 1999.
4. Reema Thareja - Programming in C
5. Byron Gotlfried – C Programming; Oxford University Press

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Subject Code: 24DCSE19 Programming in C Lab							
Diploma in Computer Science and Engineering Semester – III							
Hours per week							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	4	2	Program Core	**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE LEARNING OUTCOMES

At the end of the course student will be able to
CO1: List and Demonstrate Basic Terminology Used in Computer Programming Write, Compile and Debug Programs in C Language.
CO2: Understand and Apply Variable, Conditional Statements, Loops, Functions in C.
CO3: Practice Pointers, Structure, Union and Class in Programming.
CO4: Explain and Differentiate the Process of Problem Solving
CO5: Understand and Practice in C Programming.

LIST OF EXPERIMENTS

- Find the area of a Triangle.
- Find greatest among 3 numbers.
- Perform the arithmetic expression using switch statement.
- Find the factorial of a given number.
- Generate all prime numbers up to nth number.
- Print Fibonacci series.
- Find total of even integers.
- Print product of two matrices.
- Concatenate two strings without using library functions.
- Print the elements of array using pointers.
- Find factorial of a given number using function.
- Find total mark of n students



24DCSE26 Basics of Computer Network							
Diploma in Computer Science and Engineering Semester – III							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	0	0	3		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

COURSE OBJECTIVES

The course aims inculcate the skills with the objectives:

- Understand network and technologies.
- Understand various networking devices.
- Use various networking and crimping tool.

COURSE LEARNING OUTCOMES

After undergoing this subject, the students will be ableto:

CO1: Understand basic of network with itstypes.

CO2: Understand data communication with its types.

CO3: Analyze the necessity of tools & connectors required during networking.

CO4: Analyze the necessity of Networking cables requiredduring networking.

CO5: Analyze the necessity of Networking devicesrequired during networking.

DETAILED CONTENTS

UNIT I

Introduction to Network

1.1 Evolution of network: ARPANET, NSFNET

1.2 OSI Model

1.3 TCP/IP Model

1.4 Introduction to Network

1.5 Network topology architecture: 2 Tier, 3 Tier, Spine Leaf

1.6 Network Toplogy

1.7 Type of network LAN(SOHO Network), PAN, CAN, MAN, WAN, SD LAN

1.8 Advantages of Network

UNIT II

The Physical Layer and Data Link Layer

2.1 Theoretical basis for communication

2.2 Wireless transmission

2.3 Public switched telephone networks

2.4 Mobile telephone system.

2.5 Data Link Layer introduction and its protocols

2.6 Medium Access Sub layer

UNIT III

Network Layer and Transport Layer

3.1 Network layer design issues

3.2 Routing

3.3 Congestion control

3.4 Network layer in the internet (IPv4 and IPv6)

3.5 Transport service, elements of transport protocol, Simple Transport Protocol, Internet transport layerprotocols: UDP and TCP

UNIT IV

Application Layer

4.1 Domain name system

4.2 Electronic mail

4.3 APPLICATION LAYER PROTOCOLS: Simple Network Management Protocol, File Transfer Protocol,Simple Mail Transfer Protocol, Telnet

UNIT V

Internet and Communication

5.1 Introduction to WWW and Internet

5.2 Applications of Internet

5.3 Introduction to communication

5.4 Communication channels used in Networking-Guided, Unguided.

5.5 Data Communication types: Simplex, Half Duplex and Full Duplex

5.6 Colour code of CAT6 cable.

REFERENCE BOOKS

1. Forouzan, B. A. (2007). Data Communications and Networking. New York: Alan R.Apt.
2. Kurose, Ross (2010), Computer Networking: A top down approach, Pearson Education, India.

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24DCSE27 Basics of Computer Networks Lab							
Diploma in Computer Science and Engineering Semester – III							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	2	1		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE OBJECTIVES:

The course aims to inculcate skills among students with following objectives

- Identify different network devices.
- Execute Network commands.

COURSE LEARNING OUTCOMES:

At the end of the course, student will be able to:

CO1: Identify different types of network cables and other Networkdevices.

CO2: Install and configure Network devices.

CO3: Understand different types ofNetworks.

CO4: Identify different Network tools.

CO5: Practice using Network tools.

LIST OF EXPERIMENTS

1. Study of different types of Network cables and practically implement the cross-wired cable and straightthrough cable using clamping tool.
2. Install and Configure Wired and Wireless NIC and transfer files between systems in LAN and WirelessLAN.
3. Install and configure Network Devices: HUB, Switch and Routers.
4. Connect the computers in Local Area Network.
5. Configure Host IP, Subnet Mask and Default Gateway in a System in LAN (TCP/IP Configuration).
6. Establish Peer to Peer network connection using two systems using Switch and Router in a LAN.
7. Configure Internet connection and use IPCONFIG, PING / Tracer and Net stat utilities to debug the networkissues.
8. Transfer files between systems in LAN using FTP Configuration, install Print server in a LAN and share theprinter in a network.
9. Study of basic network command and Network configuration commands.
10. Configure a Network topology using packet tracer software
11. Configure a Network topology using packet tracer software.
12. Identify various Network tools like:
    a) Crimping tool (RJ45)
    b) Punch Down Impact tool(RJ45)
    c) Fiber Stripper
    d) Fiber Cleaver

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e) LAN Tester

13. Identify various Network connectors like:
    a) RJ45
    b) SC/ST
    c) MT-RJ
    d) Patch Panel
    e) Keystone
    f) Information Outlets Box, Gang Box
14. Identify various Networking cables like:
    a) Co-axial cable(Cat5e/6), UTP
    b) Fiber-optic
15. Identify various Network devices like:
    a) Hub
    b) Switch
    c) Repeater
    d) Router
    e) Network Rack
    f) Patch Panel
    g) Wireless Access Point
    h) Visual Fault Locater
    i) Wireless Network Adapter, Wi-Fi Card
    j) Firewall k) Network Splitter/Economizer
    l) Network Load Balancer m) Media Converter (LAN to Optic, vice-versa).
16. Practice Ethernet cabling with straight-through, crossover and rolled cable and further testing them usingLAN tester.
17. Practice crimping with Fibre Optic cable using SC connector and further testing them using Visual FaultLocater.
18. Practice punching the IO Box using punch tool.
19. Practice punching the Patch panel using punch tool.
20. Set up and configure wired LAN in between at least three computers.
21. Setting up the network Rack.



24DCSE28 Introduction to Operating System							
Diploma in Computer Science and Engineering Semester – III							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	0	0	3		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

COURSE OBJECTIVES:

The course aims to inculcate skills among students with following objectives:

- To understand the fundamental concepts and techniques of Operating Systems.
- To study the concepts in process management and concurrency control mechanisms.
- To understand the concepts in memory managements and deadlocks.
- To study on file management and storage structures.

LEARNING OUTCOMES:

At the end of the course, the student will be able to:

CO1: Understand basic concepts of operating system.

CO2: Describe process management, scheduling and concurrency controlmechanisms.

CO3: Analyze memory management and deadlocks.

CO4: Compare various file systems and its operating systemsexamples.

CO5: Understand file management and storage structures.

DETAILED CONTENTS

UNIT I

INTRODUCTION

1.1 Introduction: Definition - System Components - Operating System Services
1.2 System Calls and its types
1.3 Types of Operating System in various computing environments
1.4 Operating System Structure
1.5 Open Source Operating Systems.

UNIT II

PROCESSES AND THREADS

2.1 Process Management: Process Concepts - Process definition - Process State - Process Control Block
2.2 Process Scheduling – Basic Concepts - Scheduling Criteria
2.3 Scheduling Algorithms FCFS, SJF, Priority, Round- Robin
2.4 Thread – Overview – Benefits - User & Kernel Threads And Multithreading Models
2.5 Deadlocks –Characterization - Necessary Conditions
2.6 Resource Allocation graph
2.7 Detection (Single Instance and Multiple Instance)
2.8 Recovery (Process Termination and Resource Preemption).

UNIT III

MEMORY MANAGEMENT

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3.1 Memory Management: Swapping - Contiguous Memory Allocation
3.2 Memory Protection
3.3 Memory Allocation - Fragmentation - Paging - Basic method - Hardware Support - Protection,
3.4 Structure of the Page table- Hierarchical Paging - Hashed Page Tables - Inverted Page Table
3.5 Segmentation- Basic Method – Hardware - Protection and Sharing
3.6 Fragmentation
3.7 Demand Paging- Basic Concepts
3.8 Page Replacement- Basics Concepts

UNIT IV
FILE MANAGEMENT

4.1 File Management: File Concepts - Attributes – Operations – Types – Structure - Internal File Structure
4.2 Access Methods: Sequential – Direct – Indexed
4.3 Directory Structures – Single – level - Two-level
4.4 Tree Structured - Allocation Methods – Contiguous – Linked – Indexed
4.5 Free Space Management: Bit Vector - Linked List – Counting - Grouping.

UNIT V
DEVICE MANAGEMENT

5.1 Device Management: Overview - I/O Hardware- Polling
5.2 Interrupts – DMA
5.3 Application I/O interface- Block and Character devices
5.4 Network Devices - Clocks and Timers
5.5 Blocking and Nonblocking I/O
5.6 Device drivers - introduction.

RECOMMENDED BOOKS:

1. Abraham Silberschatz, Greg Gagne, Peter Galvin. Operating Systems Principles. John Wiley Publications. 2006.7th Edition.
2. Andrew S Tanenbaum, Modern Operating Systems, Prentice Hall of India Learning. 2009.3 rdEdition.
3. Gary Nutt, Operating Systems. Pearson Education. 3rd edition.
4. D.M. Dhamdhere, Operating Systems: A Concept-based Approach, Tata McGraw-Hill Education-2012, 3rd edition

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24DCSE65 Indian Constitution							
Diploma in Computer Science and Engineering Semester – III							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
2	0	0	2		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				24.07.2024	**Duration of Exam**	:	3 Hrs
Prerequisite							

COURSE CONTENT

Unit 1 – The Constitution – Introduction

1.1 The History of the Making of the Indian Constitution

1.2 Preamble and the Basic Structure, and its interpretation

1.3 Fundamental Rights and Duties and their interpretation

1.4 State Policy Principles

Unit 2 – Union Government

2.1 Structure of the Indian Union

2.2 President – Role and Power

2.3 Prime Minister and Council of Ministers

2.4 Lok Sabha and Rajya Sabha

Unit 3 – State Government

3.1 Governor – Role and Power

3.2 Chief Minister and Council of Ministers

3.3 State Secretariat

Unit 4 – Local Administration

4.1 District Administration

4.2 Municipal Corporation

4.3 Zila Panchayat

Unit 5 – Election Commission

5.1 Role and Functioning

5.2 Chief Election Commissioner

5.3 State Election Commission

SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication
1.	Ethics and Politics of the Indian Constitution	Rajeev Bhargava	Oxford University Press, New Delhi, 2008
2.	The Constitution of India	B.L. Fadia	Sahitya Bhawan; New edition (2017)
3.	Introduction to the Constitution of India	DD Basu	Lexis Nexis; Twenty-Third 2018 edition

Suggested Software/Learning Websites:

a. https://www.constitution.org/cons/india/const.html
b. http://www.legislative.gov.in/constitution-of-india
c. https://www.sci.gov.in/constitution
d. https://www.toppr.com/guides/civics/the-indian-constitution/the-constitution-of-india/

24DCSE36 Python Programming Fundamentals							
Diploma in Computer Science and Engineering Semester – IV							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	0	0	3		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.2024	**Duration of Exam**	:	3 Hrs
Prerequisite							

COURSE OBJECTIVES:

The course aims to inculcate skills among students with following objectives

- To provide basic knowledge of python.
- To analyse the concept of module programming.
- To apply the basic concepts of OOPs and its use in Python.

COURSE LEARNING OUTCOMES:

At the course, the student will be able to:

CO1: Learn how to design and program python applications

CO2: Demonstrate the Python shell in interactive and script modes.

CO3: Define and design objects and classes in Python and access attributes and methods.

CO4: Understand and apply the methods to create and execute threads and perform multithreading inPython.

CO5: Understand various methods and operations available in Python libraries and packages.

DETAILED CONTENTS

UNIT I

PYTHON PROGRAMMING FUNDAMENTALS

1.1 Introduction to Python language: History, Versions, Features and Applications

1.2 Python development environment (IDE).

1.3 Variables, data types, keywords, operators, expressions, statements, input, output, comments etc.

1.4 Mutable and immutable sequence types in Python.

1.5 Functions: modules, built-in and user-defined.

1.6 Argument Passing

1.7 Module Programming

1.8 Selection, Loop and iteration statements.

1.9 Lambda and other functions in Python.

UNIT II

PYTHON PROGRAMMING CONSTRUCTS

2.1 Input, store and use strings in Python.

2.2 Immutable strings.

2.3 Slicing, traversing, concatenation, comparison, repetition, in, not in, range etc.

2.4 Strings

2.5 Re-module for Regular expressions.

UNIT III

HIGHER ORDER DATA STRUCTURES

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3.1 Introduction to higher order data structures such as lists, dictionaries, tuples and sets.
3.2 Create, access, traverse, append, manipulate, search and sort list objects.
3.3 List, Passing list as arguments
3.4 Dictionaries
3.5 Tuples

UNIT IV

OBJECT ORIENTED PROGRAMMING CONCEPTS USING PYTHON

4.1 Introduction to OOPS and its use in Python.
4.2 Name spaces and scope rules.
4.3 Objects and classes in Python.
4.4 Access methods, attributes
4.5 Built-in class attributes (dict., doc, name, module, bases)
4.6 Multithreading in Python
4.7 Static methods.
4.8 Class Inheritance
4.9 Abstract Data Types
4.10 Constructor and Destructor

UNIT V

FILE AND EXCEPTION HANDLING

5.1 File Handling in Python.
5.2 Error Handling
5.3 Exception Handling
5.4 Iterators and Generators

RECOMMENDED BOOKS

1. "Head First Python" – 2nd Edition – written by Paul Barrey and published by O'Reilly.
2. "Core Python Programming"- 3rd Edition – written by R. Nageswara Rao and published by DreamTechPress
3. Taneja, S. & Kumar, N., (2017), *Python Programming- A Modular Approach*. Pearson Education
4. "Dive into Python" – written by Mark Pilgrim
5. Brown, M. C. (2001). *The Complete Reference: Python*, McGraw Hill Education.

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24DCSE37 Python Programming Fundamental Lab							
Diploma in Computer Science and Engineering Semester – IV							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	4	2		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

COURSE OBJECTIVES:

The course aims to inculcate skills among students with following objectives

- To provide basic knowledge of python.
- To analyse the concept of module programming.
- To apply the basic concepts of OOPs and its use in Python.

COURSE LEARNING OUTCOMES:

At the course, the student will be able to:

CO1: Learn how to design and program python applications

CO2: Demonstrate the Python shell in interactive and script modes.

CO3: Define and design objects and classes in Python and access attributes and methods.

CO4: Understand and apply the methods to create and execute threads and perform multithreading inPython.

CO5: Understand various methods and operations available in Python libraries and packages.

LIST OF EXPERIMENTS

1. Practice programs on Variables, data types, keywords, operators, expressions, statements, input, output, comments etc.
2. Implement problems using Selection, Loop and iteration statements.
3. Implement user defined functionsWrite program to Input, store and use strings in Python
4. Write a program to check string is palindrome or not
5. Write a program to check repetition of characters in string.
6. Introduction to higher order data structures such as lists, dictionaries, tuples and sets.
7. Create, access, traverse, append, manipulate, search and sort list objects.

RECOMMENDED BOOKS

1. "Head First Python" – 2nd Edition – written by Paul Barrey and published by O'Reilly.
2. "Core Python Programming"- 3rd Edition – written by R. Nageswara Rao and published by DreamTechPress
3. Taneja, S. & Kumar, N., (2017), *Python Programming- A Modular Approach*. Pearson Education
4. "Dive into Python" – written by Mark Pilgrim
5. Brown, M. C. (2001). *The Complete Reference: Python*, McGraw Hill Education.
6. Dromey, R. G. (2006), *How to Solve it by Computer*, Pearson Education.
7. Guttag, J.V.(2016), *Introduction to computation and programming using Python*. MIT Press.

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24DCSE40 Data Structure							
Diploma in Computer Science and Engineering Semester – IV							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	0	0	3		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Learning Outcomes:

At the course, the student will be able to:

CO1: understand different data structures

CO2: remember functions associated with data structures

CO3: implementing programming language to formulate Data Structure Problems

CO4: analyze data structures problems.

CO5: develop solutions

Course Content:

UNIT I

INTRODUCTION

1.1 Introduction to Data Structures: Basic Terminology

1.2 Classification of Data Structures

1.3 Operations onData Structures.

UNIT II

LINEAR DATA STRUCTURE-ARRAYS AND STACK

2.1 Linear Data Structures- Arrays

2.2 Stacks: Introduction to Stacks, Array Representation of Stacks

2.3 Operations ona Stack

2.4 Applications of Stacks-Infix-to-Postfix Transformation

2.5 evaluating Postfix Expressions.

UNIT III

LINKDED LIST AND QUEUES

3.1 Linked Lists: Singly Linked List, Representation in Memory, Operations on a Single Linked List

3.2 Circular Linked Lists, Doubly Linked Lists

3.3 Linked List Representation and Operations of Stack,

3.4 Queues: Introduction to Queues, Array Representation of Queues, Operations on a Queue

3.5 Types ofQueues-DeQueue, Circular Queue, Applications of Queues-Round Robin Algorithm.

3.6 Linked List Representation and Operations of Queue.

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UNIT IV

NON-LINEAR DATA STRUCTURE

4.1 Non-Linear Data Structures - Trees: Basic Terminologies, Definition

4.2 Concepts of Binary Trees

4.3 Representations of a Binary Tree using Arrays and Linked Lists

4.4 Operations on a Binary Tree-Insertion,Deletion, Traversals

4.5 Types of Binary Trees.

UNIT V

GRAPHS

4.1 Graph Terminologies

4.2 Representation of Graphs- Set, Linked, Matrix, Graph Traversals

TEXT BOOKS

1. Data Structures, R.S. Salaria, Khanna Book Publishing, New Delhi
2. Data Structures Using C, Reema Thareja, Oxford University Press India.

Reference Books:

1. Classic Data Structures, Samanta Debasis, Prentice Hall of India.
2. Fundamentals of Data Structure in C, Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan, University Press, India.
3. Data Structures: A Pseudo code approach with C, Richard F. Gilberg, Behrouz A. Forouzan, CENGAGE Learning, India.
4. Data Structures and Algorithms: Concepts, Techniques and Applications, G. A. V. Pai, McGraw-Hill Education, India.

24DCSE41 Data Structure Lab							
Diploma in Computer Science and Engineering Semester – IV							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	4	2		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				24.07.2024	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Learning Outcomes:

At the course, the student will be able to:

CO1: understand different data structures

CO2: remember functions associated with data structures

CO3: implementing programming language to formulate Data Structure Problems

CO4: analyze data structures problems.

CO5: develop solutions

LIST OF EXPERIMENTS

S.No.	Topics for Practice
1	Write a program using recursive and non-recursive functions to perform search opera- tion in a given list of integers using linear search technique
2	Search operation in a given list of integers using binary search technique
3	Write a program to implement insertion sorting for a given random data
4	Write a program to implement bubble sorting for a given random data
5	Write a program to implement quick sorting for a given random data
6	Write a program to implement selection sorting for a given random data
7	Write a program to implement heap sorting for a given random data
8	Write a program to implement Hashing tables
9	Write a program to implement single linked list
10	Write a program to implement double linked list
11	Write a program to implement circular linked list
12	Write a program to Implement Stack operations using array and linked list
13	Write a program to Implement Queue operations using array and linked list.
14	Write a program to implement Breadth First Search (BFS)
15	Write a program to implement Depth First Search (DFS)
16	Write a program to implement a binary tree of integers
17	Write a program to find the minimum depth of a binary tree

Manika

24DCSE67 Essence of Indian Knowledge and Tradition							
Diploma in Computer Science and Engineering Semester – IV							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
2	0	0	2		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Content:

Basic Structure of Indian Knowledge System:

(i) वेद, (ii) उपवेद (आयुर्वेद, धनुर्वेद, गन्धर्वेद, स्थापत्य आदद) (iii) वेदाङ्ग (शिक्षा, कल्प, निरुक्त, व्याकरण, ज्योतिष छान्दस), (iv) उपाङ्ग (धर्म शास्त्र, इतिहास, पुराण, तर्कशास्त्र)

- Modern Science and Indian Knowledge System
- Yoga and Holistic Health care
- Case Studies.

SUGGESTED TEXT/REFERENCE BOOKS:

S. No.	Title of Book	Author	Publication
1.	Cultural Heritage of India-Course Material	V. Sivaramakrishna	Bharatiya Vidya Bhavan, Mumbai, 5th Edition, 2014
2.	Modern Physics and Vedant	Swami Jitatmanand	Bharatiya Vidya Bhavan
3.	The wave of Life	Fritzof Capra	
4.	Tao of Physics	Fritzof Capra	
5.	Tarkasangraha of Annam Bhatta, Inernational	V N Jha	Chinmay Foundation, Velliarnad, Amaku,am
6.	Science of Consciousness Psychotherapy and Yoga Practices	RN Jha	Vidyanidhi Prakasham, Delhi, 2016

Monika

24DCSE48 Introduction to Database Management							
Diploma in Computer Science and Engineering Semester – V							
L	**T**	**P**	**Credits**		**Internal Examination**	:	30
3	0	0	3		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE LEARNING OBJECTIVES:

It covers the development of database-driven applications using the capabilities

provided by modern database management system software. The concepts includeconceptual modeling, relational database design and database query languages.

COURSE OUTCOMES:

After completing the course, the students will be able to

CO1: understand database concepts

CO2: design a database, database-based applications

CO3: use a DBMS

CO4: understand relational table database.

CO5: critical role of database system in designing several information system-based software systems or applications.

COURSE CONTENT:

UNIT I

Introduction; Database System Concepts and Architecture

UNIT II

Data Modeling using the Entity-Relationship Model; The Enhanced Entity-Relationship (EER)model

UNIT III

The Relational Data Model and Relational Database Constraints; ER/EER to RelationalModel mapping; Relational Algebra and Relational Calculus

UNIT IV

SQL-99: Schema definition, Constraints, Queries, and Views; Security; Introduction toSQL programming Techniques

UNIT IV

Functional dependencies and normalization for relational databases; Relational database designalgorithms and further dependencies.

TEXT BOOK

1. Fundamentals of Database Systems, Elmasri & Navathe, Pearson Education

Database Management Systems, Raghurama

Reference Books:

2. Krishnan, Johannes Gehrke, Tata McGraw-Hill.

REFERENCE BOOKS

1. Database System Concepts, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw- Hill, New Delhi, India.
2. Introduction to Database Systems, C.J.Date, Pearson Education

24DCSE49 Introduction to Database Management Lab							
Diploma in Computer Science and Engineering Semester – V							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	4	2		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE LEARNING OBJECTIVES:

This Lab course is intended to practice whatever is taught in theory class of 'Introduction to DBMS'. A few sample case studies are listed with some suggested activities. More case studies may be added to this list. You need to develop these case studies, apply all relevant concepts learnt in theory class as the course progress, identify activities/operations that may be performed on the database. It will be a good idea to also use concepts learnt in the course on Software Engineering/SSAD.

COURSE OUTCOMES:

After completing the course, the students will be able to

CO1: understand database concepts

CO2: design a database, database-based applications

CO3: use a DBMS

CO4: understand relational table database.

CO5: critical role of database system in designing several information system-based software systems or applications.

S.No.	Topics for Practice
1	Case Study-1: Employee database – 'Create' employee table, 'Select' and display an em- ployee matching a given condition, 'Delete' duplicate records, delete rows using triggers, insert and update records, find net salary, etc.
2	Case Study-2: Visitor Management database
3	Case Study-3: Students Academic database
4	Case Study-4: Inventory Management System database
5	Case study-5: Bank Operations database
6	Case Study-6: Bus Operator (Roadways) – Do related activities such as prepare E-R Mod- el, Relational Model, do Normalisation, Create Tables, Insert data, Delete Data, Query da- tabase, create stored procedures, etc.

This is a skill course. More student practice and try to find solution on their own, better it will be.

Monika

24DCSE50 Basics of Data Analytics							
Diploma in Computer Science and Engineering Semester – V							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	0	0	3		**External Examination**	:	70
Effective from Session:				2024-2025	**Total**	:	
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE OBJECTIVES

The course aims to inculcate skills among students with following objectives :

- Understanding of Data analysis and its applications.
- Implement a wide range of data analytics techniques.
- Understand machine learning concepts.
- Design experiments and creating datasets.

COURSE LEARNING OUTCOMES

At the end of the course student will be able to

CO1: Identify need of data analysis in real world .

CO2: carry out descriptive analytics on the datasets.

CO3: Have a good understanding of the fundamental issues and challenges of machine learning and data analysis.

CO4: Design experiments and creating data using machine learning techniques.

CO5: Predictions using Regression Least square method.

DETAILED CONTENTS

UNIT-I:

INTRODUCTION

1.1 Introduction to Data: Definition, types and sources or data

1.2 Data Management

1.3 Data Quality (Noises, Outliers, Missing Values, etc.)

1.4 Data Pre-processing

UNIT-II:

DATA ANALYTICS BASICS

2.1 Introduction to Data Analytics and its Types

2.2 Introduction Tools and Techniques for Data Analytics

2.3 Applications of Data Analytics

2.4 Challenges of Data Analytics

2.5 Case Studies and Real world Examples

UNIT-III:

DESCRIPTIVE STATISTICS

3.1 Introduction to Descriptive Statistics

3.2 Central Tendency and Dispersion

3.3 Frequency Distribution

3.4 Probability Distributions: Binomial, Poisson, Normal

UNIT-IV:

MACHINE LEARNING BASICS

4.1 Basics of Machine Learning

4.2 Supervised and Unsupervised Machine Learning

4.3 Role of Machine Learning in Data Analytics

4.4 Decision Tree and Rule Based Classification

4.5 Introduction to Regression: Linear and Non-linear, Least Square Method

UNIT-V:

PRESCRIPTIVE ANALYTICS

5.1 Designing Experiments

5.2 Active Learning

5.3 Creating Data Using Active Learning

5.4 Reinforcement Learning

5.5 Creating Data Using Reinforcement Learning

RECOMMENDED BOOKS

1. Hastie, Trevor, et al. The elements of statistical learning. Vol. 2. No. 1. New York: springer, 2009.
2. Montgomery, Douglas C., and George C. Runger.Applied statistics and probability for engineers. John Wiley & Sons, 2010
3. Moreira, J., Carvalho, A., & Horvath, T. (2018). *A general introduction to data analytics*. John Wiley & Sons.

Mamta

24DCSE51 Basics of Data Analytics Lab							
Diploma in Computer Science and Engineering Semester – V							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	4	2		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE OBJECTIVES:

The course aims to inculcate skills among students with following objectives:

- Understand the fundamental concepts and techniques data analysis using excel
- Implement the basic data analytics tools on the datasets.

LEARNING OUTCOMES:

At the end of the course, the student will be able to:
CO1: Perform Descriptive analytics of the Dataset.
CO2: Understand Pivot Tables
CO3: Analysis using Pivot Tables
CO4: Understand and performing What-if Analysis
CO5: Visualizing data using Charts and Tables.

LIST OF EXPERIMENTS

1. Create or download a dataset
2. Compute following using Excel Formula and functions
    a. Central tendency of the dataset
    b. Dispersion of the dataset
    c. Frequency distribution of the dataset
3. Perform sorting and filtering of dataset
4. Create a customized list and perform custom sort on it.
5. Perform Conditional Formatting on the customized list
6. Creating and understanding Pivot Tables
7. Performing what-if analysis in Excel.
8. Data visualization using Charts in Excel
9. Linear Regression in Excel
10. Correlation in Excel

RECOMMENDED READINGS

1. Aqlan, F., Nwokeji, J. C., & Shamsan, A. (2020, October). Teaching an introductory data analytics course using microsoft access® and excel®. In *2020 IEEE Frontiers in Education Conference (FIE)* (pp. 1-10). IEEE.
2. Blayney, P. J., & Sun, Z. (2019). Using excel and excel VBA for preliminary analysis in big data research. In *Managerial Perspectives on Intelligent Big Data Analytics* (pp. 110-136). IGI Global.

24DCSE63 Introduction to E-governance							
Diploma in Computer Science and Engineering Semester – V							
L	T	P	Credits	Core Course	Internal Examination	:	70
2	0	0	2		External Examination	:	30
Effective from Session:				w.e.f. 2024-2025	Total	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

Course Learning Objectives:

To cover the concepts of e-Governance and to understand how technologies and business models shape the contours of government for improving citizen services and bringing in transparency.

Course outcomes:

CO1:Through exposure to introductory ideas and practices followed in a selected number of e-Gover- nance initiatives in India

CO2: the course will help students to understand and appreciate the essence of e-Governance.

Course Content:

UNIT 1:

Exposure to emerging trends in ICT for development; Understanding of design and implementation of e-Government projects, e-governance lifecycle.

UNIT 2:

Need for Government Process Re-engineering (GPR); National e-Governance Plan(NeGP) for India; SMART Governments & Thumb Rules

UNIT 3:

Architecture and models of e-Governance, including Public Private Partnership (PPP); Need for Innovation and Change Management in eGovernance; Critical Success Factors; Major issue including corruption, resistance for change, e-Security and Cyber laws

UNIT 4:

Focusing on Indian initiatives and their impact on citizens; Sharing of case studies to highlight best practices in managing e-Governance projects in Indian context. Visits to local e-governance sites (CSC, eSeva, Post Office, Passport Seva Kendra, etc) as part of Tutorials.

UNIT 5:

Mini Projects by students in groups – primarily evaluation of various e-governance projects.

Reference Books:

1. Managing Transformation –Objectives to Outcomes. J Satyanarayana, Prentice Hall India
2. The State, IT and Development. Kenneth Kenniston, RK Bagga and Rohit Raj Mathur, Sage Publications India Pvt Ltd.
3. e-Government -The Science of the Possible. J Satyanarayana, Prentice Hall, India
4. http://www.csi-sigegov.org/publications.php
5. https://negd.gov.in
6. https://www.nisg.org/case-studies-on-e-governance-in-india

Monika.