Shreyarth University

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NOTIFICATION-AC0704

No.: SU/ACD/AC/NOT/2025/1389 **Date:** 08/01/2026

Subject: Approval of syllabus of various programmes of School of Engineering.

Read following with respect to the subject mentioned above:

i. Resolution no. 3,4 of the 3rd meeting of the Board of Studies of the School of Engineering dated 28/06/2025. (Attached as Appendix-1)
ii. Resolution no. 3,4 of the 4th meeting of the Board of Studies of the School of Engineering dated 19/11/2025. (Attached as Appendix-2)
iii. Resolution No. 11, 12 of the 7th meeting of the Academic Council dated 01/12/2025. (Attached as Appendix-3)

In pursuance of the above mentioned read i and ii, the following decision is notified with regard to the approval of the syllabus of various programmes of School of Engineering:

- Resolved that the recommendations of the Board of Studies of School of Engineering be accepted and the post-facto approval be given to the Syllabus & Teaching & Examination Scheme of Diploma in Computer Science Engineering Sem.-I and Diploma in Information Technology, Semester-III programmes to be made effective from the academic year 2025-26 and onwards as per AICTE 2022 guidelines as per appendix-3 attached herewith.
- Resolved that the recommendations of the Board of Studies of School of Engineering be accepted and the approval be given to the Syllabus & Teaching & Examination Scheme of Diploma in Computer Science Engineering Sem.-II and Diploma in Information Technology, Semester-IV programmes to be made effective from the academic year 2025-26 and onwards AICTE 2022 guidelines as per appendix-4 attached herewith.

Dr. Suresh Sorathia,
Registrar (I/C),
Shreyarth University, Ahmedabad.

SHREYARTH UNIVERSITY Ahmedabad

Attachments: As mentioned above

Copy forwarded for information and necessary action To:

- President, Shreyarth University
- Provost, Shreyarth University
- Library, Shreyarth University
- Director / Head of School of Engineering
- All the employees of the School of Engineering
- All academic and administrative sections of the University
- Select File

SHREYARTH UNIVERSITY

School of Engineering

Diploma CSE Semester I

Syllabus

Diploma CSE Semester 1 Teaching Scheme

Sr. No	Course Code	Course Name	Curricular Components	Lecture	Tutorial	Practical	Credit
1		Mathematics – I	Basic Science	3	1	0	4
2		Physics	Basic Science	3	0	1	4
3		Communication Skills	Humanities	2	0	0	2
4		Essence of Indian Traditional Knowledge	Audit	0	0	0	0
5		Computer Workshop	Engineering Science	2	0	1	3
6		Fundamental of Computer	PCC	2	0	2	4
7		Introduction to Computer Programming	PCC	3	0	2	5
Total				12	1	6	22

Course: Mathematics-I								
Course Code:			**Semester:** I			**Programme: DE-CSE**		
Teaching Scheme				**Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Contact Hours**	**CIE Theory**	**CIE Practical**	**ESE Theory**	**ESE Practical**	**Total**
3	1	-	4	24/60	-	16/40	-	40/100

Course Objectives:

- To enable students to interpret and analyze functions graphically, numerically, and analytically; apply trigonometric and vector concepts to engineering problems; solve problems involving straight lines and circles; and illustrate functions using the concept of limits.

Course Learning Outcomes (COs):

Having completed this course, the learner will be able to

1. Understand rank and nullity of matrix and application in computer sciences and employ techniques to classify and solve linear systems of equations
2. Understand the concepts of vector spaces, subspaces, bases, dimension and their properties.
3. Learn properties of Determinant and Function, Trigonometry, Coordinate Geometry, Limit in computer graphics.
4. Compute Eigen values and Eigen vectors of matrices and apply in computer graphics.

Course Content

Module	Topics	Weightage (%)
1	**Determinant and Function:** Solve simple problems of Determinant up to order 3*3, Determinant and its value up to 3rd order (Without properties), Function and simple examples, Logarithm as a function, Laws of Logarithm and related Simple examples	25
2	**Trigonometry:** Apply the concept of Compound angle, Allied angle, and Multiple angles to solve the given simple engineering	25

	problem(s), Explain the concept of Sub- Multiple and solve related problem(s), Invoke the concept of Sum and Factor formulae to solve the given simple problem(s), Investigate given simple problems using inverse Trigonometric functions, Units of Angles (degree and radian),Trigonometric Functions, Allied & Compound Angles, Multiple –Submultiples angles, Graph of Sine and Cosine, Periodic Trigonometric function, Sum and factor formulae, Inverse Trigonometric function	
3	**Vectors:** Apply the concept of algebraic operations of Vectors to solve given simple engineering problem(s), Apply the concept of Scalar and Vector product to solve specified simple problem(s), Solve problems of work done and moment of force using the concept of Vectors, Vector, Addition, Subtraction, Magnitude and direction, Scalar and Vector Product and it's properties, Angle between two Vectors, Applications of Scalar and Vector Product (Work Done and Moment of Force)	25
4	**Coordinate Geometry:** Employ the equation of straight line to solve given simple problems, Apply the concept of slope and its consequences to solve the given problems, Straight line (Two-point form) and slope of straight line,Slope point form, Intercept form, General form of line, Condition of parallel and perpendicular lines, Find the angle between two lines using the concept of Parallel and Perpendicular lines, Apply the concept of equation of circle with center and radius to solve the given problems, Solve problems related to general equation of circle based on tangent and normal. **Limit:** Analyze the characteristic of functions using the concept of Limit, Solve the given problems using standard formulae of Limit, Limit of a Function, Standard formulae of Limit and related simple examples.	25

Text Book(s):

1 Engineering Mathematics (Third edition), Croft, Anthony, Pearson Education, New Delhi,

Reference Book(s):

1. A Text Book of Vector Analysis, Narayan Shanti and Mittal P.K, S. Chand Publication

2. Calculus and Analytic Geometry. B. Thomas, R. L. Finney, Addison Wesley, 9th Edition, 1995.
3. Understanding Engineering Mathematics, John Bird, Routledge
4. Advanced Engineering Mathematics, Krezig, Ervin,Wiley Publ., New Delhi

CO–PO Mapping Table

COs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
CO-1	3	2	2	1	1	1	1
CO-2	2	1	2	1	2	2	2
CO-3	2	2	1	1	1	1	1
CO-4	3	2	3	1	1	1	1

Course: Physics								
Course Code:			**Semester:** I			**Programme:** DE-CSE		
Teaching Scheme				**Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Contact Hours**	**CIE Theory**	**CIE Practical**	**ESE Theory**	**ESE Practical**	**Total**
3	0	1	5	24/60	-	16/40	-	40/100

Course Objectives

- To develop students' competency through practical exercises and essential soft skills, enabling them to precisely use measurement instruments, apply heat transfer and thermometric concepts, utilize wave dynamics, and employ LASER and fiber-optic principles in various engineering applications.

Course Learning Outcomes (CLOs)

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

1. Students will understand fundamental concepts of physics including mechanics, electromagnetism, thermodynamics, and quantum mechanics.
2. They will develop problem-solving skills, critical thinking, and experimental techniques.
3. They will apply mathematical principles to analyze and predict natural phenomena, fostering an appreciation for the scientific method and its role in understanding the universe.
4. Additionally, students will recognize the interdisciplinary nature of physics and its connections to other scientific fields and real-world applications.

Course Content

Module	Topics	Weightage (%)
1	**Units and Measurements** - Measurement and units in engineering and science, Physical quantities; fundamental and derived quantities,Systems of units: CGS, MKS and SI, definition of units (only for information and not to be asked in examination).	25

	Interconversion of units MKS to CGS and vice versa, requirements of standard unit,Vernier caliper, Micrometer screw gaugeAccuracy, precision and error, estimation of errors - absolute error, relative error and percentage error, error propagation, significant figures.	
2	**Electrostatics:** Charge, unit of charge, Coulomb's law, Electric field, electric field lines and its properties, Electric flux, electric potential and potential difference (point charge only), Capacitor and its capacitance, types of capacitors: Plane, spherical & cylindrical (Information only), capacitance of capacitors in series and in parallel combinations **Heat and Thermometry:** Heat and Temperature, Modes of Heat transfer: Conduction, Convection and Radiation, Temperature measurement scales: Kelvin, Celsius and Fahrenheit and interconversion between them, Heat Capacity and Specific Heat, Coefficient of thermal conductivity and its engineering applications, Expansion of solids, coefficient of linear expansion	25
3	**Wave motion and its applications:** Waves, wave motion, and types of waves: longitudinal and transverse waves, Frequency, periodic time, amplitude, wave length and wave velocity and their relationship, Properties of sound and light waves,Superposition of waves, Interference: constructive and destructive interference , condition for stationary interference pattern, beat formation,Ultrasonic waves, production of ultrasonic waves – magnetostriction and piezoelectric method, their properties, applications of ultrasonic waves in the field of engineering and medical	25
4	**Optics and Modern Physics:** Refraction, refractive index and Snell's law, Total internal reflection, critical angle and necessary conditions for total internal reflection, Application of total internal reflection in optical fire, LASER, characteristics of LASER, differences between LASER and ordinary light, Applications of LASER in engineering and medical field, Optical fiber and light propagation through optical fiber, acceptance angle and numerical aperture, Step index and graded index, Applications of optical fiber in engineering and medical, Advantages of optical fiber over coaxial cable.	25

Text Books:

1. Engineering Physics K. Rajagopal Prentice-Hall of India Pvt. Ltd., New Delhi

Reference Books:

1. Physics For Scientists & Engineers With Modern Physics, Douglas C. Giancoli, Pearson 2. University Physics, William Moebs,Samuel J. Ling & Jeff Sanny, Openstax 3. Introductory Physics: Building Models to Describe Our World,

Course Content

List of suggestive programs.

1. To determine the dimensions of the given object using Vernier callipers.
2. To measure diameter of a given wire and volume of the given metallic piece using a micrometre screw gauge.
3. To determine the acceleration due to gravity using a simple pendulum.
4. To determine the force constant of a spring using oscillations of the spring.
5. To determine the frequency of a given tuning fork using a sonometer.
6. To determine the speed of sound in air at room temperature using a resonance tube.
7. To determine the angle of minimum deviation of a given glass prism.
8. To determine refractive index of liquid by concave mirror.
9. To determine the refractive index of glass using a travelling microscope.
10. To obtain the radius of curvature of a given lens using a spherometer.
11. Use different types of thermometers to measure the temperature of a hot bath and convert it into different scales.
12. Determine numerical aperture (NA) of optical fiber.
13. Study series and parallel combination of capacitors and solve different configurations.
14. Study about dependence of capacitance of a parallel plate capacitor on various factors.
15. Study about spectrometers and obtain dispersive power of a glass prism.

CO-PO mapping:

COs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
CO1	2	1	1	1	3	1	2
CO2	1	1	1	1	3	2	2
CO3	2	3	2	1	2	2	3
CO4	1	1	1	1	3	2	2
CO5	1	2	2	1	3	3	3

Course: Communication Skills								
Course Code:			**Semester:** I				**Programme: DE-CSE**	
Teaching Scheme				**Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Contact Hours**	**CIE Theory**	**CIE Practical**	**ESE Theory**	**ESE Practical**	**Total**
2	0	0	2	24/60	-	16/40	-	40/100

Course Objectives

- To develop students' communication competency by minimizing barriers, constructing grammatically correct sentences, enhancing reading and listening fluency, composing various forms of written communication, and communicating effectively in diverse oral situations.

Course Learning Outcomes (CLOs)

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

1. Develop and Expand Writing Skills through Controlled and Guided Activities.
2. Apply Verbal and Non-Verbal Communication Techniques in

The Personal and Professional Environment

3. Write well-organized and effective business circulars, notices, agenda and minutes.
4. The students will be able to write correctly and properly with special reference to Letter Writing.

Course Content

Module	Topics	Weightage (%)
1	Theory of Communication- Define the theory of communication, State different types of communication, explain barriers in communication, Communicate effectively, Concept of effective communication and communication skills, Basic communication model(S+M+C+R+F), Types of communication, Barriers of effective communication	25

2	**Grammar:** Identify different parts of speech and their usage in the sentence, Choose appropriate parts of speech for day to day communication, Apply correct verbs in the given sentence, Use grammatically correct sentence in day to day communication, Use appropriate Modal Auxiliaries in a given expression, Choose the correct verb for the given subject, Identify basic sentence patterns of English and form sentences in correct word order.	25
3	**Prose and Poetry:** Realise the central idea of the literary piece, Formulate sentences using new words, Enrich vocabulary through reading, Write short as well as long answers to questions, Express ideas in English in written form effectively. **Techniques of Writing**: Compose emails on given topics/ situations, Write a paragraph in words with synchronized sentence structure on the given situation/topic, Answer the questions on the given unseen passage, Summarize the given unseen passage, Face oral examinations and interviews, Grasp the main idea of any conversation, and communicate accordingly.	25
4	**Mechanics of Speaking**: Develop a welcome and farewell speech for the given theme/situation. Prepare a speech to introduce a guest to the given situation. Make a weather report for the given condition. Introduce oneself with correct pronunciation, and intonation, using verbal and non-verbal gestures. Speak in specified formal situations with correct pronunciation. Speak in specified informal situations with correct pronunciation.	25

Text Books:

1. Effective Communication Skills, Kulbhushan Kumar, Khanna Publishing House, New Delhi

Reference Book(s):

1. Living English Structures, W. S. Allen, Pearson Education India 1992
2. Essentials of English Grammar and Composition,N. K. Aggrawal,Goyal Brothers Prakashan
3. English Grammar at Glance,M. Gnanamurali,S. Chand & Co. Ltd. 2010
4. Effective English,E. Suresh Kumar & Others,Pearson 2010
5. English Communication for Polytechnics,S. Chandrashekhar & Others, Orient BlackSwan 2013

List of suggestive programs.

1 Make correct sentences using tenses.

2 Compose Syntactical statements in written and Oral Communication (especially Formal Communication).

3 Make meaningful sentences using confusing words..

4 Develop listening skills through listening to recorded lectures, poems, interviews and speeches.

5 Use antonyms and synonyms effectively in oral and written forms.

6 Use grammatically correct sentence

7 Communicate ideas effectively and fluently in oral and written communication.

8 Apply idioms and one word substitute effectively in oral and written forms of communication.

9 Articulate vowels, consonants and diphthongs correctly.

10 Syllable and Syllable Stress

11 Speak with appropriate intonation, voice modulation,pitch, speed and volume.

12 Participate in conversations (GD /meetings etc.)

13 Deliver the presentation effectively in the class.

14 Communicate effectively through verbal and non-verbal means of communication.

15 Practice online exercises for listening and reading comprehension.

16 Perform role play and mock interview

CO-PO Mapping Table

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	2	2	1	1	2	2
CO2	1	3	2	1	2	3	2
CO3	1	2	3	1	1	3	1
CO4	1	2	3	1	1	2	1

Course: Essence of Indian knowledge and Tradition								
Course Code:			**Semester:** I			**Programme: DE-CSE**		
Teaching Scheme				**Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Contact Hours**	**CIE Theory**	**CIE Practical**	**ESE Theory**	**ESE Practical**	**Total**
0	0	0	2	24/60	-	16/40	-	40/100

Course Objectives:

- To enable learners to explore the scientific foundations and astronomical knowledge of ancient India, including calendar calculations, celestial observations, and early insights into cosmic measurements. To develop an understanding of India's rich heritage in mathematics, architecture, and infrastructure — highlighting contributions of great scholars, historic trade networks, ship-building, and the evolution of major Hindu temple styles.

Course Outcomes (COs):

1. Students will attain awareness regarding the significance of IKS
2. The syllabus will enhance their confidence in Indian traditional knowledge system and enable them to perceive at the problems with Indian perspective
3. This will also enable them to analyze the issues on their own and enable them for critical thinking.
4. The knowledge about the ancient Indian Scientific traditions will generate more confidence in themselves.
5. This will lead them to make research and innovative thinking which can result in global contribution at a later stage.

Course Content:

Module	Topics	Weightage (%)
1	**Ancient Indian Astronomy :** Development of Astronomy: A) Consideration of Purnima and Amavasya B) Beginning of The New Year- Vasant Ritu- (Vernal Equinox) C) Ancient Indian Calender D) Science Behind "Adhikmaas" E) Uttarayan and Dakshinayan ¬ Knowledge about Constellations / planets / distance between planets etc. A)	20

	Saptarushi – seven Seers- Significant Knowledge of star and constellations B) Knowledge of Speed of Light – Rigveda(1.50.04) C) Distance between Earth and Sun (Hanuman Chalisa), Advances in Mathematics and Geometry in Ancient India A) Sulbha- Sutra (Kalpa Sutra) composed by Baudhayana, Manava, Apastamba and Katyayana B) Contribution of Ancient Rushis to Mathematics A)Bodhayana's value of pie B) Lilavati C) Bhaskaracharya D) Arya Bhatt.	
2	**Town Planning in Ancient India** A) Roads in Ancient India – Uttarpath by Chandra Gupta B) Ancient Indian Trade Routs/ Waterways C)Ship- Building In Ancient India D)Temple Architecture -Nagar Style/ Dravida style/ Vesara style	20
3	**Atomic Theory of by Kanada** A) Concept of Seven Padartha and Nine Dravyas B) Theory of Gurutva C) Characteristics of Atom	20
4	**Metallurgical Discoveries in Ancient India** Lime a Mortar , Bronze, Gold & Silver, Glass / Iron, Nagarjuna's Contribution in making Alloys	20
5	**Vimanshastra - Airbourne Vehicles.** A) References of Vimana- Flying Machines in Rigveda, Mahabharat and Ramayana B) BhardwajSutra- Chapter-1 Rasyagnoadhikari	20

Text Book(s):

1. History of Science, Arts & Technology By Dr. Shripad Dattatrya Kulkarni, Bhishma Prakashan, Mumbai -1998.Modern PHP: New Features and Good Practices: Josh Lockhart.
2. Introduction to Indian Knowledge System: Concepts and Applications by B. Mahadevan, Vinayak Rajat Bhat, Nagendra Pavana, PHI Learning Pvt. Ltd., Delhi
3. Town Planning in Ancient India by Binode Bihari Dutt, Thacker, Spink & Co.
4. ભારતનો વૈજ્ઞાનનક વારસો લેખક-જે . જે . રાવલ યુનનવનસસટી ગ્રંથ નનર્ોાોાોાોાણ બોર્ોા, ગુજરાત રાજ્ય

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Viva
6. Project (if applicable)
7. Presentation
8. Attendance

Mapping with Programme Outcomes (POs):

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	1	1	1	3	1	2
CO2	1	1	1	1	3	2	2
CO3	2	3	2	1	2	2	3
CO4	1	1	1	1	3	2	2

Course: Computer Workshop								
Course Code:			**Semester:** I			**Programme:** DE-CSE		
Teaching Scheme				**Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Contact Hours**	**CIE Theory**	**CIE Practical**	**ESE Theory**	**ESE Practical**	**Total**
2	0	1	4	24/60	-	16/40	-	40/100

Course Objectives

- To enable students to demonstrate active and passive circuit components, categorize various cables and connectors based on their characteristics and applications, and apply hands-on skills by building a mini project using Arduino, Raspberry Pi, PCB, or a breadboard to promote project-based learning.

Course Learning Outcomes (CLOs)

1. Upon completing the course, students will exhibit comprehensive proficiency in understanding, categorizing, and effectively utilizing various active and passive components essential for circuit design and implementation.

2. They will demonstrate the ability to classify different types of cables and connectors based on their specific characteristics and applications.

3. Moreover, students will gain practical experience and skills in operating digital multimeters for diverse measurements.

4. Furthermore, they will develop the capability to conceive, plan, and execute mini-projects utilizing platforms such as Arduino, Raspberry Pi, PCB, or breadboard, thereby reinforcing project-based learning principles and enhancing their practical problem-solving abilities.

Course Content

Module	Topics	Weightage (%)
1	**Basic of Electrical and Electronic:** Resistor, Capacitor, Inductor, transformer, Voltage Source (AC 230 Volt)/Current Source, Battery, Various types of Diodes including LEDs, Transistors,	25

	IC, PCB, Breadboard, jumpers, switch, knob, Soldering, Desoldering Process	
2	**Identification of Cables:** Twisted Pair Cable (UTP/STP), Fiber Optic Cable, Coaxial Cable, Ribbon Cable	25
3	**Identification on of Connectors:** HDMI Port, RS-232 Interface, RJ-45 Connectors, USB Connectors, Audio-Video Jack, Connectors, Type C connector, Micro USB connector	25
4	**Operate measuring instruments:** Digital Multimeter **Internet of things**: Develop application based on PCB/Breadboard/Arduino/Rasp berry pi electronic board, Mini Project based on PCB/Breadboard, Mini Project based on Arduino/Raspberry pi electronic board	25

Text Books:

1 Principles of Electronics, V. K. Mehta, S. Chand

2 Electronic Principles, A .P. Malvino, TMH Edition

Reference Books:

1. Electronic Devices and Circuit:An Introduction, Mottershead, Allen, Goodyear Publishing Co. ,New Delhi
2. Basic Electronic Engineering, Baru, V.; Kaduskar, R. Gaikwad S.T., Dreamtech Press, New Delhi
3. Fundamentals of Electronic Devices and Circuits, Bell, David, Oxford University Press New Delhi

Course Content

List of suggestive programs.

1. Identification/Measurement of various electronic hardware components
2. Identification of various types of cables.
3. Identification of various connectors/Interfaces.
4. Hands on practice on Digital Multimeter
5. Miniproject based on PCB(Group Activity*)
6. Miniproject based on Arduino/Raspberry Pi based board(Group Activity*)

PO-COMPETENCY-CO MAPPING

For CO-PO mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	2	1	1	1
CO2	2	2	2	1	1	1	1
CO3	2	2	3	3	1	1	1
CO4	2	3	3	3	2	3	2

Course: Fundamentals of Computer								
Course Code:			**Semester:** I			**Programme: DE-CSE**		
Teaching Scheme				**Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Contact Hours**	**CIE Theory**	**CIE Practical**	**ESE Theory**	**ESE Practical**	**Total**
2	0	2	6	24/60	-	16/40	-	40/100

Course Objectives

- To enable students to effectively use computer systems and peripherals, create forms and sheets using Google applications, perform word processing and basic DTP tasks in MS Word, analyze and present data using spreadsheets, and develop professional electronic presentations with MS PowerPoint.

Course Learning Outcomes (CLOs)

1. Fundamentals of Computer with a focus on MS Word, Excel, and PowerPoint, students will acquire proficiency in document creation, formatting, and editing using MS Word.
2. They'll master data analysis, manipulation, and visualization techniques in MS Excel. Additionally, students will develop skills in creating dynamic presentations, incorporating multimedia elements, and effectively communicating ideas using MS PowerPoint.
3. The course aims to cultivate efficient use of these essential Microsoft Office tools, enhancing students' workplace readiness.
4. Participants will be capable of producing professional documents, managing data efficiently, and delivering compelling presentations, essential for success in various academic and professional settings.

Course Content

Module	Topics	Weightage (%)
1	**Basics of Computer:** List the Generation of Computer, Classify the given type of Device, Describe functioning of CU, ALU and memory unit, Differentiate various types of Storage Devices,	25

	Classifying Computer Languages, Explain various file handling operations **Basics of Internet and Google Applications:** Describe basic terminologies of Internet, Write the procedure of creating Email Account, explain different features of google drive, Write the procedure to Create Google form with validation checks.	
2	**MS-Word:** Describe the given features of MS Word, Select basics text formatting features, Write steps to apply graphics and pictures in the document, Explain procedure to Create and manipulate table with styles, Explain the procedure to apply Proofing, sharing and Printing Document, write steps to create Google Document	25
3	**MS-Excel:** Describe Features of the Spreadsheet, Explain basic formatting features of Excel, Explain the procedure to apply Formulas and calculations in Excel Spreadsheet with cross-referencing and validation, Explain procedure to create and Manipulate Charts and diagrams, Explain procedure to create and Manipulate Pivot Tables and Charts, Write steps to Create a Google Spreadsheet	25
4	**MS-PowerPoint:** Explain the procedure to create a presentation with the basic features of PowerPoint, Explain procedure to apply themes, animation and hyperlinks in presentation, Explain procedure to apply audio and sounds by inserting pictures, a chart and a Clipboard, Write steps to create Master slides, Explain procedure for printing, sharing, and exporting slides, Explain procedure for creating Google PowerPoint Presentation	25

Text Book(s):

1. Fundamentals of Computers, Sixth Edition, Rajaraman V, Adabala N, Prentice Hall India Learning Private Limited

Reference Book(s):

1. MS-Office for Dummies, Wallace Wang, Wiley India, New Delhi
2. Sams Teach Yourself Internet and Web Basics All in One, Ned Snell, Bob Temple, Michael Clark, Sams Publishing, Indiana, USA

Course Content

List of suggestive programs.

1 Create and Manage Files & Folders

2 (a) Create Gmail Account and use its Features like adding contacts

(b) Compose mail, create and manage labels, filters and signatures

3 Configure browser settings and use browsers.

4 Create and Manage Files and Folders in Google Drive

5 MS-Word: Create bills/brochures for Company: Use Insert menu option, text adjustment between the table, page size, text boxes

6 MS-Word: Use smart art and create organization charts

7 MS-Word: Design E-book cover pages / Magazine front/ books front/back page: Header & Footer

8 MS-Word: Design a Happy Birthday Message by using Word Art and print it.

9 MS-Word: Design Newspaper advertisement: Use high-quality images, text, and layout

10 MS-Word: Create a chart and show the Results comparison between 2019, 2020, and 2021

11 MS-Word: Insert template in Microsoft Word from the Internet and edit those templates with your content.

12 MS-Word: Create Letter Head

13 Google document: Create Google Document for Resume

14 MS Excel: - Create Work book using basic features of Excel

15 MS Excel: Create basic charts for 2020 Car sales

16 MS Excel: Create Target Sheet for Company using Conditional Formula

17 MS Excel: Create Company Salary Table using VLOOKUP

18 MS Excel: Create Pivot Table and Pivot Chart For any Expense Sheet

19 MS Excel: Create Worksheet using Macros

20 MS Excel: Create Pay bills, pay slips, Electricity bills using Excel

21 Google Sheet: Create Google Sheet for Results of Students

22 MS Power Point: Create Presentation with basic formatting features, insert and delete slides, using master slide

23 MS Power Point: Working with drawing tools, applying shape or picture styles, Applying object borders, object fill, object effects.

24 MS Power Point: Create Table and Charts in Presentation

25 MS Power Point: Create PPT with adding Sound, Video, Animation, Transition and Hyperlink in Presentation

27 Google Presentation: Create a Google Presentation comprising all the features as mentioned in previous practicals.

28 Google Form: (a) Create google form for User's feedback

(b) Create a sample quiz

CO- PO Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	1	1	2	1
CO2	2	2	3	1	1	2	1
CO3	2	2	2	1	1	3	2
CO4	2	2	3	1	1	3	2

Course: Introduction to Computer Programming								
Course Code:			**Semester:** I			**Programme: DE-CSE**		
Teaching Scheme				**Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Contact Hours**	**CIE Theory**	**CIE Practical**	**ESE Theory**	**ESE Practical**	**Total**
3	0	2	7	24/60	-	16/50	-	40/100

Course Objectives

- To equip students with the ability to design algorithms and flowcharts, develop C programs using control structures, arrays, pointers, user-defined functions, structures, unions, and perform file and I/O operations effectively.

Course Learning Outcomes (CLOs)

Environmental Studies CLOs include

1. Basic Computer Programming with a focus on the C language, students will acquire a solid foundation in programming fundamentals.
2. They will demonstrate proficiency in designing, implementing, and debugging C programs, understanding concepts such as control structures, data types, and functions.
3. Students will develop problem-solving skills through algorithmic thinking and gain hands-on experience with key elements like arrays, pointers, and file handling.
4. Additionally, they'll cultivate a systematic approach to program development, enhancing their ability to tackle real-world coding challenges.

Course Content

Module	Topics	Weightage (%)
1	**Flowchart and Algorithm :** Write pseudo code for the given problem statements, Select appropriate flowchart symbols to represent problem solution graphically, Write algorithms for the given problem statements, Develop flowchart for the given problem statement, Develop Algorithm for the given problem statement	25

	Basics of 'C': Comprehend general structure of 'C' program, Choose appropriate operators amongst C operators to form expressions in C, Write simple C programs using operator.	
2	**Decision Statements and Control Structure :** Develop programs using decision making if-else statement, Develop programs using decision making switch – case statement, Develop programs using unconditional branching goto statements in 'C' language, Develop C programs using control structure: for, While and Do-While, Apply Break and Continue Statement based on the problem statements in 'C' language. **Array:** Introduction to an Array, A characteristics of an array, One-dimensional array: Declaration, initialization and accessing, Two-dimensional array: Declaration, initialization and accessing, Introduction to a String: Declaration and Initialization of String, gets() and puts(),	25
3	**Functions:** Introduction to Functions, Types of Functions: Built-in and user-defined Functions, Advantages of using Functions, Working of a Function, Declaring, Defining and calling user-defined Functions, Categories of user-defined Functions, Call by Value and call by Reference, Recursion **Pointers :** Introduction to Pointers, Characteristics of Pointers, Address of Operator and Indirection operator, Declaration and initialization of Pointers, Types of Pointers: void and null, Pointers to Pointers	25
4	**Structure, Union and Files:** User-defined Data types: Enum, typedef, Introduction to Structures Declaration, Initialization, and accessing of Structures, Array of structures, Introduction to Union Declaration, Initialization and Accessing of Union, Introduction to Text Files, Opening & Closing Files in Text Mode	25

Text Books:

1. Programming in ANSI, E. Balagurusamy, McGraw Hills Education, New Delhi

Reference Books:

1. Introduction to C Programming, Reema Thareja, Oxford University Press, New Delhi
2. Programming with ANSI and Turbo C, Ashok N. Kamthane, Pearson Education, New Delhi

List of suggestive programs.

1 Practice using Visual Programming Language like scratch

2 Design and test sample C programs to display a message on screen.

3 Design and test minimum 3 C programs using constants, variables and datatypes.

4 Design and test a C program to swap 2 numbers using a third variable and without using a third variable.

5 Design and test a C program to compute volume and surface area of a sphere.

6 Design and test a C program to convert temperature in Fahrenheit to Celsius and vice versa.

7 Design and test at least 4 C programs to using enlisted operators:

(1) Assignment (2) Arithmetic (3) Relational (4) Logical

8 Design and test at least 5 C programs using the enlisted operators:

(1) Bitwise (2) Increment and Decrement (3) Conditional (4) Comma (5) size of

9 Design and test at least 3 C programs to test the operator precedence and their associativity, implicit and explicit type conversion.

10 Design and test at least 3 C programs to show formatted and unformatted input and output.

11 Design and test at least 2 C programs using decision making statements: (1) Simple if (2) if…else (3) Nested if (4) if…elseladder (5) switch (6) goto

12 Design and test at least 3 C programs using the for loop.

13 Design and test at least 3 C programs using the while loop.

14 Design and test at least 3 C programs using do…while loop.

15 Design and test a C program using break and continue statements.

16 Design and test at least 5 pattern programs using loop structures.

17 Design and test at least 5 C programs using one dimensional array.

18 Design and test at least 3 C programs using two dimensional arrays.

19 Design and test at least 3 C programs using strings.

20 Design and test at least 3 C programs using pointers.

21 Design and test a C program using the concept of pointer to pointer.

22 Design and test at least 5 C programs using user defined functions.

23 Design and test at least 3 C programs by applying the recursion concept.

24 Design and test a C program to test various inbuilt string functions.

25 Design and test a C program to demonstrate various inbuilt math functions.

26 Design and test a C program to demonstrate storage classes.

27 Design and test a C program to demonstrate usage of enum and typedef.

28 Design and test at least 3 C programs on structures and unions.

29 Design and test at least 2 C programs using file operations.

CO-PO Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	1	1	1	1
CO2	3	3	3	2	1	2	1
CO3	3	3	2	2	1	2	1
CO4	2	2	3	2	1	3	2

SHREYARTH UNIVERSITY

School of Engineering

Diploma IT Semester III

Syllabus

Program Outcomes (POs) – Diploma

After completing the Diploma program, a graduate will be able to:

1. Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
2. Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods.
3. Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
4. Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
5. Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.
6. Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
7. Life-long learning: Ability to analyse individual needs and engage in updating in the context of technological changes.

Diploma in Information & Technology

Teaching Scheme

SEMESTER-3

Sub Code	SubjectName	Category	Lecture Credit	Tutorial Credit	Practical Credit	Total Credit
	Data Structure with Python	Program Core	3	0	2	5
	Operating System	Program Core	3	0	1	4
	Database Management	Program Core	3	0	2	5
	Software Engineering	Program Core	3	0	1	4
	Engineering Chemistry	Program Core	3	0	1	4
	Total		**15**	**0**	**7**	**22**

Course: Data Structure with Python								
Course Code:			**Semester: III**			**Programme:** Diploma in IT		
Teaching Scheme				**Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Contact Hours**	**CIE Theory**	**CIE Practical**	**ESE Theory**	**ESE Practical**	**Total**
3	0	2	7	24/60	-	16/40	-	40/100

Course Objectives:

- Understand the fundamental concepts of data structures and algorithms using Python.
- Explore various linear and non-linear data structures (lists, stacks, queues, linked lists, trees, graphs) through Python.
- Analyze and evaluate the performance (time and space complexity) of algorithms in Python.
- Apply appropriate data structures to solve real-world computational problems using Python.

Course Learning Outcomes (CLOs):

By the end of the course, students will be able to:

1. Identify and explain the basic concepts of data structures and algorithm analysis in Python.
2. Implement linear data structures like arrays, lists, stacks, and queues using Python.
3. Implement non-linear data structures like linked lists, trees, and graphs in Python.
4. Analyze and compare different searching and sorting algorithms in Python.

Course Content

Module I: Fundamentals of Data Structures and Algorithms

Introduction to Data Structures, Types (Primitive, Non-Primitive), Linear vs Non-Linear Structures. **Algorithms:** Key features, Time & Space Complexity, Asymptotic Notations (Big O, Ω, Θ). Arrays, Row & Column Major, Operations (Insert, Delete, Traverse), Searching (Linear & Binary Search).

Module II: Stack and Queue Operations

Stack, Representation, Push/Pop, Applications (Infix, Prefix, Postfix, Recursion). Queue: Representation, Enqueue/Dequeue, Circular Queue, Applications and Limitations

Module III: Linked Lists and Their Applications

Pointers and Structures (Revision), Dynamic Memory Allocation, Singly Linked List, Operations: Insert, Delete, Search, Count, Circular and Doubly Linked Lists, Differences & Operations, Applications of Linked Lists

Module IV: Advanced Data Structures: Sorting, Hashing, Trees, and Graphs

Sorting Techniques, Bubble, Selection, Quick, Insertion, Merge, Radix, Hashing: Concepts, Methods (Division, Folding, Middle Square), Collisions & Resolution (Linear Probing). Trees: Binary Trees, BST: Insertion, Deletion, Search, Traversals: Inorder, Preorder, Postorder. Graphs: Representation, Operations: BFS, DFS, Spanning Trees.

Text Books:

1. **Data Structures Through C –** *Yashavant Kanetkar*
2. **Data Structures and Algorithms in C –** *Michael T. Goodrich, Roberto Tamassia*

3. **Data Structures Using C** – *Tanenbaum, Langsam, Augenstein*

References Books:

1. Data and File Structures using C-Reema Thareja
2. Data Structures using C-ISRD Group
3. Data Structures- Chitra A., Rajan P.T.
4. Classic Data Structures-D.Samanta

List of Practical:

1. Define various terms such as algorithm, various approaches to design an algorithm, time complexity, space complexity, big 'o' notation, best case, average case and worst case time complexity etc.
2. Implement Sequential search algorithms.
3. Implement Binary search algorithms
4. Implement push and pop algorithms of stack using array.
5. Implement recursive functions.
6. Implement insert, delete algorithms of queue using array.
7. Implement insert, delete algorithms of circular queue.
8. Implement insertion of node in the beginning of the list and at the end of list in singly linked list.
9. Implement insertion of node in sorted linked list.
10. Implement insertion of node at any position in liked list.
11. Implement searching of a node, delete a node and counting no of node algorithms in singly linked list.
12. Implement insertion of node in the beginning and at the end of doubly linked list.
13. Implement insertion of node at any position in doubly liked list.
14. Implement searching of a node, delete a node and counting no of node algorithms in doubly linked list.
15. Implement Bubble sort, Selection sort algorithms.
16. Implement Quick Sort.
17. Implement Insertion sort.
18. Implement Merge Sort algorithm.
19. Solve hash table example using division method, method square method, folding method (paper work only).
20. Implement construction of binary search tree.
21. Implement inorder, preorder and postorder traversal methods in binary search tree.
22. Implement searching algorithm in binary search tree.

PO-COMPETENCY-CLO MAPPING:

For CLO-PO mapping:

CLO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CLO1	M	H	M	M	L	H	M	H	M	L	M	M
CLO2	H	M	H	H	H	M	H	L	H	M	H	H
CLO3	M	H	M	H	M	L	M	H	M	H	M	M
CLO4	M	H	H	H	H	M	M	L	H	M	M	H

For CLO-PSO mapping:

CLO	PSO1	PSO2	PSO3	PSO4
CLO1	M	H	M	M
CLO2	H	L	M	H
CLO3	M	L	H	M
CLO4	M	H	H	M

Course: Operating System								
Course Code:			**Semester: III**			**Programme:** Diploma in IT		
Teaching Scheme				**Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Contact Hours**	**CIE Theory**	**CIE Practical**	**ESE Theory**	**ESE Practical**	**Total**
3	0	1	5	24/60	-	16/40	-	40/100

Course Objectives:

- To know the components of an operating system
- To understand the basics of process management and memory management.
- To know the concepts of I/O and file systems
- To provide information about the functions and roles of each of the components of the operating system.

Course Learning Outcomes (CLOs):

By the end of the course, students will be able to:

1. Clarify the basic understanding of the Operating system.
2. Describe the concepts of process and can practice various process Scheduling Algorithms.
3. State and interpret the role of Process Synchronization in increasing throughput of the system and can practice various deadlock concepts for handling deadlock
4. Describe the techniques of memory management.

Course Content

Module I: Introduction to Operating System

What is an Operating System?, Operating system software, Types of Operating System, Process Management , Job Scheduler, Process Scheduler, Job and Process Status, Process Control Block, Process Scheduling Policies, Process Scheduling Algorithms: First Come First Serve, Shortest Job Next, Priority Scheduling, Shortest Remaining Time, Round Robin, Process Synchronization, What is parallel Processing? , Typical Multiprocessing configurations, Process Synchronization Software-test and set, Wait and Signal, Semaphores, Process Cooperation-Producers and consumers

Module II: Deadlock & Device Management

Deadlock, Seven cases for dead lock, Conditions for Deadlock, Strategies for handling Deadlocks, Starvation (Dining Philosophers Problem) Device Management,
Types of System Devices, Component of I/O subsystem, Communication among devices, Management of I/O requests, Device Handler Seek Strategies, FCFS, SSTF, Elevator (Look), RAID

Module III: Memory Management

Memory Management: Early System, Single User Contiguous Scheme, Fixed Partitions, Dynamic Partitions, Allocation and deallocation methods, Relocatable Dynamic Partitions, Memory Management: Virtual Memory, Paged Memory Allocation, Demand Paging, Page Replacement Algorithms -First In First Out, Least Recently Used, Segmented Memory allocation, Segmented/Demand Paged Memory allocation, Virtual Memory.

Module IV: File Management & Security

The File Manager, Interacting with the file manager, Typical Volume Configuration, About Subdirectories, File Organization, Physical storage allocation, Data Compression, Access Control

Verification module, Security- Role of Operating system in security, Security Breaches System Protection

Text Books:

1. Flynn/Mc Hoes, Operating Systems, Cengage Learning, Latest Edition.
2. Stallings William, Operating Systems: Internals and Design Principles, Pearson Higher Education, Latest Edition.

References Books:

1. Silberschatz, Galvin & Gagne, Operating Systems Concepts, Pearson Higher Education

List of suggestive programs:

1. Study of Basic commands of Linux/UNIX.
2. Study of Advance commands and filters of Linux/UNIX.
3. Write a shell script to generate marksheet of a student. Take 3 subjects, calculate and display total marks, percentage and Class obtained by the student.
4. Write a shell script to find factorial of given number n.
5. Write a shell script which will accept a number b and display first n prime numbers as output.
6. Write a shell script which will generate first n fibonnacci numbers like: 1, 1, 2, 3, 5, 13,…
7. Write a menu driven shell script which will print the following menu and execute the given task.
8. MENU
9. Display calendar of current month
10. Display today's date and time
11. Display usernames those are currently logged in the system
12. Display your name at given x, y position
13. Display your terminal number
14. Write a shell script to read n numbers as command arguments and sort them in descending order.
15. Write a shell script to display all executable files, directories and zero sized files from current directory.
16. Write a shell script to check entered string is palindrome or not.
17. Shell programming using filters (including grep, egrep, fgrep)
18. Study of Unix Shell and Environment Variables.
19. Write a shell script to validate the entered date. (eg. Date format is : dd-mm-yyyy).
20. Write an awk program using function, which convert each word in a given text into capital.

Course: Database Management System								
Course Code:			Semester: III			Programme: Diploma in IT		
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
3	0	2	7	24/60	-	16/40	-	40/100

Course Objectives:

- Understand the need for databases, data models, and DBMS architecture over traditional file systems.
- Design relational schemas using E-R modeling and apply normalization for efficient database design.
- Develop SQL skills for data definition, manipulation, and implement transaction management principles.
- Explore data storage techniques, indexing, and gain basic knowledge of NoSQL and its comparison with relational databases.

Course Learning Outcomes (CLOs):

By the end of the course, students will be able to:

1. Explain the need for database systems, data models, and DBMS architecture compared to traditional file systems.
2. Design relational database schemas using E-R modeling and normalization techniques for efficient data organization.
3. Apply SQL for data definition and manipulation, including advanced queries and transaction management concepts.
4. Analyze data storage methods and compare NoSQL and relational databases in terms of structure, performance, and scalability.

Course Content

Module I: Introduction to DBMS

Need for databases, File system vs. DBMS, Advantages of DBMS, DBMS users and architecture, Data models: Hierarchical, Network, Relational

Relational Database Model

Basic concepts: relation, attribute, tuple, domain, Relational schema and keys: primary key, foreign key, candidate key, Integrity constraints: domain, entity, referential

Module II: Entity-Relationship (E-R) Model

Entity types, attributes, relationships, E-R diagrams: symbols and conventions, Mapping E-R diagrams to relational model

Structured Query Language (SQL)

Basic SQL commands: SELECT, INSERT, UPDATE, DELETE, Clauses: WHERE, GROUP BY, ORDER BY, HAVING, Joins: inner, outer, self joins, Subqueries and views, Data definition language (DDL) & data manipulation language (DML)

Module III: Normalization
Need for normalization, Functional dependency, 1NF, 2NF, 3NF, BCNF
Transaction Management
Transactions and ACID properties, Concurrency control, Locking mechanisms, Deadlock and recovery techniques

Module IV: Database Storage and File Structure
File organization, Indexing (single-level, multi-level), Hashing techniques
Introduction to NoSQL (Optional/Advanced)
Key-value stores, Document-based databases, Use cases and comparison with RDBMS

Text Books:

1. **"Database System Concepts"** by Korth, Silberschatz & Sudarshan
2. **"Fundamentals of Database Systems"** by Elmasri & Navathe

References Books:

1. **"SQL For Dummies"** by Allen G. Taylor
2. Online: W3Schools SQL, MySQL Docs

List of suggestive programs:

Program 1: Write a comparison report (or simple CLI tool) showing differences between File System and DBMS through examples.
Program 2: Create a basic DBMS user role chart showing different user types (admin, end-user,
Program 3: Create a table structure in MySQL/PostgreSQL for a Student Management System including primary, foreign, and candidate keys.
Program 4: Write a program/script to enforce domain and referential integrity using SQL CHECK,
Program 5: Draw an E-R diagram for a Library Management System using any diagram tool (draw.io, Lucidchart) or manually.
Program 6: Convert your E-R diagram to SQL table creation scripts (map entities to tables and relationships to foreign keys).
Program 7: Create a database for a Hospital Management System and perform:

- INSERT, UPDATE, DELETE, and SELECT operations.
- Apply WHERE, ORDER BY, and GROUP BY clauses.

Program 8: Write queries using:

- JOINs (inner, outer, self joins)
- SUBQUERIES
- VIEWS
- DDL: CREATE, ALTER, DROP
- DML: INSERT, UPDATE, DELETE

Program 9: Given a raw unnormalized table, apply:

- 1NF (remove repeating groups)
- 2NF (remove partial dependencies)
- 3NF / BCNF (remove transitive dependencies)

Implement using SQL table transformations.

Program 10: Write a SQL program to simulate two transactions:

- Use START TRANSACTION, COMMIT, ROLLBACK
- Demonstrate ACID properties and consistency

Program 11: Simulate concurrency issues like lost updates or dirty reads using multiple client connections (with InnoDB engine).

Program 12: Write a program/script to:

- Analyze how MySQL stores tables using SHOW TABLE STATUS;
- Demonstrate single-level vs. multi-level indexing (conceptually or using sample indexes)

Program 13: Simulate hashing using a programming language (e.g., Python or Java) to show how keys map to data blocks.

Program 14: Using MongoDB or any NoSQL tool:

- Create a key-value store for a product inventory
- Insert and retrieve documents

Program 15: Compare MongoDB collections to SQL tables by implementing the same data structure in both and observing differences.

PO-COMPETENCY-CLO MAPPING:

For CLO-PO mapping:

CLOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CLO1	M	H	M	M	L	H	M	H	M	L	M	M
CLO2	H	M	H	H	H	M	H	L	H	M	H	H
CLO3	M	H	M	H	M	L	M	H	M	H	M	M
CLO4	M	H	H	H	H	M	M	L	H	M	M	H

For CLO-PSO mapping:

CLO	PSO1	PSO2	PSO3	PSO4
CLO1	M	H	M	M
CLO2	H	L	M	H
CLO3	M	L	H	M
CLO4	M	H	H	M

Course: Software Engineering								
Course Code:			**Semester: III**			**Programme:** Diploma in IT		
Teaching Scheme				**Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Contact Hours**	**CIE Theory**	**CIE Practical**	**ESE Theory**	**ESE Practical**	**Total**
3	0	1	5	24/60	-	16/40	-	40/100

Course Objectives:

- Understand the fundamental concepts, needs, and characteristics of software and software engineering.
- Learn various software development life cycle (SDLC) models and software process frameworks.
- Gain knowledge about requirements gathering, analysis, design principles, and software project management.
- Understand software testing methods, quality assurance, and software maintenance concepts.

Course Learning Outcomes (CLOs):

By the end of the course, students will be able to:

1. Describe software engineering fundamentals and software development life cycle models.
2. Explain the process of requirement gathering, requirement specification, and software design principles.
3. Understand software project estimation, scheduling, risk management, and the role of a project manager.
4. Discuss software testing types, code reviews, documentation, and software maintenance concepts.

Course Content

Module I: Introduction to Software Engineering

Software: Definition and Characteristics, Software Engineering: Definition, Need, and Layered, Technology Approach, Generic Framework Activities and Umbrella Activities, Overview of Software Development Process

Module II: Software Development Models

Waterfall Model, Incremental Model, Rapid Application Development (RAD) Model, Prototyping Model, Spiral Model, Brief Introduction to Agile Model (conceptual overview only)

Module III: Requirement Engineering and Design Process

Requirement Gathering and Analysis, Software Requirement Specification (SRS) : Characteristics, Customer Requirements, Functional Requirements, Design Process : Classification of Design Activities and Methodologies, Concepts of Cohesion and Coupling, Data Modeling Concepts : Data Objects, Data Attributes, Relationships, Cardinality, and Modality, Data Flow Diagrams (DFD): Primitive Symbols, Developing DFD Models, Limitations of DFD, Scenario-Based Modeling : Writing Use-Cases, Developing Activity Diagrams, Architectural Design Decisions : Architectural Views and Patterns, Application Architectures

Module IV: Software Project Management

Responsibilities of Software Project Manager : Job Responsibilities and Required Skills Software Size

Metrics : Lines of Code (LOC) and Function Points (FP) Project Estimation Techniques : Empirical, Heuristic (Expert Judgment), and Analytical Techniques
Project Scheduling : Work Breakdown Structure (WBS), Activity Network, Critical Path Method (CPM), Gantt Chart, Project Monitoring and Control Risk Management : Risk Identification, Assessment, and Containment

Module V: Software Implementation and Testing
Code Review Techniques : Code Walkthrough and Code Inspection (Conceptual)
Software Documentation : Internal and External Documentation
Software Testing : Unit Testing, Black Box Testing, White Box Testing, Test Case Preparation and Test Documentation (Theory only)

Text Books:

1. Software Engineering: A Practitioner's Approach, Roger S. Pressman & Bruce R. Maxim, McGraw Hill

References Books:

1. Fundamentals of Software Engineering, Rajib Mall, PHI
2. Software Engineering, Ian Sommerville, Pearson
3. Software Engineering Principles and Practice, Deepak Jain, Khanna Publishing

PO-COMPETENCY-CLO MAPPING:

For CLO-PO mapping:

CLO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CLO1	H	M	M	L	L	M	L	M	L	L	L	M
CLO2	H	H	H	M	L	M	M	M	L	M	M	M
CLO3	H	H	H	M	M	M	H	M	M	M	M	M
CLO4	H	M	H	M	H	M	M	L	M	M	M	M

For CLO-PSO mapping:

CLO	PSO1	PSO2	PSO3	PSO4
CLO1	H	M	L	M
CLO2	H	H	M	M
CLO3	H	H	M	M
CLO4	M	H	M	L

Course: Engineering Chemistry								
Course Code: Insert here			Credit:4	Semester: III			Programme: Diploma IT	
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
3	0	1	5	24 / 60	-	16/ 40	-	40 / 100

Course Objectives:

- The course enables students to understand atomic structure, chemical bonding, solutions, electrochemistry, corrosion, and fuels, and to apply these concepts to solve engineering problems and select appropriate materials and energy sources.

Course Outcomes (COs):

On successful completion of this course, students will be able to

1. Apply the principles of atomic structure, chemical bonding, and solutions to solve engineering-related problems.
2. Solve engineering problems using the fundamental concepts of electrochemistry.
3. Apply the concepts of corrosion to identify and propose solutions to engineering problems.
4. Select and use appropriate fuels and lubricants for domestic and industrial applications.

Course Content:

Module	Topics	Weightage (%)
1	**Atomic Structure, Chemical Bonding and Solutions** **Atomic Structure:** Concepts of orbits and orbitals, Pauli's exclusion principle, Hund's rule of maximum spin multiplicity, Aufbau rule, Electronic configuration of elements having atomic number 1 to 30. **Chemical Bonding:** Concept of chemical bond, Octet rule, Types of chemical bonds: Ionic(Electrovalent) bond and its characteristics (Example NaCl.),Covalent bond and its characteristics(examples–Non-polar covalent bond: H_2, O_2, N_2, CH_4; Polar covalent bond: HCl, H_2O, And NH_3.), Coordinate covalent (Dative) bond (examples – NH_4^+, H_3O^+), Metallic bond and its characteristics, Hydrogen bond, its types and significance, Intermolecular force of attraction (van der Waals bond), Structures of solids: Ionic solids, Molecular solids, Network solids, and Metallic solids. **Solutions:** Definitions of solute, solvent, solution and concentration, Modes of expressing concentration of solutions –Molarity (M = mole/litre), Normality (N), Molality (m), mass percentage (%w/w), volume percentage (%v/v), mass by volume percentage (%w/v), mole fraction (χ), ppm (μg/mL).	30
2	**Electrochemistry** Arrhenius theory of ionization, Electronic concept of oxidation, reduction, and redox reactions, Degree of ionization () and the factors affecting on it, Concept of pH and pOH; pH scale for acids, bases and neutral solutions, Calculations of pH and pOH for dilute solutions of acids and bases, Importance of pH in various fields, Buffer solutions, Types of buffer	25

	solutions: Acidic buffers and Basic buffers, Applications of buffer solutions, Definition of Electrolytes, Non-electrolytes with suitable examples, Types of Electrolytes with examples, Construction, working, cell-reactions and symbolic representation of an Electrochemical cell, Conditions for a half-cell to be standard, Construction and working of Standard Hydrogen Electrode (SHE), Measurement of Standard half-cell potential / Standard electrode potential (E°R or EoL), Electrochemical/electromotive force (emf) series, Standard cell potential (E°cell), Construction of Electrolytic cell and Electrolysis, Faraday's Laws of Electrolysis.	
3	**Corrosion of metals and its prevention** Definition of Corrosion with example, Dry or Chemical corrosion: Oxidation corrosion, Corrosion by other gases, Wet or electrochemical corrosion: Liberation of H_2, Absorption of O_2,Galvanic (Bimetallic) corrosion, Concentration cell corrosion, Pitting corrosion, Waterline corrosion and Crevice corrosion, Factors affecting the rate of corrosion: Nature of the metal, Nature of surface film, Relative areas of the anodic and catholic parts, Purity of metal, Temperature, Humidity of air, Influence of ph, Preventive measures for internal corrosion and External corrosion: Modification of environment, Modification of the properties of metal, Use of protective coatings, Anodic and catholic protection, Modification in design and choice of material.	25
4	**Fuels and Combustion** Definition and Classification of Fuels, Calorific values and their Units, Determination of Calorific value using a Bomb Calorimeter, Characteristics of a good fuel, Comparison between solid, liquid, and gaseous fuels, Theoretical calculation of HCV and LCV of fuel using Dulong's formula, Solid fuels: Coal, Classification of coal, Proximate and ultimate analysis of coal. Liquid fuels: Petroleum, Origin of petroleum and classification of petroleum, Refining of petroleum, Petrol and Diesel-fuel rating (Octane and Cetane numbers), Power alcohol and Bio-diesel, Chemical composition, Calorific values and Applications of LPG, CNG, and Biogas.	20

Text Book(s):

1. Shikha Agarwal, Engineering Chemistry, Cambridge Uni. Press, New Delhi, 2019, ISBN: 978-1-108-72444-9

Reference Books:

1. Rajesh Agnihotri, Chemistry for Engineers, Wiley India Pvt. Ltd., 2014, ISBN: 9788126550784
2. Dr S. S. Dara & Dr S. S. Umare, A Textbook of Engineering Chemistry, S. Chand & Co. (P) Ltd., New Delhi, 2014, ISBN: 81-219-0359-9
3. Jain & Jain, Engineering Chemistry, Dhanpat Rai Publishing Co. (P) Ltd., New Delhi, 2015 ISBN: 93-521-6000-2

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Attendance

Mapping with Programme Outcomes (POs):

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	–	1	2	2
CO2	3	3	2	–	–	2	2
CO3	3	3	3	2	2	2	2
CO4	3	2	2	–	3	2	3
CO5	3	2	2	2	2	2	2

SHREYARTH UNIVERSITY

School of Engineering

Diploma Semester II

Syllabus

Program Outcomes (POs) – Diploma

After completing the Diploma program, a graduate will be able to:

1. Basic Knowledge:Apply knowledge of basic mathematics, science, and engineering fundamentals to Solve well-defined engineering problems.
2. Discipline Knowledge: Apply discipline-specific knowledge to solve core IT and computing problems.
3. Experiments and Practice: Plan and perform experiments, interpret and analyse data, and report results to support IT-related decisions.
4. Engineering Tools Usage: Apply appropriate information technology tools and techniques, including software and hardware, to identify and solve technical problems.
5. The Engineer and Society: Demonstrate awareness of societal, health, safety, legal, and cultural issues relevant to IT practices.
6. Environment and Sustainability: Understand the impact of IT solutions in societal and environmental contexts and demonstrate sustainable practices.
7. Ethics: Apply ethical principles and commit to professional responsibilities and norms of IT practice.
8. Individual and Team Work: Function effectively as an individual and as a member or leader in diverse technical teams.
9. Communication: Communicate effectively in oral and written forms with engineering communities and society at large.
10. Life-long Learning: Recognize the need for and engage in independent and life-long learning in the context of technological advancements.
11. Project Management and Finance: Apply knowledge of engineering and management principles to manage projects and understand financial aspects related to IT work.

Teaching Scheme

Sr. No	Course Code	Course Name	Curricular Components	Lecture	Tutorial	Practical	Credit
1		Mathematics – II	Basic Science	3	1	0	4
2		Basic Electrical and Electronic Engineering	Engineering Science	3	0	1	4
3		Professional Development	Humanities	2	0	0	2
4		Web Technologies	PCC	2	0	2	4
5		Object Oriented Programming	PCC	3	0	2	5
6		Chemistry	Basic Science	3	0	0	3
Total				16	1	5	22

Course: Engineering Mathematics								
Course Code: Insert here			Credit:4	Semester: II			Programme: Diploma IT	
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
4	0	0	4	24 / 60	-	16 / 40	-	40 / 100

Course Objectives:

- To apply concepts of Matrices to analyze and solve engineering-related problems effectively.
- To utilize differentiation techniques to model, analyse, and solve real-world engineering applications.
- To apply integration methods to evaluate and solve engineering-related problems with practical significance.
- To develop proficiency in solving differential equations to address applied problems.

Course Outcomes (COs):

On successful completion of this course, students will be able to

1. Demonstrate the ability to Crack engineering related problems based on Matrices.
2. Demonstrate the ability to solve engineering related problems based on applications of differentiation.
3. Apply integration methods to solve engineering related problems based on applications of integration.
4. Develop the ability to apply differential equations to significant applied problems.

Course Content:

Module	Topics	Weightage (%)
1	**Matrices** Concept of Matrix, Types of Matrices, Addition, Subtraction and multiplication by scalar of matrices, Product of two matrices, Adjoint and Inverse of a matrix of order 2X2 and 3X3, Solution of Simultaneous linear equations of two variables.	30

2	**Differentiation and its Applications** Concept and Definition of Differentiation, Working rules: Sum, Product, Division, Chain Rule, Derivative of Implicit functions, Derivative of Parametric functions, Logarithmic Differentiation, Successive Differentiation up to second order Applications: Velocity, Acceleration, Maxima & Minima of given simple functions.	25
3	**Integration and its Applications** Concept and Definition of Integration, Working rules and Integral of standard functions, Method of substitution, Integration by parts, Definite Integral and its properties Applications: Area and volume. (Simple problems)	25
4	**Differential Equations** Concept and Definition, Order and Degree of differential equation, Solution of DE of first degree and first order by Variable Separable method, Solution of linear Differential equation.	20

Text Book:

1. Croft, Anthony, Engineering Mathematics (Third edition), Pearson Education, New Delhi, 2014, ISBN 978-81-317-2605-1.

Reference Book(s):

1. John Bird, Understanding Engineering Mathematics, Routledge; 1st edition, ISBN 978-0415662840.
2. Krezig, Ervin, Advanced Engineering Mathematics, Wiley Publ., NewDelhi, 2014, ISBN: 978-0-470-45836-5

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Attendance

Mapping with Programme Outcomes (POs):

COs / Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	1	–	–	1	2	2	–
CO2	3	3	3	3	2	1	–	1	2	2	–
CO3	3	3	3	3	2	1	–	1	2	3	–
CO4	3	3	3	3	2	1	–	1	2	3	1

Course: Basic Electrical & Electronics Engineering								
Course Code: Insert here			Credit:4	Semester: I			Programme: DE-CSE	
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
3	0	2	5	24/60		16/40		40/100

Course Objectives:

The practical exercises, the underpinning knowledge and the relevant soft skills associated with this competency are to be developed in the student to display the following COs:

- Differentiate active and passive components and test them.
- Identify various types of diodes and their applications.
- Apply transistors in electronics circuits.
- Demonstrate various electronic hardware components like PCB, ICs, cables and connectors.

Course Learning Outcomes (CLOs)

Environmental Studies CLOs include

1. Basic Electrical & Electronics Engineering equips students with a comprehensive understanding of electrical principles.
2. By course end, students can analyze and design basic electrical circuits, comprehend electronic components, and troubleshoot common issues.
3. They'll develop practical skills in using tools and instruments, applying fundamental laws, and interpreting circuit diagrams.
4. Additionally, the course fosters an understanding of electromagnetic principles, transformers, and DC/AC machines. Students will gain proficiency in using simulation tools for circuit analysis and demonstrate ethical and safety considerations in electrical work.
5. This foundation sets the stage for advanced studies and application of electrical and electronics concepts in diverse engineering disciplines.

Course Content:

Module	Topics	Weightage (%)
1	**Basic of Electrical Engineering**: Explain Electric current and voltage, Explain Electrical circuits and elements: Resistor, inductor, and capacitor, Calculate Voltage and current using Kirchoffs' laws, Differentiate active and passive components, Differentiate between various types of signals and signal parameters, Kirchoffs' current and voltage law, Active components(Voltage source and current source), Passive components(Resistor, inductor, capacitor	25
2	**Diode theory and Rectifiers:** Explain atomic structure and conductivity, Explain diode theory, Distinguish various diodes, Designing various rectifier circuits, Justify the application of Diode, Doping, Intrinsic semiconductor, extrinsic semiconductor, P-type and N-type semiconductor, majority charge carrier, minority charge carrier, P-N junction, Depletion layer, knee voltage, forward bias, reverse bias, Types of Rectifiers: Half Wave, Full Wave Rectifier (bridge and center tapped): circuit operation I/O waveforms for voltage and current	25
3	**Transistors:** Distinguish the specification of the given type of transistors, Differentiate the performance of the specified transistor with sketches, Interpret with sketches the performance of the CE Configuration, Justify the application of the transistor circuit, Transistor configurations (CE): circuit diagram, input and output characteristics. Different points of characteristics (Cut- off, Active and Saturation), input resistance, output resistance, current gain.	25
4	**Electronic Hardware:** Identify ICs, Explain PCB types and manufacturing, Introduce Electronic components manufacturing Hierarchy, Explain logic families, Identify different types of Cables and connectors **Handling Electronic Waste:** Justify the need to understand electronic waste, Establish the relationship between sustainability and electronic waste, and Suggest methods of handling electronic waste with examples, Suggest methods to dispose of electronic waste	25

Practical List:

Note: Ask students to maintain a journal for practical hands-on (if required)

List of suggestive programs.

1. Study of various analog electronics Terminology and symbols
2. To Study and Verify Ohm's Law

3. Calculate the resultant resistor value for series and parallel connection of resistors.

4. Test VI characteristic of PN junction diode.

5. Study the Zener voltage regulator for the Given voltage.

6. Build/test half-wave rectifier.

7. Build/test a full wave rectifier using two diodes.

8. Build/test a full wave bridge rectifier using Four diodes.

9. Test I/O Characteristics for CE Configuration

10. Identify and study different types of cables.

11. Identify and study different types of connectors.

12. Demonstrate various methods of handling Electronic waste.

Text Book(s):

1. Principles of Electronics, V. K. Mehta, S. Chand
2. Electronic Principles, A .P. Malvino, TMH Edition

Reference Book(s):

1. Electronic Devices and Circuit:An Introduction, Mottershead, Allen, Goodyear Publishing Co. ,New Delhi
2. Basic Electronic Engineering, Baru, V.; Kaduskar, R. Gaikwad S.T., Dreamtech Press, New Delhi
3. Fundamentals of Electronic Devices and Circuits, Bell, David, Oxford University Press New Delhi.

Mapping with Programme Outcomes (POs)

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	2	2	2	1	1	1	1	–
CO2	3	3	2	2	1	1	1	1	2	1	–
CO3	3	3	3	3	2	2	1	2	2	1	1
CO4	2	3	3	2	2	3	2	2	3	2	2

Course: Professional Development								
Course Code: -			Credit:2	Semester: II		Programme: Diploma CS/IT		
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
2	0	0	2	24/60		16/40		40/100

Course Objectives:

- Demonstrate self-awareness and apply emotional intelligence techniques such as stress management, empathy, and resilience in both professional and personal contexts..
- Apply leadership principles and collaborate effectively in teams through group projects, negotiation exercises, and workplace simulations.
- Evaluate workplace situations and practice professional ethics, integrity, and etiquette, including responsible digital behaviour.
- Design and create career development tools such as resumes, cover letters, and portfolios, and perform effectively in interviews and recruitment activities.
- Integrate time management strategies and productivity frameworks to plan, prioritize, and execute academic and workplace responsibilities.

Course Outcomes (COs):

1. Demonstrate self-awareness and apply emotional intelligence techniques (stress management, empathy, and resilience) in professional and personal contexts.
2. Apply leadership principles and collaborate effectively in teams through group projects, negotiation exercises, and workplace simulations..
3. Evaluate workplace situations and practice professional ethics, integrity, and etiquette including digital responsibility
4. Design and create career development tools (resumes, cover letters, portfolios) and perform effectively in interviews and recruitment activities.
5. Integrate time management strategies and productivity frameworks to plan, prioritize, and execute academic and workplace responsibilities.

Course Content:

Module	Topics	Weightage (%)
1	**Emotional Intelligence & Self-Management** • Understanding EQ and workplace relevance • Self-awareness & self-regulation techniques • Empathy & relationship management • Stress management & resilience building	20

2	**Leadership, Teamwork & Problem-Solving** • Control Statements, Fundamentals of leadership styles • Leading and motivating diverse teams • Critical thinking frameworks (5 Whys, Fishbone, SWOT) • Collaborative problem-solving exercises • Basics of negotiation & conflict resolution	30
3	**Professional Ethics & Workplace Etiquette** • Ethics & integrity in workplace decision-making • Codes of conduct in professional environments • Social image, body language & professional etiquette • Responsible digital behaviour (netiquette & data security basics)	20
4	**Career Development & Digital Competencies** • Resume and portfolio development • Interview preparation and mock interviews • Time management and productivity tools • Digital literacy for workplace: MS Office, Google Workspace, basic data handling • Introduction to data-informed decision making (simple analytics)	30

Text Book(s):

1. "Emotional Intelligence at Work" – by HR professional or psychologist.
2. "Leadership in Action: Stories from Industry" – guest speaker from corporate/social leadership.
3. "Ethics in the Digital Age" – interactive talk on workplace integrity and digital footprint.
4. "Career Paths beyond Graduation" – alumni or industry practitioner sharing opportunities and skill demands.
5. "Digital Tools for Smarter Work" – workshop on productivity apps & analytics basics.

Reference Book(s):

1. "Emotional Intelligence at Work" – by HR professional or psychologist.
2. "Leadership in Action: Stories from Industry" – guest speaker from corporate/social leadership.
3. "Ethics in the Digital Age" – interactive talk on workplace integrity and digital footprint.
4. "Career Paths beyond Graduation" – alumni or industry practitioner sharing opportunities and skill demands.

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Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Viva
6. Project (if applicable)
7. Presentation
8. Attendance

Mapping with Programme Outcomes (POs):

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	2	2	1	2	2	3	3	2
CO2	2	3	2	2	2	1	2	3	3	3	2
CO3	2	3	3	2	3	1	3	2	3	3	2
CO4	2	3	3	3	2	2	2	2	3	3	2
CO5	2	3	3	3	2	2	2	2	3	3	2

Course: Web Technologies								
Course Code: Insert here			Credit:4	Semester: II			Programme: Diploma IT	
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
2	0	2	6	24/60		16/40		40/100

Course Objectives:

- Understand and create the basic structure of HTML5 documents using essential tags and elements, including text formatting, lists, and metadata.
- Design and manage tables, frames, hyperlinks, and multimedia elements to build rich and interactive web pages.
- Develop and style HTML forms using new and traditional form elements to enable user interaction and data collection.
- Customize webpage appearance and improve usability by applying background styles, formatting text, and implementing accessible navigation and multimedia features.

Course Outcomes (COs):

On successful completion of this course, students will be able to

1. Create and manage hyperlinks, including linking webpages, sections, and images, to enhance webpage navigation.
2. Insert, format, and optimize images by using alignment, borders, alternate text, and image maps for better visual presentation.
3. Embed multimedia elements such as audio, video, and objects, and ensure compatibility across different browsers.
4. Design and implement interactive HTML forms using input controls, text areas, selection elements, and new HTML5 form features.

Course Content:

Module	Topics	Weightage (%)
1	**Introduction to HTML & Basic Document Structure** New Structure, New Form Elements and Attributes, Browser Support, Defining HTML Mark-up, Basic structure of HTML Document, the <! DOCTYPE html> Element, the <HTML> Element, The <head> Element, The <title> Element, the <Body> Element, modifying the background of an HTML webpage, adding Background color, Adding Background Image, Specifying Metadata About an HTML webpage, Introduction to HTML 5.	25
2	**Text, and List Tags** Adding a plain text to an HTML webpage, Adding text in new line, Creating Headings on webpage, Creating a paragraph, Creating a Horizontal Rule, Creating a Subscript and Superscript, Aligning the Text, Formatting the Text, Grouping the Text, Indenting Quotations, Working with character entities, Commenting the Text, Working with Lists, Creating an Unordered List, Creating an Ordered List, Creating an Definition List, Nested Lists.	25
3	**Tables and Frames Tags** Adding a plain text to an HTML webpage, Adding text in new line, Creating Headings on webpage, Creating a paragraph, Creating a Horizontal Rule, Creating a Subscript and Superscript, Aligning the Text, Formatting the Text, Grouping the Text, Indenting Quotations, Working with character entities, Commenting the Text, Working with Lists, Creating an Unordered List, Creating an Ordered List, Creating an Definition List, Nested Lists.	25
4	**Hyperlinks, Images, Multimedia, Forms & Controls** Working with Hyperlinks, Creating Hyperlinks Setting hyperlink color, Linking Different sections of page, Working with Images Inserting an Image on webpage, Display alternate text for an Image, Adding Border to an Image & Align an Image, Using Image as a Links, Creating Image Maps, Working with Multimedia, Embedding multimedia on webpage, Handling Browser that do not support embedding, Creating a link to a multimedia file Using <object> tag insert objects, Creating an HTML Form, Specifying the Action URL and The method to send form, Adding Controls to an HTML Form, Using the<input> tag, Adding Text Area <textarea> ,Adding Selection Control, Understanding new form elements, The <datalist> element, The <keygen>Element, Grouping the controls of HTML. Form Specifying Label for a control.	25

Practical List:

Note: Ask students to maintain a journal for practical hands-on (if required)

1. Create and save simple HTML documents & Modifying the background of HTML Webpage with different colors.
2. Demonstrate use of subscript, super script, align tag and Format the text by using formatting tags like bold and italic.
3. Write a code for the given format

<table>
<tr><td>A</td><td>B</td><td>C</td><td>D</td></tr>
<tr><td></td><td rowspan="4">L</td><td>G</td><td rowspan="2"></td></tr>
<tr><td>J</td><td>H</td><td>E</td></tr>
<tr><td>K</td><td>I</td><td>F</td></tr>
<tr><td>i</td><td>j</td><td>k</td><td>J</td></tr>
<tr><td>L</td><td rowspan="2">n</td><td>I</td><td rowspan="2">Q</td></tr>
<tr><td>m</td><td>H</td></tr>
</table>

4. Create a web page using metadata & <! DOCTYPE html> tag.
5. Create a Web page to display your resume.
6. Show the use of all tags and attributes of ordered list and unordered list.
7. Create a web pagewhich shows the use of hyperlink.
8. Show the use of all tags related to images.
9. Create a webpage for online Jewellery shopping. Display Menu in left frame. Clicking on the menu should display the related webpage in the right frame. Keep header and footer frames to display related information.
10. Create a login page.
11. Create a web page for registering for the online exam form filling process.
12. Create the student Grade History.

Text Book(s):

1. Jon Duckett, ***HTML & CSS: Design and Build Websites***, Wiley, 1st Edition, 2011. **ISBN:** 978-1118008188
2. Elisabeth Robson & Eric Freeman, ***Head First HTML and CSS***, O'Reilly Media, 2nd Edition, 2012. **ISBN:** 978-1449324452

Reference Book(s):

1. Ivan Bayross "Web Enabled commercial application development using HTML, JavaScript, DHTML and Php", Publisher-BPB Publication.
2. Thomas A Powell "The Complete Reference HTML and CSS (Fifth Edition)", Publisher McGraw Hill Education.

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Viva
6. Project (if applicable)
7. Presentation
8. Attendance

Mapping with Programme Outcomes (POs):

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	2	2	1	2	2	3	3	2
CO2	2	3	2	2	2	1	2	3	3	3	2
CO3	2	3	3	2	3	1	3	2	3	3	2
CO4	2	3	3	3	2	2	2	2	3	3	2

Course: Object Oriented Programming								
Course Code: -			Credit:3	Semester: II		Programme: Diploma CS/IT		
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
3	0	2	5	24/60		16/40		40/100

Course Objectives:

- To introduce the fundamental concepts, principles, and structure of Object-Oriented Programming and highlight its advantages over procedural programming.
- To develop the ability to design and implement modular programs using C++ constructs such as functions, classes, objects, constructors, and destructors.
- To enable students to apply Object-Oriented Programming features like inheritance and polymorphism for code reusability and runtime flexibility.
- To familiarize students with operator overloading, type conversion, and the use of pointers in object-oriented environments.
- To provide hands-on experience in handling files and performing input/output operations using C++ stream classes and file management functions.
- To cultivate problem-solving skills and software development practices through implementation of real-world examples using C++ programming.

Course Outcomes (COs):

1. Explain the fundamental concepts, structure, and principles of Object-Oriented Programming.
2. Apply C++ constructs such as functions, classes, objects, and constructors to develop programs
3. Implement inheritance and polymorphism using appropriate OOP concepts in C++.
4. Demonstrate file handling and stream-based I/O operations using C++ standard libraries.

Course Content:

Module	Topics	Weightage (%)
1	**Introduction and Concepts of OOP** Introduction OOP, Procedural Vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP. Overview, Program, structure, Namespace, Identifiers, Variables, Constants, Enum, Operators, Typecasting, Control structures.	20

2	**Functions, Objects and Classes** Simple functions, Call and Return by reference, Inline functions, Macro Vs . Inline functions, Overloading of functions, Default arguments, Friend functions, Virtual functions. Basics of object and class in C++, Private and public members, Static data and function members, Constructors and their types, Destructors Operator overloading, Type conversion.	30
3	**Object Oriented Concepts** Inheritance: Concept of Inheritance, Types of inheritance: single, multiple, multilevel, hierarchical, hybrid, Protected members, overriding, Virtual base class. Polymorphism: Pointers in C++, Pointers and Objects, This pointer, Virtual and pure, Virtual functions, Implementing polymorphism	30
4	**I/O and File Management** Concept of streams, Cin and Cout objects, C++ stream classes, Unformatted and formatted I/O, Manipulators, Filestream, C++ File, Stream classes, File management functions, File modes, Binary and random Files	20

Practical List:

Note: Ask students to maintain a journal for practical hands-on (if required)

1. Write a C++ program to demonstrate basic structure and syntax (namespace, main, cout, cin).
2. Program to use variables, constants, enumerations, and typecasting.
3. Write a program using different types of operators (arithmetic, logical, relational, assignment).
4. Implement various control structures: if-else, switch, for, while, do-while loops.
5. Write a program using simple functions and function overloading.
6. Program using call by value, call by reference, and return by reference.
7. Demonstrate use of inline functions and compare with macros.
8. Use default arguments in a function.
9. Write a program using friend functions.
10. Write a program demonstrating use of virtual functions.
11. Create a class with private and public members, and access them using objects.
12. Write a program to demonstrate static data members and static member functions.
13. Implement constructors and destructors (default, parameterized, and copy constructors).
14. Program to demonstrate operator overloading (unary and binary).
15. Write a program for single inheritance with protected and public access.
16. Implement multiple inheritance and resolve ambiguity using scope resolution.

17. Write a program to demonstrate multilevel and hierarchical inheritance.
18. Program using hybrid inheritance and virtual base class.
19. Demonstrate runtime polymorphism using virtual functions and base class pointers.
20. Use this pointer in a class to refer to current object.
21. Demonstrate use of cin, cout, and manipulators (setw, setprecision, etc.).
22. Write a program using unformatted and formatted I/O operations.
23. Create and write data to a file, then read the file contents.
24. Program for file operations on binary files (read/write using objects).

Text Book(s):

1. Bjarne Stroustrup– "The C++ Programming Language"- Addison-Wesley Professional
2. Robert Lafore– "Object-Oriented Programming in C++"- Pearson

Reference Book(s):

1. Scott Meyers– "Effective Modern C++ "- O'Reilly Media
2. Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides– "Design Patterns: Elements of Reusable Object Oriented Software"- Addison-Wesley Professional
3. Stanley B. Lippman, Josée Lajoie, and Barbara E. Moo–" C++ Primer"- Addison-Wesley Professional

Open Source – learning websites:

1. https://github.com
2. https://mnd.com
3. https://freecodecamp.com

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Viva
6. Project (if applicable)
7. Presentation
8. Attendance

Mapping with Programme Outcomes (POs):

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	2	1	–	1	1	2	–	–
CO2	2	3	2	3	1	–	1	1	2	2	–
CO3	2	3	3	3	2	1	–	1	2	2	–
CO4	2	3	3	3	2	1	–	1	2	3	1

Course: Engineering Chemistry								
Course Code: Insert here			Credit:4	Semester: II		Programme: Diploma IT		
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
4	0	0	4	24 / 60	-	16/ 40	-	40 / 100

Course Objectives:

- To provide fundamental knowledge of atomic structure, chemical bonding, and solution chemistry, enabling students to apply these concepts in solving basic engineering problems.
- To develop an understanding of electrochemical principles, including ionization, pH, buffer solutions, electrochemical cells, and electrolysis, with applications in engineering systems.
- To explain the mechanisms, types, influencing factors, and prevention methods of corrosion, preparing students to propose suitable strategies for corrosion control in engineering practice.
- To impart knowledge of different types of fuels, their properties, calorific values, and analysis methods, enabling students to evaluate and select suitable fuels for industrial and domestic applications.

Course Outcomes (COs):

On successful completion of this course, students will be able to

1. Apply the principles of atomic structure, chemical bonding, and solutions to solve engineering-related problems.
2. Solve engineering problems using the fundamental concepts of electrochemistry.
3. Apply the concepts of corrosion to identify and propose solutions to engineering problems.
4. Select and use appropriate fuels and lubricants for domestic and industrial applications.

Course Content:

Module	Topics	Weightage (%)
1	**Atomic Structure, Chemical Bonding and Solutions** **Atomic Structure:** Concepts of orbits and orbitals, Pauli's exclusion principle, Hund's rule of maximum spin multiplicity, Aufbau rule, Electronic configuration of elements having atomic number 1 to 30. **Chemical Bonding:** Concept of chemical bond, Octet rule, Types of chemical bonds: Ionic(Electrovalent) bond and its characteristics (Example NaCl.),Covalent bond and its characteristics(examples–Non-polar covalent bond: H_2, O_2, N_2, CH_4; Polar covalent bond: HCl, H_2O, And NH_3.), Coordinate covalent (Dative) bond (examples – NH_4^+, H_3O^+), Metallic bond and its characteristics, Hydrogen bond, its types and significance, Intermolecular force of attraction (van der Waals bond), Structures of solids: Ionic solids, Molecular solids, Network solids, and Metallic solids. **Solutions:** Definitions of solute, solvent, solution and concentration, Modes of expressing concentration of solutions –Molarity (M = mole/litre), Normality (N), Molality (m), mass percentage (%w/w), volume percentage (%v/v), mass by volume percentage (%w/v), mole fraction (χ), ppm (µg/mL).	30
2	**Electrochemistry** Arrhenius theory of ionization, Electronic concept of oxidation, reduction, and redox reactions, Degree of ionization () and the factors affecting on it, Concept of pH and pOH; pH scale for acids, bases and neutral solutions, Calculations of pH and pOH for dilute solutions of acids and bases, Importance of pH in various fields, Buffer solutions, Types of buffer solutions: Acidic buffers and Basic buffers, Applications of buffer solutions, Definition of Electrolytes, Non-electrolytes with suitable examples, Types of Electrolytes with examples, Construction, working, cell-reactions and symbolic representation of an Electrochemical cell, Conditions for a half-cell to be standard, Construction and working of Standard Hydrogen Electrode (SHE), Measurement of Standard half-cell potential / Standard electrode potential (E°R or EoL), Electrochemical/electromotive force (emf) series, Standard cell potential (E°cell), Construction of Electrolytic cell and Electrolysis, Faraday's Laws of Electrolysis.	25
3	**Corrosion of metals and its prevention** Definition of Corrosion with example, Dry or Chemical corrosion: Oxidation corrosion, Corrosion by other gases, Wet or electrochemical corrosion: Liberation of H_2, Absorption of O_2,	25

	Galvanic (Bimetallic) corrosion, Concentration cell corrosion, Pitting corrosion, Waterline corrosion and Crevice corrosion, Factors affecting the rate of corrosion: Nature of the metal, Nature of surface film, Relative areas of the anodic and catholic parts, Purity of metal, Temperature, Humidity of air, Influence of ph, Preventive measures for internal corrosion and External corrosion: Modification of environment, Modification of the properties of metal, Use of protective coatings, Anodic and catholic protection, Modification in design and choice of material.	
4	**Fuels and Combustion** Definition and Classification of Fuels, Calorific values and their Units, Determination of Calorific value using a Bomb Calorimeter, Characteristics of a good fuel, Comparison between solid, liquid, and gaseous fuels, Theoretical calculation of HCV and LCV of fuel using Dulong's formula, Solid fuels: Coal, Classification of coal, Proximate and ultimate analysis of coal. Liquid fuels: Petroleum, Origin of petroleum and classification of petroleum, Refining of petroleum, Petrol and Diesel-fuel rating (Octane and Cetane numbers), Power alcohol and Bio-diesel, Chemical composition, Calorific values and Applications of LPG, CNG, and Biogas.	20

Text Book:

1. Shikha Agarwal, Engineering Chemistry, Cambridge Uni. Press, New Delhi, 2019, ISBN: 978-1-108-72444-9

Reference Books:

1. Rajesh Agnihotri, Chemistry for Engineers, Wiley India Pvt. Ltd., 2014, ISBN: 9788126550784
2. Dr S. S. Dara & Dr S. S. Umare, A Textbook of Engineering Chemistry, S. Chand & Co. (P) Ltd., New Delhi, 2014, ISBN: 81-219-0359-9
3. Jain & Jain, Engineering Chemistry, Dhanpat Rai Publishing Co. (P) Ltd., New Delhi, 2015

ISBN: 93-521-6000-2

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Attendance

Mapping with Programme Outcomes (POs):

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	2	1	1	1	1	2	2	–

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO2	3	3	3	3	2	1	1	1	2	2	–
CO3	3	3	3	3	2	2	2	1	2	3	–
CO4	2	3	2	2	2	3	2	2	2	3	1

SHREYARTH UNIVERSITY

School of Engineering

Diploma IT Semester IV

Syllabus

Program Outcomes (POs) – Diploma

After completing the Diploma program, a graduate will be able to:

1. **Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.**
2. **Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods.**
3. **Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.**
4. **Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.**
5. **Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.**
6. **Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.**
7. **Life-long learning: Ability to analyse individual needs and engage in updating in the context of technological changes.**

Teaching Scheme

Sr. No	Course Code	Course Name	Curricular Components	Lecture	Tutorial	Practical	Credit
1		Essentials of Digital marketing	PCC	3	0	2	5
2		Advanced Object-oriented Programming- Java	PCC	3	0	1	4
3		Cyber Security	PCC	3	0	1	4
4		Introduction to Web Development -php	PCC	3	0	2	5
5		Essential Indian Knowledge System	Elective I (Any one)	2	0	0	2
5		Contributor Personality Development		2	0	0	2
6		Integrated Personality Development		2	0	0	2
Total				14	0	6	20

PCC: - Professional Core Course.

CIE: - Continuous Internal Evaluation.

ESC: - End Semester Evolution.

SHREYARTH UNIVERSITY Ahmedabad

Index

Sr. no	Course Name	Curricular Components	Page No
1	Essentials of Digital marketing	PCC	5
2	Advanced Object-oriented Programming-Java	PCC	9
3	Cyber Security	PCC	13
4	Introduction to Web Development -php	PCC	16
5	Essential Indian Knowledge System	Elective I	20
6	Contributor Personality Development	Elective I	23
7	Integrated Personality Devlopment	Elective I	25

Course: Essentials of Digital marketing								
Course Code:			Credit:5	Semester: IV		Programme: Diploma IT		
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
3	0	2	7	24 / 60	-	16 /40	-	40 / 100

Course Objectives:

- To enable learners to understand core concepts and tools of digital marketing such as SEO, SEM, social media marketing, content marketing, email marketing, and analytics. To develop the ability to plan, implement, and measure effective digital marketing strategies for promoting products, services, and brands in the online environment.

Course Outcomes (COs):

On successful completion of this course, students will be able to

1. Expose and prepare students for a lucrative employment opportunity.
2. Equip students with demands of the digital world with global competency.
3. Bridge the gap between academia and industry.
4. The knowledge of various styles and techniques of writing and editing and the knowledge of new writing methods.

Course Content:

Module	Topics	Weightage (%)
1	**Introduction to Digital Marketing** Fundamentals of Digital marketing & Its Significance, Traditional marketing Vs Digital Marketing, Evolution of Digital Marketing, Digital Marketing Landscape, Key Drivers, Digital Consumer & Communities, Gen Y & Netizen's expectation & influence wrt Digital Marketing.	25
2	**Digital Marketing Strategy & Planning** The Digital users in India, Digital marketing Strategy- Consumer Decision journey, POEM Framework, Segmenting & Customizing messages, Digital advertising Market in India, Skills in Digital Marketing, Digital marketing Plan.	25
3	**Social Media Marketing (SMM)** Terminology used in Digital Marketing, PPC and online marketing through social media, Social Media Marketing, SEO techniques, Keyword advertising, Google web-master and analytics overview, Affiliate Marketing, Email Marketing, Mobile Marketing.	25
4	**Digital Branding** Display adverting, Buying Models, different type of ad tools, Display advertising terminology, types of display ads, different ad formats, Ad placement techniques, Important ad terminology, Programmatic Digital Advertising.	25

Practical List:

Note: Ask students to maintain a journal for practical hands-on (if required)

1. SEO Campaign for a Local Business Website
    - Tools Used: Google Keyword Planner, SEMrush, Moz.
    - Skills Developed: How to choose the best keywords, writing SEO friendly content, Tracking
    - How people visit the website
2. SMM Campaign for a College Event
    - Tools Used: Facebook Ads Manager, Canva, Instagram
    - Skills Developed: Creating engaging content for social media, engaging with the community online, targeting the right audience with ads.

3. Email Marketing for a Start-up
    - Tools Used: Mail chimp, Hub Spot
    - Skills Developed: Generating leads through email marketing, A/B testing to improved email performance, email lists segmenting for better targeting.
4. Create a Facebook Business Page
    - Tools Used: Canva, Google Analytics, Facebook creating tools, Facebook ads manager.
    - Skills Developed: Knowledge of Facebook polices, communication, campaign Management.
5. Write a Blog Post (150 words)
    - Tools Used: WordPress, Blogger, Google Docs, Grammerly.
    - Skills Developed: Blog writer skills, social media marketing, marketing skills, content writing.
6. Create a Simple Google Ad Copy
    - Tools Used: Google Keyword Planner, SEMrush, chatGPT, copy.AI.
    - Skills Developed: Keyword research, understanding google ads, SEO, ad creation.
7. Google ads campaign for an Online product
    - Tools Used: Google Ads, Google Analytics, Ubersuggest.
    - Skills Developed: Structuring PPC campaign, tracking return on investment, managing bids.
8. Instagram Reels & Video Campaign Project
    - Tools Used: InShot, Canva, Instagram Reels Insights.
    - Skills Developed: Video editing and design, performance monitoring and analytics, content planning.

Text Book(s):

1. **Dodson, Ian: The Art of Digital Marketing** - The Definitive Guide to Creating Strategic, Targeted, and Measurable Online Campaigns. Wiley, 3 February 2016, ISBN: 9781119265702.
2. **Ryan, Damien: Understanding Digital Marketing** - Marketing Strategies for Engaging the Digital Generation. Kogan Page Limited, 2014, ISBN 978 0 7494 7102 6.
3. **Digital Marketing**, S.Gupta, McGraw-Hill Education, 2017, ISBN 9387067610.

Reference Book(s):

1. Marketing Strategies for Engaging the Digital Generation, D. Ryan, 2012, ISBN 0749464283
2. Digital Marketing, V. Ahuja, Oxford University Press, 2015, First, ISBN-13-978-0199455447.
3. Gupta, Sunil: Driving Digital Strategy. Harvard Business Review Press, 2018, ISBN 1633692.
4. Quick win Digital Marketing, H. Annmarie, A. Joanna, and Paperback edition, 2009.
5. Kotler, Philip: Marketing 4.0: Moving from Traditional to Digital. Wiley, 2017.

Open Source – Learning Websites:

1. https://www.learnvern.com/course/digital-marketing-tutorial?utm_source=chatgpt.com Google Digital Garage
2. https://academy.hubspot.com/courses/digital-marketing?utm_source=chatgpt.com
3. https://www.simplilearn.com/free-digital-marketing-basics-course-skillup?utm_source=chatgpt.com

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Viva
6. Project (if applicable)
7. Presentation
8. Attendance

Mapping with Programme Outcomes (POs):

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	2	–	–	1	–	2
CO2	2	2	3	2	–	2	2
CO3	1	1	2	3	–	2	2
CO4	-	–	2	3	–	2	2

Back

Course: Advanced Object-Oriented Programming - Java								
Course Code: -			Credit:4	Semester: IV			Programme: Diploma IT	
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
3	0	1	5	24/60	-	16/40	-	40/100

Course Objectives:

- To develop understanding of Object-Oriented Programming concepts and Java language fundamentals for building reusable and modular programs. To enable students to design and implement secure, platform-independent applications using Java features such as exception handling, multithreading, interfaces, and file handling.

Course Outcomes (COs):

1. Understand the fundamentals of Java programming, Object-Oriented Programming principles, and basic constructs such as variables, data types, operators, and control structures.
2. Develop Java applications using conditional statements, loops, arrays, and string manipulation techniques. Implement inheritance and polymorphism using appropriate OOP concepts in C++.
3. Implement object-oriented concepts such as classes, objects, inheritance, polymorphism, abstraction, and interfaces in Java.
4. Apply multithreading, packages, and exception handling to build robust and concurrent Java programs

Course Content:

Module	Topics	Weightage (%)
1	**Introduction and Concepts of OOP, Conditional statements** Introduction of Object Oriented Programming concept, Features of JAVA, Basic concepts of OOPs: Object, Class, Inheritance, Polymorphism, Abstraction, Encapsulation, Structure of JAVA Program, Creating a JAVA source file, Compiling of JAVA source file and Compilation process, Run the application using the JAVA interpreter, Using Data with JAVA programs, Constants, Literals, Variables, Keywords, Identifier, Data types Operators, Conditional statements.	20
2	**Array, string, Methods** Array and String in JAVA, Declaring and initializing an array, using two dimensional and multidimensional arrays, Passing arrays to methods, methods of arrays	30
3	**Methods, Classes and Objects:** Class variables and class methods, Classification of variable declared in a class(local variable, Instance variable, Class variable), Method Overloading, Constructors, Visibility modifiers for Access control(Public, Private , Protected), Passing object as a parameter in a method, Inheritance, Super class, Final method, Static method, Abstract class, Aggregation and composition, Import statement, Static import, Access control, Creation and Implementation of an interface, Interface reference, instance of operator, Interface inheritance, Comparison between Abstract Class and interface.	30
4	**Exception Handling** Learning about exceptions, Limitations of traditional error handling, Types of JAVA Exceptions(Checked exception, Unchecked exception, error), Java Try and catch block, Java Multiple catch Block, Java Finally Block, Java Throw block, Java throws block, Java Custom exceptions, Advantages of Exception Handling.	20

Practical List:

Note: Ask students to maintain a journal for practical hands-on (if required)

1. Write a Java program to display "Hello Java" and print student details.
2. Write a Java program to demonstrate variables, literals, data types & operators.
3. Write a Java program to check whether a number is **even or odd** using conditional statements.
4. Write a Java program to find the **largest of 3 numbers** using nested if.
5. Write a Java program to perform **Simple Calculator operations** using switch case.

6. Write a Java program to check **voting eligibility based on age** using if–else.
7. Write a program to pass array as parameter and demonstrate methods: fill(), sort(), equals(), binarySearch().
8. Write a program to initialize and manipulate strings using toUpperCase(), toLowerCase(), charAt(), length (), substring ().
9. Create a class with local, instance, and class (static) variables and demonstrate access.
10. Demonstrate method overloading with different parameter lists.
11. Write a program using constructors: default, parameterized, and copy constructor (via method).
12. Demonstrate inheritance with super class and sub class using super keyword.
13. Write a program to create and implement an abstract class and an interface.
14. Create a multithreaded program using Thread class and Runnable interface.
15. Demonstrate thread synchronization and communication (wait (), notify ()).
16. Create a package and use import, static import, and demonstrate access control.
17. Write a program to demonstrate basic exception handling using try-catch-finally.
18. Write a program using multiple catch blocks to handle different exceptions.
19. Demonstrate use of throw and throws keyword in exception handling.
20. Create and use a custom exception class in Java.
21. Write a Java program to demonstrate **try–catch block**.
22. Write a Java program to demonstrate **multiple catch blocks & finally block**.
23. Write a Java program to create **user-defined (custom) exception** and handle it using throws / throw.
24. Build a small Java application using Classes, Objects, Inheritance, Arrays, and Exception Handling

Text Book(s):

1. Bjarne Stroustrup– "The C++ Programming Language"- Addison-Wesley Professional
2. Robert Lafore– "Object-Oriented Programming in C++"- Pearson

Reference Book(s):

1. Pandey, Hari Mohan,"JAVA Programming", Pearson JAVA- Hebert Schildt
2. Balagurusamy, "E,Programming with JAVA", McGraw Hill

Open Source – learning websites:

1. https://github.com
2. https://mnd.com
3. https://freecodecamp.com
4. https://www.javatpoint.com/java-programs

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Viva
6. Project (if applicable)
7. Presentation
8. Attendance

Mapping with Programme Outcomes (POs):

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	–	1	–	–	2
CO2	3	2	2	3	–	1	2
CO3	3	2	3	2	–	2	2
CO4	2	2	2	3	–	-	-

Back

Course: Cyber Security								
Course Code: Insert here			Credit:4	Semester: IV		Programme: Diploma IT		
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
3	0	1	5	24/60		16/40		40/100

Course Objectives:

- Understand fundamental principles of cyber security, threats, and vulnerabilities in network, system, and application security mechanisms and their real-world application.

Course Outcomes (COs):

On successful completion of this course, students will be able to

CO1. Describe core concepts of cyber security and common attack types.

CO2. Explain network and operating system security controls, including firewalls and access control.

CO3. Demonstrate understanding of symmetric/asymmetric encryption, digital signatures, and PKI..

CO4. Interpret national and international cyber laws, privacy regulations, and ethical considerations.

CO5. Evaluate risks and recommend security management strategies in contemporary IT environments.

Course Content:

Module	Topics	Weightage (%)
1	**Network Architecture** Network Architecture Basics – LAN, WAN, DMZ, TCP/IP, IP Addressing, Network-based Attacks – Sniffing, Spoofing, MITM, Firewalls – Types and Configuration, Intrusion Detection and Prevention Systems (IDS/IPS), Secure Protocols – HTTPS, SSH, Network Access Control	20

2	**Cyber Introduction** Information security objectives (CIA triad); Security terminology (threat, vulnerability, exploit, patch); Malware, phishing, DoS/DDoS, insider attacks; Social engineering and security awareness., Cybersecurity Domains – Network, Application, Data, End-user, Indian IT Act 2000, Cyber Laws and Ethical Hacking.	35
3	**Encryption** Symmetric and asymmetric encryption (hashing excluded), Digital signatures and Public Key Infrastructure (PKI), Key management overview, Risk assessment, mitigation techniques, and incident response process	25
4	**Vulnerabilities** Common Web Vulnerabilities, Operating System Security – Windows Policies, Ethical Hacking and Penetration Testing Basics, Tools – Nmap, Security Operations Center (SOC) Introduction, Emerging Trends – AI in Cybersecurity, Case Study	20

Practical List:

Note: Ask students to maintain journal for practical hands-on (if required)

1. Identify threats and vulnerabilities in a sample windows/Linux system. Simulate malware detection and removal using a safe sandbox tool.
2. Phishing awareness exercise: Create and analyze a mock phishing email.
3. Configure a small LAN with IP addressing and basic connectivity (Packet Tracer). Detect packet sniffing and spoofing on a simulated network.
4. Set up a basic firewall and test traffic filtering rules.
5. Configure a simple IDS/IPS (like Snort) to detect simulated attacks.
6. Encrypt and decrypt files using symmetric encryption (AES).
7. Encrypt and decrypt files using asymmetric encryption (RSA) and generate digital signatures.
8. Mini risk assessment: Identify risks on a sample network and propose mitigation.
9. Basic network scanning using Nmap and prepare a simple report.

Text Book(s):

1. **William Stallings** – *Cryptography and Network Security*
2. **Michael T. Goodrich** – *Introduction to Computer Security*

Reference Book:

- **Behrouz Forouzan** – *Cryptography & Network Security* Continuous Internal Evaluation (CIE) Components:

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Viva
6. Project (if applicable)
7. Presentation
8. Attendance

Mapping with Programme Outcomes (POs):

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	1	2	1	–	2
CO2	3	2	1	–	3	–	2
CO3	3	2	2	3	–	1	2
CO4	2	3	2	3	–	2	2

Back

Course: Introduction to Web Development – PHP								
Course Code: -			Credit:5	Semester: IV		Programme: Diploma IT		
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
3	0	2	7	24/60	-	16/40	-	40/100

Course Objectives:

- To enable students to understand server-side scripting concepts and develop dynamic web pages using PHP. To equip students with skills to integrate PHP with MySQL for database-driven web applications including authentication and data management.
-

Course Outcomes (COs):

1. Understand the basics of PHP scripting language and its integration with HTML.
2. Implement decision-making, looping, array, and string operations using PHP.
3. Develop user-interactive web pages using functions and form handling mechanisms.
4. Create dynamic web applications integrated with MySQL database using PHP.**Course**

Content:

Module	Topics	Weightage (%)
1	**Introduction to HTML, CSS** Introduction, Concept of Internet- History of Internet, Protocols of Internet, World Wide Web, URL, Web Server, Web Browser. HTML-Introduction, History of HTML, Structure of HTML Document: Text Basics, Structure of HTML Document: Images and Multimedia, Links and webs, Document Layout, Creating Forms, Frames and Tables, Cascading style sheets.	20
2	**JavaScript** Client side scripting with JavaScript, variables, functions, conditions, loops and repetition, Pop up boxes, Advance JavaScript: JavaScript and objects, JavaScript own objects, the DOM and web browser environments, Manipulation using DOM, forms and validations, DHTML: Combining HTML, CSS and JavaScript, Events and buttons	20

3	**Introduction to PHP** Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, reading data from web form controls like text boxes, radio buttons, lists etc., Form processing, Files, Advance Features: Cookies and Sessions, Object Oriented Programming with PHP	30
4	**Php with MySql** Basic commands with PHP examples, Connection to server, creating database, storing data, selecting a database, listing database, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, php my admin and database bugs	30

Practical List:

1 Create a basic webpage using HTML including headings, paragraphs, formatting tags, and lists.

2 Design a student profile webpage using images, multimedia (audio/video), links and tables.

3 Create a webpage layout using frames / div sections (header, menu, content, footer).

4 Design a registration form using HTML form controls (textbox, radio, checkbox, dropdown, textarea, submit).

5 Apply external, internal and inline CSS to style a webpage (fonts, text, background, borders, margins, padding).

6 Write a JavaScript program to perform arithmetic operations using variables and functions.

7 Validate a registration/login form using JavaScript (name, email, mobile number, password).

8 Create an event-based program using JavaScript (onClick, onMouseOver, onChange, etc.).

9 Create an interactive webpage using Pop-ups (alert, confirm, prompt) and loops.

10 Create a DHTML application combining HTML, CSS & JavaScript to animate content.

11 Write a PHP script using variables, expressions, operators, and control structures.

12 Create a PHP form handling program (reading input from textbox, radio button, checkbox, dropdown).

13 Develop a PHP application to demonstrate string & array functions.

14 Create a file upload and file read/write program in PHP.

15 Develop a login/logout system using PHP Sessions & Cookies.

16 Create a database and table in MySQL using phpMyAdmin.

17 Connect PHP with MySQL and insert form data into database.

18 Display database records in tabular format using PHP (SELECT query).

19 Update and Delete records in database using PHP.

20 Mini Project: Develop a complete dynamic web application (Registration + Login + Dashboard + CRUD).

Mini Project Suggestions (Any 1)

- ✓ Student Management System
- ✓ Library Management System
- ✓ Employee Payroll System
- ✓ Online Product Ordering System
- ✓ Event Registration System

Text Book(s):

1. Advanced PHP Programming: A Practical Guide to Developing Large-scale Web Sites and Applications with PHP 5: Hung Le and Paul Murphy.
2. Modern PHP: New Features and Good Practices: Josh Lockhart.
3. PHP, MySQL & JavaScript All-in-One For Dummies: Janet Valade.

Reference Book(s):

1. Robin Nixon, O'reilly "Learning PHP, MySQL, JavaScript, CSS & HTML5".
2. Steven Holzner "PHP: The Complete Reference" McGraw-Hill,
3. W. Jason Gilmore "Beginning PHP and MySQL", Apress.

Open Source – learning websites:

1. https://github.com
2. https://mnd.com
3. https://freecodecamp.com

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)

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5. Viva
6. Project (if applicable)
7. Presentation
8. Attendance

Mapping with Programme Outcomes (POs):

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	1	1	–	–	2
CO2	3	2	2	3	–	1	2
CO3	3	2	3	3	–	2	2
CO4	3	3	3	3	–	2	2

Back

Course: Essence of Indian knowledge and Tradition								
Course Code: -			Credit:2	Semester: IV		Programme: Diploma IT		
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
2	0	0	2	24/60	-	16/40	-	40/100

Course Objectives:

- To enable learners to explore the scientific foundations and astronomical knowledge of ancient India, including calendar calculations, celestial observations, and early insights into cosmic measurements. To develop an understanding of India's rich heritage in mathematics, architecture, and infrastructure — highlighting contributions of great scholars, historic trade networks, ship-building, and the evolution of major Hindu temple styles.

Course Outcomes (COs):

CO1. Students will attain awareness regarding the significance of IKS
CO2. The syllabus will enhance their confidence in Indian traditional knowledge system and enable them to perceive at the problems with Indian perspective
CO3. This will also enable them to analyze the issues on their own and enable them for critical thinking.
CO4. The knowledge about the ancient Indian Scientific traditions will generate more confidence in themselves.
CO5. This will lead them to make research and innovative thinking which can result in global contribution at later stage.

Course Content:

Module	Topics	Weightage (%)
1	**Ancient Indian Astronomy :** Development of Astronomy: A) Consideration of Purnima and Amavasya B) Beginning of The New Year- Vasant Ritu- (Vernal Equinox) C) Ancient Indian Calender D) Science Behind "Adhikmaas" E) Uttarayan and Dakshinayan ¬ Knowledge about Constellations / planets / distance between planets etc. A) Saptarushi – seven Seers- Significant Knowledge of star and constellations B) Knowledge of Speed of Light – Rigveda(1.50.04) C) Distance between Earth and Sun (Hanuman Chalisa), Advances in Mathematics and Geometry in Ancient India A) Sulbha- Sutra (Kalpa Sutra) composed by Baudhayana, Manava, Apastamba and Katyayana B) Contribution of Ancient Rushis to Mathematics A)Bodhayana's value of pie B) Lilavati C) Bhaskaracharya D) Arya Bhatt.	20
2	**Town Planning in Ancient India** A)Roads in Ancient India – Uttarpath by Chandra Gupta B)Ancient Indian Trade Routs/ Waterways C)Ship- Building In Ancient India D)Temple Architecture -Nagar Style/ Dravida style/ Vesara style	20
3	**Atomic Theory of by Kanada** A) Concept of Seven Padartha and Nine Dravyas B) Theory of Gurutva C) Characteristics of Atom	20
4	**Metallurgical Discoveries in Ancient India** Lime a Mortar , Bronze, Gold & Silver, Glass / Iron, Nagarjuna's Contribution in making Alloys	20
5	**Vimanshastra - Airbourne Vehicles.** A) References of Vimana- Flying Machines in Rigveda, Mahabharat and Ramayana B) BhardwajSutra- Chapter-1 Rasyagnoadhikari	20

Text Book(s):

1. History of Science, Arts & Technology By Dr. Shripad Dattatrya Kulkarni, Bhishma Prakashan, Mumbai -1998.Modern PHP: New Features and Good Practices: Josh Lockhart.
2. Introduction to Indian Knowledge System: Concepts and Applications by B. Mahadevan, Vinayak Rajat Bhat, Nagendra Pavana, PHI Learning Pvt. Ltd., Delhi
3. Town Planning in Ancient India by Binode Bihari Dutt, Thacker, Spink & Co.
4. ભારતનો વૈજ્ઞાનનક વારસો લેખક-જે . જે . રાવલ યુનનવનસસટી ગ્રંથ નનર્ાોાોાોાણ બોર્ાોા, ગુજરાત રાજ્ય

Continuous Internal Evaluation (CIE) Components:

1. Mid Semester Exam
2. Assignments
3. Quiz (MCQ based)
4. Test (Descriptive)
5. Viva
6. Project (if applicable)
7. Presentation
8. Attendance

Mapping with Programme Outcomes (POs):

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	–	–	3	–	2
CO2	3	2	1	–	–	–	2
CO3	3	1	2	–	2	1	2
CO4	3	2	–	–	–	–	2
CO5	2	1	–	–	2	–	2

Back

Course: Contributor Personality Development								
Course Code:			Credit:2	Semester: IV		Programme: Diploma IT		
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
2	0	0	2	24 / 60		16 / 40		40 / 100

Course Objectives:

- To help learners develop a contributor mindset that focuses on responsibility, initiative, empathy, and creating value for self, workplace, and society. To enhance personal and professional effectiveness through skills such as positive attitude, teamwork, communication, leadership, problem-solving, and ethical decision-making.

Course Outcomes (COs):

On successful completion of this course, students will be able to

- **CO1.** Students will be able to consistently apply the Creator Mindset to take ownership of challenges
- **CO2.** analyse and utilize diverse career models to build a sustainable "engine of success"
- **CO3.** strategically expand their contribution and impact within any role
- **CO4.** integrate these concepts through practical research and fieldwork assignments

Course Content:

Module	Topics	Weightage (%)
1	**Contributor and Creators.** Students build a vision of who they can become as a 'Contributor' in their career. They gain clarity on expectations from the future workforce, and importance of being a contributor. This enables students to transform their expectation of themselves in their career and future work. In a "caged approach", we see the career environment as full of difficulties and hurdles. We feel powerless or blame our circumstances for not having many opportunities. This makes us fearful of uncertainty and makes us settle for jobs where we remain mediocre. In this topic, students discover the "creator approach" to challenges and situations. This helps them take ownership & responsibility to shape destiny, build a new future, find answers to challenges; and stop being complainers.	20
2	**Develop yourself to succeed and achieve your Goals** Students discover how to achieve sustainable or lasting success, by making themselves success worthy. Where their focus shifts to building one's "engine of success" rather than being focused on chasing the "fruits of success". This is important, because over a lifetime of work, all people go through ups and downs – where the fruits are not in their	30

	control. People who are focused on the fruits of success fall prey to disappointment, loss in motivation, quitting too early, trying to find shortcuts – when fruits don't come. Whereas people focused on building their engine of success continue to contribute steadily, irrespective of whether fruits come or not. This helps them make better choices in life, that leads to steady success & long-term career fulfillment in an uncertain world. In this topic, students explore a range of diverse "career development models" and the possibilities for contribution that each opens up for them. This helps them open up hidden opportunities that such an environment offers. And free themselves from a herd mentality when making career and Choice.	
3	**Unleashing our Power to Contribute** Terminology used in Digital In this topic, students learn how to expand the contribution possible in any role they play. This helps them take charge of their own career growth & discover their power to contribute in any role or job.	30
4	**Project work** Project Assignments are given corresponding to each of the six topics. These projects require research and field work beyond the classroom that students are expected to do.	20

Text Book(s):

1. *Career Development and Counselling: Putting Theory and Research to Work (3rd or 4th Edition)*Authors: Steven D. Brown and Robert W. Lent

Reference Book(s):

1. ***The Career Development Handbook: The Foundations of Professional Career Practice*** by Tristram Hooley, Gill Frigerio, and Rosie Alexander.
2. ***Impact Players: How to Take the Lead, Play Bigger, and Multiply Your Impact*** by Liz Wiseman.
3. ***Mindset: The New Psychology of Success*** by Carol S. Dweck.

Open Source – Learning Websites:

1. https://www.edx.org/
2. https://www.futurelearn.com/

Continuous Internal Evaluation (CIE) Components:

9. Mid Semester Exam
10. Assignments
11. Quiz (MCQ based)
12. Test (Descriptive)
13. Viva
14. Project (if applicable)
15. Presentation
16. Attendance

Mapping with Programme Outcomes (POs):

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	1	–	–	3	2	3
CO2	2	2	2	–	–	2	3
CO3	2	3	2	–	2	2	3
CO4	2	2	2	–	2	3	3

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Course: Integrated Personality Devlopment								
Course Code: -			Credit:2	Semester: IV		Programme: Diploma IT		
Teaching Scheme				Evaluation Scheme				
Lecture	Tutorial	Practical	Contact Hours	CIE Theory	CIE Practical	ESE Theory	ESE Practical	Total
2	0	0	2	24/60	-	16/40	-	40/100

Course Objectives:

- To foster holistic growth of learners by integrating emotional, social, spiritual, and intellectual development for building a balanced and confident personality. To enhance life skills such as self-awareness, communication, leadership, ethics, empathy, and a positive mindset for effective personal and professional success.

Course Outcomes (COs):

CO1. Demonstrate self-awareness and apply foundational principles of value-based living, emotional intelligence, and self-control (habits, social media, and faith) to secure holistic personal development.

CO2. Adopt a resilient mindset capable of transforming challenges and failures into opportunities for growth, drawing strategic inspiration and ethical guidance from the lives of successful national leaders and legends.

CO3. Utilize effective soft skills, including active listening, professional networking, and a proactive leadership attitude, to communicate effectively and function successfully in diverse teams.

CO4. Analyze and apply foundational management and organizational principles (e.g., project management, Seva) to successfully execute complex tasks and contribute positively to both academic and social environments.

CO5. Articulate a deep appreciation for India's "Glorious Past" and cultivate stronger social and family bonds, recognizing their role in fostering stability, inspiration, and responsible citizenship.

Course Content:

Module	Topics	Weightage (%)
1	**The Self-Mastery Foundation** Focuses on internal restructuring, core values, mindset, and self-control (habits and social media). This module builds the mental 'engine' for all future growth.	25
2	**Mindset for Resilience & Growth** Focuses on how individuals handle external pressures. Includes facing failures/challenges constructively and drawing inspiration/lessons from legends (Tendulkar, Tata, Kalam) to foster a positive, resilient attitude.	25
3	**Professional & Social Skills** Focuses on interpersonal and organizational effectiveness. Includes crucial soft skills like active listening, networking, leadership, project management, and the value of selfless service (Seva) for broader contribution.	30
4	**Context, Culture, & Connection** Focuses on the student's place in the world. Includes developing national pride by studying the Glorious Past of India and strengthening family bonds ("From House to Home") as the foundational social unit.	20

Text Book(s):

5. *The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change* by Stephen Covey.
6. ***Soft Skills: Key to Professional Success*** by **M. S. Rao**
7. ***A Concise Textbook of Value Education*** by **M. G. Chitkara**

Continuous Internal Evaluation (CIE) Components:

17. Mid Semester Exam
18. Assignments
19. Quiz (MCQ based)
20. Test (Descriptive)
21. Viva
22. Project (if applicable)
23. Presentation
24. Attendance

Mapping with Programme Outcomes (POs):

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	–	–	3	2
CO2	2	3	2	–	–	3	3
CO3	2	2	3	2	3	3	3
CO4	2	1	2	–	–	3	3

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