**Programme : Diploma in CE/EE/ET/ME/MT/CM/IT/DDGM**
**Programme Code : 01/02/03/04/05/06/07/08/21/22/23/24/26**
**Name of Course : English**
**Course Code : HU181**

**Teaching Scheme:**

| | Hours/Week | Total Hours |
|---|---|---|
| **Theory** | **02** | **32** |
| **Practical** | **02** | **32** |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term Work |
| Duration | **Two Class Tests each of 60 Minutes** | **03 Hrs.** | **---** | **---** | **---** |
| Marks | **20** | **80** | **---** | **---** | **25** |

**Course Rationale:**

This is been noticed that diploma pass outs lack in grammatically correct written and oral communication in English. It is also been noticed that communication is not a problem of students, communication in correct English is the basic problem of Diploma pass outs. Students will have to interact in this language so far as their career in industry is concerned. In order to enhance this ability in students English is introduced as a subject to groom their personality.

**Course Outcomes:**

After studying this course, the student will be able to

1. Practice Grammar usage.
2. Interpret passages for preparing abstracts.
3. Express own ideas on a given topic.
4. Practice Jargon wise vocabulary.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | | Name of Topic/Subtopic | Hrs |
|---|---|---|---|
| **Unit-1 GRAMMAR** | | | |
| • To apply Grammar for day today and routine Reading, writing, Speaking and Listening Practices | 1.1 | Tenses : Past Perfect, Past Perfect Continuous | 12 |
| | 1.2 | Types of Sentences: Simple, Compound and Complex. | |
| | 1.3 | Verbs | |
| | 1.4 | Reported Speech : Complex Sentences | |
| | 1.5 | Uses of 'too' and 'enough' : Conversion and Synthesis | |
| | 1.6 | Modal Auxiliary : Will, shall, can, could | |
| | 1.7 | Articles | |
| | 1.8 | Preposition | |
| | 1.9 | Conjunctions Interjections | |
| | 1.10 | Affirmative and negative, interrogative | |
| | 1.11 | Question tag | |
| **Unit-2 PARAGRAPH WRITING** | | | |
| • To practice Writing Paragraphs | 2.1 | Types of paragraphs (Narrative, Descriptive, Technical) | 04 |
| **Unit-3COMPREHENSION** | | | |
| • To practice Comprehensions | 3.1 | Unseen passages | 10 |
| **Unit-4 VOCABULARY** | | | |
| • To Improve Vocabulary And learn Various Jargon related Vocabulary | 4.1 | Homophones: To understand the difference between meaning and spelling of words | 04 |
| | 4.2 | Vocabulary : Understanding meaning of new words | 02 |
| | | **Total** | **32** |

**List of Practicals/Experiments/Assignments:**

| Sr. No. | Name of Practical/Experiment/Assignment | COs | Hrs. |
|---|---|---|---|
| 1 | Building of Vocabulary – 2 assignments 25 new words for each assignment with sentence | CO3 | 04 |
| 2 | Conversational Skills – Role play student will perform the role on any 6 situations. Dialogue writing for the given situations. | CO6 | 04 |
| 3 | Grammar – 2 assignments | CO1 | 04 |
| 4 | Write paragraphs on given topics. 2 assignments. | CO4 | 04 |
| 5 | Errors in English 2 assignments.<br>Find out the errors and rewrite the sentences given by the teacher. | CO1 | 04 |
| 6 | Essay writing 2 assignments. | CO4 | 04 |

| | | | |
|---|---|---|---|
| | Write 2 assays on topic given by the teacher. | | |
| 7 | Biography (Write a short biography on your role model approximately in 250-300 words) | CO4 | 04 |
| 8 | Idioms and phrases<br>Use of idioms and phrases in sentences(20 examples) | CO1 | 04 |
| | **Total** | | **32** |

The term work will consist of 10 assignments.

**Instructional Strategy :**

| Sr. No. | Topic | Instructional Strategy |
|---|---|---|
| 1 | Grammar | Class room Teaching |
| 2 | Paragraph Writing | Class room Teaching |
| 3 | Comprehension | Class room Teaching |
| 4 | Vocabulary | Class room Teaching |

**Reference Books :**

| Sr. No. | Author | Title | Publication |
|---|---|---|---|
| 1 | J.D.O. Connors | Better English Pronunciation | London Cambridge University Press ELBS |
| 2 | Geofrey Leech | A communicative Grammar of English | Essex Longman Group Ltd. : ELBS |
| 3 | Randolf Quirk | University Grammar of English | Essex Longman Group Ltd. : ELBS |

**Learning resources :**Books, Audio Visual aids

**Specification Table :**

| Sr. No. | Topic | Cognitive Levels | | | Total |
|---|---|---|---|---|---|
| | | Knowledge | Comprehension | Application | |
| 1 | Grammar | -- | 10 | 10 | 20 |
| 2 | Paragraph Writing | -- | 05 | 05 | 10 |
| 3 | Comprehension of Unseen Passages | -- | 30 | 10 | 40 |
| 4 | Vocabulary/Homophones | 02 | 04 | 04 | 10 |
| | **Total** | **02** | **49** | **29** | **80** |

Prepared by
Mr.M.A.Surdikar

Member Secretary PBOS
Mr. S.V.Chaudhari

Chairman PBOS
Mr. M.S.Satarkar

**Name of Programme : Diploma in CE/EE/ET/ME/MT/CM/IT/DDGM**
**Programme Code : 01/02/03/04/05/06/07/08/21/22/23/24/26**
**Name of Course : Communication Skills**
**Course Code : HU182**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 02 | 32 |
| Term work / Practical | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | One class test of 60 minutes and an oral | 03 Hrs | -- | -- | -- |
| Marks | 20 | 80 | -- | 25 | -- |

**Rationale:**

Classified under human sciences this subject is intended to introduce students with the process of communication so that they can identify conditions favorable to effective communication. They will also be taught basic and applied language skills viz. listening, speaking, reading and writing – all useful for the study of a technical course and communication. Specifically, writing and oral presentation skills are two top ranking capabilities needed for professional careers and must be developed systematically.

**Course Outcomes:**

1. Interpret basic concepts of communication for analyzing various communication events
2. Correlate organizational structure and flow of communication.
3. Interpret nonverbal codes for effective communication and oral communication.
4. Apply various written communication tools for effective correspondence.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1 : Basic concepts and principles of communication** | | |
| • Define all elements of communication<br>• Analyze communication event<br>• Define the stages of communication process<br>• Apply the principles of communication and minimize the barriers | 1.1 The communication Event<br>The communication event: Definition<br>The elements of communication: The sender, receiver, message, channel, feedback.<br>1.2 The communication Process<br>The communication process:Definition<br>Stages in the process: defining the context, knowing the audience, designing the message, encoding, selecting the proper channels, transmitting, receiving, decoding and giving feedback.<br>1.3 Principles of Effective communication<br>Effective Communication: definition<br>Communication Barriers and how to overcome them at each stage of communication process.<br>Developing effective message: Thinking about purpose, knowing the audience, structuring the message, selecting proper channels, minimizing barriers and facilitating feedback | 12 |
| **Unit 2: Organizational Communication** | | |
| • Understand non-verbal codes and use them effectively | 2.1 What is an organization? Goal.<br>Patterns of communication: Upward, Downward, Horizontal and Grapevine | 04 |
| **Unit 3: Non-verbal Communication** | | |
| • Understand non-verbal codes and use them effectively | 3.1 Non-verbal codes: Kinesics (eye-contact, gesture, postures, body movements and facial expressions) Proxemics(using space), Haptics (touch ), Vocalics ( Aspect of Speech like tone, emphasis, volume, pauses etc. ) Physical Appearance, Chronemics ( manipulating time ), Silence | 06 |
| **Unit 4: Business Correspondence and Office Drafting** | | |

| | | |
|---|---|---|
| • Understand office drafts and letters and practice those in various contexts | 4.1 Business Correspondence: Letter of Enquiry, Order letter, Complaint Letter<br>4.2 Office Drafting: Circular, Notice and Memo<br>4.3 Job Application with Resume | 10 |
| | **Total** | **32** |

**List of Practicals /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Introduce themselves with self informative parameters | Self introduction | 02 |
| 2. | Present orally a speech on a topic using body language and vocalic | Elocution | 04 |
| 3. | Practice to speak on given unknown topic instantly | Extempore | 04 |
| 4. | Rehearse a role play of an interview | Mock Interview | 04 |
| 5 | Participate in a debate activity | Debate | 02 |
| 6. | Understand, practice various applications and reports | Variety Application/Reports | 02 |
| 7. | Write paragraphs on technical subjects | Writing Paragraphs on Technical Subjects | 02 |
| 8. | Draft business letters | Business letter | 02 |
| 9. | Practice and present one of the syllabus topics | Individual/ Group Presentation on identified topics | 02 |
| 10. | Discuss on a current topic sitting in a group | Group discussion | 02 |
| 11. | Rehearse various role plays of various oral presentation | Role play | 06 |
| | | **Total** | **32** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Basic concepts and principles of Communication | Classroom teaching and demo sessions |
| 2 | Organizational communication | Classroom teaching and demo sessions |
| 3 | Non-verbal communication | Classroom teaching and demo sessions |
| 4. | Business Correspondence and Office Drafting | Classroom teaching |

**Specification Table for Theory Paper :**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| **1** | Basic concepts and principles of communication | -- | 10 | 14 | 24 |
| **2** | Organizational communication | -- | 04 | 08 | 12 |
| **3** | Non-verbal communication | -- | 02 | 10 | 12 |
| **4** | Business correspondence and office drafting | 08 | 08 | 16 | 32 |
| | **Total** | **08** | **24** | **48** | ***80*** |

**R – Remember U – Understand A – Analyze / Apply**

**Scheme of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Presentations | 10 |
| 2 | Oral skills | 10 |
| 3 | Content | 05 |
| | **TOTAL** | **25** |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Communication skills | MSBTE | |
| 2 | Communication skills | Joyeeta Bhatacharya | |
| 3 | Written communication in English | Sarah Freeman | |
| 4 | Developing communication skills | Krishna Mohan and Meera Banerji | |

Prepared by Member Secretary PBOS Chairman PBOS

Mr. M.A.Surdikar Mr..S.V.Chaudhari Mr.M.S.Satarkar

**Name of Programme : CE/EE/ET/ME/MT/CM/IT Engineering**
**Programme Code : 01/02/03/04/05/06/07/21/22/23/24/26**
**Name of Course : APPLIED MAHEMATICS I**
**Course Code : SC181**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 03 | 48 |
| Term work / Practical | 01 | 16 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 03Hrs | -- | -- | -- |
| Marks | 20 | 80 | -- | -- | -- |

**Rationale:**

The students of Diploma in Engineering and technology must acquire some essential Competencies in Mathematics.

**Course Outcomes:**

**After completing this course students will be able to**

1.Solve Mathematical Problems related to logarithm, Partial Fraction and binomial theorem.
2.Solve Mathematical Problems related to determinant and Matrices.
3. Solve trigonometric problems.
4. Apply knowledge of straight line for solvingMathematicalproblems.
5. Apply knowledge of circle for solving Mathematicalproblems.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| | **Units 1 : Algebra** | |
| • Solve the examples using laws of logarithm<br>• Solve simultaneous equations in three variables using Cramer's rule<br>• Perform all algebraic operations on matrices.<br>• Solve simultaneous equations in three variables using adjoint matrix method.<br>• Find partial fraction of proper and improper fraction.<br>• Define binomial expansion& general term<br>• Solve examples using binomial theorem. | 1.1 Logarithm: Definition, Laws of Logarithms, Simple examples based on laws.<br><br>1.2 Determinant: Determinants of second and third orders, solution of simultaneous equations in two and three unknowns (Cramer's Rule), Properties of determinants of order 3 and examples.<br><br>1.3Partial fraction: Rational fractions, resolving given rational fraction into partial fraction (Type : Denominator containing non-repeated, repeated linear factors and non repeated quadratic factor)<br><br>1.4 Matrices: Definition of a matrix, types of matrices, Equal matrices, Addition, subtraction, multiplication of matrices. Scalar multiple of a matrix. Transpose of a matrix, Singular and Non singular matrix. Adjoint of a square matrix. Inverse of a matrix. Solution of simultaneous linear equations in 3 unknowns by Adjoint method.<br><br>1.5 Binomial expansion : Definition of factorial notation, definition ofpermutation and combinations with formula,Binomial theorem for positive index,General term,<br><br>Binomial theorem for negative index,<br><br>Approximate value (only formula) | **18** |
| | **Unit 2:Trigonometry** | |

| | | |
|---|---|---|
| • Define basic trigonometric terms<br>• Determine values of trigonometric ratios of standard angles.<br>• Solve examples of allied angle, compound angle, multiple and sub-multiple angles.<br>• Solve examples using factorization and de-factorization formulae<br>• Solve examples of inverse trigonometric ratios | 2.1 Trigonometric ratios and fundamental identities.<br><br>2.2 Trigonometric ratios of allied angles, compound angles, multiple angles (2A, 3A), submultiples angle.<br><br>2.3 Sum and product formulae.<br><br>2.4 Inverse Circular functions. (definition and simple problems) | **20** |
| **Unit 3: Co ordinate geometry** | | |
| • Define slope , various forms of equation of straight line.<br>• Find slope and intercepts of straight line<br>• Find Angle between two straight lines<br>• Define condition of Parallel andPerpendicular lines<br>• Define various forms of equation of circle<br>• Solve problems with given condition | 3.1 Straight Line: Slope and intercept of straight line. Equation of straight line in<br><br>slope point form, slope-intercept form, two-point form, two-intercept form, normal form. General equation of line. Angle between two straight lines. Condition of Parallel and<br><br>Perpendicular lines. Intersection of two lines. Length of perpendicular from a point on the line and perpendicular distance between parallel lines.<br><br>3.2 Circle: Equation of circle in standard form, Centre-radius form, Diameter form, two intercept form. General equation of a circle and its centre & radius. | **10** |

**List of Practicals/Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Examples on laws of logarithm | **Algebra** | 1 |
| 2. | Examples on expansion of order 2& 3 determinant and solution of simultaneous equation by Cramer's rule | | 1 |

| | | | |
|---|---|---|---|
| 3. | Examples on Proper and Improper partial fraction | | 1 |
| 4. | Examples on algebra of matrices. | | 1 |
| 5 | Examples on Adjoint, Inverse of matrix and solution of simultaneous equations by adjoint method | | 1 |
| 6. | Examples on Binomial expansion and general term in expansion. | | 1 |
| 7. | Examples on Trigonometric ratios and fundamental identities. | **Trigonometry** | 1 |
| 8. | Examples on allied angles, compound angles, multiple angles (2A, 3A), submultiples angle. | | 1 |
| 9. | Examples on Sum and product formulae | | 1 |
| 10 | Examples on Inverse trigonometric function | | 1 |
| 11 | Examples on straight line. | **Co ordinate geometry** | 1 |
| 12 | Examples on Circle | | 1 |
| | Skill Test | | 02 |
| | | **Total** | **14** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Algebra | Class room teaching , chalk board |
| 2 | Trigonometry | Class room teaching , chalk board |
| 3 | Co ordinate geometry | Class room teaching , chalk board |

**Specification Table for Theory Paper:**

R-Remember U – Understand A – Analyze / Apply

**Scheme Of Practical Evaluation:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Algebra | 08(04) | 16(08) | 08(04) | 32(16) |
| 02 | Trigonometry | 08(04) | 16(08) | 08(04) | 32(16) |
| 03 | Co ordinate geometry | 04(02) | 08(04) | 04(02) | 16(08) |
| | **Total** | **20**(10) | **40**(20) | **20**(10) | **80**(40) |

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations, | N.A. |
| 2 | Calculations and Result | N.A. |
| 3 | Viva voce | N.A. |
| | **TOTAL** | |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Mathematics for Polytechnic Students | Pune Vidyarthi Griha , Shri S.P. Deshpande | |
| 2 | Plane Trigonometry | Macmillan and London , Shri S.L. Loney | |
| 3 | Mathematics for Engineers ( Vol.I) | S.Chand and Comp. , Shri H.K. Dass | |
| 4 | Engg. Maths Vol.I and II | S. Chand and Comp. Shri hantinarayan | |

**Prepared by** **Member Secretary PBOS** **PBOS Chairman**

**Mr.V.B.Shinde** **Mr.S.V.Chaudhari** **Mr.U.V.Kokate**

**Name of Programme : CE/EE/ET/ME/MT/CM/IT Engineering**
**Programme Code : 01/02/03/04/05/06/07/21/22/23/24/26**
**Name of Course : APPLIED MAHEMATICS II**
**Course Code : SC182**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 03 | 48 |
| Term work / Practical | 01 | 16 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 03Hrs | -- | -- | -- |
| Marks | 20 | 80 | -- | -- | -- |

**Rationale:**

This subject intends to teach students basic facts, concepts, principles and procedure of Mathematics as a tool to analyze Engineering problems and as such it lays down foundation for the understanding of engineering science and core technology subjects.

**Course Outcomes:**

**After completing this course students will be able to**

1. Evaluate limits of different types of functions.
2. Apply derivatives to differentiate various types of functions.
2. Compute maxima and minima of given function.
3. Determine work done and moment of force using dot product and cross product.
4. Apply numerical methods to solve algebraic equations and simultaneous equations.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1 : FUNCTIONS AND LIMITS** | | |
| • Identify the function and find the value of function.<br>• Evaluate limits of different types of functions. | 1.1 Functions: Concept of functions, Types of functions ( only definitions)<br>1.2 Limits: Concept of limits and limits of function ( algebraic, trigonometric, logarithmic and exponential.) | **13** |
| **Unit 2: DERIVATIVES** | | |
| • Find the derivatives by first principle.<br>• Solve problems using rules and methods of derivatives<br>• Apply derivative in engineering tools. | 2.1 Definition of the derivative, derivatives of standard Functions.<br>2.2 Differentiation of sum, difference, product and quotient of two or more functions<br>2.3 Differentiation of composite, inverse, implicit functions.<br>2.4 Differentiation of parametric, exponential and logarithms functions.<br>2.5Successive differentiation. | 16 |
| **Unit 3: APPLICATIONS OF DERIVATIVES** | | |
| • Find slope and equations of tangent and normal<br>• Calculate maxima and minima of function | 3.1 Geometrical meaning of derivative ( Equations of tangents and Normals)<br>3.2 Maxima and minima of functions. | 05 |
| **Unit 4:VECTORS** | | |

| | | |
|---|---|---|
| • Define different types of vectors<br>• Find dot and cross product of vectors<br>• Find work done and moment of force about the point and line | 4.1 Definition of vector, position vector, Algebra of vectors (Equality, addition, subtraction and scalar multiplication)<br>4.2 Dot (Scalar) product with properties.<br>4.3 Vector (Cross) product with properties.<br>4.4 Work done and moment of force about a point & line | 06 |
| **Unit 5:NUMERICAL METHODS** | | |
| • Find the approximate root of algebraic equation<br>• Solve the system of equations in three unknowns | 5.1 Solution of algebraic equations : Bisection method, Regulafalsi method and Newton –Raphson method.<br>5.2 Solution of simultaneous equations containing 2 and 3Unknowns :Gauss elimination method. Iterative methods- Gauss Seidal and Jacobi's method | 08 |

**List of Practicals /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Examples on function | Function and Limits | 1 |
| 2. | Examples on algebraic limits | | 1 |
| 3. | Examples on trigonometric limits | | 1 |
| 4. | Examples on exponential and logarithmic limits | | 1 |
| 5 | Examples on differentiation of sum, difference, product and quotient of two or more functions and composite function. | Derivative | 1 |
| 6. | Examples on differentiation of exponential , logarithms , inverse, implicit functions. | | 1 |
| 7. | Examples ondifferentiation of parametric function and Successive differentiation. | | 1 |

| | | | |
|---|---|---|---|
| 8. | Examples on equation of tangent & normal & determination of maxima & minima of function. | Application of derivative | 1 |
| 9. | Examples on properties f dot and cross product of vectors. | Vector | 1 |
| 10 | Examples on Work done and moment of force about a point & line | | 1 |
| 11 | Solution of algebraic equations: Bisection method, Regulafalsi method and Newton – Raphson method. | Numerical methods | 1 |
| 12 | Solution of simultaneous equations containing 2 and 3Unknowns: Gauss elimination method. Iterative methods- Gauss Seidal and Jacobi's method | | 1 |
| | Skill Test | | 02 |
| | | **Total** | **14** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Function and Limit | Class room teaching , chalk board |
| 2 | Derivatives | Class room teaching , chalk board |
| 3 | Application of derivatives | Class room teaching , chalk board |
| 4 | Vector | Class room teaching , chalk board |
| 5 | Numerical methods | Class room teaching , chalk board |

**Specification Table for Theory Paper:**

R-Remember U – Understand A – Analyze / Apply

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Function and Limit | 04(04) | 08(04) | 06(02) | 18(10) |
| 02 | Derivatives | 08(04) | 16(08) | 00(00) | 24(12) |
| 03 | Application of derivatives | 00(00) | 00(00) | 08(04) | 08(04) |
| 04 | Vector | 04(02) | 04(00) | 06(04) | 14(06) |
| 05 | Numerical methods | 04(02) | 04(02) | 08(04) | 16(08) |
| | **Total** | 20(12) | 32(14) | 28(14) | 80(40) |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Engineering Mathematics Vol.I | Vishwanath , Satya Prakashan, New Delhi | -- |
| 2 | Mathematic for polytechnic students I & II | S.P. Deshpande ,Pune Vidyarthi Griha Prakashan | -- |
| 3 | Mathematics for Engineering Vol-I | H.K. Dass ,S.Chand and Company | -- |
| 4 | Engineering Mathematics vol-I and II | Shantinarayan ,S.Chand and Company | -- |

Prepared by — Member Secretary, PBOS — Chairman PBOS

Prof.V.B.Shinde — Prof.S.V.Chaudhari — Prof.M.U.Kokate

**Name of Programme** : **CE /EE/ ET/ME/MT/CM/IT Engineering**
**Programme Code** : **01/02/03/04/05/06/07/21/22/23/24/26**
**Name of Course** : **Engineering Physics**
**Course Code** : **SC183**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 03 | 48 |
| Term work / Practical | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 3 Hrs | 2Hrs | -- | -- |
| Marks | 20 | 80 | 50 | -- | -- |

**Rationale:**

The study of Engineering Physics emphasizes the application of basic scientific
Principles to the design of equipments which includes electronic and electromechanical systems for use in measurement, communications and data acquisition.
The course covers the basic laws of nature and gives brief idea about principles of physics and their applications to meet the challenges posed by fast changing technology.

**Course Outcomes:**

**After completing this course students will be able to**

1. Interpret types of motion.
2. Calculate physical properties of different materials.
3. Apply principles of Heat, Sound and Light in EngineeringApply principles and laws of physics .
4. Use electrical instruments for measuring different attributes.
5. Solve problems based on Modern physics.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| | **Units 1 : Motion** | |
| • Define circular motion and UCM<br>• Define Simple harmonic motion with example<br>• State characteristics of SHM<br>• Explain centripetal and centrifugal force with its example and application<br>• Explain SHM as a projection of UCM on any one diameter of circle.<br>• Distinguish between centripetal and centrifugal force.<br>• 7 Derive equation of SHM when particle starts motion from mean position. | 1.1 **Introduction**<br><br>1.2 **Circular Motion**: UCM, angular displacement, angular velocity, angular acceleration, radial velocity, tangential velocity, periodic time, frequency, relation between linear and angular velocity, explanation of centripetal and centrifugal force, with application, relation between velocity frequency and wavelength<br><br>1.3 **SHM**: Definition, SHM as a projection of UCM on the diameter, Equation of SHM, displacement and graphical representation | **06** |
| | **Unit 2:Properties of matter** | |
| • Define Surface tension of liquid with its unit.<br>• State significance of angle of contact..<br>• State the effect of temperature and impurity on surface tension of liquid.<br>• Explain phenomenon of ST with the help of Laplace's molecular theory<br>• State Newton's law of viscosity.<br>• Distinguish between stream line and turbulent flow.<br>• State Significance of Reynolds number<br>• Explain behavior of wire under continuous increase in load.<br>• State Hooks law and define elasticLimit | 2.1 **Surface Tension :**<br>Molecular theory of surface tension, Cohesive and adhesive forces, Angle of contact, shape of liquid surface in capillary tube, capillary action (Examples). Surface tension by capillary rise method, (no derivation), simple problem, effect of impurity and temperature on surface tension.<br><br>2.2 **Viscosity:**<br>Definition, velocity gradient, Newton's & Stokes' law of viscosity, terminal velocity, coefficient of viscosity by stokesmethod(No derivation), type of flow of liquid - stream line flow, turbulent flow, Reynolds's number (significance), applications and simple problems<br>2.3 **Elasticity:** Elastic, plastic and rigid bodies, stress and strain, Hook's law, types of elastic | **08** |

| | | |
|---|---|---|
| • Define different Moduli with its unit. | moduli with its relation, problems. Behavior of wire under continuously increasing load. | |
| **Unit 3: Sound** | | |
| • Distinguish between Transverse wave andLongitudinal wave.<br>• Define Resonance with its applications.<br>• Define….1)Coefficient of absorption2)Coefficient of transmission3)Coefficient of reflection<br>• State characteristics of Free vibrations and forced vibration. | 3.1Wave motion, Transverse and longitudinal waves, free and forced vibrations, Resonance - explanation and example. absorption, reflection and transmission of sound. | **03** |
| **Unit 4: Heat** | | |
| • State Boyle's law and Charles's law and Gay lussac's law.<br>• State the factors affecting conduction of heat and give relation between them.<br>• Define coefficient of thermal conductivity of a material with its unit.<br>• Explain absolute zero scale of temperature | 4.1Explanation of Gas laws, Boyle's law, Charles's law, Gay Lussac's law, General Gas Equation, problems on gas laws, units of temperature $^0$C, $^0$K with their conversion, absolute scale of temperature, modes of heattransfer, conduction, convection and radiation. | |
| **Unit 5:Optics** | | |

| | | |
|---|---|---|
| • State Snell's law of reflection.<br>• Define reflection and refraction.<br>• Define refractive index and state its physical significance.<br>• Define Numerical aperture and Acceptance cone.<br>• Explain different types of optical fiber.<br>• Distinguish between electrical cable and optical fiber communication.<br>• Explain the phenomenon of Total internal reflection with diagram.<br>• State properties of LASER.<br>• Explain construction and working of He-Ne LASER.<br>• Define population inversion With diagram. | 5.1 Introduction to reflection and refraction of light,Snell's law, physical significance of refractive index, critical angle, total internal refraction of light.<br><br>5.2**Fiber optics** : Propagation of light through optical fiber, numerical aperture, types of optical fibers, applications and comparison with electrical cable.<br><br>5.3 **LASER:** Definition, spontaneous and stimulated emission, population inversion, He-Ne laser- construction and working, applications and properties of LASER. | |
| **Unit 6: Electrostatics** | | |
| • State Coulomb's law of charges.<br>• Define Electric field and Intensity of electric field.<br>• State any four properties of electric lines of forces.<br>• Define charge of one coulomb.<br>• Explain why potential of earth is Zero.<br>• Define potential difference and absolute potential. | 6.1 **Electric charge**, Coulomb's law in Electrostatics, unit of charge, electric field, intensity of electric field, electric lines of forces<br><br>(Properties), electric flux, flux density.<br><br>6.2 **Electric potential:** Explanation, definition**,** potential due to apoint charge, potential due to a charged sphere, absolute electric potential, simple problems. | **06** |
| **Unit:7 Current Electricity 06** | | |
| • State and explain Ohm's law.<br>• Define Resistance and Specific resistance.<br>• Explain Wheatstone's network with its principle.<br>• With neat diagram explain construction and principle of potentiometer.<br>• Define EMF and potential gradient with its unit.<br>• Define electric energy and power. | 7.1 **Current**, resistance, specific resistance, Whetstone's network,meter bridge, balancing condition of meter bridge, measurement of unknown resistance using meter bridge, problems<br><br>7. 2 **Principle of potentiometer,** potential gradient, E.M.F., comparison of E.M.F. using potentiometer.<br><br>7:3 **Electric work**, electric power, energy, units | |

| | | |
|---|---|---|
| | and calculations of electric bill | |
| **Unit:8 Electromagnetism** | | |
| • State and explain Biot's savart law.<br>• State Fleming's left hand rule.<br>• Give Ampere's Right hand rule<br>• Obtain an expression for force experienced by current carrying straight conductor placed in magnetic field. | 8:1 **Magnetic effect of electric current**, Ampere's rule, intensity of magnetic field, magnetic induction, Biot- Savert's Law (Laplace's Law), Fleming's left hand rule, force experienced by current carrying straight conductor placed *in* magnetic field, problems. | **03** |
| **Unit:9 Modern Physics** | | |
| • State properties of X-Ray.<br>• Explain production of X-Ray with neat label diagram.<br>• State application of X-Ray.<br>• Explain photoelectric effect.<br>• Define Threshold frequency and Stopping potential.<br>• State application of photoelectric cell.<br>• State Einstein's photoelectric equation.<br>• With neat diagram explain working of photoelectric cell. | 9:1 **X- ray's**, principle, production, properties and applications<br><br>9:2 **Photo electricity**: Plank's quantum theory, photoelectric effect (circuit diagram and working), threshold frequency, stopping potential, worfunction, Einstein's photoelectric equation, photocell, problems | **06** |

**List of Practicals /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Use of vernier calliper to measure the dimensions of different objects. | Motion | 2 |
| 2. | To understand the concept of error in instrument and to measure the dimensions of different objects using micrometer screw gauge | Motion | 2 |
| 3. | To determine period of simple pendulum | Motion | 2 |

| | | | |
|---|---|---|---|
| 4. | To determine the velocity of sound using resonance tube method. | Sound | 2 |
| 5. | To determine Surface Tension by Capillary rise method. | Properties of matter | 4 |
| 6 | To determine Specific resistance using Ohm'slaw. | Current electricity | 4 |
| 7. | To understand the concept of Wheatstone network and to determine specific resistance using Meter bridge. | Current electricity | 4 |
| 8. | To compare EMF of cell using Single cellmethod. | Current electricity | 2 |
| 9. | To determine coefficient of viscosity using Stokes law. | Properties of matter | 2 |
| 10. | Study of concept of total internal reflection. | Light | 2 |
| 11. | Study of characteristics of photocell. | Modern physics | 2 |
| 12. | To determine permittivity of free space. | Electromagnetism | 2 |
| 13. | Skill Test | | 2 |
| | | **Total** | **32** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Motion | Classroom teaching and Demonstration method |
| 2 | Properties of matter | Audio video,Classroom teaching |
| 3 | Sound | Role-Play, Classroom and visual teaching. |
| 4 | Heat | Demonstration and classroom teaching |
| 5 | Optics | Demonstration and classroom teaching |
| 6 | Electrostatics | Classroom teaching |
| 7 | Current Electricity | Classroom teaching ,laboratory method |
| 8 | Electromagnetism | Classroom teaching |
| 9 | Modern Physics | Brain Storming |

**Specification Table:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Motion | 2(4) | 3(2) | 1(2) | 6(8) |
| 02 | Properties of matter | 4(5) | 2(3) | 2(4) | 8(12) |
| 03 | Sound | 1(2) | 1(2) | 1(2) | 3(6) |
| 04 | Heat | 2(2) | 1(2) | 1(2) | 4(6) |
| 05 | Optics | 3(6) | 2(3) | 1(3) | 6(12) |
| 06 | Electrostatics | 2(4) | 2(4) | 2(2) | 6(10) |
| 07 | Current Electricity | 3(4) | 1(3) | 2(3) | 6(10) |
| 08 | Electromagnetism | 1(3) | 1(2) | 1(1) | 3(6) |
| 09 | Modern Physics | 3(5) | 2(3) | 1(2) | 6(10) |
| | **Total** | **21(35)** | **15(24)** | **12(21)** | **48(80)** |

**Scheme Of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations, | 20 |
| 2 | Calculations and Result | 20 |
| 3 | Viva voce | 10 |
| | **TOTAL** | **50** |

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | R.K. Gaur and S. L. Gupta | Engineering Physics | Dhanpat Rai and Sons Publications |
| 2 | Manikpure, Prakash Deshpande and Dagwar | Basic Applied Physics | S. Chand and Co. New Delhi. |
| 3 | Modern Physics | Text book in Physics for diploma Engg. Student. | Sony Publications Pvt. Ltd. |
| 4 | Applid Physics | Schum's Series. | |

**Reference & Text Books:**

| | | | |
|---|---|---|---|
| 5 | Kshirsagar, Avdhanalu- | Engineering Physics | |
| 6 | M.S.Pawar, M.A.Sutar | Basic Physics (E Scheme) | |

**E-References:**

1. **www.howstuffworks.com**
2. https://en.wikipedia.org/wiki/**Engineering_physics**
3. https://www.laser.com.ve
4. www.nanowerk.com
5. www.brainscape.com
6. https://www.open2study.com/courses/**basic-physics**

**Prepared By** **Chairman PBOS** **Member Secretory PBOS**

**Name of Programme : Diploma in Comp Engg/Info.Tech**
**Programme Code :06/26/07**
**Name of Course : Programming in 'C'**
**Course Code : CM282**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | **03** | **48** |
| Practical | **02** | **32** |
| Tutorial | **01** | **16** |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 02Hrs | | | |
| Marks | **20** | **80** | **50** | **---** | **25** |

**Course Rationale:**

In this era of high speed computing, it is necessary to program computers with the help of structured & dynamic languages like 'C' to study programming is useful in solving problems/tasks related to various domains. Now days almost every setup in software engineering domain chooses 'C' as a basic tool to develop software.

**Course Outcomes:**

**After completing this course students will be able to**

1. Represent the solution to problem with procedure oriented methodology.
2. Form expressions using data elements, character set and operators in C.
3. Write Programs Using Decision Making and Looping statements.
4. Represent data with Arrays, Strings, Structures, and Unions as applicable.
5. Write user defined functions in C Program.
6. Implement C programs with pointers.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1: Overview of 'C'** | | |
| • State importance of 'C'.<br>• Describe Basic structure of 'C' programs.<br>• Demonstrate sample C program.<br>• Execute sample C program. | **1.1**Introduction: development of 'C'<br><br>**1.2**Importance of 'C',<br>**1.3**Basic structure of 'C' programs, programming style, sample 'C' programs, execution of 'C' program | **02** |
| **Unit 2:Data Types & Character Set** | | |
| • Describe Character set.<br>• Define keywords, identifiers,<br>• constants, variables, symbolic constants<br>• Describe data types. | **2.1**Character set, C tokens, keywords & identifiers, constants, variables. Data types, declaration of variables, assigning values to variables, defining symbolic constants. | **04** |
| **Unit 3: Operators & Expressions** | | |

| | | |
|---|---|---|
| • Describe different types of operators.<br>• State different types of Expressions.<br>• Demonstrate input and output operators. | **3.1** Operators: Arithmetic, relational, logical, increment & decrement, conditional, bit-wise special.<br>**3.2** Expressions**:** Arithmetic expressions, evaluation of expressions, procedure of arithmetic operators, type conversions in expressions, operator precedence & associatively, mathematical functions<br>**3.3** Managing input & output operators: Introduction, reading a character, writing a character, formatted input, formatted output. | **06** |
| **Unit 4: Decision Making** | | |
| • Understand and demonstrate branching and looping statements.<br>• Understand and demonstrate decision making with if statement, simple if statement, the if-else statement, The else if ladder, The switch statement and The?: operator | 4.1 Branching & looping introduction, decision making with if statement, simple if statement, the if-else statement, The else if ladder, The switch statement, The?: operator, the go to statement, looping , introduction , the while statement , jumps in the loop, break statement | **04** |
| **Unit 5: Arrays** | | |
| • List different types of Arrays.<br>• Distinguish between one-dimensional , two-dimensional and multidimensional arrays,<br>• Demonstrate initialization of arrays | 5.1 Introduction, one- dimensional arrays, two-dimensional arrays, multidimensional arrays, Initialization of arrays | **04** |
| **Unit 6: Strings** | | |
| • Understand declaring and initializing string variables.<br>• Describe String functions.<br>• Understand table of Strings. | 6.1 Introduction, declaring & initializing string variables, reading string, writing strings, arithmetic operations on string , putting strings together , comparison of two strings, string handling functions, table of strings | **04** |
| **Unit 7: User defined Functions** | | |

| | | |
|---|---|---|
| • Define Function.<br>• Identify different categories of function.<br>• Understand nesting of functions, recursion.<br>• Demonstrate function with arrays. | 7.1Need of user defined function, the types of C functions, return values & their types, calling a function.<br>7.2Category of functions: No argument- No return value, Argument-No return value, No argument-return value & No argument-return value.<br>7.3Handling non-integer functions, nesting of functions, recursion, and function with arrays | **10** |
| **Unit 8:Structures and Unions** | | |
| • Define Structure.<br>• Understand Structure initialization<br>• Demonstrate arrays of structure, arrays within structure<br>• Identify use of structure in functions<br>• Compare structure and Union. | 8.1Structure definition, giving values to members, structure initialization and comparison of structure variables.<br>8.2Arrays of structures, arrays within the structure, structure and functions, Unions, size of structures, bit fields & bit operations | **08** |
| **Unit 9: Introduction to Pointers** | | |
| • Define Pointer<br>• Understand declaration of pointers, initialization of pointers and pointer Expressions<br>• Describe application of pointers<br>• Demonstrate function returning pointer and passing address to functions | 9.1 Pointer Concept,& and * operators, Declaration of Pointers, Initialization of pointers, Pointer Expressions, Application of pointers, Array of Pointers, Pointer to array, function, structure, Function returning pointer and passing addresses to functions. | **06** |
| | **Total** | **48** |

**List of Practicals /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | TUTORIAL | CO | Hrs. |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1. | Demonstration of GCC Compiler, Creating a programCompiling & linking executing programs | Overview of 'C' | 01 | | 02 |
| 2. | Write 'C' programs based on declaring variables & assigning values to variables. (Minimum 3). | Data Types & Character Set | 01 | | 02 |
| 3. | Write programs based on expressions and operators.<br>Programs using scanf(), printf(), getch(), putch**().(Minimum 4)** | Operatorsn& Expressions | 02 | | 02 |
| 4. | Programs using following control statements:<br>If statement,Switch statements,?: operator, go to statements<br>Programs using following loop controls,while loop<br>do.. while loop for loop**(Minimum 5)** | Decision Making | 02 | | 06 |
| 5 | Write programs based on arrays**. (Minimum 4)** | Arrays | 02 | | 04 |
| 6. | Write programs using strings operations such as comparison, concatenation, copying etc.**(Minimum 3)** | Strings | 02 | | 04 |
| 7. | Examples on User defined functions, demonstration of return data types.<br>Write programs demonstrating four categories of functions.<br>Programs based on recursion & nesting of functions.**(Minimum 5)** | User defined functions | 02 | | 04 |
| 8. | Write programs based on structure definition and initialization. | Structures and Unions | | | 04 |

| | | | | | |
|---|---|---|---|---|---|
| | Write programs based on structure within structure.<br>Write programs based on bitwise operations.**(Minimum 3)** | | 02 | | |
| 9 | Write programs based on Pointers and pointer applications.<br>**(Minimum 3)** | Introduction to Pointers | 02 | | 04 |
| | Total | | **16** | | **32** |

**Note :**

- All Practicals should be performed on GCC compiler.
- Minimum 30 Programs as specified in practical coverage section should be executed.
- Actual program statements on practical topics should be framed by the respective teachers.
- During Tutorial session various examples should be taken as per the concepts of Theory.

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Overview of 'C' | Demonstration of GCC Compiler, Create simple program |
| 2 | Data types & character set | Write 'C' programs based on declaring variables & assigning values to variables. |
| 3 | Operators & Expressions | Explanation of operators, expressions & managing i/p & o/p operators. |
| 4 | Decision Making | Theoretical explanation + writing program using different control statements. |
| 5 | Arrays | Theoretical explanation & implementation of arrays. |
| 6 | Security & Permissions, Application Deployment | Explanation on security and App development and deployment. Demonstrate App deployment and publishing App. Hands-on practice on App deployment. |

| | | |
|---|---|---|
| 7 | Strings | Theoretical explanation & implementation of strings. |
| 8 | User defined functions | Explanation & implementation of examples on user defined functions, |
| 9 | Structures and Unions | Theoretical explanation & implementation of structures & Unions. |

**Specification Table for Theory Paper:**

| Unit No | Topic | Levels from Cognition Process Dimension | | | Total marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Overview of 'C' | 01 | 01 | 02 | 04 |
| 02 | Data types & character set | 02 | 01 | 03 | 06 |
| 03 | Operators &Expressions | 03 | 03 | 04 | 10 |
| 04 | Decision Making | 02 | 04 | 02 | 08 |
| 05 | Arrays | 03 | 04 | 05 | 12 |
| 06 | Strings | 02 | 02 | 02 | 06 |
| 07 | User defined functions | 04 | 04 | 04 | 12 |
| 08 | Structures and Unions | 05 | 04 | 03 | 12 |
| 09 | Pointers | 03 | 02 | 05 | 10 |
| Total marks | | | | | 80 |

R-Remember U – Understand A – Analyze / Apply

**Scheme Of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations | 10 |

| | | |
|---|---|---|
| | | |
| 2 | Practical Performance | 20 |
| 3 | Viva voce | 20 |
| | **TOTAL** | **50** |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication |
|---|---|---|
| 1 | Programming in ANSI 'C' | E. Balagurusamy<br>Tata- McGraw Hill pub.(Second Edition) |
| 2 | Let us 'C' | YeshwantKanetkarBPB Publication |
| 3 | C for Beginners | MadhusudhanMothe SPD Publication |

**Prepared by** **Member Secretary PBOS** **Chairman PBOS**

**Name of Programme** **: Diploma in Comp Engg / Info.Tech.**
**Programme Code** **:06 / 07/26**
**Name of Course** **: Computer Workshop (CM/ IT)**
**Course Code** **: CM283**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| Theory | -- | -- |
| Term Work/Practical | 04 | 64 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |

| | | | | | |
|---|---|---|---|---|---|
| Duration | -- | -- | -- | -- | -- |
| Marks | -- | -- | -- | 25 | 50 |

**Course Rationale:**

The Subject is intended to teach the student conversant with use of various PC components and devices which will enable him to apply for connecting different components of Computer system.. This subject serves as the base for understanding the principles and procedures ofExternal Interfaces of Laptop such as Memory card reader, USB connectors.

**Course Outcomes:**

**After completing this course, student will be able to**

1. Identify various components of Computer System.
2. Assemble and dissemble Computer system
3. Mount and Un-mount different expansion cards/memory cards on Motherboard.
4. Identify various types of i/o ports for any computer system.
5. Connect different types of external devices to computer.

**List of Practicals/Experiments/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Hrs |
|---|---|---|
| 1. | Demonstration of Parts of Computer System | 02 |
| 2 | Practice I/O devices : Keyboard, Mouse, Monitors, Speakers | 04 |
| 3 | Practice I/O devices: Web Camera, Printers, and Scanner | 04 |
| 4 | Demonstration of Switching on and Turn off , Log Off the Computer and its modes | 02 |
| 5 | Demonstration of Front Panel View and its use. | 02 |
| 6 | Implementation of Rear Panel View, I/O Serial and Parallel Ports | 02 |
| 7 | Demonstration of opening and closing of the Computer | 02 |
| 8 | Installing Keyboards and Mouse Interface | 02 |
| 9 | Setting up CRT Monitor, Installing LCD Monitors. Demonstration of settings on monitor. | 04 |
| 10. | Connections inside CPU and its demonstration | 02 |
| 11. | Setting up the Cabinet. | 04 |
| 12. | Identify and Demonstration of different slots on motherboard. Mounting and Un mounting of RAM, Graphics card and Network card | 04 |
| 13. | Connecting motherboard connections to Front Panel , Mouse , Keyboard , and Monitor | 04 |
| 14. | Connecting the Optical Drives | 02 |
| 15. | Connecting Printer to the machine and network and studying configurations | 04 |

| | | |
|---|---|---|
| 16. | Connecting Scanner and scan the document. | 02 |
| 17. | Connecting Speakers and Microphone and it's usage. | 02 |
| 18. | Connecting Web Camera and it's usage. | 02 |
| 19. | Demonstration of RJ45 connector and its use. | 04 |
| 20. | Demonstration of Bluetooth as an external interface | 02 |
| 21. | Connecting External hard disk. | 02 |
| 22. | Identify and Demonstration of External Interfaces of Laptop such as Memory card reader, USB connectors | 02 |
| 23. | Study of Laptop: Replacing Laptop Battery, Dismantling Laptop. | 04 |
| | Total | 64 |

**Scheme Of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations, | 05 |
| 2 | Practical Performance | 15 |
| 3 | Viva voce | 05 |
| | **TOTAL** | **25** |

Prof. B.K. Vyas Prof. S.V. Chaudhari Prof. U. V. Kokate

**Prepared By (Member Secretary PBOS) (Chairman PBOS)**

**Programme : Diploma in Comp Engg/Info Tech**
**Programme Code : 06/26/07**
**Name of Course : Linux Basics**
**Course Code : CM284**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| Theory | 01 | 16 |
| Practical | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 Minutes | -- | -- | --- | --- |
| Marks | -- | -- | 50 | -- | 25 |

**Course Rationale:**

Linux Operating System is Open source and freely distributed O.S. Apart from the fact that it's freely distributed, Linux's functionality, adaptability and robustness makes it highly suitable for server platform. The course aims at providing knowledge of shell and command line essentials

**Course Outcomes:**

1. Install and Configure Linux O.S.
2. Use and Implement basic commands of Linux operating system.
3. Write and execute programs using shell scripting
4. Use vi editor to handle files.
5. Compress and archive files in Linux OS.

**Course Content:**

| **Specific Learning Outcomes (Cognitive Domain)** | **Name of Topic/Sub topic** | | **Hrs** |
|---|---|---|---|
| **Unit-1 Introduction to Linux Operating system** | | | |
| • Describe History of linux<br>• Identify different types of shells | 1.1 | Operating system and Linux | **03** |
| | 1.2 | History, Overview of Linux | |
| | 1.3 | Shell: Bourne, Korn, Cshell | |

| | | | |
|---|---|---|---|
| • Compare Linux file systems | 1.4 | Linux releases, Linux File Systems(ext) and versions. | |
| **Unit-2 The Linux File Structure:** | | | |
| • Describe Linux file structure<br>• Use file name arguments, absolute and relative pathnames.<br>• Execute file related commands.<br>• Execute commands using pipes and I/O redirection | 2.1 | Linux Files, The File Structure: Directories & files. | **04** |
| | 2.2 | Absolute and Relative Pathnames | |
| | 2.3 | Listing, Displaying and Printing Files: ls, cat, more and Managing Directories: mkdir, rmdir, ls, cd and pwd, File and Directory Operations: find, cp, mv, rm | |
| | 2.4 | File Name Arguments: *, ?, [ ], Standard Input/ Output and Redirection | |
| | 2.5 | Pipes, invoking command history. | |
| **Unit-3 :File Management Operations** | | | |
| • Change file and directory permissions<br>• Compress and archive files. | 3.1 | File and Directory Permissions: chmod | **02** |
| | 3.2 | Archive :tar | |
| | 3.3 | File Compression: gzip, gunzip | |
| **Unit-4 Editors and Utilities** | | | |
| • Create and modify files using vi editor.<br>• Apply line editing command. | 4.1 | The vi Editor: vi Command, Input, and Line Editing Modes | 03 |
| | 4.2 | Creating, Saving and Quitting a File in vi, Managing Editing Modes in vi | |
| | 4.3 | vi Editing Commands: Common Operations | |
| **Unit-5 Shell Programming** | | | |

| | | | |
|---|---|---|---|
| • Execute Linux Filters.<br>• Execute commands using regular expressions.<br>• Execute shell script programs. | 5.1 | Filters and Regular Expressions: Using Redirection and Pipes with Filters: cat, tee, head and tail | 04 |
| | 5.2 | Types of Filter Output : wc, spell and sort. | |
| | 5.3 | Configuring Your Login Shell with Special Shell Variables | |
| | 5.4 | Introduction to BASH Shell Programming, Variables and Scripts | |
| | | **Total** | **16** |

**List of Practicals/Experiments/Assignments:**

| Sr. No. | Name of Experiment/Assignment | Unit No. | Course Outcomes | Hrs |
|---|---|---|---|---|
| **1.** | Installing Linux:Hardware, Software , Requirements, Opening Disk space for Linux partitions | 1 | CO1 | 04 |
| | Virtual Consoles | | CO1 | |
| | Configuring GRUB / LILO Boot Loader. | | CO1 | |
| **2.** | Executing commands related to Login into user accounts, start up and shutdown commands, command line editing commands, man, who, who am i ,info , pwd. | 2 | CO2 | 04 |
| | Practicing Absolute and Relative Pathnames | 2 | CO2 | |
| **3.** | Executing various file Related commands –cat, more,ls, cd, cp, mv , rm, touch, mkdir,rmdir, find. | 2 | CO2 | 04 |
| | Executing Commands I/O redirection and pipes. | 2 | CO2 | |
| **4.** | Practicing File Name Arguments: *, ?, [ ] | 2 | CO2 | 04 |
| | Creating User Defined commands | 2 | CO2 | |
| **5.** | Setting/Changing file and directory related permissions chmod | 3 | CO2 | 02 |

| | | | | |
|---|---|---|---|---|
| **6.** | Executing commands related to archive and file compression | 3 | CO5 | 02 |
| **7.** | Executing various commands related to vi Editor. . | 4 | CO4 | 04 |
| | Practicing editing with vi editor | 4 | CO4 | |
| | Practicing vi editing commands | 4 | CO4 | |
| **8.** | Executing various Shell commands: cat, tee, head and tail. | 5 | CO3 | 02 |
| | Creating shell variables. | 5 | CO3 | |
| **9.** | Configuring Login Shell with Special Shell Variables. | 5 | CO3 | 02 |
| | Practicing filter output: wc, spell and sort. | 5 | CO3 | |
| **10.** | BASH Shell Programming (any 4 basic programs without looping) | 5 | CO3 | 04 |
| | | | **Total** | **32** |

**Text Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1. | Peterson | The Complete Reference Linux (Second Edition) | Tata McGraw Hill |
| 2. | Linux command line and shell scripting | Richard Blum | Willey India |

**Reference Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1. | Prof. Dayanand Ambawade and Prof. Prof. Deven N.Shah | Linux Lab: Hands on Linux | Dreamtech publications |
| 2. | Kerry Cox | Red Hat Linux | PHI |

| Prepared By | Secretary, PBOS | Chairman, PBOS |
|---|---|---|
| (Smt. M. H. Thakare<br>Shri.S.P.Emekar) | Prof. S.V. Chaudhari | Prof. U. V. Kokate |

**Programme : Diploma in CM/IT**
**Programme Code : 06/26/07**
**Course Name : Web Designing using HTML**
**Course Code : CM285**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | 01 | 16 |
| **Practical** | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| **Duration** | -- | -- | -- | -- | -- |
| **Marks** | -- | -- | 50 | -- | 25 |

**Course Rationale:**

In the Era of Web technology it is essential for every Diploma Engineering students to understand the various steps for designing a creative and dynamic Web site and finally create good effective and customized websites. This course covers Web designing using HTML/ DHTML, internet related technologies and systematic way of developing a Website.

**Course Outcomes:**

**After completing this course students will be able to**

1. Use HTML tags for information representation on webpages..
2. Design HTML forms.
3. Format web pages using CSS.
4. Develop static web sites.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1 :Introduction to Common HTML and Links and Addressing.** | | |

| | | |
|---|---|---|
| • Define HTML.<br>• State the Terminologies used in Web Design.<br>• Describe Block Level Elements.<br>• Define Components of HTML Tags.<br>• Enlist Text Level Elements.<br>• Create the different List.<br>• Write a program for Linking HTML Documents. | 1.1 Introduction to HTML<br>1.2 Web Publishing<br>1.3 Terminologies used in Web Design: Web, Web site, Web page, Web server, Web Browser, Search Engine<br>1.4 Components of HTML: Tags – closed tags and open tags, Attributes, Elements<br>1.5 Structure Tags : !DOCTYPE, HTML, HEAD, TITLE, BODY tags.<br>1.6 Block Level Elements : Headings, Paragraphs, Breaks, Divisions, Centered Text, Block Quotes, Preformatted text, Address.<br>1.7 Text Level Elements: Bold, Italic, Teletype, Underline, Strikethrough, Superscript, subscript.<br>1.8 Horizontal Rules, Special characters, Adding comments , The Meta tag.<br>1.9 Creating Lists: OrderedLists ,Unordered Lists ,Definition Lists, Nested Lists.<br>1.10 Linking HTML DocumentsURL: Types of URLs, Absolute URLs, Relative URLs, The Anchor Tag.Linking : To document in the same folder, To document in the different folder, To document on the web, To specific section within the document, Inserting E-mail link. | **04** |
| **Unit 2:IMAGES, COLORS AND BACKGROUNDS** | | |
| • Find Image Formats, Inline Image.<br>• Describe HSPACE & VSPACE.<br>• Differentiate between Server side image maps & Client side image maps.<br>• Describe Text Color.<br>• Write a program for setting text color & background Color.<br>• Write a program for setting background images.<br>• Describe attribute of BODY tag | 2.1 Image:<br>Image formats : gif, jpeg, png<br>The inline image: an IMG tag, alternate text, image alignment, buffer space – HSPACE, VSPACE, wrapping text, height and width of images, Image as a link. Image maps : Server side image maps, Client side image map<br>2.2 colors and Backgrounds:<br>The text color: color attribute of FONT tag, text attribute of BODY tag.<br>Background color: bgcolor attribute of BODY tag.<br>Background images: background attribute of BODY tag.<br>Changing link colors: link, alink, vlink | **04** |

| | | |
|---|---|---|
| | attributes of BODY tag. | |
| **Unit 3: TABLES, FRAMES AND FORMS** | | |
| • State Basic Tables Tags.<br>• Describe how to add Captions.<br>• Define Frames.<br>• Enlist Advantages & Disadvantages of Frames.<br>• Write a program to Create Frame using Frame Tag.<br>• Define Forms.<br>• Write a program to Create basic form using different form fields.<br>• Describe Buttons Tag. | 3.1 Tables:<br>Creating basic tables: TABLE, TR, TH, TD tags.<br>Formatting tables : border, cellspacing, cellpadding, width, align, bgcolor attributes.<br>Adding captions : CAPTION tag.<br>Formatting contents in the table cells: align, valign, bgcolor, height, width, nowrap attributes. Spanning rows and columns :rowspan and colspan attributes.<br>3.2 Frames:<br>Introduction to frames : What is frame?, Advantages and disadvantages of using frames.<br>Creating frames: FRAMESET tag – rows, cols attributes, FRAME tag – name, frame border, margin height, margin width, src, resize, scrolling attributes.<br>Use of NOFRAMES tag , Frame targeting.<br>3.3 Forms:<br>Creating basic form: FORM tag, action and method attributes.<br>Form fields: Single line text field, password field, multiple line text area, radio buttons, check boxes. Pull down menus: SELECT and OPTION tags.<br>Buttons: submit, reset and generalized buttons. Formatting technique: Using table to layout form<br>. | **04** |
| **Unit 4: STYLE SHEETS** | | |
| • Define CSS.<br>• Write a program for adding different Style to the Document.<br>• Describe Selectors.<br>• Describe Style Sheet Properties.<br>• Write a Program displaying Style Sheet Properties. | 4.1 Adding style to the document: Linking to style sheets, Embedding style sheets, Using inline style.<br>4.2 Selectors: CLASS rules, ID rules.<br>4.3 Style sheet properties: font, text, box, color and background properties. | **04** |
| | **Total** | **16** |

## LIST OF PRACTICALS/LABORATORY EXPERIENCES/ASSIGNMENTS:

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Designs Web page and apply some block level tags and some text level tags. | Introduction to Common HTML and Links and Addressing. | 04 |
| 2. | Include Horizontal Rules and special characters in a Web page. | | 04 |
| 3. | Design web page and include different list | | 02 |
| 4. | Implement various links in a Web page | | 02 |
| 5 | Include images with different alignments and wrapped text in Web page. Also include image as a link in the Web page. | Images, Colors And Backgrounds | 04 |
| 6. | Design a web page and set background colour and document wide text colour. | | 02 |
| 7. | HTML table, format contents in table cells and span the rows and columns. Create | TABLES, FRAMES AND FORMS | 02 |
| 8. | Create basic frameset and format the frames within the frameset using different attributes. Also use frame targeting | | 04 |
| 9. | Create a basic form using different input controls and pull down menu. | | 02 |
| 10 | Use table to lay out form with different form controls and generalized buttons. | | 02 |
| 11 | Create a web page and apply style sheet properties (font, text and box properties). | STYLE SHEETS | 02 |
| 12 | Create a web page to get watermark effect using style rules. | | 02 |
| | | **Total** | **32** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|

| | | |
|---|---|---|
| 1 | Introduction to Common HTML and Links and Addressing. | Class room teaching, laboratory work |
| 2 | Images, Colors And Backgrounds | Class room teaching, laboratory work |
| 3 | Tables, Frames And Forms | Class room teaching, laboratory work |
| 4 | Style Sheets | Class room teaching, laboratory work |

**Specification Table for Theory Paper:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total |
|---|---|---|---|---|---|
| | | R | U | A | |
| **1** | Introduction to Common HTML and Links and Addressing: | 02 | 02 | 02 | 06 |
| **2** | HTML Images And Layout: Text Alignment, Tables and Fonts | 01 | 03 | 01 | 05 |
| **3** | Advanced Layout: Frames and Layers | 01 | 01 | 02 | 04 |
| **4** | Style Sheets and HTML Forms | 02 | 02 | 01 | 05 |
| **Total** | | **06** | **08** | **06** | **20** |

R-Remember U – Understand A – Analyze / Apply

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | The Complete Reference: HTML | Thomas A.Powell, Tata McGraw Hill,5th Edition | 9780071496292 |
| 2 | Mastering HTML 4.0 | Deborah S. Ray , Eric J. Ray ,BPB | 9780782121025 |

**E-References:**

- https://www.w3.org/TR/**html**401/struct/**links**.**htm**

- **www.w3schools.com/html/html_links.asp**
- www.w3schools.com/TAGs/att_body_bg**color**.asp
- link.springer.com/chapter/10.1007%2F978-0-85729-449-4_3
- https://www.tutorialspoint.com/**html**/**html_frames**.htm
- www.**html**help.com/reference/**css**/**style-html**.**html**

| | | |
|---|---|---|
| Prof.Aafiya Shaikh | Prof.U.V.Kokate | Prof.S.V.Chaudhari |
| **Prepared By** | **Chairman, PBOS** | **Secretary ,PBOS** |

| | | |
|---|---|---|
| **Programme** | **:** | **Diploma in Comp Engg/Info Tech.** |
| **Programme Code** | **:** | **06/26/07** |
| **Name of Course** | **:** | **Fundamentals of Electrical Engineering** |
| **Course Code** | **:** | **EE283** |

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | 03 | 48 |
| **Practical** | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two Class Tests each of 60 Min duration | 03 Hrs | --- | --- | --- |
| Marks | 20 | 80 | --- | 25 | 25 |

**Course Rationale:**

Every branch of engineering is related with electrical engineering. Every student Should know fundamentals of electrical engineering. From this point of view this Course is introduced

**Course Objectives:**

After studying this course, the student will be able to

1. Apply basic principles and different effects of electrical current in electrical engineering field.
2. Apply the principles ofmagnetic circuits and electromagnetic induction to DC motor, Induction motor and Transformer and supervise their operation.
3. Analyse behavior of capacitor from basic concepts and principles.
4. Compute electrical quantities like current, voltage, power in AC circuit.
5. Describe the precautionary measures and their importance while working with electrical installation.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Name of Topic/Sub topic | | Hrs |
|---|---|---|---|
| **Unit-1 Electrical Circuits:** | | | |
| • Enlist advantages and disadvantages of electrical power supply<br>• Identify the commonly used materials and components used in electrical circuit.<br>• Apply voltage divider rule for series circuit.<br>• Apply current division rule for parallel circuit. | 1.1 | Introduction to electric power supply system, AC supply –single phase and three phase, DC supply. | |
| | 1.2 | Resistance, Effect of temperature on resistance (pure metals, insulators, alloys), temperature coefficient of Resistance. | |
| | 1.3 | Resistances in series, voltage division formula. | |
| | 1.4 | Resistances in parallel, current division formula. | |
| **Unit-2 Magnetic Circuit** | | | |
| • Describe the various basic parameters of magnetic field.<br>• Give the comparison between magnetic circuit and electric circuit.<br>• Solve basic problems of series magnetic circuit.<br>• Describe significance of magnetization curve and hysteresis loop. | 2.1 | Introduction to magnetic circuit, M.M.F., absolute and relative permeability, reluctance, relation between M.M.F. and reluctance | |
| | 2.2 | Comparison of magnetic & electrical circuits. | |
| | 2.3 | Simple series magnetic circuits, concept of useful flux, leakage flux, total flux & fringing. | |
| | 2.4 | Magnetization curves. Concept of hysteresis, hysteresis loop & loss | |
| **Unit-3 Electromagnetic Induction** | | | |
| • State and apply Faraday's law of electromagnetic | 3.1 | Faradays laws of Electromagnetic Induction. | |
| | 3.2 | Types of induced e.m.f : Dynamically induced e.m.f and Statically induced e.m.f (self and mutually) | |
| | 3.3 | Lenz's law, Fleming's right hand rule. | |

| | | | |
|---|---|---|---|
| induction.<br>• Differentiate between statically and dynamically induced emf.<br>• State and apply Lenz's law and Fleming's right hand rule.<br>• Differentiate between self and mutual inductance. | 3.4 | Self and mutually induced inductance ,Coefficient of coupling. | |
| **Unit-4 Electrostatics** | | | |
| • Define the terms related to electrostatic.<br>• Explain the concept of capacitance and working of capacitor. Calculate the capacitance in electrical circuits.<br>• Explain the concept of capacitance with single and composite dielectric medium.<br>• State the expressions for charging and discharging of capacitor through resistance and solve simple numericals on it. | 4.1 | Brief review of electric field, field density, permittivity, relative permittivity, charge & their relation | |
| | 4.2 | Capacitor & Capacitance, Dielectric constant, Capacitors in series & parallel | |
| | 4.3 | Capacitance of parallel plate capacitor with single dielectric and composite dielectric medium. | |
| | 4.4 | Charging and discharging of capacitor to give idea of RC time constant (no derivation) | |
| **Unit-5 A.C. Fundamentals** | | | |
| • Explain generation of alternating voltage.<br>• Define various electrical parameters related with alternating quantity.<br>• Explain concept of | 5.1 | Generation of single phase alternating voltage and current, Graphical representations of sinusoidal e.m.f and current. General Equation of Alternating quantity | |
| | 5.2 | Definitions of instantaneous value, cycle, period, frequency, amplitude.Peak value, average value, r.m.s. value of an alternating quantity, peak factor and form factor | |

| | | | |
|---|---|---|---|
| lagging and leading alternating quantity.<br>• Explain the concept of phasor representation of alternating quantity.<br>• Explain the behaviour of alternating voltage, current and power through pure resistance, pure inductance and pure capacitance with phasor diagram and waveforms.<br>• Explain the behaviour of alternating voltage and current through series RL circuit with phasor diagram and waveform.<br>• Explain the behaviour of alternating voltage and current through series RC circuit with phasor diagram and waveform. | 5.3 | Concept of phase and phase difference. Concept of lagging and leading | |
| | 5.4 | Representation of an alternating quantity by phasor | |
| | 5.5 | Waveforms and Phase diagram for a | |
| | | Purely resistive AC circuit | |
| | | Purely inductive AC circuit. | |
| | | Purely capacitive AC circuit. | |
| | | (Voltage, Current, power, p.f. relations and phasor diagrams,). | |
| | 5.6 | RL Series circuit: Waveforms , phasor diagram, Impedance, Impedance triangle, power factor. | |
| | 5.7 | RC circuit: Waveforms, phasor diagram, Impedance, Impedance triangle, power factor | |
| **Unit-6 Three Phase Circuits** | | | |
| • Explain the concept of generation of 3 phase alternating voltage.<br>• Define phase sequence and types of interconnection of three phase systems.<br>• Explain the concept of balanced load and balanced supply system.<br>• Solve numerical related to star and delta connection for line and phase quantities. | 6.1 | Generation of 3-phase voltage and its waveform. | |
| | 6.2 | Phase sequence, star & delta connection. | |
| | 6.3 | Concept of balanced load.Concept of balanced supply system. | |
| | 6.4 | Voltage, current, power relations in star & delta connected system & numerical ,Vector diagram. | |

| | | | |
|---|---|---|---|
| **Unit-7 Single phase Transformer** | | | |
| • Explain the working principle of single phase transformer and function of various parts of single phase transformer.<br>• Classify the various types of transformer.<br>• State the emf equation of single phase transformer.<br>• State voltage and current ratio of single phase transformer.<br>• State various losses in transformer, expression for efficiency and regulation of single phase transformer. | 7.1 | Definition, principal of working, construction, | |
| | 7.2 | Types of transformer on the basis of voltage, power & construction. | |
| | 7.3 | E.M.F. equation (No derivation). | |
| | 7.4 | Voltage, current ratio o f a transformer. | |
| | 7.5 | Losses in transformer, efficiency & regulation of transformer.(No Numericals) | |
| **Unit-8 Electrical Motors** | | | |
| • Explain working principle of dc motor. Material used and function of various parts of dc motor.<br>• Classify different types of motor.<br>• Compare performance and list applications of various types of dc motors.<br>• Justify the need of starter for dc motor.<br>• Explain working principle of three phase I.M. Material used and function of each part of | **A)** | D.C. Motors | |
| | 8.1 | Construction and Working principle of d .c. motor | |
| | 8.2 | Types of motors | |
| | 8.3 | Characteristics & applications of d. c. motors. | |
| | 8.4 | Necessity of a starter for dc Motor. | |
| | **B)** | Induction Motor | |
| | 8.1 | Construction and working principle of three phaseInduction Motor | |
| | 8.2 | Synchronous speed, slip | |
| | 8.3 | Necessity of a starter ,D.O.L starter for three phase induction motor. | |
| | 8.4 | Change the direction of rotation | |
| | 8.5 | Single Phase Induction Motors-<br>Working principle and applications of following Motors<br>I)Split Phase a)Resistance b)Capacitance<br>II)Capacitor start capacitor run<br>III) Shaded pole.<br>Reversal of rotation of above motors. | |
| | **C)** | Special Motors | |

| | | | |
|---|---|---|---|
| three phase I.M.<br>• Describe concept of synchronous speed and slip<br>• Justify the necessity of starter and explain DOL starter used for three phase induction motor.<br>• Study the concept of reversal of rotation for three phase induction motor.<br>• Explain working principle of single phase I.M.<br>• Explain constional features and working of various types of single phase I.M.<br>• Explain working principle of stepper motor and servo motor. State their applications. | 8.1 | Working principle and applications-stepper motor servo motor-AC servo motor & DC servo motor | |
| **Unit-9 Electrical Safety** | | | |
| • Know I.E. rules regarding safety of persons and equipment. Know various types of electrical hazards their causes and remedies.<br>• Know necessary precautions to avoid electrical shock. Rescue electrocuted person and follow artificial respiration methods.<br>• Explain necessity of earthing. | 9.1 | I.E. rules for safety of person & equipment followedwhen working with electrical installation. Electrical Hazards : Causes and Remedies | |
| | 9.2 | Electrical shock, Operational precautions necessary to avoid electrical shock ,Procedure for rescuing a person who has received an electrical shock. | |
| | 9.3 | Necessity of Earthing | |
| | 9.4 | Introduction to circuit protective devices: Concept of overload, O.C.,S.C., leakage current, H.R.C. fuses, MCB, use ofELCB. | |

| | | | |
|---|---|---|---|
| • Explain the necessity of HRC fuse, MCB and ELCB. | | | |

**List of Practical/Experiments/Assignments:**

| Sr. No. | Name of Experiment/Assignment | Hrs |
|---|---|---|
| **1** | To determine temperature rise of resistance of metal | 04 |
| **2** | Verification of Right hand rule for solenoid. | 02 |
| **3** | Verification of Faradays laws of Electromagnetic Induction. | 02 |
| **4** | To plot the B-H curve of a magnetic material. | 02 |
| **5** | To plot the charging & discharging curve of a capacitor. | 02 |
| **6** | To verify the relation between line & phase values of current and voltage in a balanced star & delta connected circuit | 04 |
| **7** | To determine voltage & current ratio of single-phase transformer and determine efficiency and voltage regulation of single phase transformer | 04 |
| **8** | Reversal of rotation of following motor<br>I)D.C.Motor<br>II)Three phase Induction motor | 04 |
| **9** | Demonstration o f use & tripping of MCB against overload & short circuit. | 04 |
| **10** | Demonstration of use & tripping of ELCB against leakage current. | 04 |
| | **Total** | 32 |

**Note:** All practicals are Compulsory.

**Instructional Strategy:**

| Sr. No. | Topic | Instructional Strategy |
|---|---|---|
| **1** | Electrical Circuits | Lecture, Problem solving ,practical |
| **2** | Magnetic Circuits | Lecture, Q/A Technique |
| **3** | Electromagnetic Induction | Lecture, Problem solving |
| **4** | Electrostatics | Lecture, Problem solving ,practical |
| **5** | A.C. Fundamentals: | Lecture, Problem solving ,practical, Q/A Technique |
| **6** | Three Phase Circuits | Lecture, Problem solving ,practical |
| **7** | Single phase Transformer | Lecture, Problem solving ,practical |
| **8** | Electrical Motors | Lecture, Problem solving ,practical |
| **9** | Electrical Safety | Lecture, Demonstration and PPTs |

**Text books:**

| Sr. No. | Author | Title | Publication |
|---|---|---|---|
| 1 | B.L.Theraja | Electrical Technology Vol. I & II. | S. Chand & Co. |

**Reference books:**

| Sr. No. | Author | Title | Publication |
|---|---|---|---|
| | | | |
| 1 | Edvard Hughes | Electrical Technology | Pearson Education |
| 2 | H.Cotton | Electrical Technology | CBC,Delhi |
| 3 | V.N.Mittle | Basic Electrical Engineering | Tata McGraw Hill |

**Specification table:**

| Sr. No. | Topic | Cognitive levels | | | Total |
|---|---|---|---|---|---|
| | | Knowledge | Comprehension | Application | |
| 1 | Electrical Circuits | 02 | 04 | 02 | 08 |
| 2 | Magnetic Circuits | 02 | 04 | 02 | 08 |
| 3 | Electromagnetic Induction | 02 | 04 | 00 | 06 |
| 4 | Electrostatics | 04 | 02 | 02 | 08 |
| 5 | A.C. Fundamentals: | 08 | 06 | 02 | 16 |
| 6 | Three Phase Circuits | 04 | 02 | 02 | 08 |
| 7 | Single phase Transformer | 02 | 02 | 02 | 06 |
| 8 | Electrical Motors | 06 | 06 | 04 | 16 |
| 9 | Electrical Safety | 02 | 01 | 01 | 04 |
| Total | | 32 | 31 | 17 | 80 |

| Prepared By | Secretory PBOS | Chairman PBOS |
|---|---|---|
| ( Ms.V.L.Munde) | (Mr.S.V.Chaudhari ) | ( Mr.C.Y.Totewar ) |

**Name of Programme** : **Diploma in Comp Engg/Info Tech**
**Programme Code** : **06/07/26**
**Name of Course** : **Fundamental of Electronics**
**Course Code** : **ET284**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 03 | 48 |
| Term work / Practical | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 3Hrs | 2 Hrs | — | — |
| Marks | 20 | 80 | -- | 25 | 25 |

**Rationale:**

This course will be useful in understanding of construction, working and applications of semiconductor devices and circuits.

**Course Outcomes:**

**After completing this course students will be able to**

1. Plot the characteristics of semiconductor devices.
2. Interpret working of oscillators.
3. Use OP-AMPIC in circuits.
4. Operate CRO and Function generator.
5. Select appropriate transducers for relevant applications.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| • **Units 1 : Semiconductor devices** | | |
| • Plot V-I characteristics of PN Diode<br>• Define and Measure parameters of diode<br>• Implement Zener diode as voltage regulator<br>• Differentiate between half wave , Full wave and Bridge rectifiers<br>• Analyze and differentiate between CE, CB, CC configurations<br>• Interpret construction and working of UJT, FET and SCR.<br>• Plot V-I characteristics of FET, UJT and SCR. | 1.1 Rectifying diode: Review of P - type and N - type semiconductor,PN junction, Barriervoltage, depletion region,Junction Capacitance, Forward biased & reversed biased junction.<br>Diode symbol , forward & reversed Characteristics of PN junction diode<br>Specifications :<br>Forward voltage drop , Reverse saturation current, maximum forward current , power dissipation ,Package view of diodes of different power ratings (to be shown during practical hours)<br>1.2Zener diode :<br>Construction ,Symbol ,characteristics ( forward & reversed ) Avalanche &Zener breakdown<br>Specifications :<br>Zener voltage , power dissipation , break over current, dynamic resistance & maximum reverse current (to be shown during practical hours)<br>1.3Rectifier :<br>Half wave and Full wave Rectifier, circuit diagram, working, comparison, merits and demerits. Filters, necessity, types, comparison, merits, demerits.<br>1.4 Transistor :<br>construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison between CB, CE, CC. | **16** |

| | | |
|---|---|---|
| | 1.5 UJT<br><br>Construction, symbol, operating principle, characteristics, applications, rating and specifications.<br><br>1.6 FET**:** Construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison.<br><br>1.7 SCR :<br><br>Symbol, their construction, working, characteristics, applications. | |
| **Unit 2:Oscillator** | | |
| • State Barkhausen criteria for oscillator.<br><br>• Classify oscillators.<br><br>• Draw circuit and explain working of RF, LF and tuned oscillator. | 2.1Block diagram, Barkhausen Criteria for sustained oscillations<br><br>2.2classifications: LC and RC. Oscillations in LC tank circuit; Hartley; Colpitts. RC Wein Bridge and Phase shift, Oscillator. Crystal Oscillator. | **08** |
| **Unit 3:Linear ICs** | | |
| • Draw symbol and pin diagram of IC 741.<br><br>• Define various parameters related to OP-AMP.<br><br>• Derive expression for various mathematical operation of OP-AMP.<br><br>• Draw and explain block diagram of Timer IC555.<br><br>• Implementation of timer as Astable andMono stablemultivibrator. | 3.1OP AMP. IC 741, symbol, pin diagram, ideal and typical characteristics, Applications such as Inverting , Non Inverting amplifier, Difference amplifier, adder substractor , Integrator, differentiator.<br><br>3.2Timer IC 555: Block diagram, operating modes viz. Astable, Monostable. | **09** |

| Unit 4:Instrumentation | | |
|---|---|---|
| • Draw and explain blocks of CRO and Function generator.<br>• State applications & specifications of CRO and Function generator. | 4.1 CRO: Cathode Ray Tube, Oscilloscope Block diagram, operation, oscilloscope specifications, Applications.<br>4.2Function generator, Block diagram, operation, specifications, applications | **07** |
| **Unit 5:Transducer** | | |
| • Define and classify transducers.<br>• State selection criteria of transducer.<br>• Differentiate betweenActive-Passive, Primary- Secondary, and Analog- Digital transducers.<br>• Interpret working principle and application ofResistive, Capacitive, Inductive, Transducers (LVDT), Photoelectric, Piezoelectric Transducers, proximity switchtransducers. | 5.1Definition, classification: Active, Passive, Primary, Secondary, Mechanical, Electronic, Analog, Digital, Selection criteria, Resistive, Capacitive, Inductive, Transducers(LVDT), Photoelectric, Piezoelectric Transducers, proximity switch, Construction, Operation, One example of each, Applications | **08** |
| | **Total** | **48** |

**List of Practicals/Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Plot V-I characteristics of P-N junction diode. | Semiconductor Devices | 02 |
| 2. | Study of Half wave and Full wave rectifier with and without filter. | | 02 |
| 3. | Plot the input and output characteristics in CE configurations. | | 04 |
| 4. | Plot the characteristics of FET. | | 04 |

| | | | |
|---|---|---|---|
| 5 | Plot the characteristics of UJT. | | 02 |
| 6. | Plot the characteristics of SCR. | | 02 |
| 7. | Study of Hartley and Colpitts oscillator. | Oscillator | 02 |
| 8. | Study of RC phase shift and Wein Bridge. | | 02 |
| 9. | Study of Inverting and Non Inverting Amplifier. | Linear ICs | 02 |
| 10. | Study of Integrator and Differentiator. | | 02 |
| 11. | Study of astablemultivibrator using 555. | | 02 |
| 12. | Study of C.R.O. | Instrumentation | 02 |
| 13. | Study of Function generator. | | 02 |
| 14. | Study of Transducers. | Transducer | 02 |
| | | **Total** | **32** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Semiconductor Devices | Classroom teaching and laboratory work, assignments, PPTs,Videos and animation. |
| 2 | Oscillator | Classroom teaching and laboratory work, assignments, PPTs, Videos and animation. |
| 3 | Linear ICs | Classroom teaching and laboratory work, assignments, PPTs. |
| 4 | Instrumentation | Classroom teaching and laboratory work, assignments, preparing charts. |
| 5 | Transducer | Classroom teaching and laboratory work, assignments, PPTs, Videos and animation, preparing charts. |

**Specification Table for Theory Paper**

R-Remember U – Understand A – Analyze / Apply

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Semiconductor Devices | 08(04) | 08(04) | 06(02) | 22(10) |
| 02 | Oscillator | 04(04) | 08(04) | 04(00) | 16(08) |
| 03 | Linear ICs | 04(00) | 06(00) | 04(06) | 14(06) |
| 04 | Instrumentation | 04(00) | 04(06) | 04(00) | 12(06) |
| 05 | Transducer | 04(02) | 06(08) | 06(00) | 16(10) |
| | **Total** | **24(10)** | **30(22)** | **26(08)** | **80(40)** |

**Scheme Of Practical/Oral Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations, | 05 |
| 2 | Calculations and Result | -- |
| 3 | Viva voce | 20 |
| | **TOTAL** | **25** |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Basic Electronics. | Albert Malvino, 8th Edition,Tata McGraw Hill,2015 | ISBN10:1259200116ISBN13:9781259200113 |
| 2 | Basic Electronics. | J.S.Katre. Edition 2017, Techmax Publishers | ISBN-10: 9350779641 ISBN-13: 978-9350779644 |
| 3 | Basic Electronics. | B.L.Theraja, S Chand Publishing, 2007 | ISBN 10: 8121925568 ISBN 13: 9788121925563 |
| 4 | Linear Integrated Circuits | RamakantGaikwad,4TH EDITION, PHI Publication, | ISBN 10: 8120320581 ISBN 13: 9788120320581 |
| 5 | Modern Digital Electronics | R P Jain, McGraw Hill Education Pvt. Ltd, 4th Edition,2012 | ISBN 10: 0070669112 ISBN 13: 9780070669116 |
| 6 | Instrumentation | A K Sawheny, Nineteenth edition, 2017, DhanpatRai publication | ISBN : 8177001006 |

**E-References:www.howstuffworks.com**

1. www.nptel.com
2. http://www.electronics-tutorials
3. https://en.wikipedia.org/wiki/P%E2%80%93n_junction
4. https://learn.sparkfun.com/tutorials/transistors
5. http://www.pitt.edu/~qiw4/Academic/ME2082/Transistor%20Basics.pdf
6. http://faculty.cord.edu/luther/physics225/Handouts/transistors_handout.pdf
7. http://www.technologystudent.com/elec1
8. www.slideshare.net/manash234/classification-of-transducers
9. http://www.electrical4u.com
10. /linear-variable-differential-transformer/

**Prepared by** **(Member Secretary PBOS)** **(Chairman PBOS)**

**Programme : Diploma in Information Technology**

**Programme Code : 07**
**Name of Course : Basics of Information Technology**
**Course Code : IT281**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | **03** | **48** |
| **Practical** | **02** | **32** |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | **Two class tests of 60 Minutes** | 02 | 02 | --- | --- |
| Marks | 10 | 40 | 25 | -- | 25 |

**Course Rationale:**

IT for fast communications, data processing and market intelligence. IT plays an integral role in every industry, helping companies improve business processes, achieve cost efficiencies, drive revenue growth and maintain a competitive advantage in the marketplace.

**Course Outcomes:**

1. Represent logic in algorithm and understand binary systems.
2. State characteristics of Memories.
3. Describe working of input output devices.
4. Explain Classification ,Components and Applications of Computers
5. Explain types of Internet connections and multimedia concepts.
6. Explain importance of E-Commerce.

**Course Content:**

| Unit No. | Name of Topic/Sub topic | | Hrs |
|---|---|---|---|
| **1** | **Algorithms and Data Representation** | | |
| • Learning Outcomes:<br>• Differentiate between algorithm and a program.<br>• Explain ASCII EBCDIC and Unicode<br>• Define :<br>• - Bits<br>• - Bytes<br>• - Parity Bit<br>• State the need for Binary System.<br>• Use MS-Office Word, Excel , Powerpoint and Access | 1.1 | Introduction | **08** |
| | 1.2 | Three Basic Operations | |
| | 1.3 | Procedures and Programs | |
| | 1.4 | Representing Different Symbols | |
| | 1.5 | Relevance to the Computer | |
| | 1.6 | Minimizing Errors | |
| | 1.7 | Representing more symbols | |
| | 1.8 | Generic Formula | |
| | 1.9 | ASCII and EBCDIC Code | |
| | 1.10 | Bits and Bytes | |
| | 1.11 | Parity Bit | |
| | 1.12 | Writing a Character in the memory and on the disc | |
| | 1.13 | Unicode | |
| | 1.14 | Need for Binary | |
| **2** | **Main memory and Secondary Memory** | | |
| • Differentiate between Load and Store operation.<br>• List and state characteristics of Primary and Secondary storage devices.<br>• Describe working of Hard Disk, Optical Disk , Pen Drive.<br>• Install, Configure, | 2.1 | Introduction | |
| | 2.2 | Main memory | |
| | 2.3 | Load and Store Instructions | |
| | 2.4 | Transferring a Data Item and a Record | |
| | 2.5 | Cache Memory | |
| | 2.6 | Memory Capacity | |

| | | | |
|---|---|---|---|
| • Setup Hard Disk.<br>• Setup BIOS | 2.7 | Memory Categories | **08** |
| | 2.8 | What are Memories Made of | |
| | 2.9 | Hard Disks and CDs | |
| | 2.10 | Memory Hierarchy | |
| | 2.11 | Hard Disks Working | |
| | 2.12 | Optical Disks Working | |
| | 2.13 | Pen Drives | |
| **3.** | **IO Media** | | |
| • List and state features of Input-Output Devices.<br>• Describe Types ofPrinters.<br>• State characteristic and use of RFID and Barcode Reader | 3.1 | The Keyboard | **06** |
| | 3.2 | The Screen and Its Working | |
| | 3.3 | LCD | |
| | 3.4 | Mouse | |
| | 3.5 | Types of Printers | |
| | 3.6 | Bar Code Reader and RFID | |
| **4.** | **Classification ,Components and Applications of Computers** | | |
| • Draw diagram and describe classification/components of Digital Computer<br>• Use & Configure Windows Desktop.<br>• Write & Execute basic O.S Commands | 4.1 | Introduction | **08** |
| | 4..2 | Classification of Digital Computer | |
| | 4.3 | Anatomy of Digital Computer | |
| | 4.4 | Components of a PC | |
| | 4.5 | Characteristics of Computers | |
| | 4.6 | What can Computers do? | |
| | 4.7 | Applications of Computers | |
| **5.** | **The Internet and Multimedia** | | |

| | | | |
|---|---|---|---|
| • List uses of Internet<br>• State types of Internet Connections.<br>• Browse Internet<br>• Create mail account. | 5.1 | Introduction | **08** |
| | 5.2 | History of Internet | |
| | 5.3 | Uses of Internet | |
| | 5.4 | Equipment for Internet | |
| | 5.5 | Types of Internet Connections | |
| | 5.5 | Internet Related Concepts : Web Browser, Searching the Web | |
| | 5.7 | Digital Images | |
| | 5.8 | Digital Audio and Digital Video | |
| **6.** | **Business Information Systems and E-Commerce** | | |
| • Identify Use of Computers in Businesses.<br>• Describe types of Ecommerce.<br>• State the need of IT Act.<br>• Explain the clauses in IT Act.<br>• Use E-Commerce sites. | 6.1 | Introduction | **10** |
| | 6.2 | Types of Information needed by organisations. | |
| | 6.3 | Why should we use Computers in Businesses. | |
| | 6.4 | Ecommerce: Introduction | |
| | 6.5 | Ecommerce -Business to Customer, Business to Business,Customer to Customer | |
| | 6.6 | Advantages and Disadvantages of Ecommerce | |
| | 6.6 | IT Act 2000 | |
| | | Total | **48** |

**List of Practicals/Experiments/Assignments:**

| Sr. No. | Name of Experiment/Assignment | Unit No. | Hrs |
|---|---|---|---|
| 1. | **Demonstrate types of Computers**. | | 02 |
| | Demonstrate use of various I/O Devices. **(Maximum Devices Available in the LAB as per theory should be demonstrated)** | 3 | |
| | Functioning of Cathode Ray Tube, TFT/Flat Monitors and other monitors | 3 | |
| | Introduction of interface of other output devices like Fax Machines, Internet phones, Digital Camera etc. | 3 | |
| | Functioning of various types of Audio-Output Devices. | 3 | |
| 2. | **Functions and working of Secondary Storage devices** | 2 | 04 |
| | Types of Secondary Storage devices. | 2 | |
| | Installation, configuration and setting of Hard Disks. | 2 | |
| | BIOS Settings for Primary and secondary Memory. | 2 | |
| | Installation and working of CD-ROM/DVD-ROM/ DVD-Combo/ DVD-Writer (Internal and External). | 2 | |
| | Future of Secondary Storage Devices. | 2 | |
| 3. | Practice of basic commands in command window:<br>Ex: dir, md, copy, cd, move, rmdir, rd etc. | 4 | 04 |
| 4. | **Operating System** | | 04 |
| | Various operations on Window based operating system. | 4 | |
| | Windows Operations: Minimising, Maximising, Resizing. | 4 | |
| | Using Windows Help. | 4 | |
| | Creating, copying, moving files and folders. | 4 | |
| | Creating shortcuts. | 4 | |

| | | | |
|---|---|---|---|
| | Creating and Removing/Deleting User Accounts. | **4** | |
| | Setting window views. | **4** | |
| | Using Add /Remove Programs Utility. | **4** | |
| | Using Add Hardware Utility | **4** | |
| | Adding Fonts. | **4** | |
| | Viewing Computer Configuration. | **4** | |
| | Desktop settings: Display properties, time and date setting, Screen Saver , Appearance | **4** | |
| **5.** | **Application Software** | | **07** |
| | **Word Processors** | **1** | |
| | Hands on Word Processors.(Ex: MS WORD, OpenOffice.org) | | |
| | Various options and its use in creating/ updating/ printing/ Adding Image/mail merge etc. (Perform at least 5 assignments Covering all menu items). Spreadsheets: | **1** | |
| | Assignments based on use of Spreadsheets &Various menu items and its use in worksheets to solve problems. (Perform at least 5 assignments using any spreadsheet software)<br>Presentation Graphics: | **1** | |
| | Preparation of Various slides<br>(Perform at least 5 assignments covering Presentation Graphics like objects grouping, Customising Slide transition, Embedding<br>Links) | **1** | |
| **6** | **Database Management System** | | **07** |
| | Creation of tables using DBMS tools like MS Access.<br>(Teachers should frame their own assignments for above tools which covers maximum features provided by respective softwares). | **1** | |

| | | | |
|---|---|---|---|
| 7. | **Introduction to Internet and WWW** | | |
| | Conduct minimum 2 practical assignments on Internet and Web, like creating mail accounts, using web based applications, browsing internet sites to fetch relevant information, etc. | **5** | **02** |
| | Introduction to e-Commerce and related web sites. Example Railway Reservations, Air Ticket Reservations etc.. | **6** | **02** |
| | | **Total** | **32** |

**Specification Table:**

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R | U | A | Total Marks |
| I | Algorithms and Data Representation | 4 | 2 | 2 | 08 |
| II | Main Memory and Secondary Memory | 4 | 4 | 2 | 10 |
| III | The I/O Media | 2 | 1 | 1 | 04 |
| IV | Classification, Components and Applications of Computers | 4 | 2 | - | 06 |
| V | The Internet and Multimedia | 3 | 2 | 1 | 06 |
| VI | Business Information Systems and E-Commerce | 3 | 2 | 1 | 06 |
| **Total** | | **20** | **13** | **07** | **40** |

**Text Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1. | Achyut Godbole | Demystifying Computers | McGraw Hill |
| 2. | V.Rajaraman | Introduction to Information Technology | PHI |

**Reference Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1. | Timothy J. O. Leary | Computing Essentials | TMH |
| 2. | Vikas Gupta | Comdex Computer Course Kit | Dreamtech |

**Prepared By**

**(Smt. M. H. Thakare**

**Smt. S.S.Sant)**

**Secretary, PBOS**

**Chairman, PBOS**

**Programme : Diploma in Information Technology**
**Programme Code : 07**
**Name of Course : Emerging Trends in IT**
**Course Code : IT282**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| **Theory** | **03** | **48** |
| **Term work / Practical** | **--** | **--** |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | **Two class tests of 60 Minutes** | 03Hrs | -- | -- | - |
| Marks | 20 | 80 | | | |

**Course Rationale:**

This course will be focused on the new trends and disruptive technologies in IT. Emphasis will be given to the way technologies create a competitive edge and generate business value. This course focuses on Gaming Technologies, cloud Computing, electronic transactions and security.

**Course Outcomes:**

After studying this course, the student will be able to-

1. Identify models of E-commerce and E-governance.
2. Identify KM tools.
3. Describe functioning of BPO.
4. Compare and identify various E-learning techniques.
5. Explain GIS and GPS systems
6. Compare different cloud platforms

**Course Contents:**

| Unit No. | | Name of Topic/Sub topic | Hrs |
|---|---|---|---|
| **Overview of E– Commerce, E – Logistics and E-Governance** | | | |
| Learning Outcomes:<br>• Understand models of E-Commerce.<br>• Identify various E-transaction systems.<br>• Explain various E-logistics and managements.<br>• Identify E-Governance models. | 1.1 | Internet, Intranet, Extranet, Definition, Goals of E-Commerce | **12** |
| | 1.2 | Difference between E-Commerce and E- Business Models of E- Commerce. Limitations and Advantages of E-Commerce , Limitations and Advantages of E-Commerce | |
| | 1.3 | Transactions: Inter Banking, Intra Banking, Electronic Payments, (Payment –Gateway Example)Services Provided: -ATM, Smart CardECS (Electronic Clearing System) e.g. Telephone, Electricity Bills | |
| | 1.4 | Logistics & Supplier Chain Management, Warehousing Management, Transportation/ Distribution Management. | |
| | 1.5 | E – Governance –Governance Models: (G2B, G2C, C2G, G2G), Challenges to E – Governance, Strategies and tactics for implementation of E – Governance Case Study | |
| **Knowledge management and Gaming Technology** | | | |
| Learning Outcomes:<br>• State Knowledge management.<br>• Identify KM tools.<br>• Identify components in gaming system. | 2.1 | What is KM? (Components and Type of Knowledge), Knowledge Building Models,KM Cycle | **08** |
| | 2.2 | KM architecture, KM tools, KM approaches | |
| | 2.3 | Introduction to OpenGL: Basic OpenGL Syntax, Related Libraries, Header files, Display window Management, Complete OpenGL Program, OpenGL.Introduction to Graphics Tools:-Maya,3D Studio Max. | |

| | | | |
|---|---|---|---|
| **CRM** | | | |
| Learning Outcomes:<br>• Explain process of BPO/BCP.<br>• Describe functioning and Ethics of Call Center | 3.1 | Sales, Marketing and Service Management, What is BPO/BCP, Why it is required, Guidelines, Merits/De-Merits | **06** |
| | 3.2 | Call Center – brief perspective technology wise, Functioning, Ethics, Disaster Recovery Management, Case Study. | |
| **Content Management and Disseminations** | | | |
| Learning Outcomes:<br>• Compare various E-learning techniques.<br>• Relate various online communities | 4.1 | E-learning – Models WBT, CBT, Virtual Campus, LMS & LCMS, Video Conferencing. | **08** |
| | 4..2 | Chatting Bulleting, Building Online Community, Asynchronous/Synchronous Learning, Case Study. | |
| **GIS/GPS** | | | |
| Learning Outcomes:<br>• Define geographic and spatial data.<br>• Explain GIS development process.<br>• State the use of GPS. | 5.1 | What is GIS?, Nature of Geographic data, Spatial Objects & Data Models, Getting Map on Computers | **06** |
| | 5.2 | GIS standards & Standardization Process of GIS development, Implementation and Deployment phases. | |
| | 5.3 | Introduction to GPS | |
| **Introduction to cloud computing** | | | |
| • Compare different computing environments.<br>• Define cloud computing and its benefits.<br>• Compare different | 6.1 | Overview of Computing Paradigm | |
| | 6.2 | Recent trends in Computing :Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing | |

| | | | |
|---|---|---|---|
| Cloud platforms. | 6.3 | Introduction to Cloud Computing :Cloud Computing (NIST Model),Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers Properties, Cloud Services, Characteristics & Disadvantages Pros and Cons of Cloud Computing, Benefits of Cloud Computing. | **08** |
| | | **Total** | **48** |

**Text Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1. | Jawadekar | Management Information System | Tata McGraw-Hill Publishing Company Limited |
| 2. | Laudon&Laudon | Management Information System | Pearson Education Inc. |
| 3. | AmritTiwana | The Essential Guide to Knowledge management | Printice Hall |
| 4. | George B. Karte | The GIS Book: | On Word Press |
| 5. | Milind Oka | E – Commerce: Milind Oka | Everest publishing House |
| 6. | Nikos Antonopoulos, Lee Gillam, | Cloud Computing: Principles, Systems and Applications, Editors | Springer |
| 7. | Radha Shankamani,Sauabh Jain,Gaurang Sinha. | Game architecture and Programming | Wiley India. |

**Specification Table**

**Mapping Course Outcomes With Program Outcomes:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 1. | Overview of E – Commerce, E – Logistics and E-Governance | 08 | 08 | -- | 16 |
| 2. | Knowledge Management and Gaming Technology | 06 | 08 | -- | 14 |
| 3. | CRM | 06 | 06 | -- | 12 |
| 4. | Content Management and Disseminations | 04 | 08 | -- | 12 |
| 5. | GIS/GPS | 04 | 08 | -- | 12 |
| 6. | Introduction to cloud computing | 06 | 08 | -- | 14 |
| | Total | 34 | 46 | -- | 80 |

**Prepared By** **Secretary, PBOS** **Chairman, PBOS**

**Name of Programme : EE / ET / CM / IT**
**Programme Code : 02/03/06/07**
**Name of Course : Engineering Mathematics-III**
**Course Code : SC282**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 02 | 32 |
| Term work / Practical | 01 | 16 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 03 Hrs | -- | -- | -- |
| Marks | 20 | 80 | -- | -- | -- |

**Rationale:**

The student shall learn various techniques in integration and differential equations and use these techniques to their related Engineering problems.

**Course Outcomes:**

After completing this course students will be able to

1. Apply appropriate methods of integration to various functions.
2. Apply properties of definite integrals to solve given problems.
3. Evaluate Mean value and R.M.S value using definite integral.
4. Solve differential equations of first order and first degree.
5. Determine roots of complex numbers.
6. Apply Laplace transform on different types of functions.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1 : Integration** | | |
| • Define integration as anti derivative.<br>• Integrate function using different method | 1.1Definitions, standard formulae, integration of algebraic sum of two or more functions, integration by substitutions and by trigonometric transformations, integration of $1/ax^2+bx+c$, $1/\sqrt{ax^2}+bx+c$, integration by parts, integration by partial fractions | **10** |
| **Unit 2: Definite integrals** | | |
| • Solve problems on definite integrals using the properties | 2.1Definition and properties of definite integrals Example based on these properties. | **04** |
| **Unit 3: Applications of integration** | | |
| • Find mean and R.M.S. value | 3.1Mean value and root mean square value. | **04** |
| **Unit 4:Differential Equations** | | |
| • Define order and degree of differential equation<br>• Solve the differential equation of first order and first degree<br>• Solve different engineering problems using differential equation | 4.2Definition, order and degree of differential equations.<br>Formation of differential equations.<br>Solution of differential equations : (using following methods)<br>i) Variable separable (ii) Reducible to variable separable.<br>(iii) Homogeneous differential equations. (iv) Exact diff. equations.<br>(v) Linear differential equations. | **05** |
| **Unit 5: Complex number** | | |

| | | |
|---|---|---|
| • Define complex number<br>• Define modulus ad amplitude<br>Solve examples on complex number using De Moivre's theorem<br>• Find roots of complex number. | 5.1Definition and algebra of a complex numbers. Geometrical representation(Argand's diagram), modulus and amplitude of a complex number. De Moivre's theorem (without proof), roots of complex number. | **05** |
| **Unit 6:Laplace Transform** | | |
| • Define Laplace transform, inverse transform , and Convolution theorem.<br>• Solve examples on L.T. and Inverse L.T.<br>• Solve differential equation using L.T. | 6.1Definition, Laplace Transforms of elementary functions, important properties of Laplace Transforms, Inverse of Laplace Transforms, Convolution Theorem and application of Laplace Transform for solving differential equations. | **04** |
| | **Total Hrs.** | **32** |

**List of Practicals/Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Integration based on standard formulae. | Integration | 1 |
| 2. | Integration by substitution method | | 1 |
| 3. | Integration on the type $1/ax^2+bx+c$, $1/\sqrt{ax^2}+bx+c$ ,$1/asinx+bcosx+c$ , $1/ asin^2 x +bcos^2 x +c$. | | 1 |
| 4. | Integration using By Part Rule and integration by partial fraction method. | | 1 |
| 5 | Examples on Definite integral and it's properties | Definite integrals. | 1 |
| 6. | Examples on Mean and R.M.S. value | Applications of integration | 1 |
| 7. | Examples on order ,degree and formation of differential equation. | Differential Equation | 1 |
| 8. | Solution of first order first degree D.E. using various methods. | | 1 |

| | | | |
|---|---|---|---|
| 9 | Examples on algebra of complex number and determination of modulus and amplitude. | | 1 |

| Unit No. | Units | Levels from Cognition Process Dimension | Total Marks |
|---|---|---|---|
| | | Complex Number | |

| | | | |
|---|---|---|---|
| 10 | Examples on De Moivre's theorem and roots of complex number. | | 1 |
| 11 | Examples on Laplace transform and inverse Laplace transform. | Laplace Transform | 1 |
| 12 | Examples on Convolution theorem and Solution of D.E. by Laplace transform. | | 1 |
| | | **Total Hrs.** | **14** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Integration | Class room teaching , chalk board |
| 2 | Definite integration | Class room teaching , chalk board |
| 3 | Applications of integration | Class room teaching , chalk board |
| 4 | Differential equation | Class room teaching , chalk board |
| 5 | Complex number | Class room teaching , chalk board |
| 6 | Laplace transform | Class room teaching , chalk board |

| | | R | U | A | |
|---|---|---|---|---|---|
| 01 | Integration | 08(04) | 16(08) | 00(00) | 24(12) |
| 02 | Definite Integrals | 04(04) | 04(00) | 00(00) | 08(04) |
| 03 | Applications of integration | 00(00) | 00(00) | 08(04) | 08(04) |
| 04 | Differential Equation | 04(00) | 08(04) | 04(04) | 16(08) |
| 05 | Complex number | 04(04) | 04(02) | 04(00) | 12(06) |
| 06 | Laplace transform | 04(02) | 04(00) | 04(04) | 12(06) |
| | **Total** | **24(14)** | **36(18)** | **20(08)** | **80(40)** |

**Specification Table for Theory Paper:**

R-Remember U – Understand A – Analyze / Apply

**Scheme Of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations, | N.A. |
| 2 | Calculations and Result | N.A. |
| 3 | Viva voce | N.A. |
| | **TOTAL** | |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Higher Engineering Mathematics | Khanna Publishers, New DelhiGrewal B.S | |
| 2 | Engineering Mathematics Vol.II | Satya Prakashan, New DelhiVishwanath | |
| 3 | Mathematics for Polytechnic students | Pune Vidyarthi Griha Prakashan<br>S.P. Deshpande | |
| 4 | Engineering Mathematics Part II | S. Chand & Co. Ltd. Delhi ,H.K. Dass | |

**Prepared by** **Member Secretary PBOS** **Chairman PBOS**

**Prof.V.B.Shinde** **Prof.S.V.Chaudhari** **Prof.M.U.Kokate**

**Name of Programme : Diploma in Information Technology**
**Programme Code : 07**

**Name of Course** : **Operating System**
**Course Code** : **IT385**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 04 | 64 |
| Term work / Practical | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 3Hrs | -- | -- | -- |
| Marks | 20 | 80 | -- | 25 | 25 |

**Rationale:**

Operating Systems are system programs, which are very essential components of Computer system. Two primary aims of operating systems are to manage resources (e.g. CPU time, memory) and to control users and software. Operating system design goals are often contradictory and vary depending of user, software, and hardware criteria. This course describes the fundamental concepts behind operating systems, and examines the ways that design goals can be achieved and practice the concept of Operating System design.

**Course Outcomes:**

**After completing this course students will be able to**

1. Differentiate between types of operating systems
2. Describe services of operating system
3. Describe process management and execute related commands
4. Describe various processor scheduling algorithms and deadlock handling techniques .
5. Explain different approaches to memory management
6. Describe and manage structure and organization of the file system

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs |
|---|---|---|

| Units 1 : Introduction | | |
|---|---|---|
| • State functions of operating system<br>• Differentiate between types of operating systems<br>• Install OS (Ref. to Practical 01) | 1.1 What Operating Systems Do, Computer-System Organization, Computer-System Architecture<br>1.2 Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security<br>1.3 Special-Purpose Systems, Open-Source Operating System | **06** |
| **Unit 2:Operating-System Structures** | | |
| • Describe services of operating system<br>• State system callsfor managing processes, memory and the file system.<br>• State the concept of Virtual Machines and Kernel<br>• Create,delete& manage partitions on disk using fdisk utility (Ref. to Practical 02) | 2.1 Operating-System Services, User Operating-System Interface,<br>2.2 System Calls, Types of System Calls<br>2.3 Operating-System Structure, Virtual Machines<br>2.4 The kernel, System Boot. | **10** |
| **Unit 3:Processes and Thread** | | |
| • Differentiate between Process Scheduling algorithms.<br>• Explain Inter Process Communication<br>• Describe threading.<br>• Execute process management commands (Ref. to Practical 06)<br>. | 3.1 Process Concept, Process Scheduling, Operations on Processes<br>3.2 Inter process Communication, Examples of IPC Systems<br>3.3 Communication in Client–Server Systems, Multithreading Models<br>3.4 Thread Libraries, Threading Issues, Operating-System Examples | **10** |

| Unit 4:CPU Scheduling and Process Synchronization | | |
|---|---|---|
| • Compare various processor scheduling algorithms<br>• Define critical section problem<br>• Write algorithm for critical section problem<br>• Differentiate between critical section problem solutions<br>• Job scheduling through execution of commands (Ref. to Practical 08) | 4.1 Basic Concepts, Scheduling Criteria. Scheduling Algorithms<br>4.2 Operating System Examples, The Critical-Section Problem<br>4.3 Peterson's Solution, Synchronization Hardware, Semaphores<br>4.4 Classic Problems of Synchronization, Monitors, Synchronization Examples | **10** |
| **Unit 5:Deadlocks** | | |
| • State and describe deadlock characteristics<br>• Describe various methods for deadlock prevention, recovery etc<br>• State conditions for deadlock avoidance | 5.1 System Model, Deadlock Characterization<br>5.2 Methods for Handling Deadlocks<br>5.3 Deadlock Prevention, Deadlock Avoidance<br>5.4 Deadlock Detection, Recovery from Deadlock | **10** |
| **Unit 6:Memory Management** | | |
| • Explain different approaches to memory management<br>• Calculate page faults based on given data (Ref. to Practical 07)<br>• Describe paging | 6.1 Main Memory: Background<br>6.2 Swapping, Contiguous Memory Allocation<br>6.3 Paging, Structure of the Page Table<br>6.4 Segmentation Example: The Intel Pentium<br>6.5 Virtual Memory: Background, Demand Paging, Copy on Write, Page Replacement Allocation of frames, Trashing. | **12** |
| **Unit 7:Storage Management** | | |

| | | |
|---|---|---|
| • Describe structure and organization of the file system<br>• Describe file allocation method<br>• Managing file permission (Ref. to Practical 03)<br>• Execute file related command((Ref. to Practical 04 & 05) | 7.1 File-System Interface: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection<br>7.2 File-System Implementation: File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Recovery | **06** |
| | **Total Hrs.** | **64** |

**List of Practicals/Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Course Outcome | Hrs. |
|---|---|---|---|---|
| 1. | Advanced Linux Installation: Network and Dual Boot | Introduction | CO1, CO2 | 02 |
| 2. | Linux Disk Management using fdisk utility to create, delete and change the partitions on the disk. | Operating-System Structures | CO1,CO2 | 02 |
| 3. | Setting/Changing file and directory related permissions chmod and umask command. | Operating-System Structures | CO2 | 02 |
| 4. | Displaying File Information : inodes, inodes and directories, cp and inodes, mv and inodes, rm and inodes, ls –l | Introduction,<br>Operating-System Structures | CO4 | 04 |
| 5. | Working with Linux-supported File Systems: Mounting and Unmounting to be tested with external drives | Storage Management | CO4 | 02 |
| 6. | Linux Process Management : Jobs: Background, Kills and Interruptions and setting process priority Get Process status, | Processes and Thread | CO3 | 04 |

| | | | | |
|---|---|---|---|---|
| | Find Processes by Pattern or User, Display the Most Active Processes,Kill processes, kill all processes(Executing commands for process management –ps, fg, bg, kill ,killall, nice, at ,jobs) | | | |
| 7. | Linux: Memory Management Practicing top, vmstat and free command | Memory Management | CO3,CO5, CO6 | 02 |
| 8. | Scheduling jobs with crontab : cron daemon, crontab options, The format of crontab file, Environment variable settings, crontab command lines | CPU Scheduling and Process Synchronization | CO3 | 02 |
| 9. | System states :init Shutting down and changing Runlevels, Managing Users and Groups: Adding and Removing users with adduser,usermod and userdel commands | Processes and Thread | CO6 | 04 |
| 10. | Adding and Removing groups with groupadd,groupmod and groupdel commands, Superuser-The root User Desktop, System Time and Date | Storage Management | CO6 | 02 |
| 11. | Executing various Shell commands<br>Creating shell variables , Writing shell scripts using decision making and various control structures., Executing various shell utilities, Using file test and string test conditions in scripts., Making use of Positional Parameters.<br>Configuring your own login shell. Using Functions in Shell scripts. | Memory Management | CO5, CO6 | 06 |
| | | | **Total** | **32** |

**Instructional Strategy:**

| Sr. No. | Topic | Instructional Strategy |
|---|---|---|
| 1 | Introduction | Explanation of basic concept |
| 2 | Operating-System Structures | Explanation Structure of Operating System |
| 3 | Processes and Thread | Explanation of Process concepts |
| 4 | CPU Scheduling and Process Synchronization | Explanation & Practical implementation of algorithm |
| 5 | Deadlocks | Explain concept & principle |
| 6 | Memory Management | Explain concept & principle |
| 7 | Storage Management | Explanation of concept & practical implementation of storage Management. |

**Specification Table for Theory Paper:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Introduction | 06 | 02 | -- | 08 |
| 02 | Operating-System Structures | 06 | 04 | 02 | 12 |
| 03 | Processes and Thread | 06 | 04 | 04 | 14 |
| 04 | CPU Scheduling and Process Synchronization | 04 | 04 | 06 | 14 |
| 05 | Deadlocks | 04 | 04 | 04 | 12 |
| 06 | Memory Management | 06 | 04 | 04 | 14 |
| 07 | Storage Management | 02 | 02 | 02 | 06 |
| | **Total** | 28 | 30 | 22 | 80 |

R-Remember U – Understand A – Analyze / Apply

**Scheme Of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations, | |
| 2 | Calculations and Result | |
| 3 | Viva voce | |
| | **TOTAL** | |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Operating System Concepts | Silberschatz Galvin, Gagne, John Wisley& Sons | **ISBN-13:** 978-0470128725 |
| 2 | Operating Systems | Achyut S. Godbole, Tata McGraw-Hill | **ISBN-10:** 0070702039 **ISBN-13:** 978-0070702035 |
| 3 | System Programming & Operating System | D. M. Dhamdhere,TMH | |
| 4 | DOS 6 & 6.2 | Kamin Jonathan, Galgotia Publication | |
| 5 | Operating System | Peterson | |
| 6 | Operating System Concept & Design | Milan Milenkovic,TMH | |
| | Modern Operating Systems | Andrew S. Tanenbaum, Prentice Hall of India | |

**( Prepared by ) (Member Secretary PBOS) (Chairman PBOS)**

**Name of Programme** : **Diploma in Computer Engineering/IT**
**Programme Code** : **06 /26 / 07**
**Course Code** : **CM387**
**Name of Course** : **Data Structures**
**Pre-requisite** : **CM282 (Programming In C)**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | **04** | **64** |
| Term work / Practical | **02** | **32** |
| Tutorial | **02** | **32** |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 03 Hrs | | | |
| Marks | 20 | **80** | **25** | -- | **25** |

**Rationale:**

In the present era it is very essential to develop programs and organize data in such a way that it solves a complex problem efficiently. Data structure is such a tool, which aims in developing data organizing and programming skills

**Course Outcomes:**

**After completing this course students will be able to**

1. Describe Time & Space Complexity.
2. Implement algorithms for searching and sorting with arrays.
3. Execute programs for Linked List operations.
4. Implement programs for Stack, Queue and Recursion using Arrays and Linked List
5. Implement Tree data structure.
6. Implement Graph data structure

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1 : Introduction to data structures** | | |
| • Differentiate between various complexities.<br>• Enlist various data structure Operation.<br>• Use dynamic memory allocation in programs | 1.1 Introduction, Basic Terminology:- Elementary data structure organization<br>Classification of data structure.<br>1.2 Operations on data structures:- Traversing, Inserting, deleting Searching, sorting, and merging.<br>1.3 Complexity :-Time complexity ,SpaceComplexity, Big 'O' Notation.<br>1.4 Structures in 'C', Dynamic memory Allocation. | **08** |
| **Unit 2: Arrays** | | |
| • Implement array data structure to carry out various data structure operation on array.<br>• Enlist advantages and disadvantages of array compare to other data structures. | 2.1 Introduction, Linear ArraysRepresentation of linear arrays in memory.<br>2.2 Traversing linear Arrays, Inserting and Deleting.<br>2.3 Multidimensional Arrays | **06** |
| **Unit 3: Searching & sorting** | | |
| • Analyze time and space complexity of various searching and sorting method.<br>• Create programs for various sorting and searching operation | 3.1 Searching: Basic search techniques, Linear search, Binary search, Hashing.<br>3.2 Sorting: General background, bubble sort, Selection sort, insertion sort, merge sort and radix sort, Shell sort. | **08** |
| **Unit 4: Linked Lists** | | |

| | | |
|---|---|---|
| • Implement linked list data structure to carry out various data structure operation<br>• Use Linked list to implement other data structures | 4.1 Introduction, Singly link list, Representation of link list in memory.<br>4.2 Creating, traversing, searching in Sorted as well as unsorted link list.<br>4.3 Memory allocation, garbage Collection.<br>4.4 Inserting into linked list, Deleting from a linked list<br>4.5 Header links list, Two-way list, Implementation of link list | **10** |
| **Unit 5: Stacks, Queues & Recursion** | | |
| • Implement Stack and Queue data structure to carry out various data structure operation.<br>• Use stack and queues to solve various problem(likes prefix to postfix conversion, evaluation of expression, Tower of Hanoi etc)<br>• Differentiate between stack and queue**.** | 5.1 Stacks: Concept, representing stacks in 'C', Applications of stacks<br>5.2 Polish Notations (Prefix, postfix, Infix), Quick sort.<br>5.3 Recursion: Recursive definitions and processes, Recursion in 'C', writing recursive programs factorial, Fibonacci.<br>5.4 Tower of Hanoi, Implementation of recursive, procedures by means of stack.<br>5.5 Queues: The queue and its sequential representation, concept of queues, priority queues. | **12** |
| **Unit 6: Trees** | | |
| • Implement Tree data structure to carry out various data structure operation.<br>• Use tree For Sorting and searching. | 6.1 Introduction, Binary trees, Binary tree representation, Traversing binary tree.<br>6.2 Traversal algorithms using stacks.<br>6.3 Binary search tree (BST), searching and inserting in BST, deleting from BST.<br>6.4 Heap, Heap sort, Path lengths: Huffman algorithm. | **10** |
| **Unit 7: Graphs and their applications** | | |

| | | | |
|---|---|---|---|
| • Implement Graph data structure to carry out various data structure operation.<br>• Find out Shortest Path between to vertices using various graph techniques | 7.1 Introduction, Graph theory terminology.<br>7.2 Sequential representation of graphs, Adjacency matrix, Path matrix.<br>7.3 Warshall's Algorithm; Shortest Paths.<br>7.4 Linked representation of graph, Operations on graphs, traversing a graph(BFS,DFS).<br>7.5 Application Of Graph. | **10** | |
| | **Total** | **64** | |

**List of Practicals /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. | Tutorial Hrs |
|---|---|---|---|---|
| 1. | Write Programs based on: Structures & Dynamic Memory allocation | Introduction to data structures | -- | 02 |
| 2. | Write Programs based on: Array operations; insertion, deletion. | Arrays | 01 | 01 |
| 3. | Write Programs based on Multidimensional Arrays | | 01 | 01 |
| 4. | Write Programs based on Various searching operation (Linear & Binary Search) | | 01 | 01 |
| 5 | Write Programs based on Various sorting Method (bubble sort, Selection sort, insertion sort, merge sort and radix sort, Shellsort) | | 04 | 03 |
| 6. | Write Programs based on Creating a link list | Linked List | -- | 02 |
| 7. | Write Programs to search in sorted and unsorted linked list | | 03 | 01 |
| 8. | Write Programs based on inserting of the node, inserting at first node, inserting after given position | | 03 | 02 |
| 9. | Write Programs to delete a node in linked list | | 01 | 01 |

| | | | | |
|---|---|---|---|---|
| 10 | Write Programs based on two way (doubly) link list. | | 02 | 02 |
| 11 | Write Programs based on Stack implementation using PUSH & POP operations | Stacks, Queues & Recursion | 02 | 02 |
| 12 | Write Programs based on Infix to postfix operation | | 01 | 01 |
| 13 | Write Programs based on Tower of Hanoi | | 01 | 02 |
| 14 | Write Programs based on recursion | | 01 | 01 |
| 15 | Write Programs based on Queue implementation using PUSH & POP operations | | -- | 02 |
| 16 | Write Programs based on Creating a binary tree | Tree | 02 | -- |
| 17 | Write Programs based on inorder, preorder and post order traversal | | 01 | 01 |
| 18 | Write Programs based on Inserting, searching BST | | 01 | 01 |
| 19 | Write Program to Heapsort | | 03 | 03 |
| 20 | Write Programs based on Shortest path | Graph | 02 | 02 |
| 21 | Write Programs based on BFS & DFS using Graph | | 02 | 01 |
| | | **Total** | **32** | **32** |
| | | | | |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Introduction to Data Structures | Demonstration of 'C' Compiler, Create simple program array, pointer, string, function. |
| 2 | Arrays | Write 'C' programs based on Arrays |
| 3 | Sorting and Searching | Write 'C' programs based on Sorting & searching. |
| 4 | Link Lists | Write 'C' programs based on linked list |
| 5 | Stacks, Queues & Recursion | Demonstration of 'C' Compiler, Create simple program Stack, Queue & Recursion. |
| 6 | Trees | Write 'C' programs based on Tree |
| 7 | Graphs and their applications | Demonstration of 'C' Compiler, Create simple program graphs. |

**Scheme Of Practical Evaluation:**

| **S.N.** | **Description** | **Max. Marks** |
|---|---|---|
| 1 | Observations, | 05 |
| 2 | Practical performance | 10 |
| 3 | Viva voce | 10 |
| | **TOTAL** | **25** |

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Introduction to Data Structures | 04 | 02 | 02 | 08 |
| 02 | Arrays | 02 | 02 | 02 | 06 |
| 03 | Sorting and Searching | 03 | 03 | 06 | 12 |
| 04 | Link Lists | 02 | 05 | 07 | 14 |
| 05 | Stacks, Queues & Recursion | 02 | 07 | 06 | 15 |
| 06 | Trees | 04 | 07 | 02 | 13 |
| 07 | Graphs and their applications | 04 | 06 | 02 | 12 |
| | **Total** | **21** | **32** | **27** | **80** |

**Specification Table:**

**Reference & Text Books:**

| S.N. | Author | Title, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Tanenbaum, Langsman, Augenstein | Data Structures in 'C' PHI Publications | |
| 2 | Lipschultz | Data Structures Schaum Outline Series | |
| 3 | Yashwant Kanetkar | Pointers in 'C', BPB Publications | |
| 4 | Tremblie and Sorrenson | Data Structures, TMH Publications | |

**E-References:**

1. https://en.wikipedia.org/wiki/Data_structure
2. https://www.tutorialspoint.com/data_structures_algorithms/sorting_algorithms
3. http://www.studytonight.com/data-structures/introduction-to-linked-list
4. https://www.cs.cmu.edu/~adamchik/15-121/lectures

| | | |
|---|---|---|
| Prof. S.P.Emekar | Prof..S. V.Chaudhari | Prof. U.V.Kokate |
| & Prof. A.S.Paike | | |
| **Prepared By** | **Secretary, PBOS** | **Chairman, PBOS** |

**Name of Programme** : **Diploma in Computer Engineering/IT**
**Programme Code** : **06 /26 / 07**
**Name of Course** : **Object Oriented Programming: C++**
**Pre-requisite** : **CM282 (Programming In C)**
**Course Code** : **CM388**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | 03 | 48 |
| **Practical** | 02 | 32 |
| **Tutorial** | 01 | -- |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 3 Hrs | -- | -- | -- |
| Marks | 20 | 80 | 25 | -- | 25 |

**Rationale:**

This subject intends to teach the students the basic concepts of object-oriented programming (OOP). Large programs are probably the most complicated entities ever created by humans. Because of this complexity, programs are prone to error and software errors can be expensive and even life-threatening. Object-Oriented Programming offers a new and powerful way to cope with this complexity. Its goal is clearer, more reliable, more easily maintained programs. This subject will act as backbone for all other subjects that are based on Object Oriented concept.

.**Course Outcomes:**

**After completing this course students will be able to**

1. Distinguish between procedure/functional/logical oriented paradigms and object oriented paradigm.
2. Develop programs in C++ for representing a class.
3. Develop programs in C++ using overloading and overriding.
4. Develop programs in C++ using various types of inheritance.
5. Develop programs in C++ for handling file operations.
6. Execute programs in C++ for handling exceptions.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Section I** | | |
| **Units 1 : Basics of Object-Oriented Programming** | | |
| • State importance of Object Oriented Programming<br>• Define object, class, program, tokens, keywords, identifiers, constants, and array.<br>• List applications of Object Oriented Programming<br>• Describe Structure of C++ program.<br>• State benefits of OOP.<br>• Implement C++ program using tokens, keywords, identifiers, constants and variable.<br>• State types of arrays with example.<br>• Execute program using various operators and arrays. | 1.1 What is Object Oriented Programming?, Programming Paradigm, Benefits of OOP& Applications, Structure of C++ program, A simple C++ program, Creating source file, Compiling & Linking<br>1.2 Tokens, Keywords, Identifiers, Basic Data Types, User Defined data types, Derived Data Types, Symbolic Constants, type Compatibility, Declaration Of Variables, Reference Variables<br>1.3 Operators In C++, Scope Resolution Operators, Member Dereferencing Operators, Manipulators, Type Cast Operator, Expressions &their types, Implicit Conversions, Operator Precedence, Control Structure.<br>1.4 Introduction of arrays and its types. | **10** |
| **Unit 2:Function in C++** | | |
| • Define Function, member function<br>• Implement program using main Function, Function Prototyping, Call By Reference, Return By, Reference, Inline Function<br>• Apply the concept of Default Arguments, Const Arguments, Function Overloading, Friend & Virtual Functions<br>• Perform program using classes and objects. | 2.1 Introduction, The Main Function, Function Prototyping, Call By Reference, Return By, Reference, Inline Function<br>2.3 Default Arguments, Const Arguments, Function Overloading, Friend & Virtual Functions<br>2.4 Classes &Objects**:** Introduction, Specifying a Class, Creating objects, Memory Allocation For objects, Arrays of Objects, Object As a Function Arguments Returning Objects.<br>2.5 Defining Member functions ,Making An Outside Function Inline, Nesting Of Member Function, Private Member Functions<br>2.6 Static Data Member, Static Member Functions | **08** |

| | | |
|---|---|---|
| **Unit 3: Constructors & Destructors** | | |
| • Define Constructors , Destructors<br>• Execute program using constructors and Destructors | 3.1 Introduction, Constructors, Parameterized Constructors Multiple Constructors in a Class<br>3.2 Constructors With Default Arguments, Dynamic initialization Of Objects, Object Pointers.<br>3.3 Destructors. | **06** |
| **Section II** | | |
| **Unit 4: Operator overloading and Pointers** | | |
| • Define pointer<br>• State rules of overloading operators<br>• Perform program using different operators.<br>• Execute program on pointers, string and virtual functions. | 4.1 Introductions Defining Operator Overloading, Rules For Overloading Operators Introduction, Overloading Unary Operator, Overloading Binary Operator, Overloading Binary Operators Using Friends<br>4.2 Manipulation of Strings Using Operators, Pointers, Pointers to Objects, this pointer, Pointer to Derived classes, Virtual functions, Pure virtual function. | **06** |
| **Unit 5: Inheritance and Introduction to Templates** | | |
| • Define inheritance, template, abstract class, virtual base class<br>• Describe access specifies with its types.<br>• Classify inheritance with its types.<br>• Implement programs using inheritance, virtual base class, abstract class and templates. | 5.1 Introduction, Defining Derived Classes, Access specifiers and its types, Single Inheritance<br>5.2 Making a Private Member Inheritable Multilevel Inheritance, Inheritance, Hierarchical Inheritance, Hybrid Inheritance<br>5.3 Virtual Base Classes, Abstract Classes, Constructors In Derived Classes, Member Classes: Nesting of classes.<br>5.4 Class Templates, Class Templates with Multiple Parameters, Function Templates<br>5.5 Function Templates with multiple parameters, Overloading of Templates function. | **08** |
| **Unit 6: Working with files and Exception Handling** | | |
| • Define exception, stream<br>• Describe working of files.<br>• Explain mechanism of exception.<br>• Implement program using files and exceptions. | 6.1 Managing console I/O Operations, , C++ streams, C++ stream classes, Unformatted I/O operations, Formatted I/O operations managing output with manipulators.<br>6.2 Working with files , Introduction, Classes for file stream operations, Opening & closing a file, Detecting End-of-file, more about open (): | **10** |

| | | |
|---|---|---|
| | 6.3 File modes, File pointers and their manipulations, Sequential Input and Output operations<br>6.4 Updating a file: Random access, Error handling during file operations, Command line arguments.<br>6.5 Exception Handling: Introduction, Basics of Exception Handling, Exception handling mechanism<br>6.6 Throwing mechanism, catching mechanism. | |
| | **Total** | **48** |

**LIST OF PRACTICALS/LABORATORY EXPERIENCES/ASSIGNMENTS:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Course Outcome | Hrs. |
|---|---|---|---|---|
| 1. | Write a program to implement looping different statements. | Basics of Object-Oriented Programming | CO1, CO2 | 02 |
| 2. | Write a program to demonstrate all control structures. | | CO1, CO2 | 01 |
| 3. | Write a program to implement concept of an array. | | CO1, CO2 | 01 |
| 4. | Write a program to perform matrix operations using multi-dimensional array. | | CO1, CO2 | 02 |
| 5. | Write a program to implement concept of a class. | Function in C++ | CO1, CO2 | 02 |
| 6. | Write a program to create one class which contains member functions and invoke the same using objects. | | CO1, CO2 | 02 |
| 7. | Write a program to implement concept of overloading. | | CO3 | 02 |
| 8. | Write a program which implements friend function and inline function. | | CO1, CO2 | 02 |
| 9. | Write a program which implements all the types of constructors with destructor. | Constructors & Destructors | CO1, CO2, CO3 | 02 |
| 10. | Write a program to demonstrate operator overloading for: Unary operator and Binary operator. | Operator over loading and Pointers | CO3 | 02 |
| 11. | Write a program to demonstrate: Pointer to object.<br>Pointer to derived class. | | CO3 | 02 |
| 12. | Write a program for MULTILEVEL inheritance. | Inheritance and | CO4 | 02 |

| | | | | |
|---|---|---|---|---|
| 13. | Write a program for MULTIPLE inheritances. | Introduction to Templates | CO4 | 02 |
| 14. | Write a program for HYBRID inheritance. | | CO4 | 02 |
| 15. | Write a program to implement :<br>Class template.<br>Function template. | | CO4 | 02 |
| 16. | Write a program to perform various operations on file. | Working with files and Exception Handling | CO5 | 02 |
| 17. | Write a program to perform Exception Handling. | | CO5 | 02 |
| | **Mini project:** Implement mini project using all the C++ concepts. | | **ALL** | |
| | | **Total Hrs.** | | **32** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Basics of Object-Oriented Programming | Class room teaching, laboratory demonstration |
| 2 | Function in C++ | Class room teaching, laboratory demonstration |
| 3 | Constructors & Destructors | Class room teaching, laboratory demonstration |
| 4 | Operator over loading and Pointers | Class room teaching, laboratory demonstration |
| 5 | Inheritance and Introduction to Templates | Class room teaching, laboratory demonstration |
| 6 | Working with files and Exception Handling | Class room teaching, laboratory demonstration |

**Specification Table for Theory Paper:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Basics of Object-Oriented Programming | 02 | 03 | 08 | 13 |
| 02 | Function in C++ | 03 | 04 | 08 | 15 |
| 03 | Constructors & Destructors | 02 | 02 | 08 | 12 |
| 04 | Operator over loading and Pointers | 02 | 02 | 08 | 12 |
| 05 | Inheritance and Introduction to Templates | 02 | 02 | 08 | 12 |
| 06 | Working with files and Exception Handling | 02 | 04 | 10 | 16 |
| | Total | 13 | 17 | 50 | 80 |

R-Remember U – Understand A – Analyze / Apply

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Object Oriented Programming with C++ | E Balagurusamy, Tata McGraw-Hill Education, 2001 | 9332900906, 9789332900905 |
| 2 | Beginning C++ - The complete Language | Ivor Horton, Shroff Publishers | |
| 3 | Teach Yourself C++ | Herbert Schildt, Tata McGRAW Hill | |

**E-References:**

- https://www.tutorialspoint.com/cplusplus/cpp_object_oriented.htm
- www.studytonight.com/cpp/cpp-and-oops-concepts.php
- www.aonaware.com/oop1.htm

**Prepared by** **Member Secretary PBOS** **Chairman PBOS**

**Programme : Diploma in Comp Engg / Info Tech.**
**Programme Code : 06 / 07/26**
**Name of Course : JAVA Programming-I**
**Course Code : CM389**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | 03 | 48 |
| **Practical** | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| **Duration** | Three class tests, each of 60 minutes | 3Hrs. | -- | -- | -- |
| **Marks** | 20 | 80 | 25 | -- | 25 |

**Course Rationale:**

This course introduces students to intermediate and advanced features of the Java programming language. Students will learn about object-oriented programming concepts such as inheritance, interfaces, abstract classes, abstract methods, and polymorphism; will learn how to write and read Java primitive types to and from. Any application on World Wide Web can be easily implemented. To have knowledge of Internet programming this course covers JAVA as a programming language.

**Course Outcomes:**

**After completing this course students will be able to**

1. Describe JVM and Java Features
2. Write Java Programs using classes, objects and methods, inheritance, vectors and wrapper classes
3. Execute programs using packages and interfaces
4. Implement Multithreading, exception handling in Java
5. Implement Graphics and Applet Programming.
6. Implement I/O functionality using streams in Java.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1 : Java Evolution and Basics Of Java** | | |
| • State Features of Java.<br>• Describe JVM.<br>• Enlist different data types & Operators in Java.<br>• Define decision making Branching& Looping.<br>• Describe One Dimensional arrays & Two Dimensional arrays. | 1.1.Creation Of Java, Java Features, The Java Buzzwords, Simple Java Program.<br>1.2.Java Virtual Machine, Constant, Variables, Data Types, Operators and Expressions<br>1.3.Decision making and Branching, Decision making and Looping.<br>1.4.Arrays, One Dimensional arrays, Creating an array, Two Dimensional arrays | **06** |
| **Unit 2: Classes, Object and Methods** | | |
| • Define Class, Methods, Objects.<br>• Describe creation of objects& Accessing class members.<br>• Define Constructors, Method Overloading & Nesting of Methods.<br>• Describe Inheritance .<br>• Enlist different types of Inheritance.<br>• Write a program for Overriding.<br>• Describe the final variables,final class & methods.<br>• State different visibility controls.<br>• Define Vectors & Wrapper Classes.<br>• Write a program for Vectors & Wrappers Classes. | 2.1 Defining a class, Fields declaration, Methods declaration, Creating object, Accessing class members<br>2.2 Constructors, Methods Overloading, Nesting of methods<br>2.3 Inheritance: Extending a Class (Defining a subclass Constructor, Multilevel inheritance Hierarchical inheritance)<br>2.4 Overriding Methods, Final keyword(variable and Methods, Final variables and methods, Final classes, Finalizer Methods)<br>2.5 Abstract methods and Classes, Methods with Varargs, Visibility Control (Public access, friend access, Protected access, Private access, Private Protected access)<br>2.6 Vectors, Wrapper Classes, Enumerated Types, Annotations. | **08** |
| **Unit 3:Introduction to Strings ,Interfaces and Packages** | | |

| | | |
|---|---|---|
| • Enlist Special String Operations.<br>• Describe Character Extraction & String Comparison.<br>• Define String &StringBuffer.<br>• Describe Command Line Arguments & Static Members.<br>• Define Interfaces<br>• Describe different forms of implementing Interfaces.<br>• Create user defined Packages & accessing a package<br>• Write a program to add class to a package & hiding classes. | 3.1 Special String Operations, Character Extraction, String Comparison, Searching Strings, Modifying a String, Data conversion using ValueOf(), StringBuffer<br>3.2 Command Line Arguments, Static Members.<br>3.3 Interfaces : Defining interfaces, Extending interfaces, Implementing interfaces, Accessing Interface variables.<br>3.4 Packages: Java API Packages, Using System Packages, Using system Package, Naming Conventions, Creating Packages, Accessing a package, Using a package, Adding a class to a package, Hiding Classes, Static Import | **10** |
| **Unit 4: Multithreaded Programming , Managing Errors and Exceptions** | | |
| • Define Thread.<br>• Describe Thread Life Cycle.<br>• Write a program to Create & Extending Thread class.<br>• Enlist Thread Methods & Thread Exceptions.<br>• Describe Thread Priority & Synchronization.<br>• Implement the runnable Interface.<br>• Define Exception ,Errors& its types.<br>• Write a program of Exception Handling code.<br>• Enlist Exception Handling parameters.<br>• Describe multiple catch statements.<br>• Write a program throwing our own Exceptions & Exceptions for Debugging. | 4.1 Creating Thread, Extending a thread class, Stopping and Blocking a thread, Life cycle of thread<br>4.2 Using thread methods, Thread exceptions, Thread priority, Synchronization, Implementing the 'Runnable'' Interface, Inter-thread communication<br>4.3 Exception : Types of errors, Exceptions, Syntax of Exception Handling code<br>4.4 Multiple catch statements, Using finally statement, Throwing our own Exceptions, Using Exception for Debugging | **08** |
| **Unit 5:Introduction To Applet with Graphics Programming** | | |
| • Differentiate between Local & Remote Applets, Applets & Applications.<br>• Create an Executable Applet & | 5.1 Local and remote applets, How applets differ from applications, Preparing to write applets, Building applet code, Applet life cycle.<br>1.2 Creating an Executable Applet, Designing | **08** |

| | | |
|---|---|---|
| Design a Web page using Applet tag.<br>• Write a Program for passing Parameters to Applets & Event Handling.<br>• Describe Graphics Class Methods.<br>• Displaying Numerical values, Getting input from the Use.<br>• Write a program to Draw different Shapes of Graphics Class using Applet.<br>• DefineAWT & Swing.<br>• Describe AWT Package. | a Web page, Applet tag, Adding Applet to HTML file, Running the Applet.<br>1.3 More about Applet Tag, Passing parameters to applets, Aligning the Display, More about HTML Tags, Displaying Numerical values, Getting input from the User, Event Handling.<br>1.4 Graphics Programming : The Graphics Class, Lines and rectangle, Circle and Ellipse, Drawing Arcs, Drawing Polygons, Line Graphs, Using control loops in Applets, Drawing Bar charts.<br>1.5 Introduction to AWT Package, Introduction to Swings. | |
| **Unit 6: Managing Input/Output Files in Java** | | |
| • Define Streams.<br>• Enlist Different Classes.<br>• State Input/Output Exceptions.<br>• Describe the different Files Operations.<br>• State different Primitive Data Types.<br>• Write a program for Concatenating & Buffering Files.<br>• Write a Program for Random Access Files.<br>• Describe Other Stream Classes. | 6.1 Concept of Streams, Stream classes, Byte stream classes, character stream classes, using streams, Other useful I/O classes<br>6.2 Using the file class, Input/Output Exceptions, Creation of files, Reading/writing characters, Reading/writing bytes<br>6.3 Handling primitive data types, Concatenating and Buffering files, Random Access Files, Interactive Input and Output, Other Stream Classes, | **08** |
| | **Total** | **48** |

## LIST OF PRACTICALS/LABORATORY EXPERIENCES/ASSIGNMENTS:

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Write a program to demonstrate various operators and expressions using switch case. | Java Evolution and Basics Of Java | 01 |
| 2. | Write a program to implement looping different statements | | 01 |

| | | | |
|---|---|---|---|
| 3. | Write a program based on type casting and decision making statements. | | 01 |
| 4. | Write a program to implement concept of an array. | | 01 |
| 5 | Write a program to perform matrix operations using multi-dimensional array. | | 02 |
| 6. | Write a program on multiple type constructor by using classes. | Classes, Object and Methods | 01 |
| 7. | Write a program on operator overloading. | | 01 |
| 8. | Write a program to implement vector class and wrapper class with its respective methods. | | 01 |
| 9. | Write a program on Abstract method class. | | 01 |
| 10. | Write a program for method overriding. | | 01 |
| 11. | Write a program to implement multilevel inheritance by applying various access controls to its data members and methods. | | 01 |
| 12. | Write a program to accept input for the program by using command line argument | Introduction to Strings ,Interfaces and Packages | 01 |
| 13. | Write a program to demonstrate use of all string classes and its method using switch case. | | 01 |
| 14. | Write a program to demonstrate use of all string buffer classes and its method using switch case. | | 02 |
| 15. | Programs to demonstrate<br>- use of implmenting interfaces.<br>- use of extending interfaces. | | 01 |
| 16. | Programs on creating package, Accessing a package, Importing class from other package, Adding a class to a package | | 01 |
| 17. | Write a program using thread. | Multithreaded Programming , Managing Errors and Exceptions | 01 |
| 18. | Write a program showing try and catch block for exception handling, catching invalid commandlineargument ,multiple catch statement. | | 01 |
| 19. | Write a program to create an applet that will accept values of 3 test marks i.e: Test1,Test2,Test3 and each out of 25. User will enter marks in 3 separate text fields.Applet will | Introduction To Applet with Graphics Programming | 02 |

| | | | |
|---|---|---|---|
| | have a button labeled "FIND AVG". When user clicks on button the average of test marks will be displayed in the 4th text field. | | |
| 20. | Write a program to draw different shapes using applet. (use Switch case) | Managing Input/Output Files in Java | 02 |
| 21. | Write a program to copy contents from source file to destination file by using Input/ Output Stream. | | 02 |
| 22. | Write a program to concatenate 2 strings by using file streams. | | 02 |
| 23. | Perform a mini project by using all java concepts.. | | 04 |
| | | **Total** | **32** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Java Evolution and Basics Of Java | Class room teaching, laboratory work |
| 2 | Classes, Object and Methods | Class room teaching, laboratory demonstration |
| 3 | Introduction to Strings ,Interfaces and Packages | Class room teaching, laboratory work |
| 4 | Multithreaded Programming , Managing Errors and Exceptions | Class room teaching, laboratory work |
| 5 | Introduction To Applet with Graphics Programming | Class room teaching, laboratory work |
| 6 | Managing Input/Output Files in Java | Class room teaching, laboratory work |

**Specification Table for Theory Paper:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total |
|---|---|---|---|---|---|
| | | R | U | A | |
| 1 | Java Evolution and Overview of Java Language | 2 | 2 | 5 | 9 |
| 2 | Classes, Object and Methods | 2 | 2 | 9 | 13 |
| 3 | Array, Strings ,Vectors, Interfaces and Packages | 4 | 5 | 10 | 19 |
| 4 | Multithreaded Programming, Managing Errors and Exceptions | 4 | 3 | 6 | 13 |
| 5 | Applet and Graphics Programming | 5 | 4 | 9 | 18 |
| 6 | Managing Input/Output Files in Java | 3 | 1 | 4 | 8 |
| | **Total** | **29** | **08** | **43** | **80** |

R-Remember U – Understand A – Analyze / Apply

**Scheme Of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations, | 05 |
| 2 | Practical Performance | 15 |
| 3 | Viva voce | 05 |
| | **TOTAL** | **25** |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Programming with Java | E. Balagurusamy, Tata McGraw Hill | 8189401269 |
| 2 | The Complete Reference Java2 | Herbert Schildt, Tata McGraw Hill,5th Edition | 0070495432 |
| 3 | The Complete IDIOT's Guide To JAVA 2 | Michael Morrison, PHI,2 edition | 0789721317 |
| 4 | Special Edition Using Java 1.2 | Joseph L. Weber, Que; 4th edition | 9780789715296 |
| 5 | Core Java Volume I | Cay S. Horstmann, Prentice Hall; 9th edition | 9780137081899 |

**E-References:**

**https://www.edx.org/course/introduction-java-programming-part-1-hkustx-comp102-1x-2**

https://www.**tutorialspoint**.com/**java**/

**www.javatpoint.com/java-oops-concepts**

**www.studytonight.com/java/inheritance-in-java.php**

**www.journaldev.com › Java**
https://docs.oracle.com/**java**se/tutorial/deployment/**applet**/

| Prepared by | Member Secretary PBOS | Chairman PBOS |
|---|---|---|
| Prof.T.D.Pawar | Prof.S.V.Chaudhari | Prof.M.U.Kokate |
| Prof.H.S.Pawar | | |

**Programme : Diploma in Information Technology**
**Programme Code : 07**
**Name of Course : Digital Techniques and Microprocessors**
**Course Code : IT381**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 04 | 64 |
| Term work / Practical / Tutorial | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 3Hrs | -- | -- | -- |
| Marks | 20 | 80 | 50 | -- | 25 |

**Rationale:**

It is essential to know fundamentals of digital electronics to understand the concept of microprocessor and its application. Microprocessor is challenging, to meet challenges of growing advanced microprocessor technology. The student should be conversant with microprocessor programming.

**Course Outcomes:**

**After completing this course students will be able to**

1. Perform arithmetic operations with various number systems.
2. Differentiate various logic gates and apply the logic on Boolean algebra.
3. Test combinational logic circuits of Multiplexer and De-Multiplexer.
4. Construct K-MAP using logic functions and vice versa.
5. Describe Microprocessor architecture.
6. Write and execute 8085 programs.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1: Number System, Codes & Logic Gates and Boolean Algebra** | | |
| • Convert codes from one number system to another.<br>• Perform arithmetic operations with number system.<br>• Differentiate various logic gates and apply the logic on Boolean algebra.<br>• Explain theorems for Boolean algebra.<br>• Create simplified logic circuits. | 1.1 Decimal, Binary, Octal, Hex<br>1.2 Binary addition, subtraction<br>1.3 One's complement, Two's Complement, Signed Numbers, Codes, Error code.<br>1.4 Working principals and Truth of AND,OR,NOT, NOR, NAND, EX-OR, EX-NOR Gates, Universal Gates<br>1.5 Boolean Algebra : Basic Boolean Operations , Basic Laws of Boolean Algebra , Duality Theorem, De-Morgan's Theorems | **12** |
| **Unit 2:Combinational logic design using MSI circuit** | | |
| • Design Multiplexer and De-Multiplexer.<br>• Implement combinational logic design with MUX.<br>• Implement combinational logic design with DEMUX. | 2.1 Multiplexer and their use in combinational, logic design<br>2.2 De-multiplexer/decoders and their use in combinational logic design<br>2.3 De-multiplexer- 4 to 16 line DEMUX. Demux design using sop method. 1:4, 1:8, 1:16 DEMUX. | **10** |
| **Unit 3: Standard representation for logic function & Sequential Logic Design** | | |
| • Construct K-MAP using logic functions and vice versa.<br>• Simplify equations in the minterms/maxterms. | 3.1 KARNAUGH map representation, Simplification of logic function using K-MAP<br>3.2 Minimization of logical function specified in minterms/maxterms or truth table<br>3.3 Minimization of logic function not specified in minterms/maxterms. Don't care | **10** |

| | | |
|---|---|---|
| | condition. | |
| **Unit 4: Microprocessor, Microprocessor Architecture & Microcomputer Systems** | | |
| • Describe Microprocessor architecture.<br>• Understand 8085 registers and instruction format.<br>• Draw timing diagram for read/write memory cycle. | 4.1 Microprocessor architecture & its Operations<br>4.2 Memory & I/O Devices<br>4.3 8085 MPU, Example of 8085 based microcomputer.<br>4.4 Classification of instruction, Instruction format<br>4.5 How to write & execute 8085 program<br>4.6 8085 instruction set & Instruction timing | **12** |
| **Unit 5: 8085 Programming** | | |
| • Write and execute 8085 programs for addition, subtraction.<br>• Write programs implementing branching. | 5.1 Basic instruction of 8085<br>5.2 All instructions of 8085 like Data transfer, Arithmetic Operations, Branch, Debugging Programs, etc. | **10** |
| **Unit 6: Additional Instructions, Stack, Subroutines, Interrupt** | | |
| • Perform 16-bit arithmetic and logic operations.<br>• Recognize 8085 interrupts.<br>• Write programs using looping, subroutine. | 6.1 Looping, indexing, counting<br>6.2 16-bit arithmetic logic operations, rotate, compare.<br>6.3 Stack, Subroutine & 8085 interrupts | **10** |
| | **Total Hrs.** | **64** |

**List of Practical's /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Course Outcome | Hrs. |
|---|---|---|---|---|
| 1. | Know your Digital Lab<br>1.IC Tester<br>2.Multimeter<br>3.Bread Board<br>4.Trainer Kit | Number System, Codes & Logic Gates and Boolean Algebra | -- | 02 |
| 2. | Study of Basic Gates ICs (7400, 7404, 7408, 7486, 7432) and verification of Truth tables by monitoring the output of ICs on Bread Board. | | CO2 | 02 |
| 3. | To derive AND, OR, NOT gates using universal gates by forming circuits on Bread Board. | | CO2 | 04 |
| 4. | Verify De-Morgan's Theorem by forming the circuit on Bread Board. | | CO2 | 02 |
| 5. | To verify of Multiplexer & De-multiplexer. | Combinational logic design using MSI circuit | CO3 | 05 |
| 6. | Minimization and realization of function using K-maps and its implementation by constructing the circuit on bread board. | Standard representation for logic function & Sequential Logic Design | CO4 | 05 |
| 7. | Write simple programs and execute it on 8085 kit. | Microprocessor, Microprocessor Architecture & Microcomputer Systems | CO6 | 06 |
| 8. | Addition of 8 bit numbers with carry and without carry. | 8085 Programming | CO6 | 05 |
| 9. | Subtraction of 8 bit number with carry and without carry. | | CO6 | 05 |

| | | | | |
|---|---|---|---|---|
| 10. | Multiplication of two numbers. | | CO6 | 05 |
| 11. | Transfer the block of data from one place to another. | | CO6 | 05 |
| 12. | Find the smallest and greatest number of series. | | CO6 | 05 |
| 13. | Arrange the given numbers in ascending and descending order. | | CO6 | 05 |
| 14. | Transfer the block of data in reverse order from one place to another place. | | CO6 | 08 |
| | | | **Total** | **64** |

**Instructional Strategy:**

| Sr. No. | Topic | Instructional Strategy |
|---|---|---|
| 1 | Number System, Codes & Logic Gates and Boolean Algebra | Class room teaching |
| 2 | Combinational logic design using MSI circuit | Class room teaching, laboratory demonstration |
| 3 | Standard representation for logic function & Sequential Logic Design | Class room teaching, laboratory demonstration |
| 4 | Microprocessor, Microprocessor Architecture & Microcomputer Systems | Class room teaching, laboratory demonstration |
| 5 | 8085 Programming | Class room teaching, laboratory demonstration |
| 6 | Additional Instructions, Stack, Subroutines, Interrupt | Class room teaching, laboratory demonstration |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | R. P. Jain | Modern Digital Electronics, McGraw Hill | |
| 2 | Awate S.P. | 8085 Microprocessor Assembly language Programming & Applications, McGraw Hill | |
| 3 | Ramesh Gaonkar | Microprocessor Architecture, Programming & Applications with the 8085, PenramInternational Publishing (India) (Third Edition) | |
| 4 | B.Ram | Microprocessor programming (8085) | |
| 5 | Liu –Gibson | Microprocessor systems 8086/88 family, Prentice Hall of India | |
| 6 | Douglous Hall | Microprocessor & Interfacing, Tata -McGraw Hill | |

**Specification Table for Theory Paper:-**

R-Remember U – Understand A – Analyze / Apply

| | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Number System and Codes | 03 | 03 | 06 | 12 |
| 02 | Combinational logic design using MSI circuit | 04 | 04 | 07 | 15 |
| 03 | Standard representation for logic function & Sequential Logic Design | 04 | 04 | 07 | 15 |
| 04 | Microprocessor, Microprocessor Architecture & Microcomputer Systems | 04 | 04 | 06 | 14 |
| 05 | 8085 Programming | 02 | 03 | 08 | 13 |
| 06 | Additional Instructions, Stack, Subroutines, Interrupt: | 03 | 04 | 04 | 11 |
| | **Total** | 22 | 24 | 34 | 80 |

Prepared by Member Secretary PBOS Chairman PBOS

Prof.M.U.Kokate Prof.S.V.Chaudhari Prof.U.V.Kokate

Prof.P.N.Yewale

**Name of Programme :** **Diploma in Information Technology**
**Programme Code :** **07**
**Name of Course :** **Multimedia and Animation**
**Course Code :** **IT382**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| **Theory** | 02 | 32 |
| **Term work / Practical / Tutorial** | 04 | 64 |

**Evaluation Scheme**:

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| **Duration** | Two class tests of 60 min. duration | 3Hrs | -- | -- | -- |
| **Marks** | 10 | 40 | 50 | -- | 50 |

**Rationale:**

Animation has given a boost to various areas like film production, e-learning & animated web-site etc. This subject will enable the students to implement their creative imagination to produce animated text & images. It is a practical oriented subject which deals with various fonts, audio & video formats, and basic shapes, images to the controls, tools & animation. Students will develop the skill for using the basic shapes, text, images apply controls, Colors to create final animated multimedia object.

**Course Outcomes:**

**After completing this course students will be able to**

1. State the applications and components of multimedia.
2. Create multimedia applications using various image and sound formats.
3. Build Flash Movie and Text-Based Animation.
4. Execute various programs with the help of action script and time based animation.
5. Differentiate various authoring tools.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1: Introduction To Multimedia** | | |
| • State the applications of multimedia.<br>• Identify the basic tools of multimedia.<br>• Explain concept of virtual reality. | 1.6 Definitions -Where to use Multimedia, Multimedia in Business, Multimedia in Schools, Multimedia in Home, Multimedia in Public Places<br>1.7 Basic Tools- I/P, O/P devices, Painting & Drawing Tools, OCR Software, Digital v/s Analog, Multimedia System Architecture, Framework for Multimedia System, CRT display System, Display Terminology, Flat Panel Display.<br>1.8 Virtual Reality. | **04** |
| **Unit 2:Multimedia Building Blocks** | | |
| • Describe components of multimedia.<br>• Draw various types of image files for relative applications.<br>• Create audio using different sound formats.<br>• Explain QOS architecture. | 2.1 Text. Using text in multimedia<br>2.2 Images - Before you start to Create Plan your approach, Organize your Tools, Multiple Monitors,-Making Still Images Bitmaps, Vector Drawing,3-D Drawing and Rendering Painting and Drawing Tools,-Color-Understanding Natural light & color, Computerized Color, Color Palettes ,Image File Formats, Windows Formats<br>2.3 Sound -Digital audio, Audio file format, MIDI Versus Digital Audio, Synchronization, Orchestration & QOS Architecture | **06** |
| **Unit 3: Animation & Video** | | |
| • Compose Flash Movie (Audio Video).<br>• Create Text-Based Animation.<br>• Differentiate between video standards. | 3.1 The Power of motion, Principles of Animation, Making Animation that Work, A Rolling Ball, A Bouncing Ball, Creating an Animated Scene.<br>3.2 How Video Works and Broadcast Video Standards.<br>3.3 Digital video, Study of story board. | **06** |

| Unit 4: Introduction to action script in flash | | |
|---|---|---|
| • Execute various programs with the help of action script.<br>• Build time based animation. | 4.1 Programming Concepts – Variables, Data types, conditionals, loops, arrays, Functions<br>4.2 Custom objects - Properties, Methods and Events – Display List, Timeline Control | **10** |
| **Unit 5: Multimedia Authoring Tools** | | |
| • Choose various authoring tools.<br>• Differentiate various authoring tools. | 5.1 Types of Authoring Tools-Different features<br>5.2 Card- and Page-Based Authoring tools<br>5.3 Icon-and Object Based Authoring tools, Time Based Authoring tools | **06** |
| | **Total** | **32** |

**List of Practical's/Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Course Outcome | Hrs. |
|---|---|---|---|---|
| 1 | Installation of Adobe Flash, Photoshop and Corel draw software. | Introduction To Multimedia | CO1 | 02 |
| 2 | Creating any simple video in Movie maker using Timeline & Sound. | Multimedia Building Blocks, Animation & Video | CO2 | 02 |
| 3 | Corel Draw Assignments<br>Implementing and Study of all tools in Corel Draw software<br>Implementing different fonts of text on the screen<br>Creating Wallpaper using multiple tools of Corel draw.<br>Applying Drop Shadow effect or vignette effect | | CO2 | 16 |

| | | | | |
|---|---|---|---|---|
| | or mirror, reflection effect etc. to text<br>Merging photographs and rotate & change rotation center in CorelDraw<br>Creating Banner effect etc.<br>Interfacing of sound, editing, mixing sound, cropping, cross fading & effect. | | | |
| 4 | Photoshop Assignments<br>Implementing and Study of all tools in Photoshop software<br>Creating or Adding Rainy Season effect in image<br>Creating funny image<br>Creating water drop effect in image<br>Designing poster by using different Text effect (Ketchup, rope, Fire, fruit).<br>Create broken mirror effect, Flaming ball effects<br>Interfacing of images, Resolution, Editing, color modes. Setting current & background colors. | | CO2 | 16 |
| 5 | Adobe Flash Assignments<br>Implementing and Study of all tools in Adobe Flash software.<br>Study & Implementing Shape & Motion Tweening in flash.<br>Example for Implementation of types of symbols<br>Creating Animation using Motion guide layer<br>Creating Animation using Masking<br>Creating Bouncing and Rolling ball down etc | Animation & Video, Introduction ToAction Script In Flash | CO2,CO 3, CO4 | 16 |

| | | | | |
|---|---|---|---|---|
| | examples,<br>Controlling windows to load URL, Creating advanced/animated buttons<br>Creating Roll Over/Roll Out effect on buttons<br>Rotating ball using scripting and other Scripting Animation etc.<br>Create Animation for Start/Stop Button for Animation using Script.<br>Create Animation Using Progress Bar preloaded Action Script<br>Create a variable for different Data Types using Action Script<br>Program for conditional loop and array<br>Loading Sound into Animation Clip | | | |
| 6 | Mini project -Create a movie of minimum 15 minutes. | ALL | ALL | 12 |
| | | | **Total** | **64** |

**Instructional Strategy:**

| Sr. No. | Topic | Instructional Strategy |
|---|---|---|
| 1 | Introduction To Multimedia | Explanation of basic concept and Slide Presentation |
| 2 | Multimedia Building Blocks | Explanation and Practical Implementations |
| 3 | Animation & Video | Explanation and Practical Implementations |
| 4 | Introduction To Action Script In Flash | Explanation and Practical Implementations |
| 5 | Multimedia Authoring Tools | Explanation and Slide Presentation |

**Specification Table for Theory Paper:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 1 | Introduction To Multimedia | 04 | 04 | 00 | 08 |
| 2 | Multimedia Building Blocks | 02 | 04 | 04 | 10 |
| 3 | Animation & Video | 00 | 04 | 04 | 08 |
| 4 | Introduction To Action Script In Flash | 00 | 04 | 04 | 08 |
| 5 | Multimedia Authoring Tools | 02 | 04 | 00 | 06 |
| | Total | 13 | 13 | 14 | 40 |

R-Remember U – Understand A – Analyze / Apply

**Reference & Text Books:**

| Sr. No. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Multimedia Making it Work 3th edition | Tay Vaughan, TMH | |
| 2 | Essential ActionScript 2.0 | Colin Mock, OReilly | |

**E-References:**

- Books, Models, OPH, LCD Projector
- http://www.coreldrawtips.com/site/basic-tutorials
- http://www.freeadobeflashtutorials.com/
- http://www.techiwarehouse.com/engine/65eeb3b5/Flash-Tutorial-For-Beginnershttp://en.wikibooks.org/wiki/Introduction_to_ActionScript_2.0/Variables_and_Data_Type

| Prepared by | Chairman PBOS | Member Secretary PBOS |
|---|---|---|
| Smt. P. N. Yewale | **Mr..S.V.Chaudhari** | **Mr.U.V.Kokate** |
| Smt. H. F. Khan | | |

**Name of Programme : Diploma in Information Technology**
**Programme Code : 07**
**Name of Course : Data Communication and Networks**
**Course Code : IT383**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 04 | 64 |
| Term work / Practical | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 3Hrs | -- | -- | -- |
| Marks | 20 | 80 | -- | 25 | 25 |

**Rationale:**

The world in the information era has become network centric.Computer networks has been growing with rapid technological progress. Computer communication through networking becomes essential part of our life. We can manage many application like Air Line Reservation, Railway Reservation, E-banking, E-Governance, On-Line shopping, E-learning etc. by clicking mouse button from our own place. Because of this, world has become the global village. By considering importance of networking towards all aspects of our life, we have introduced basic concepts of networks, network classification, network topologies, network devices, Transmission media, Network reference models, concept of TCP/IP.

**Course Outcomes:**

**After studying this course, the student will be able to**

**1.** Identify modes of transmission and multiplexing.

**2**. Describe various network performance criteria.

**3.** Design network using various network technologies**.**

**4.** Identify and correct errors in transmission.

**5.** Describe and differentiate between various networking devices.

**6**. Describe various packet formats.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **SECTION-I** | | |
| **Unit 1: Introduction to Data Communication and Networking** | | |
| • Describe different modes of data transmission<br>• Differentiate various multiplexing techniques.<br>• Compare between bit rate and baud rate. | **1.1**Introduction, Fundamental Concepts, protocols, Components, Data Representations, data flow. ,Standards, Bandwidth and Data Transmission Rate. Networks: Distributed Processing, Network Criteria, Physical Structures, Categories of Networks<br>**1.2**Analog Signal, Analog Transmission, Digital Signal ,Digital Transmission, Digital Signal Analog Transmission, Baud Rate and Bits per second<br>**1.3** Modes of Data Transmission and Multiplexing, Parallel and Serial Communication, Asynchronous, Synchronous and Isochronous Communication, Simplex, Half-Duplex, Full Duplex,Multiplexing and Demultiplexing,Types of Multiplexing: TDM,FDM , TDM Vs FDM | **12** |
| **Unit 2:Signals and Transmission Modes** | | |
| • Define analog and digital signals.<br>• Describe various coding schemes<br>• State various network performance criteria<br>• Compare ASK,FSK,PSK. | **2.1** Signals :Analog and Digital Data, Analog and Digital Signals, Periodic and non periodic signals<br>**2.2** Analog Signals: Sine Wave, Phase, Time and Frequency domain, Composite Signals, Bandwidth<br>**2.3** Digital Signals: Bit Rate, Bit Length, Digital Signal as a composite analog signal, Transmission of Digital Signals: Baseband Transmission, Broadband Transmission.<br>**2.4** Transmission Impairment: Attenuation, Distortion, Noise<br>**2.5** Data Rate Limits: Noiseless channels: Nyquist Bit Rate, Noisy channel: Shannon capacity, Using both | **12** |

| | | |
|---|---|---|
| | limits<br><br>**2.6** Performance: Bandwidth, Throughput, Latency, Bandwidth-Delay product<br><br>**2.7** Transmission: Line Coding: Characteristics, Schemes<br><br>**2.8** Block coding: Some common block codes<br><br>**2.9** Analog-To-Digital Conversion: Pulse Code Modulation<br><br>**2.10** Transmission modes: Parallel transmission, Serial transmission<br><br>**2.11** Analog Transmission : Digital-To-Analog Conversion : Aspects of Digital-to-Analog conversion, ASK, FSK, PSK<br><br>**2.12** Analog-To-Analog Conversion: Amplitude modulation, Frequency modulation, Phase modulation | |
| **Unit 3:Overview: OSI Model and MAC Sublayer** | | |
| • Describe Layered architecture<br>• Design network using any network technology | **3.1** Introduction– Layered Architecture , Peer-to- Peer Processes ,Interfaces between Layer, Protocols, Organization of the Layers, Encapsulation.**3.2** Layers of the OSI Reference Model (Functions of each Layer & Protocols used) – Physical Layer, Data-Link Layer, Network Layer, Transport Layer, Session Layer, Presentation Layer, Application Layer<br><br>**3.3** LAN, Ethernet, Virtual LAN, Fast and Gigabit Ethernet, Token Ring, FDDI, Comparison of Ethernet, Token Ring FDDI | **08** |
| **SECTION-II** | | |
| **Unit 4: Transmission Error: Detection ,Correction and FRAMING** | | |
| • Identify and correct errors in transmission.<br>• Analyze noisy channels. | **4.1** Error Detection and Correction Types of Errors: Single bit error, Burst Error. Redundancy, Detection Vs Correction, Forward error correction Vs Retransmission | **12** |

| | | |
|---|---|---|
| | **4.2** Block coding: Error detection, Error correction, Hamming Distance, Linear Block Codes, Cyclic codes: Cyclic Redundancy Check, Polynomials, Advantages of cyclic codes, Checksum<br><br>**4.3** Data link control: Framing, Flow and error control, Protocols, Noiseless Channels: Simplest protocol, Stop-and-Wait Protocol, Noisy Channels : Stop-and-Wait Automatic Repeat Request, Go-Back-N Automatic Repeat Request, Selective repeat Automatic Repeat Request, Piggybacking.<br><br>**4.4** Framing, Transition Phases, Multiplexing, LCP, PAP, CHAP, NCP, IPCP, Other Protocols, Multilink PPP, An Example | |
| **Unit 5: Internetworking Basics** | | |
| • Identify problems in internetworking.<br>• Describe and differentiate between network devices.<br>• Differentiate between ISP services category. | **5.1** Introduction–Why Internetworking, Problems in Internetworking, Dealing with Incompatibility, Vistual Network, internetworking Devices, Repeaters, Bridges, Routers, Gateways<br><br>**5.2** Brief History of Internet, Growth of Internet, Internet Topology, Internal Architecture of ISP<br><br>**5.3** Ways of Accessing the Internet : Introduction, Dial Up access for an Individual User, Leased Lines, DSL and Cable Modems | **10** |
| **Unit 6: Networking Protocols** | | |
| • Compare OSI and TCP/IP protocol suite<br>• Describe ports and sockets.<br>• Describe packet formats. | **6.1**Introduction, TCP/IP Basics, Why IP addresses, Logical Addresses, Concept of IP Address and IP datagram Packet, ARP,RARP, ICMP, Data Fragmentation and Reassembly, Comparison of OSI and TCP/IP Protocol Suite.<br><br>**6.2** TCP and UDP :Introduction, TCP Basics, Features of TCP,Relationship between TCP and IP, Ports and Sockets,Connections, TCP Connections, Packet Format, Persistent TCP Connection, UDP and UDP Packet . | **10** |

| | | |
|---|---|---|
| | **6.3** Introduction DNS, TCP,FTP TFTP | |
| | **Total** | **64** |

**List of Practical's /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| **1** | Observe components of network in your network laboratory and state their specifications | 1 | 02 |
| **2** | a. Identify transmission media and study their specifications.<br>b. Identify network control devices and study their specifications. | 1,2 | 04 |
| **3** | Study of RS232 standard | 3 | 02 |
| **4** | Crimping for RJ-45 according to desired standards and formation of cross cable and direct cable | 3 | 02 |
| **5** | Designing layout of a Network for small organization<br>Deciding upon type of network, Floor designing/ building designing<br>Deciding upon number/ length of components | 5 | 04 |
| **6** | Connect computers of your laboratory in star topology using transmission media and network control device. | **5** | 04 |
| **7** | Configuring Static and dynamic IP address | 6 | 02 |
| **8** | Write a program to check and correct the error in the data at receiver end by implementing Hamming code | 4 | 02 |
| **9** | Write a Program for bit Stuffing and Byte stuffing | 4 | 02 |
| **10** | Share Printer and Folder in network. | 3 | 02 |
| **11** | Run TCP/IP utilities and networking commands with options.(arp/rarp/ipconfig/ping/tracert) | 6 | 02 |

| | | | |
|---|---|---|---|
| **12** | Study of specifications of layer2 switches, hubs, repeaters and listing their manufacturers | 3 | 02 |
| | | | |
| **13** | Identify available ISPs in India | 5 | 02 |
| | | **Total** | 32 |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Introduction to Data Communication and Networking | Class room teaching |
| 2 | Signals and Transmission Modes | Class room teaching, laboratory work |
| 3 | Overview: OSI Model and MAC Sublayer | Class room teaching |
| 4 | Transmission Error: Detection ,Correction and FRAMING | Class room teaching, laboratory work |
| 5 | Internetworking Basics | Class room teaching, laboratory work |
| 6 | Networking Protocols | Class room teaching, laboratory work |

**Specification Table for Theory Paper:**

R-Remember U – Understand A – Analyze / Apply

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Introduction to Data Communication and Networking | 4 | 6 | 5 | 15 |
| 02 | Signals and Transmission Modes | 4 | 6 | 5 | 15 |
| 03 | Overview: OSI Model and MAC Sublayer | 2 | 4 | 4 | 10 |
| 04 | Transmission Error: Detection ,Correction and FRAMING | 3 | 4 | 8 | 15 |
| 05 | Internetworking Basics | 3 | 4 | 8 | 15 |
| 06 | Networking Protocols | 2 | 4 | 4 | 10 |
| | **Total** | 18 | 28 | 34 | 80 |

**Scheme of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Practical performance | 15 |
| 3 | Viva | 10 |
| | **TOTAL** | **25** |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Data Communications and Networking | Behrouz A. ForouzanTata McGraw Hill (Fourth Edition) | |
| 2 | Data Communications and Networks | Achyut S. Godbole Tata McGraw Hill | |
| 3 | Computer Networks | Tanenbaum Tata McGraw Hill | |

**E-References:**

1.www.4shared.net
**2.**www.networkcomputing.com
3. www.networkconceptsinc.com

(Mrs.H.F.Khan,Mrs.P.Ghode) Prof. S. V. Chaudhary Prof. U. V. Kokate

**Prepared by** **(Member Secretary PBOS)** **(Chairman PBOS)**

**Programme** : **Information Technology**
**Programme Code** : **07** 06/07
**Name of Course** : **Relational Database Management System**
**Course Code** : **IT384**
**Class Declaration** : **YES**

**Teaching Scheme:**

| | **Hours /Week** | **Total Hours** |
|---|---|---|
| **Theory** | 03 | 48 |
| **Practical** | 02 | 32 |
| **Tutorial** | 01 | 16 |

**Evaluation Scheme:**

| | **Progressive Assessment** | **Semester End Examination** | | | |
|---|---|---|---|---|---|
| | | **Theory** | **Practical** | **Oral** | **Term work** |
| **Duration** | Two class tests, each of 60 minutes | 3Hrs. | -- | -- | -- |
| **Marks** | 20 | 80 | 25 | -- | 25 |

**Course Rationale:**

The major objective of this course is to provide a strong formal foundation in Database Concepts, technology and practice to the students to enhance them into well informed application developers. After learning this subject, the students will be able to understand the designing of RDBMS and can use any RDBMS package as a backend for developing database applications.

**Course Outcomes:**

After studying this course, the student will be able to-

1. Identify the need of Database Management System.
2. Apply Normalization techniques to normalize a database
3. Create the database Tables with constraints and perform various operations on database
4. Create and Manage views, Sequences and Indexes.
5. Develop PL/SQL programs using cursor and control structure.
6. Create and debug stored procedures, functions and triggers.

**Course Content:**

| Specific Learning Outcomes (Cognitive Domain) | | Name of Topic/Sub topic | Hrs |
|---|---|---|---|
| **Section I** | | | |
| **Unit-1 Introduction to Database system** | | | |
| • Define the database management system.<br>• Identify the advantages of the database approach over the file-based data storage system<br>• Describe levels of data abstraction.<br>• Explain DrE.F Codd's rules.<br>• Describe the architecture of DBMS and Data Models.<br>• Describe Big data. | 1.1 | Basic Database concepts: Data, database, Database system, DBMS, and Drawbacks of file system, Advantages of DBMS, Applications of DBMS, data abstraction, Data independence, schema, , The Codd's laws for fully functional RDBMS. | **06** |
| | 1.2 | Architecture: Overall architecture of DBMS. | |
| | 1.3 | Data Models: Three classical Data Models-Hierarchical, Networking, Relational Data Models. | |
| | 1.4 | Big data: Introduction to big data. | |
| **Unit-2Relational Data Model** | | | |
| • Define RelationalModel terminologies.<br>• Create Normalized Database structure on given data.<br>• Describe Data constraints.<br>• Draw the ER Diagrams on given Database. | 2.1 | Relational Structure- Tables (Relations), Rows (Tuples), Domains, attributes. | |
| | 2.2 | Keys: Candidate Keys, Primary Keys, Foreign Keys, Super Keys. | |
| | 2.3 | Data Constraints: Referential Integrity Constraints: Primary key constraint, Unique, Check constraint. Entity Integrity Constraints. | |

| | | | |
|---|---|---|---|
| • Analyze functional dependencies for designing a robust database | 2.4 | Database Design: Relational database Design, Normalization based on functional dependencies, Normal forms: 1NF, 2NF, 3NF. | **12** |
| | 2.5 | Conceptual Design: Entity Relationship Model, Strong Entity set, Weak Entity set, Types of Attributes, E-R Diagrams. | |
| **Unit-3 Interactive SQL** | | | |
| • Perform various operations on given data using DDL, DML and DCL Commands.<br>• Write and execute Database Queries on given data by using different operators ,functions and clauses<br>• Retrieve data from single or multiple tables | 3.1 | Invoking SQL*PLUS, The Oracle Data-types, Data Definition Language (DDL), Data Manipulation language (DML), data control language (DCL) . | **10** |
| | 3.2 | Clauses & Join: Different types of clauses in SQL ,Joins, Types of Joins, Nested queries. | |
| | 3.3 | Operators: Relational, Arithmetic, Logical, set operators. | |
| | 3.4 | Functions: Date and time, String functions, Aggregate Functions. | |
| **Section II** | | | |
| **Unit-4SQL Performance Tuning** | | | |
| • Create and Manage views, Sequences and Indexes on given data.<br>• Examine given Database performance. | 4.1 | Views: Creating Views, Types of Views: Read Only View and Updatable Views, Dropping Views. | **08** |
| | 4.2 | Sequences: Creating Sequences, Altering Sequences, Dropping Sequences. | |
| | 4.3 | Indexes: Index Types, Creating of an Index: Simple Unique, and Composite Index, Dropping Indexes. | |
| **Unit-5 PL/SQL** | | | |

| | | | |
|---|---|---|---|
| • Write PL/SQL code Using control structure .<br>• Manage data retrieval with cursors and cursor variables.<br>• Write PL/SQL program for handling Exceptions. | 5.1 | Introduction of PL/SQL: The PL/SQL Syntax, The PL/SQL Block Structure, Fundamentals of PL/SQL, Advantages of PL/SQL data Types. | **08** |
| | 5.2 | Control Structure: Conditional Control, Iterative Control, Sequential Control. | |
| | 5.3 | Exception handling: Predefined Exception, User defined Exception. | |
| | 5.4 | Cursors: Implicit and Explicit Cursors, Declaring, Opening and Closing a Cursor, Fetching a Record from Cursor, Cursor for loops, Parameterized Cursors. | |
| **Unit- 6 PL/SQL Database Objects and File System** | | | |
| • Write and Execute stored procedures<br>• Write and Execute Functions.<br>• Create triggers to solve business challenges<br>• Describe Database File System Organization. | 6.1 | Procedures: Advantages, Creating, Executing and Deleting a Stored Procedure. | **10** |
| | 6.2 | Functions: Advantages, Creating, Executing and Deleting a Function. | |
| | 6.3 | Database Triggers: Use of Database Triggers, Types of Triggers, Syntax for Creating Trigger, Deleting Trigger. | |
| | 6.4 | File System: File Organization: Fixed Length record, Variable Length records Organization of records in files:Heap, Sequential, Hashing, Clustering file organization. | |
| | | **Total** | **48** |

**List of Practicals/Experiments/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Course Outcome | Pract. Hrs | Tut. Hrs |
|---|---|---|---|---|---|
| **1.** | Create Normalized Database structure ,Creating a Table, Inserting Data into Tables, Updating Contents of a Table, | 3 | CO1&<br>CO2 | 02 | 01 |

| | | | | | |
|---|---|---|---|---|---|
| | Delete Operations, Modifying the Structure of the Table, Renaming the table, Dropping Tables. | | | | |
| **2.** | Applying Constraints such as Referential Integrity and Entity Integrity constraints. | 2 | CO2 | 02 | 01 |
| **3.** | Writing Queries using various types of operators. | 3 | CO3 | 02 | 01 |
| **4.** | Writing Queries using various types of Functions. | 3 | CO3 | 02 | 01 |
| **5** | Writing Queries using different types of clauses. | 3 | CO3 | 02 | 01 |
| **6.** | Writing Queries using different types of Joins. | 3 | CO3 | 02 | 01 |
| **7.** | Working with Views. | 4 | CO4 | 02 | 01 |
| **8.** | Working with Sequence. | 4 | CO4 | 02 | 01 |
| **9.** | Working with Index and its types. | 4 | CO4 | 02 | 01 |
| **10.** | Write the basic PL/SQL Programs. | 5 | CO5 | 02 | 01 |
| **11.** | Write the PL/SQL Program using different Control structures. | 5 | CO5 | 02 | 01 |
| **12.** | Write a program to implement cursors. | 5 | CO5 | 02 | 01 |
| **13.** | Programs based on Exceptions handling.(Predefined and user-defined exceptions) | 5 | CO5 | 02 | 01 |
| **14.** | Write different Stored Procedures and Functions. | 6 | CO6 | 02 | 01 |
| **15.** | Write program to implement Functions. | 6 | CO6 | 02 | 01 |
| **16.** | Write program for creating Various types Triggers. | 6 | CO6 | 02 | 01 |

| | | | | | |
|---|---|---|---|---|---|
| **17.** | Mini project: Design mini project using all database commands and Normalization technique. | - | - | - | - |
| | | **Total** | | 32 | 16 |

**Instructional Strategy:**

| Sr.No. | Topic | Instructional Strategy |
|---|---|---|
| 1 | Introduction to Database system | Class room teaching |
| 2 | Relational Data Model | Class room teaching, laboratory demonstration |
| 3 | Interactive SQL | Class room teaching |
| 4 | SQL Performance Tuning | Class room teaching, laboratory work |
| 5 | PL/SQL | Class room teaching, laboratory work |
| 6 | PL/SQL Database Objects and File System | Class room teaching, laboratory work |

**Scheme of Practical Evaluation:**

| **Sr.No.** | **Description** | **Max. Marks** |
|---|---|---|
| 1 | Designing database model | 05 |
| 2 | Query Execution | 15 |
| 3 | Viva voce | 05 |
| | **TOTAL** | **25** |

**Specification Table:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Introduction to Database system | 06 | 06 | 00 | 12 |
| 02 | Relational Data Model | 04 | 04 | 06 | 14 |
| 03 | Interactive SQL | 04 | 04 | 06 | 14 |
| 04 | SQL Performance Tuning | 02 | 04 | 04 | 10 |
| 05 | PL/SQL | 02 | 04 | 06 | 12 |
| 06 | PL/SQL Database Objects and File System | 04 | 06 | 08 | 18 |
| | **Total** | 22 | 28 | 30 | 80 |

**Reference & Text Books:**

| Sr.No. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Database system concepts(3rd edition | Abraham Silberschtz,Henry Korth and S.Sudharshan, Tata McGraw Hill | 8189401269 |
| 2 | SQL, PL/SQL The Programming Language of ORACLE(3rd Edition) | Ivan Bayross, BPB Publication | 8120004221 |
| 3 | Oracle DBA Handbook | Kevin Lonely, Tata McGraw Hill | 8131806618 |

| Prepared By | Secretary, PBOS | Chairman, PBOS |
|---|---|---|
| Smt. Mrs.S.B.Gosavi, | Prof.M.U.Kokate | |
| Smt.A.A.Shaikh, | | |

**Name of programme : CE/ EE/ET/ME/MT/CM/IT/DDGM**
**Programme Code : 01/02/03/04/05/08/21/22/23/24/15/16/17/18/19**

**Name of course : Environmental Science**
**Course code : AU481**

**Teaching Scheme:**

| | Hours/Week | Total Hours |
|---|---|---|
| Theory | -- | -- |
| Term work / Practical | 2 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term Work |
| Duration | -- | -- | -- | -- | -- |
| Marks | -- | -- | -- | -- | 50 |

**CourseOutcomes:**

1 Identify the sources in engineering domain responsible for global warming and ozone depletion
2 Use the equipment/methods for air and water pollution control due to mechanical devices/processes/products.
3 Use the relevant renewable energy sources.
4 Use land fill and incineration methods for treatment of industrial solid waste.

**Course Contents:**

| Ch. No | | Topic / Subtopic | Practical Hrs |
|---|---|---|---|
| 1. | 1.1 | **Introduction** | 04 |
| | | Need of the study of environmental science, definition scope and importance of environmental studies. | |
| | 1.2 | Environment & its component need of public awareness, effect of human activities on technological environment. | |
| | 1.3 | Depleting Nature of environmental sources such as soil, water, minerals & forests. Need of conserving natural resources preserving the environment. | |
| 2 | | **Sustainable Development** | 04 |
| | 2.1 | Concept of sustainable development. | |
| | 2.2 | Social, Economical & Environmental aspect of sustainable development. | |
| | 2.3 | Control measure: 3 R (Reuse, Recovery, and Recycle). Appropriate Technology, Environmental education. | |
| 3 | | **Environmental Pollution:** | 16 |
| | 3.1 | Introduction. | |

| | | | |
|---|---|---|---|
| | 3.2 | Water Pollution: Sources of water pollution-Sewage, Industrial waste, Agriculture chemicals, Thermal & radioactive waste, Heavy metals. Effects of water pollution. Control of water pollution. | |
| | 3.3 | Air pollution: Introduction, sources of air pollution, types of air pollution, effects of air pollution, control measures of air pollution. | |
| | 3.4 | Concept of Global Warming, Ozone Layer Depletion, Acid rain, Greenhouse effects. | |
| | 3.5 | Noise Pollution: Definition, Classification of noise pollution, effects of noise pollution, control of noise pollution. | |
| | 3.6 | Land Pollution: Causes, effects and remedies. | |
| | 3.7 | E-Pollution: Definition, Causes and effects and remedies measures. | |
| | 3.8 | Introduction to solid waste management. | |
| | 3.9 | Water Conversation: Rainwater harvesting, Watershed Management | |
| 4 | | **Renewable sources of Energy:** | 04 |
| | | Biomass, Biogas, Solar Energy, Nuclear Power, Hydropower, Wind Energy, Ocean (Tidal Energy), Geothermal Energy. | |
| 5 | 5.1 | **Environmental Legislation:** | 04 |
| | | Introduction | |
| | 5.2 | Ministry of Environment and Forest. (MOEF) Organizational Structure of MOEF. | |
| | 5.3 | Functions & Powers of Control Pollution Control Board. | |
| | 5.4 | Functions & Powers of State Pollution Control Board. | |
| | 5.5 | Environment Protection Act. | |
| | | **Total** | **32** |

**Assignments:**

1. Study of air quality of Pune city.
2. Study of noise pollution in Pune city.
3. Study of solid waste management of Pune city.
4. Study of E-waste management of Pune city.
5. Study of Environmental Status Report of Pune city prepared by Pune Municipal Corporation.

**Text Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1 | S.P. Nisture, D. A. | Basic Civil and Environmental | Pearson |

| | | | |
|---|---|---|---|
| | Joshi, G.S.Chhawsaria | Engineering | |
| 2 | Anindita Basak, D.L. Manjunath | Basics of Environmental Studies | Pearson |
| 3 | L.D. Danny Harvey | Global Warming The Hard Science | Pearson |
| 4 | Benny Joseph | Environmental Studies | TataMcGraw Hill |
| 5 | Godfrey Boyle | Renewable Energy | Oxford Publications |
| 6 | R. Rajagopalan | Environmental studies | Oxford University Press |

**Websites:**

1. http://www.mpcb.gov.in/
2. http://www.cpcb.nic.in/
3. **http://www.envfor.nic.in/**
4. **http://www.neeri.res.in/**

| Prepared by | Member Secretary, PBOS | Chairman,PBOS |
|---|---|---|
| Mr.R.M.Aghav<br>Mr.V.M. Kolhe<br>Mr.D.K. Fad | (Mr.S.V.Chaudhari) | (Mr.M.S.Satarkar) |

**Programme : Diploma in Comp Engg/Info Tech.**
**Programme Code : 07/06/26**
**Name of Course : E-Commerce**
**Course Code : AU486**

**TeachingScheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | **02** | **32** |
| **Practical** | **--** | **--** |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | **Two class tests of 60 Minutes** | 03 | -- | --- | --- |
| Marks | 20 | 80 | -- | -- | -- |

**Course Rationale:**

This course is aimed at providing the students with modules on the use of the Internet and e-commerce. It also includes all aspects of deploying e-business and e-commerce within an organization. It also provides theories and concepts and questions the validity of these models in the light of the differences between the Internet and other media.

**Course Outcomes:**

After studying this course, the student will be able to-

1. Illustrate e-business models.
2. Describe e-procurement process.
3. Identify new-media for marketing communications.
4. Assess e-commerce services quality

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Name of Topic/Sub topic | | Hrs |
|---|---|---|---|
| **Unit-1Introduction to E-Business and E-Commerce** | | | |
| • Identify E-technologies for e-commerce Explain ASCII EBCDIC and Unicode<br>• Tackle with business challenges of e-commerce.<br>• Identify risk and barriers of E-business. | 1.1 | Introduction ,The impact of the electronic communications on traditional businesses , Real-world E-Business: HP.com | **04** |
| | 1.2 | Difference between e-commerce and e-business, E-Commerce defined, E-business defined. | |
| | 1.3 | Business or consumer models of e-commerce transactions ,E-business opportunities ,Business adoption of digital technologies for e-commerce and e-business , Drivers of business Internet adoption . | |
| | 1.4 | E-business risks and barriers to business adoption ,Evaluating an organization's e-business capabilities , Drivers of consumer Internet adoption, Barriers to consumer Internet adoption | |
| | 1.5 | Case Study : A history of Flipcart/Paytm. | |
| **Unit-2E-Commerce Fundamentals** | | | |
| • Manage e-business infrastructure effectively<br>• Use various web services for e-commerce. | 2.1 | Web presentation and data exchange standards, Audio and video standards, Focus on Internet governance. | |
| | 2.2 | Managing e-business infrastructure, Managing hardware and systems software, infrastructure, Managing Internet service and hosting providers, Managing employee access to the Internet and e-mail, Managing e-business applications infrastructure. | |

| | | | |
|---|---|---|---|
| | 2.3 | Focus on web services, SaaS and service-oriented architecture (SOA),Benefits of web services or SaaS, Challenges of deploying SaaS. | **06** |
| | 2.4 | EDI, Focus on mobile commerce, Wireless Internet access standards, Wireless access devices, Popularity of mobile applications. | |
| | 2.5 | Case Study : New architecture or just new hype? | |
| **Unit-3E-Environment** | | | |
| • Identify environmental and green issues related to Internet.<br>• Describe implication of e-commerce for international trading. | 3.1 | Social and legal factors, Factors governing e-commerce service adoption , Privacy and trust in e-commerce , Other e-commerce legislation. | **06** |
| | 3.2 | Environmental and green issues related to Internet, usage Taxation , Freedom-restrictive legislation , Economic and competitive factors, Focus on e-commerce and globalization. | |
| | 3.3 | The implications of e-commerce for international B2B trading, Political factors, Internet governance, E-government, Technological innovation and technology assessment, Approaches to identifying emerging technology. | |
| | 3.4 | Case Study: The implications of globalization for consumer attitudes. | |
| **Unit- 4E-Procurement** | | | |
| • Apply e-procurement process in e-Business.<br>• Identify Risks and impacts of e-procurement. | 4.1 | Introduction to e-procurement, Understanding the procurement process, Types of procurement. | **04** |
| | 4..2 | Participants in online procurement , Drivers of e-procurement , Focus on estimating e-procurement cost, The impact of cost savings on profitability, Risks and impacts of e-procurement. | |

| | | | |
|---|---|---|---|
| | 4.3 | Case Study: Cambridge Consultants reduce costs through e-procurement. | |
| **Unit-5 E-Marketing** | | | |
| • Recognize new-media for marketing communications<br>• Compare e-marketing, e-business and e-commerce. | 5.1 | Introduction to e-marketing, Marketing defined, E-marketing defined, Distinguishing between e-marketing, e-business and e-commerce. | **04** |
| | 5.2 | E-marketing planning, Situation analysis, Demand analysis, Competitor analysis, Intermediary analysis, Internal marketing audit, Objective setting. Strategy, Market and product positioning. Target market strategies, Focus on characteristics of new-media marketing communications, Tactics, Product, Price, Place, Promotion, People, Process and Physical evidence. | |
| | 5.3 | Focus on online branding, The importance of brand online Actions, Control . | |
| **Unit-6 Customer Relationship Management** | | | |
| • Compare CRM and e-CRM.<br>• Assess e-commerce services quality<br>• Perform interactive marketing. | 6.1 | Introduction, Marketing applications of CRM , What is e-CRM? Benefits of e-CRM, Permission marketing, Customer profiling , Conversion marketing. | **08** |
| | 6.2 | The online buying process, Differences in buyer behavior in target markets, Differences between B2C and B2B buyer, Behavior. The net promoter score, Customer acquisition management, Focus on marketing communications for customer Acquisition. | |

| | | | |
|---|---|---|---|
| | 6.3 | The characteristics of interactive marketing, communications, Assessing marketing communications effectiveness, Online marketing communications, Customer retention management, Personalization and mass customization, Online communities Techniques for managing customer activity and value, Lifetime value modeling. | |
| | 6.4 | Focus on excelling in e-commerce service quality, Improving online service quality, Customer extension, Advanced online segmentation and targeting, techniques, Technology solutions for CRM , Types of CRM applications. | |
| | 6.5 | Integration with back-office systems, The choice of single-vendor solutions or a more, fragmented choice, Data quality. | |
| | | **Total** | **32** |

**Text Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1. | **Dave Chaffey** | E-Business and E-Commerce Management Strategy, Implementation and Practice. | Prentice Hall |
| 2. | **Kalakota et al** | Electronic Commerce: A Manager's Guide. | Addison-Wesley |

**Specification Table :**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Introduction To E-Business and E-Commerce | 06 | 04 | 02 | 12 |
| 02 | E-Commerce Fundamentals | 04 | 04 | 06 | 14 |
| 03 | E-Environment | 04 | 04 | 06 | 14 |
| 04 | E-Procurement | 04 | 04 | 04 | 12 |
| 05 | E-Marketing | 02 | 04 | 06 | 12 |
| 06 | Customer Relationship Management | 04 | 06 | 06 | 16 |
| Total | | 24 | 26 | 30 | 80 |

**Prepared By** **Secretary, PBOS** **Chairman, PBOS**

**Mr.S.V.Chaudhari** **Mr. U.V.Kokate**

**Name of Programme** : **Diploma in Comp Engg/Info Tech.**
**Programme Code** : **06/26/07**
**Name of Course** : **Management Information System**
**Course Code** : **MA487**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 03 | 48 |
| Term work / Practical | --- | --- |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 03Hrs | | | |
| Marks | 20 | 80 | -- | -- | -- |

**Rationale:**

MIS is a concept continuous to evolve; emerging trend consistent with the evolution of the MIS concept endures computing. It is the power of computers, which makes MIS feasible. It also deals with the impact of computers and information technology innovation and organizational design and planning. It is used to know how to manage any organization using Software requirement specification Data flow diagrams, coding techniques for evolution of manager. From this point of view, the course is introduced.

**Course Outcomes:**

**After completing this course students will be able to**

1. Describe functional areas of Management Information System
2. Prepare System Requirement Specification Document.
3. Perform feasibility Analysis and construct flow of System.
4. Describe the significance of Quality management and Financial management.
5. Explain Executive Information System and Executive Support System.
6. Identify the Security threats of InformationSystem.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1 : Information Systems and Organizations** | | |
| • Define Organization, Data ,MIS<br>• Classify IS and signify its use<br>• Describe functional areas of Management and DSS | 1.1 Organizational and Information, System Structure, Data and Information, Management and Decision Making, Classification of Information Systems, Information support for functional areas of Management, Impact of Business on Information System, Organizing Information System<br>1.2 Decision Support Systems:, Definition, Evolution of DSS, Characteristics of DSS,Model Management, Group Decisions | **06** |
| **Unit 2: System Analysis and Design** | | |
| • Perform System Analysis<br>• Describe SDLC<br>• Generate Requirement Specification Document | 2.1 Organizational context of System Analysis, Role of System Analyst, System Development Life Cycle, Requirements Analysis<br>2.2System Requirements Specification: System requirements specification: Example, Data dictionary, Steps in Systems Analysis, Modularizing requirement specifications, Conclusions. | **07** |
| **Unit 3: Feasibility Analysis** | | |
| • Performs feasibility Analysis and develop feasibility report<br>• Apply Structural Analysis and Design flow of System<br>• Draw context DFD and level 1 and level 2 DFD for project<br>• Describe process specification | 3.1 Deciding on project goals, Examining alternative solutions, Evaluating proposed solution, Cost-benefit analysis, Payback period, Feasibility report, and System proposal.<br>3.2 Data flow diagrams:, Symbols used in DFD's Describing a system with a DFD, Good conventions in developing DFDs Leveling of DFDs, Logical and Physical DFDs.<br>3.3 Process Specifications: Process specification methods, structured English Some examples of process specification. | **12** |
| **Unit 4:Management** | | |

| | | |
|---|---|---|
| • Define Quality and state its attribute<br>• space methods models<br>• Describe Quality objects and Quality Management principle<br><br>• Describe various Quality Control and Assurance such TQM,6-Sigma,ISO<br>• Specify significance of Financial Management | 4.1Quality Management:<br>Specific Objectives: Meaning of Quality State Principles of Quality Management, Describe Modern Technique & Systems of Quality Management<br>Quality Management System: Activities, Benefits<br>Quality Control - Objectives, Functions, Advantages<br>Quality Circle - Concept, Characteristics & Objectives<br>Quality Assurance - Concept, Quality Assurance System<br>Total Quality: Meaning of Total Quality<br>Total Quality Management: Components of TQM, Elements of TQM, Benefits Modern Technique & Systems of Quality Management like 6-Sigma, ISO 9001:2000 - Benefits, Main clauses.<br>4.2 Financial Management<br>Specific Objectives: Explain functions of financial management; State the sources of finance & types of budgets, Describe concepts of direct & indirect taxes.<br>Financial Management- Objectives & Functions<br>Budgets and accounts :Types of Budgets<br>Production Budget - Sample format: Labour Budget - Sample format,<br>Profit & Loss Account & Balance Sheet: Meaning, sample format, Meaning of different terms involved.<br>Meaning & Examples of - Excise Tax, Service Tax, Income Tax, Value Added Tax, Custom Duty<br>4.3 Data input Methods: Data input, Coding techniques, Detection of error in codes, Validating input data, interactive data input. | **15** |
| **Unit 5:Executive Information System and Executive Support System** | | |
| • Define EIS,ESS<br>• State the characteristics ESS,ESS<br><br>• Compare EIS with ESS | 5.1 Why EIS and ESS? Internal factor and External factor<br>5.2 What is EIS and ESS? Characteristics of EIS and ESS<br>5.3 Informational characteristics, User Interface/Orientation Characteristics, Managerial/Executive Characteristics | **04** |

| | | |
|---|---|---|
| • .Discuss need of Expert System in Organization | 5.4 EIS/ESS Capabilities and Benefits<br>5.5ExpertSystem-Definition,Components,Application and Limitations | |
| **Unit 6:Management Issues in MIS** | | |
| • Demonstrate need of Information Security<br>• Discuss and Determine different threats for IS System<br>• Apply various Security Tools for Information System<br>• Realize Ethical and Social Dimensions of Information System and publishing its significance | 6.1 Information Security and Control: Why break IT System Security?<br>6.2Information System Security Threats: External Security Threats: Internet Connections, Remote Dial –in Capabilities, Internal Security Threats: Passwords, User Terminations, Authorizations Levels, Special Privileges, Virus Checking, Audit Trails<br>6.3 Ethical And Social Dimensions | **04** |
| | **Total** | **48** |

**Specification Table**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Information Systems and Organizations | 04 | 04 | 02 | 10 |
| 02 | System Analysis and Design | 04 | 02 | 04 | 10 |
| 03 | Feasibility Analysis | 02 | 08 | 05 | 15 |
| 04 | Management | 02 | 08 | 05 | 15 |
| 05 | Executive Information System and Executive Support System | 06 | 04 | 05 | 15 |
| 06 | Unit 6: Management Issues in MIS | 04 | 05 | 06 | 15 |
| | Total | 22 | 31 | 27 | 80 |

**Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1. | V Rajaraman | Analysis & design of Information system, PHI | |
| 2. | S.Sadagopan | Management Information Systems, PHI | PHI |
| 3. | James A.O`Brien<br>George M.Marakas | Management Information Systems -Tenth Edition, McGraw Hill | |

**Reference Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1. | Gordon B. Davis and Margeth H. Olson | MIS | |
| 2. | Kroenke Davis | Management information System, 2nd edition | |
| 3. | Sein | MIS | |
| 4. | Jawadekar W.S. | MIS | |
| 5. | Millind Oka | MIS | |
| 6. | Jayashankar | Decision Support Systems | |
| 7. | Lucas | Information System Concepts for Management, 4th edition | 4th edition |

| (Preparedby) | (Member Secretary PBOS) | (Chairman PBOS) |
|---|---|---|
| Prof.N.RWagh | Prof. S.V. Choudhari | Prof. U.V. Kokate |
| Prof A.B. Bhusagare | | |

**Programme** : Diploma in Computer Engineering/Information Technology
**Programme Code** : 06/07
**Name of Course** : Project And Seminar
**Course Code** : CM481
**Class Declaration** : **YES**

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| **Duration** | Progressive Assessment of Seminar | -- | -- | -- | -- |
| **Marks** | **50** | **--** | **50** | **--** | **50** |

**Course Rationale:**

This Subject tends to mould students towards integrating the knowledge acquired throughout and applying it to the real life projects, in order to gain the confidence of acquiring Engineering skills and thus fulfill the objective of Diploma Programme.

**Course Outcomes:**

After undergoing this course, the student will demonstrate the following Course Outcomes :

1. Analyze and define the real life problem from Project development point of view.
2. Apply appropriate design methodology to the Projects.
3. Make use of designing tools.
4. Conduct feasibility study and cost estimation
5. Create test and debug working model.
6. Compile and Write a Software Project Report
7. Work in team and deliver presentations.

**Subject Guideline regarding implementation:**

| Sr. No. | Name of Experiment/Assignment |
|---|---|
| **1.** | Subject would contain two components :<br>1. Seminar<br>2. Project |
| **2.** | Seminar Should be on Technical Topic only. It can be taken on Subject to be continued as project or any other technical Topic. Evaluation of Seminar should be based on Topic Selection, Technical Contents, Content Understanding, Content Delivery and Response to the Questions. |
| 3. | Project can be Hardware or Software or Combination of Both. It must involve logic building and application of various technologies learnt during Diploma Completion |
| 4. | May Form a team of students as per industry roles- Developers, testers, Business Analysts, Project managers, Customers. Assign this team a project.Each group is to be assigned a guide faculty. Project titles are to be decided in co-ordination with Faculty. |
| 5. | Students Must Submit One Hard copy and one softcopy each of Seminar and Project. |
| 6. | These titles are to be covered in Project Report:<br>a. Problem Definition<br>b. Platform and/Hardware Specifications<br>c. Feasibility Study.<br>d. Various Design UML charts/diagrams as applicable like Use Case Diagram, Activity Charts, Class Hierarchy, DFD, CFD, ER-Diagrams or any other<br>e. Cost Estimation<br>f. Time Estimation<br>g. Limitations<br>h. Use<br>i. Future Scope/Extendability<br>j. Books/References/WebSites<br>(Other titles may be added and used as applicable, based on the nature of project) |
| 7. | Student should maintain a project diary and note down all the progress steps and details in the diary. Faculty should check the diary each week and accordingly interact with students based on the progress shown and keep proper notings.Impart proper guidance. This will assist in proper evaluation of students. |

| Prepared By | Secretary, PBOS | Chairman, PBOS |
|---|---|---|
| Prof. M.U.Kokate | Prof. S. V. Chaudhari | Prof.U.V.Kokate |

**Name of Programme** : **Diploma in Computer Engg/Information Technology**
**Programme Code** : **06 / 07/26**
**Name of Course** : **Java Programming II**
**Course Code** : **CM482**
**Prerequisite** : **CM389(Java Programming I)**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 03 | 48 |
| Term work / Practical | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | Hrs | | | |
| Marks | 20 | **80** | **25** | **--** | **25** |

**Rationale:**

This course introduces students to intermediate and advanced features of the Java programming language. Student will know how to implement graphical user interfaces using Javacomponents. In the Era of Web technology it is essential for every diploma Engineer to have knowledge of Internet programming. This course covers advanced features of JAVA.

**Course Outcomes:**

**After completing this course students will be able to**

1. Develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
2. Develop client/server applications using TCP/IP and UDP socket programming.
3. Write Java programs using databases with Java Data Base Connectivity (JDBC) as interface.
4. Create and useJava Bean.
5. Develop applications for Remote Method Invocation (RMI).

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Unit 1 : Event Handling and Introducing the AWT** | | |
| • Enlist various AWT components<br>• Practice event handling<br>• Describe various handling events by extending AWT<br>• Design a form containing various AWT components and apply event handling. | 1.1 Two event handling mechanisms, The delegation Event Model<br>1.2 Event classes, Sources of Events, Event Listener Interfaces<br>1.3 Using the Delegation Event Model, Adapter classes, Inner classes<br>1.4 AWT classes, Window fundamentals, Working with frame Windows, Creating a frame Window in an Applet, Creating windowed program, Display information within a window<br>1.5 Working with graphics, Working with color, Setting the paint mode<br>1.6 Working with Fonts, Managing text output using Font Metrics, Exploring text & graphics<br>1.7 Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, Checkbox Group, Choice Controls, Using Lists, Managing scroll Bars, Using a Text Field, Using a Text Area<br>1.8 Understanding Layout Managers, Menu Bars and Menus, Dialog Boxes, File Dialog<br>1.9 Handling events by Extending AWT Components, Exploring the Controls, Menus, and Layout Managers | **14** |
| **Unit 2: Swing Component** | | |
| • Demonstrate working of applet<br>• Use swing components in applet | 2.1The Tour of Swing : Japplet, Icons and Labels ,Text Fields, Buttons<br>2.2Combo Boxes, Tabbed Panes, Scroll Panes, Trees, Tables, Exploring the Swings | **4** |
| **Unit 3:Networking Basics** | | |
| • Define socket<br>• Compare various sockets<br>• Write a java programs for client server communication using sockets | 3.1Socket overview, client/server, reserved sockets, proxy servers, internet addressing<br>3.2Inetaddress ,Factory methods, instance method TCP/IP Client Sockets<br>3.3What is URL Format? URL connection, TCI/IP Server Sockets<br>3.4Datagrams :Datagram packets Datagram server & client Net worth | **6** |

| | | |
|---|---|---|
| **Unit 4:Java DataBase Connectivity Client/Server** | | |
| • Develop a program for steps to connect a database<br>• Describe the Basics of JDBC<br>• Develop program to use JDBC to query a database and modify | 4.1Java as a Database front end .Database client/server methodology .Two-Tier and Three-Tier Database Design<br>4.2The JDBC API. The API Components Limitations Using JDBC (Applications vs Applets). Security Considerations A JDBC Database Example JDBC Drivers. JDBC-ODBC Bridge. JDBC Driver Types. Statement Interface and handling ResultsetObject. | **10** |
| **Unit 5:JAVA Beans** | | |
| • State advantages of Java Beans<br>• Develop your own Java Bean | 5.1What is Java Beans? Advantages of Java Beans<br>5.2Application Builder Tools, The Bean Developer kit(BDK), JAR Files, Introspection, Developing a simple Bean Using Bound properties Using the BDK<br>5.3Using Bound properties, Using the Bean Info Interface, Constrained properties<br>5.4Persistence Customizers, The Java Beans API, Using Bean Builder | **6** |
| **Unit 6:Remote Method Invocation** | | |

| | | |
|---|---|---|
| • Compare Distributed and Non distributed Java Programs<br>• Draw RMI Architecture<br>• Define stubs and skeletons<br>• Demonstrate working RMI Client side call backs | 6.1Introduction to Distributed Computing with RMI : Goals, Comparison of Distributed and Non distributed Java Programs<br>6.2Java RMI Architecture Interfaces: The Heart of RMI, RMI Architecture Layers, Stub and Skeleton Layer, Remote Reference Layer, Transport Layer<br>6.3Naming Remote Objects, Using RMI, Interfaces, Implementation, Stubs and Skeletons, Host Server, Client.<br>6.4Running RMI System, Parameters in RMI, Parameters in a Single Java Virtual Machine, Primitive Parameters, Object Parameters, Remote Object Parameters<br>6.5RMI Client-Side Call backs, Distributing and Installing RMI Software, Distributing RMI Classes, Automatic Distribution of Classes, Firewall Issues | **8** |
| | **Total** | **48** |

**List of Practicals/Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Program to design a form using various controls. | 1 | 02 |
| 2. | Program to design a form and handle various events related to each control. | 2 | 02 |
| 4. | Program to display any string using available Font and Font metrics class and their methods. | 1 | 02 |
| 5 | Program to create a menu bar with various menu items and sub menu items. Also create a checkable menu item. On clicking a menu Item display a suitable Dialog box. | 1 | 02 |
| 6 | Program to design a form using basic swing components. | 2 | 02 |
| 7 | Program to demonstrate the use of tabbed panes and scroll panes in Swing . | 2 | 02 |
| 8 | Program to map Directory tree and Table. | 2 | 02 |
| 9 | An Application program to make connectivity with database using JDBC API. | 4 | 01 |

| | | | |
|---|---|---|---|
| 10 | Application programs to send queries through JDBC bridge & handle result. | 4 | 02 |
| 11 | Program to retrieve hostname using methods in Inet Address class. | 6 | 01 |
| 12 | Program to demonstrate use of URL and URL Connection class for communication. | 6 | 02 |
| 13 | Program that demonstrates TCP/IP and UDP based communication between client and server | 6 | 04 |
| 14 | Program to develop simple bean using BDK (Bean Developing Kit) | 5 | 02 |
| 15 | Create a Client/Server application using RMI | 6 | 04 |
| | | **Total** | **32** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Event Handling and Introducing the AWT | Explanations of basic concept |
| 2 | Swing Component | Explanation & Practical implementation |
| 3 | Networking Basics | Explanation & Practical implementation |
| 4 | Java DataBase Connectivity Client/Server | Explanation & Practical implementation |
| 5 | JAVA Beans | Explanation & Practical implementation |
| 6 | Remote Method Invocation | Explanation & Practical implementation |

**Specification Table for Theory Paper:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Event Handling and Introducing the AWT | 06 | 05 | 09 | **20** |
| 02 | Swing Component | 02 | 02 | 04 | **8** |
| 03 | Networking Basics | 04 | 04 | 04 | **12** |
| 04 | Java DataBase Connectivity Client/Server | 06 | 06 | 06 | **18** |
| 05 | JAVA Beans | 02 | 02 | 04 | **8** |
| 06 | Remote Method Invocation | 06 | 04 | 04 | **14** |
| | Total | 26 | 23 | 31 | 80 |

R-Remember U – Understand A – Analyze / Apply
T= Unit/Topic Number L= Level of Question M = Marks

**Scheme Of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations, | 7 |
| 2 | Calculations and Result | 8 |
| 3 | Viva voce | 10 |
| | **TOTAL** | **25** |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Java 1.2 Unleased | Jaworski, Techmedia | 9781575213897 |
| 2 | Michael Morrison | The Complete IDIOT's Guide To JAVA 2 | 10: 0-7897-2131-7 / 0789721317 |
| 3 | Java2 Programming | Keyur Shah, Tata McGraw hill | 0070435979 |
| 4 | Core Java Volume II | Cay S. Horstmann, Pearson | 9780134177298 |
| 5 | Special edition using java1.2 | Joseph L.Weber, PHI | 9780789720184 |
| 6 | The Complete Reference Java 2 (Fifth Edition) | Patrick Naughton-Herbert Schildt, Tata – Mcgraw hill | 9780070495432 |

**E-References:**

1. www.**java**tpoint.com/**java-tutoria**
2. www.w3schools.in/**java-tutorial**

**Prepared by**

**(  )  (Member Secretary PBOS)  (Chairman PBOS)**

**Name of Programme : Diploma in Comp Engg/Info Tech.**
**Programme Code : 06/26/07**
**Name of Course : Computer Security**
**Course Code : CM485**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 03 | 48 |
| Term work / Practical | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 3Hrs | -- | -- | -- |
| Marks | 20 | 80 | -- | 25 | 25 |

**Rationale:**

Computer security is one of the most important and relevant area of computing today. The requirement to address security in computer system design is an important design consideration in many of today's system. It is essential to understand various threats to secure computing and the basic security design principles and techniques developed to address these threats to confidentiality, integrity and availability.

This course will introduce basic cryptography, fundamentals of computer/network security, risks faced by computers and networks, security mechanisms, operating system security, secure systems design principles..It focuses on concepts and methods associated with planning managing and auditing security at all levels including networks.

**Course Outcomes:**

**After studying this course, the student will be able to**

1.Identify varioussoftware threats and attacks on operating system and online/offline application software.
2.Adopt security measures for security of vital data.
3. Write and execute programs forencryption/decryption.
4.Describeapplicationsof firewall and IP Security in computer security.
5. Install IDS, Hot-fix,patch,service pack for security software up gradations.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1 : Introduction and Security trends** | | |
| • Identify threats to security<br>• List different types of attack<br>• Explain security basics<br>• Compare various access controls | 1.1 Threats to security: Viruses and worms, Intruders, Insiders, Criminal organizations, Terrorists, Information Warfare, A venues of attack, steps in attack<br>1.2 Type of attack: Denial of service, backdoors and trapdoors, sniffing, spoofing, man in the middle, replay, TCP/IP Hijacking, encryption attacks Malware: Viruses, Logic bombs<br>1.3 Security Basics - Confidentiality, Integrity, Availability, Operational model of Computer Security, Layers of security<br>1.4 Access control: Discretionary, Mandatory, Role based Authentication: Introduction | **08** |
| **Unit 2: Organizational/Operational security** | | |
| • Describe role of people in password selection<br>• Define Security Policies,standards and procedures<br>• List different access controls<br>• Explain Social engineering | 2.1Role of people in security: Password selection, Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software/hardware, Access by non employees Security awareness, Individual user responsibilities<br>2.2Security policies, standards, procedures and guideline<br>2.3Physical Security: Access controls biometrics: finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns keystrokes<br>2.4Social Engineering. | **6** |
| **Unit 3: Cryptography and Public Key Infrastructure** | | |

| | | |
|---|---|---|
| • Describe various encryption algorithms<br>• Demonstrate use of Steganography<br>• Analyze Public key Infrastructure<br>• Compare different trust models | 3.1 Encryption algorithm /Cipher, Caesar's Cipher, Shift cipher, substitution software Vigenere cipher.<br><br>3.2 Transposition Techniques, Steganography<br><br>3.3 Hashing, SHA<br><br>3.4 Symmetric encryption, DES (Data encryption standard), Asymmetric encryption, Digital Signatures, Keyescrow.<br><br>3.5Public key infrastructures: basics, digital certificates, certificate authorities, registration authorities, step for obtaining a digital certificate, steps for verifying authenticity and integrity of a certificate<br><br>3.6 Centralized or decentralized infrastructure, private key protection.<br><br>3.7 Trust models: Hierarchical, peer to peer, hybrid | **14** |
| **Unit 4: Network Security** | | |
| • Demonstrate working of firewall<br>• List different security topologies<br>• Justify importance of email security | 4.1 Firewalls: working design principles trusted systems Kerberos<br><br>4.2 Security topologies - security zones, DMS, Internet, VLAN, security implication tunneling<br><br>4.3 IP security: overview, architecture, IPSec, IPSec configuration, IPSec security<br><br>4.4 Introduction Virtual Private Network<br><br>4.5 Email Security: security of email transmission, malicious code, spam, mail encryption. | **14** |
| **Unit 5: System security** | | |

| | | |
|---|---|---|
| • Classify Intrusion detection systems<br>• Define Hot fix,patch,service pack | 5.1 Intruders, Intrusion detection systems (IDS).host based IDS, network based IDS<br>5.2 Operating system security: Operating system updates : hot fix, patch, service pack | **6** |
| | **Total.** | **48** |

**List of Practical's/Laboratory Experiences/Assignments**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| **1** | Study of any Antivirus Installation & Configurations | **1** | 08 |
| **2** | Study/Demo of Packet Sniffers | | |
| **3** | Study of Standard Vulnerabilities of Operating Systems. | | |
| **4** | Study of IT Act(2000-2008)Study of Cyber Laws. | **1** | 04 |
| **5** | Write programs for encryption and decryption using different techniques(Minimum 02) | **3** | 04 |
| **6** | Practice use of Remote Access tools | | |
| **7** | Setting Operating System Firewall, its importance and Problems. | **4** | 06 |
| **8** | Study setting of Security levels in email | | |
| **9** | Study of any intrusion detection S/W. | **5** | 02 |
| **10** | Practice use of password cracking tools | **2** | 02 |
| **11** | Practice use of data recovery tools | **4** | 02 |
| **12** | Practice use of Digital Signatures | **3** | 04 |
| | | **Total** | 32 |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | **Introduction and Security trends** | Class room teaching |
| 2 | **Organizational/Operational security** | Class room teaching, laboratory work |
| 3 | **Cryptography and Public Key Infrastructure** | Class room teaching |
| 4 | **Network Security** | Class room teaching, laboratory work |
| 5 | **System security** | Class room teaching, laboratory work |

**Specification TableFor Theory Paper:**

R-Remember U – Understand A – Analyze / Apply

| S.N | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Introduction and Security trends | 06 | 04 | 04 | 14 |
| 02 | Organizational/Operational security | 03 | 03 | 03 | 09 |
| 03 | Cryptography and Public Key Infrastructure | 10 | 08 | 06 | 24 |
| 04 | Network Security | 10 | 06 | 08 | 24 |
| 05 | System security | 03 | 03 | 03 | 09 |
| | **Total** | 32 | 24 | 24 | 80 |

**Scheme of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Practical performance | 20 |
| 3 | Viva | 05 |
| | **TOTAL** | **25** |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Principles of computer security<br><br>Security+and Beyond | Wm.Arthur Conklin Dwayne Williams Gregory B. White RogerL.Davis Chuck Cothren, McGraw Hill Technology Education International Edition2005 | |
| 2 | Cryptography And Network Security | Behrouz A Forouzan,De Anza College,DeepakMukopadhay, McGraw Hill Technology Education International 2nd Edition | |

**E-References:**

1. https://en.wikipedia.org/wiki/**Computer_security**
2. https://en.wikipedia.org/wiki/C-**list_(computer_security**)

(Smt.T.D.Pawar,

Smt. P.L.Sonawane )

**Prepared by**

Prof.. S. V. Chaudhary

**(Member Secretary PBOS)**

Prof. U. V. Kokate

**(Chairman PBOS)**

**Programme : Diploma in Comp Engg/Info Tech.**
**Programme Code : 06/07**
**Name of Course : Software Testing**
**Course Code : CM486**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | 02 | 32 |
| **Practical** | 02 | 32 |
| **Tutorial** | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| **Duration** | Two class tests, each of 60 minutes | 2Hrs. | -- | -- | -- |
| **Marks** | 10 | 40 | 50 | -- | 50 |

**Course Rationale:**

Software testing will introduce you to basic of software testing, teaching you not just the fundamentals of teaching skills but also supporting skills necessary to become a successful software tester .You will learn how to immediately find problems in any computer program, how to plan an effective test approach, how to clearly report your finding, and to tell when your software is ready for release.

**Course Outcomes:**

Students will be able to:

1. Prepare test plan and test cases for given application software product.
2. Test software for performance measures such as compatibility, usability.
3. Identify bugs to create defect report of given application software.
4. Select and Apply various software testing techniques.
5. Know various automated testing tools.

**Course Content:**

| Unit No. | Name of Topic/Sub topic | | Hrs |
|---|---|---|---|
| **Unit-1 Basics of Software Testing** | | | |
| • Identify need of testing in software development.<br>• Analyze the quality of Software. | 1.1 | Error and bug terminology, Testing terms, Test effort. | **04** |
| | 1.2 | The Fundamental Test Process: Test planning and control, Test analysis and design, Test implementation and execution, Evaluation of the test exit criteria and reporting, Test closure activities. | |
| | 1.3 | General principles of testing. | |
| | 1.4 | Requirement gathering and analysis, Planning, Design, Coding, Testing, Maintenance | |
| | 1.5 | Quality Assurance and Quality Control, Testing, Verification and Validation. | |
| **Unit-2 Types of Testing** | | | |
| • Generate test cases from software requirements using various test Processes for continuous quality improvement.<br>• Apply software testing techniques for information systems development | 2.1 | White box testing : Static testing , Structural testing. | **08** |
| | 2.2 | Black box testing: Requirement based testing, Positive and Negative testing, Boundary value analysis, Decision tables, Equivalence partitioning, User documentation testing. | |
| | 2.3 | Integration testing: Top-Down and Bottom-Up integration, System integration, Scenario testing. | |
| | 2.4 | System and Acceptance testing: Functional system testing, Design/ Architecture testing, Deployment testing, Beta testing, | |
| | 2.5 | Non-functional system testing: Configuration testing, Scalability and Reliability testing, Acceptance testing, Internationalization testing, Localization testing | |
| **Unit-3 Special Tests** | | | |
| • Test software for compatibility, usability and security issues. | 3.1 | GUI testing: Compatibility testing, Security testing | **04** |
| | 3.2 | Performance and Stress testing, Recovery and Installation testing | |
| | 3.3 | Smoke and Sanity testing: Regression testing, Usability testing. | |

| | | | |
|---|---|---|---|
| • Write test cases for given object oriented application | 3.4 | Object oriented application testing: Client-Server testing, Web based testing. | |
| **Unit-4.Test Management** | | | |
| • List uses of Internet<br>• State types of Internet Connections.<br>• Browse Internet<br>• Create mail account. | 4.1 | Test Planning : Preparing a test plan, Scope management, Deciding test approach, Setting up criteria for testing, Identifying Responsibilities, Staffing, Training needs, Resource requirements, Test deliverables, Testing tasks. | **06** |
| | 4.2 | Test Management: Choice of standards, Test infrastructure management, Test people management , Integrating with product release. | |
| | 4.3 | Test Process: Baselining a test plan, Test case specification, Update of Traceability matrix, Executing test cases, Collecting and analyzing metrics, Preparing test summary report. | |
| | 4.4 | Test Reporting: Recommending product release. | |
| **Unit-5. Defect Management** | | | |
| • Find Defect using different technique.<br>• Describe Defect Life cycle. | 5.1 | Introduction, Defect classification, Defect management process. | **04** |
| | 5.2 | Defect life cycle, Defect template. | |
| | 5.3 | Estimate expected impact of a defect, Techniques for finding a defects, Reporting a defect. | |
| **Unit-6.Testing Tools and Measurements** | | | |
| | 6.1 | Features of test tool: Guideline for selecting a tool . | **06** |
| | 6.2 | Static and dynamic testing tool, Advantages and Disadvantages of using tools. | |
| | 6.3 | When to use automated test tools, Testing using automated tools. | |
| | 6.4 | What are metrics and measurement. Types of Metrics, Project metrics, Progress and Productivity Metrics. | |
| | | Total | **32** |

**List of Practicals/Experiments/Assignments:**

| Sr. No. | Name of Experiment/Assignment | Units | Course outcome | Tutorial Hrs | Practical Hrs |
|---|---|---|---|---|---|
| **1.** | Introduction to Software Testing Concepts through writing test cases on any device.(Ex. Monitor, Keyboard, Mouse, Booting Failure) | **1** | CO1 | 06 | 02 |
| **2.** | Perform STLC (Documentation, Planning, testing, delivery) and<br>Create a test plan for any software project. | **1** | CO1 | 06 | 02 |
| **3.** | Write Test Cases For any Application(e.g. Railway res. Form) | **1** | CO1 | - | 02 |
| **4.** | Write test cases for Web Pages Testing- Functional testing and Integration testing on any Web Sites. | **2** | CO1 & CO4 | 04 | 04 |
| **5.** | Write a program to demonstrate use of following and test it<br>1) For… Loop 2) Switch…case 3) Do…While 4) If...else<br>And write test cases for white box testing on above program. | **2** | CO1 | 02 | 06 |
| **6.** | Write test cases for Regression testing on any web page. | **3** | CO4 | 02 | 02 |
| **7.** | Write test cases for an Entry screen with at least 10 parameters. | **4** | CO1 | 01 | 02 |
| **8.** | Write test cases for function calls. | **4** | CO1 | 01 | 02 |
| **9.** | Case study on Defect Management. | **5** | CO3 | 06 | 02 |
| **10.** | Study any two different Automation Testing tools, which one is cost effective and open | **6** | CO5 | 04 | 08 |

| | | | | | |
|---|---|---|---|---|---|
| | source. Study Quality standard ISO 9000:9001. | | | | |
| | | | **Total** | **32** | **32** |

**Instructional Strategy:**

| Sr. No. | Topic | Instructional Strategy |
|---|---|---|
| 1 | Basics of Software Testing | Class room teaching |
| 2 | Types of Testing | Class room teaching, laboratory demonstration |
| 3 | Special Tests | Class room teaching |
| 4 | Test Management and planning | Class room teaching, laboratory work |
| 5 | Defect Management | Class room teaching, laboratory work |
| 6 | Testing Tools and Measurements | Class room teaching, laboratory work |

**Specification Table for Theory Paper:**

| Sr. No. | Topic | Cognitive Levels | | | Total |
|---|---|---|---|---|---|
| | | Knowledge | Comprehension | Application | |
| 1 | Basics of Software Testing | 01 | 02 | 02 | 05 |
| 2 | Types of Testing | 03 | 02 | 04 | 09 |
| 3 | Special Tests | 02 | 01 | 03 | 06 |
| 4 | Test Management and planning | 02 | 02 | 04 | 08 |
| 5 | Defect Management | 02 | 01 | 02 | 05 |
| 6 | Testing Tools and Measurements | 02 | 01 | 04 | 07 |
| | Total | 12 | 09 | 19 | 40 |

**Scheme Of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Evalution | 15 |
| 2 | Practical execution | 15 |
| 3 | Viva voce | 20 |
| | **TOTAL** | **50** |

**Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication |
|---|---|---|
| 1 | Srinivasan Desikan<br>Gopalaswamy Ramesh | Software Testing: Principles and Practices,<br>Pearson,2006 |
| 2 | M G Limaye | Software Testing: Principles, Techniques and Tools , McGraw-Hill 2009 |

**Reference Books:**

| Sr. No | Author | Author, Publisher, Edition and Year of publication |
|---|---|---|
| 1. | John A. Estrella<br>Maria C. Estrella | Sample Exam Questions ISTQB |

**Preapared By** **Member Secreatory,PBOS** **Chairman ,PBOS**

(Smt .A.M.Galshetwar , Smt.J.P.Dandale & Smt.Sneha Raut)

(Mr. S.V.Chaudhari)

(Mr..M.U.Kokate)

**Name of Programme : Diploma in Information Technology**
**Programme Code : 07**
**Name of Course : Mobile Application Development**
**Course Code : IT481**
**Pre-requisite :CM389(Java Programming-I)**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 02 | 32 |
| Term work / Practical | 02 | 32 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | -- | 2Hrs | 02 | -- | -- |
| Marks | -- | -- | 25 | -- | 50 |

**Course Rationale:**

Smart phones are more common and nowadays almost everyone in this world make regular use of smart phones in their day to day lives. Students will be given introduction of Andriod operating system This course examines the principles of mobile application design and development. Students will learn application development on the Android platform. Topics will include user interface design, user interface building, data handling,use of sensors, and specifics such as GPS. Students will design and build a variety of Apps throughout the course to reinforce learning and to develop real competency

**Course Outcomes:**

**After completing this course students will be able to**

1. Install and configure Android application development tools
2. Develop rich user Interfaces by using layouts and controls.
3. Develop application for providing location based services.
4. Develop application using intent and menus.
5. Create a complete Mobile application using content provider to handle database operations

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs |
|---|---|---|
| **Units 1: Introduction To Andriod Operating System** | | |
| • Understand features of Andriod.<br>• Describe Andriod Architechture. | 1.1. What is Andriod ?, What is open handset alliance? Andriod Ecosystem.<br>1.2. Why Andriod? Features Of Andriod<br>1.3. .Andriod Architechture. | **04** |
| **Unit 2: Configuration Of Andriod Environment** | | |
| • Install and configure Android application development tools<br>• Differentiate between Java JDK and Andriod SDK | 2.1 Operating System, Java JDK, Andriod SDK<br>2.2 Andriod Development Tools(ADT)<br>2.3 Andriod Virtual Devices(AVDs)<br>2.4 Emulators<br>2.5 Dalvik Virtual Machine, Difference between JVM and DVM<br>2.6 Steps to install and configure Eclipse and SDK | **02** |
| **Unit 3: Create The First Andriod Application and study of Layouts** | | |
| • Develop First Andriod Application<br>• Use Different layouts. | 3.1 Control Flow, Directory Structure<br>3.2 Understanding components of a screen, Fundamental UI Design<br>3.3 Linear Layout<br>3.4 Absolute Layout<br>3.5 Frame Layout<br>3.6 Table Layout | **06** |
| **Unit 4: Designing your User Interface With View** | | |
| • Design and develop rich user Interfaces for the Android platform.<br>• Use various views<br>• Display Alerts. | 1.1 Text View<br>4.1 Button, Image Button<br>4.2 EditText<br>4.3 Checkbox<br>4.4 ToggleButton<br>4.5 RadioButton And RadioGroup<br>4.6 ProgressBar<br>4.7 ListView<br>4.8 GridView<br>4.9 Image View<br>4.10 Scroll View<br>4.11 Custom Toast Alert<br>4.12 Time And Date Picker | **06** |
| **Unit 5: Activity And Multimedia** | | |

| | | |
|---|---|---|
| • Apply Intents.<br>• Develop programs for playing audio and video. | 5.1 Introduction<br>5.2 Intent, Intent_Filter<br>5.3 Activity LifeCycle<br>5.4 Broadcast Lifecycle<br>5.5 Service: Features Of service, Andriod platform service, Defining new service, Service Lifecycle, Permission ,example of service<br>5.6 Andriod System Architechture ,Multimedia framework, Play Audio and Video, Text to speech, Sensors,Async tasks | **06** |
| **Unit 6: SQLITE Database In Andriod & Telephony and Messaging** | | |
| • Create database and perform various operations on it.<br>• Use location based services | 6.1 SQLite Database, Why SQLite ?Creation and connection of the database ,Extracting value from cursors, Transactions<br>6.2 SMS Telephony<br>6.3 Location Based Services: Creating the project, Getting the maps API key, Displaying the map, Displaying the zoom control ,Navigating to a specific location, Adding markers ,Getting location, Geocoding and reverse Geocoding, Getting Location data, Monitoring Location. | **08** |
| | **Total** | **32** |

**List of Practicals /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Introduction To Android OS and Setup Android Development Environment | I, II | 02 |
| 2. | Develop a program to Display Hello World On Screen. | III | 02 |
| 3. | Develop a Program for displaying text entered in password on Button Click event | IV | 02 |
| 4. | Write a Program Using UI Control ( Text View ,Edit Text , Auto Complete Text View) | IV | 02 |
| 5 | Write a Program Using UI Control ( Button , Image Button, Toggle Button ) | IV | 02 |
| 6. | Write A Program to play Audio and Video. | V | 02 |

| | | | |
|---|---|---|---|
| 7. | Develop a program to pick up a date from datepicker. | IV | 02 |
| 8. | Write a program for sensors. | V | 02 |
| 9 | Write a program for Navigation using Intent. | V | 02 |
| 10. | Develop a program for content provider | VI | 04 |
| 11. | Develop a program for sending email | IV | 02 |
| 12. | Demonstrate Async task | V | 02 |
| 13 | Demonstrate map based application | VI | 02 |
| 14 | Develop a mini project to create Android App. | IV , VI | 04 |
| | | **Total** | **32** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Introduction To Andriod Operating System | Classroom teaching, Lab Work, Powerpoint presentations, Videos |
| 2 | Configuration Of Andriod Environment | Classroom teaching ,Lab Work ,Powerpoint presentations, Videos |
| 3 | Create The First Andriod Application and study of Layouts | Classroom teaching ,Lab Work ,Powerpoint presentations, Videos |
| 4 | Designing your User Interface With View | Classroom teaching, Lab Work, Powerpoint presentations, Videos |
| 5 | ActivityAnd Multimedia | Classroom teaching ,Lab Work ,Powerpoint presentations,Videos |
| 6 | SQLITE Database In Andriod & Telephony and Messaging | Classroom teaching ,Lab Work, Powerpoint presentations, Videos |

**Scheme Of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations, | 10 |
| 2 | Practical Performance | 20 |
| 3 | Viva voce | 20 |
| | **TOTAL** | **50** |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | ANDRIOD | Prasanna Kumar Dixit,Vikas Publications,First Edition 2014 | 9789325977884 |
| 2 | Pro Andriod 5 | David Maclean,Satya Komatineni,Grant Allen | 978-1-4302-4680-0 |

**E-References:**

1. https://www.tutorialspoint.com/android
2. http://developer.android.com/guide/index.html.
3. http://developer.android.com/reference/packages.html
4. http://developer.android.com/guide/components/fundamentals.html
5. http://developer.android.com/guide/topics/ui/index.html
6. http://developer.android.com/guide/topics/ui/declaring-layout.html

**Prepared by** **(Member Secretary PBOS)** **(Chairman PBOS)**

**Prof.T.D.Pawar**

**Programme** : **Diploma in Information Technology**

**Programme Code** : **07**
**Name of Course** : **Client Side Scripting Using JavaScript**
**Course Code** : **IT482**

**Teaching Scheme:**

| | **Hours /Week** | **Total Hours** |
|---|---|---|
| **Theory** | 02 | 32 |
| **Practical** | 04 | 64 |

**Evaluation Scheme:**

| | **Progressive Assessment** | **Semester End Examination** | | | |
|---|---|---|---|---|---|
| | | **Theory** | **Practical** | **Oral** | **Term work** |
| **Duration** | Three class tests, each of 60 minutes | 2Hrs. | -- | -- | -- |
| **Marks** | 10 | 40 | 50 | -- | 50 |

**Course Rationale:**

In the current era, Web Sites are one of the important components in Business success. People need classy websites with catchy features and features which makes the website smart enough to help the surfer enter appropriate information and perform tasks correctly. JavaScript is one such limited feature programming language used to build dynamic Web Pages and respond to events. Helps create highly interactive Webpagesitt.

**Course Outcomes:**

After studying this course, the student will be able to will be able to demonstrate the following Course Outcomes :

1. Create interactive Web Pages using JavaScript.
2. Control browser window features through Scripts.
3. Write and Execute JavaScript for handling cookies.
4. Create interactive forms using regular expressions for validations.
5. Create Web Pages with Rollovers, Status Bar, Banners, and Slideshow.

**Course Contents**

| Specific Learning Outcomes (Cognitive Domain | | Name of Topic/Sub topic | Hrs |
|---|---|---|---|
| **Unit-1An Inside Look At JavaScript Programming** | | | |
| • Write and Execute webpages with JavaScript programs using basic syntactical construct. | 1.1 | Getting Down To JavaScript | 04 |
| | 1.2 | Values and Variables | |
| | 1.3 | Operators and Expressions | |
| | 1.4 | if Statement | |
| | 1.5 | switch…case Statement | |
| | 1.6 | Loop Statement | |
| **Unit-2Arrays ,Functions and String** | | | |
| • Write and Execute webpages with JavaScript programs using Arrays.<br>• Write and Execute webpages with JavaScript programs using Functions.<br>• Write and Execute webpages Using String utilities in JavaScript . | 2.1 | Array : Declaring, DefiningLooping The Array, Adding Array Element | 08 |
| | 2.2 | Sorting Array Elements | |
| | 2.3 | Making a New Array from an Existing Array, Combining Array Elements into a String, Changing Elements of the Array | |
| | 2.4 | Function : Defining, The Scope of Variables and Arguments, Calling a Function, Function Calling Another Function, Returning Values from a Function. | |
| | 2.5 | String : Joining Strings, Dividing Text, Converting Numbers and Strings,Changing the Case of the Strings,Strings and Unicode | |
| **Unit-3Forms and Event Handling** | | | |
| • Write and Execute webpages with forms and JavaScript programs responding to form events.<br>• Write and Execute Javascript to dynamically change the controls on the webpage. | 3.1 | Building Block of a Form, Responding to Form Events, Form Objects and Elements | 08 |
| | 3.2 | Changing Attribute Values Dynamically | |
| | 3.3 | Changing Option List Dynamically | |
| | 3.4 | Evaluating Check Box Selections, Manipulating Elements Before the Form, Disabling Elements, Read-Only Elements | |
| | 3.5 | Using Intrinsic JavaScript Functions | |
| | 3.6 | Changing Labels Dynamically | |
| **Unit-4Cookies and Browser Windows** | | | |
| • Write and Execute JavaScript for handling cookies.<br>• Write and Execute JavaScript for | 4.1 | Cookie Basics, Creating, Reading, Setting the Expiration Date, Deleting | 04 |
| | 4.2 | Personalizing and Experience Using a Cookie | |
| | 4.3 | Giving the New Window Focus | |
| | 4.4 | Placing an Window into Position on the Screen | |

| | | | |
|---|---|---|---|
| controlling window positions.<br>• Write and Execute JavaScript for changing window contents dynamically. | 4.5 | Changing the Contents of a Window | |
| | 4.6 | Closing the Window | |
| | 4.7 | "Magically" Scrolling a Web Page | |
| | 4.8 | Opening Multiple Windows at Once | |
| | 4.9 | Creating a Web Page in a New Window | |
| **Unit-5Regular Expressions, JavaScript and Frames** | | | |
| • Write and Execute JavaScript for handling child windows. | 5.1 | Regular Expression: The Language of a Regular Expression, Replace Text , Return the Matched Characters | 04 |
| • Write and Execute JavaScript using regular expressions for validating/ formatting user input on the webpage. | 5.2 | Using a Regular Expression | |
| | 5.3 | Invisible Borders | |
| | 5.4 | Calling a Child Windows JavaScript Function | |
| | 5.5 | Changing the Content of a Child Window | |
| | 5.6 | Changing the Focus of a Child Window | |
| | 5.7 | Writing to a Child Window from a JavaScript | |
| | 5.8 | Accessing Elements of Another Child Window | |
| **Unit6.Rollovers, Status Bar, Banners, Slideshow, Protecting Your WebPage** | | | |
| • Write and Execute JavaScript for for creating rollover images or giving rollover effects on the webpage.<br>• Write and Execute JavaScript for managing display on status bar of the window.<br>• Write and Execute secured JavaScript code. | 6.1 | Setting the Stage | 04 |
| | 6.2 | Creating a Rollover | |
| | 6.3 | Text Rollovers | |
| | 6.4 | Multiple Actions for a Rollover | |
| | 6.5 | More Efficient Rollovers | |
| | 6.6 | Making Magic Using the Status Bar | |
| | 6.7 | Banner Advertisements | |
| | 6.8 | Creating a Slideshow | |
| | 6.9 | Hiding Your Code | |
| | 6.10 | Concealing Your E-mail Address | |
| | | **Total** | 32 |

**List of Practicals/Experiments/Assignments:**

| Sr. No. | Specific Name of Experiment/Assignment i.e. Learning Outcome in Psychomotor Domain | Unit No. | Hrs |
|---|---|---|---|
| 1. | Execute Programs based on decision making statement | 1 | 02 |
| 2. | Write and Execute Programs based on looping statement | 1 | 02 |
| 3. | Write and Execute Programs based on arrays | 2 | 02 |
| 4. | Write and Execute Programs based on functions. | 2 | 02 |
| 5. | Write and Execute Programs based on strings | 2 | 04 |
| 6. | Write and Execute Programs using Form Objects | 3 | 04 |
| 7. | Write and Execute Programs using Form Elements | 3 | 04 |
| 8. | Write and Execute Programs using Form Events | 3 | 04 |
| 9. | Write and Execute Programs using Intrinsic Java Functions | 3 | 04 |
| 10. | Write and Execute Programs for Using and Personalizing cookies | 4 | 04 |
| 11. | Write and Execute Programs for placing the Window on the screen. | 4 | 04 |
| 12. | Write and Execute Programs for accessing child Window. | 5 | 04 |
| 13. | Write and Execute Programs for implementing | 5 | 04 |
| 14. | Write and Execute Programs for implementing Rollovers | 6 | 04 |
| 15. | Write and Execute Programs for implementing Status bars and Web Page Protection | 6 | 04 |
| 16. | Write and Execute Programs for implementing Banners, Slideshow | 6 | 04 |
| 17. | Mini Project implementing features of Javascript. | 1-6 | 08 |
| | | **Total** | 64 |

**SUGGESTED STUDENT ACTIVITIES**

Following is the list of proposed student activities like:

a. Prepare journal of practicals.
b. Do survey of available Browsers and HTML versions.
c. Submit Softcopy of the MiniProject.

**SPECIAL INSTRUCTIONAL STRATEGIES (if any)**

a. Guide student(s) in undertaking various activities in the lab/workshop.
b. Demonstrate students thoroughly before they start doing the practice
c. Show video/animation films to explain handling/functioning of different instruments.
d. Continuously observe and monitor the performance of students in Lab/Workshop

**TITLES OF MICRO-PROJECTS**

These micro-projects are intended to develop in the students the industry required competency and COs. The micro-projects could be market-based, internet based, workshop based, laboratory based or field based. The duration of the micro-projects could vary from anywhere between one week to a couple of weeks. It could be individual or group-based activity, wherein the affective domain LOs can also be attained. Each student will have to maintain dated work diary consisting individual contribution and work contribution in the project. Depending on the interest, capability and other factors, the projects will be assigned to the students right in the beginning of the semester so that students get ample time to assimilate and internalize various outcomes. Student should take up micro projects related to the course outcomes in a batch of three.

**Text/Reference Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1 | Jim Keogh | Javascript Demystified | Tata McGraw Hill |
| 2 | Michael Moncur | Javascript in 24 hours(SAMS teach yourself) | TechMedia |

**Learning Resources**: LCD, Projector, and Transparence, White board.

**Specification Table:**

| Sr. No | Topic | Cognitive Levels | | | Total |
|---|---|---|---|---|---|
| | | Knowledge | Comprehension | Application | |
| 1 | An Inside Look At JavaScript Programming | 02 | 02 | - | 04 |
| 2 | Arrays ,Functions and String | 02 | 02 | 06 | 10 |
| 3 | Forms and Event Handling | 02 | -- | 06 | 08 |
| 4 | Cookies and Browser Windows | 02 | -- | 04 | 06 |
| 5 | Regular Expressions, JavaScript and Frames | 02 | -- | 04 | 06 |
| 6 | Rollovers, Status Bar, Banners, Slideshow, Protecting Your WebPage | 02 | -- | 04 | 06 |
| | Total | 12 | 04 | 24 | 40 |

**Prepared By**
**Smt.M.U.Kokate**
**Mr. S.P.Emekar**

**Secretary, PBOS**
**Mr. S. V. Chaudhari**

**Chairman, PBOS**
**Mr.U.V.Kokate**

**Name of Programme : Diploma in Information Technology**
**Programme Code : 07**
**Name of Course : Programming using .NET Technology**
**Course Code : IT483**

**Teaching Scheme:**

| | **Hours /Week** | **Total Hours** |
|---|---|---|
| **Theory** | 02 | 32 |
| **Practical/Tutorial** | 04 | 64 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 Minutes | 02 hrs. | --- | --- | --- |
| Marks | 10 | 40 | 50 | --- | 50 |

**Rationale:**

Study of .NET technology is becoming a need of today's world. Knowledge of web page design is essential for studying this subject. Advanced Web Technologies is based on dot net technology, which is a frame work, which supports many languages so that application designed in one language (like C++, COBOL, JAVA, etc) can be

Connected/interfaced with this frame work hence it is more flexible and advanced.

**Course Outcomes:**

**After completing this course students will be able to**

1. Describe various components of .NET Framework.
2. Write VB.NET program using Loops, Control structures, Form controls and OOP Concepts.
3. Write VB.Net applications using Microsoft ADO.NET.
4. Set up a programming environment for ASP.Net Programs.
5. Create web applications using Asp.Net controls&ADO.Net.
6. Build VB.Net applications using Graphics and Animations.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs |
|---|---|---|
| **Units 1 : Introduction** | | |
| • Describe the procedure for using Visual Basic.Net Environment<br>• Identify different Building Blocks<br>• Differentiate between types of application architectures | 1.1 Why dot Net: Introduction to Microsoft .Net Framework, Building blocks in .Net, Drawback of previous languages, Understand what is .Net<br>1.2 VB.Net: VB.Net overview, Difference between VB and VB.Net<br>1.3 Introduction to .Net: Types of application Architecture, .Net initiative, .Net framework: components of .Net framework, Advantages, Requirement of .Net | **04** |
| **Unit 2:Introduction and implementation to VB.Net** | | |
| • Integrate variables and constants.<br>• Implement lists and loops with controls and iteration in VB.Net<br>• Separate operations into appropriate procedures and functions<br>• Implement Inheritance and exception handling using VB.Net | 2.1 Introduction to VB.Net: Features, VB.Net IDE, Data Types, Loops, Control structures, Cases, Operators, Creating forms, Procedures and functions, Form controls.<br>2.2 Implementation of OOP: Creation of class and objects, Inheritance, Constructors, Exception handling.<br>2.3 Component based programming: Working with Private assembly, shared assembly, Using COM components developed in VB or other language | **06** |
| **Unit 3: Introduction to ADO.Net and data manipulation** | | |
| • Describe ADO.NET architecture, and ADO.NET and XML<br>• Write program for database connection & querying database<br>• Define Multi-threading<br>• Explain Synchronization of Threads | 3.1 Introduction to ADO.Net: What is database? Writing XML file, ADO.Net architecture, Creating connection, Dataset and Data reader, Types of Data adapter and ADO controls, Reading data into dataset and data adapter, Binding data to controls, Data table and Data row<br>3.2 Accessing and manipulating Data: Selecting data, Insertion, deletion, updating, Sorting, How to fill dataset with Multiple tables. | **06** |

| | | |
|---|---|---|
| | 3.3 Multi-threading: Working with multithreading,<br><br>Synchronization of Threads. | |
| **Unit 4: Introduction to ASP.Net, objects and components** | | |
| • Debug and deploy ASP.NET web applications<br>• Create a rich GUI for web based applications using a rich set of controls<br>• Maintain session and controls related information in web applications | 4.1 ASP.Net: Difference between ASP and ASP.Net, Introduction to IIS, What is web application? Why it is used? ASP.Net IDE.<br><br>4.2 Web forms Controls: Creation of web forms<br><br>Controls, Using web form controls. Response, Server, Application, Session. ASP.Net scope, state, viewstate, post back and configuration<br><br>4.3 Object creation: Scripting, Drive, Folder, file, How to use objects? Server components: Ad rotator, Content linker, Browser Capabilities. Use and creation of global .asa file, How to use Application object, Events, Methods and collection, Example.<br><br>How to use session object enabling and disabling of session, Event, properties, methods, collection. Example. | **06** |
| **Unit 5: ADO.Net** | | |
| • Access data from the database in data bound controls on the web page<br>• Perform configuration settings in web.config file<br>• Generate and add crystal reports to web form | 5.1 ADO.Net in ASP.Net, Connection, Dataset and data reader, Data table and Data row, Web.config introduction, Binding data with data grid, Accessing and manipulating data.<br><br>5.2 ADO.Net : Server control templates and Data binding techniques, Understand data access in .Net using ADO.Net, Understand various Server Control Templates available for Data Binding like Repeater, Data List | **06** |

| | | |
|---|---|---|
| | and Data Grid Controls.<br><br>5.3 Crystal Reports -Adding a report ,creating a report-step by step, Report Designer, adding a report to a web form, moving a Crystal Reports | |
| **Unit 6: Graphics and Animation** | | |
| • Create, debug, and test a program using appropriate components, image buffering, timers, and user input<br>• Implement various event procedure, pen and brush objects<br>• Create simple animation controlling pictures | 6.1 The graphics Environment, Steps for drawing Graphics, The Paint Event Procedure, Pen and Brush Objects. Coordinate System, Graphics Methods, Random Number Example<br><br>6.2 Simple Animation Displaying an Animated Graphic, Controlling Pictures at run time, Moving a picture ,The Timer Component<br><br>6.3 Scroll Bar Controls Scroll Bar Properties, Scroll Bar Event, Programming Example | **04** |
| | **Total Hrs.** | **48** |

**List of Practicals/Laboratory Experiences/Assignments:**

| Sr. No. | Name of Practical/Experiment/Assignment | Units | Course Outcomes | PR Hrs |
|---|---|---|---|---|
| 1. | Installation of Visual Studio. | Introduction | CO1 | 04 |
| 2. | Design Login form with validation. | Introduction and implementation to VB.Net | CO1,CO2 | 04 |
| 3. | Design Registration form with validation of email address, date of birth, blank field, telephones and mobile numbers etc. | Introduction to ADO.Net and data manipulation | CO2 | 04 |
| 4. | Design student class, marks class, inherits it in result class and access it using form. | Introduction and implementation to VB.Net | CO2 | 04 |

| | | | | |
|---|---|---|---|---|
| 5. | Create instance of class using new operator of above example | Introduction and implementation to VB.Net | CO2 | 02 |
| 6. | Design mark sheet of student using XML file and dataset. | Introduction to ADO.Net and data manipulation | CO2, CO3 | 02 |
| 7. | Design employee details with help of database (back-end) using data Adapter, data reader and datasets. Use data grid to display result. | Introduction to ADO.Net and data manipulation | CO2, CO3 | 04 |
| 8. | Generation of database (data table) of employee or student with help of data tables of .Net. | Introduction to ADO.Net and data manipulation | CO2, CO3 | 02 |
| 9. | To use multiple table design example of employee and department. | Introduction to ADO.Net and data manipulation | CO3 | 02 |
| 10. | Design registration form of college using text box, text area, radio list, check list, Button etc. using Auto postback property. | Introduction to ASP.Net, objects and components | CO2, CO4 | 02 |
| 11 | Simple application for following function: (1) Login (2) Surfing (3)Logout taking into considerations (Application, Session, Server object, global .asa file and their events, methods and collection) also Demonstrates enabling and disabling of session.) | ADO.Net | CO4, CO5 | 04 |
| 12 | Creation of file, entry, reading data from a file. | Introduction to ASP.Net, objects and components | CO2, CO5 | 02 |
| 13 | Using components create: (1) Advertisement (using Ad rotator) (2)Book example (using Next function) (3) find capabilities of browser(Browser object capabilities) | Introduction to ASP.Net, objects and components | CO5 | 02 |

| | | | | |
|---|---|---|---|---|
| 14 | Online application (student, employee, product, shopping mall)<br>(a) Using dataset, data reader.<br>(b) Same application using data table and data row. (use data grid to display data) (c) Bind the data to data grid using properties Templates. (d) Display details (student, employee, product, etc.) using data list. (4 cols per line) | Introduction to ASP.Net, objects and components ,Introduction to ASP.Net, objects and components | CO2, CO4,<br>CO5 | 06 |
| 15 | Create Crystal Report for a Online application form.(Minimum 3 applications) | ADO.Net | CO5 | 04 |
| 16 | Using Graphics methods to create the background of a form. Draw a picture of a house including a front door ,a window and a chimney. | Graphics and Animation | CO6 | 04 |
| 17 | **Mini Project** :Design the mini project by integrating all the experiment performed as mentioned in the curriculum | ALL | CO1,CO2, CO3,CO4, CO5 | 10 |
| | **Total** | | **64** | |

**Instructional Strategy:**

| Sr. No. | Topic | Instructional Strategy |
|---|---|---|
| 1. | Introduction | Explanation & Introduction to .Net Framework |
| 2. | Introduction and implementation | Explanation of designing of forms &required classes. |
| 3. | Introduction to ADO.Net and data Manipulation | Explanation of ADO.Net and dataManipulation |
| 4. | Introduction to ASP.Net, objects and Components | Explanation & Introduction to ASP.Net |
| 5. | ADO.Net | Explanation of ASP.Net objects andComponents |
| 6. | Graphics and Animation | Explanation of Graphics functions and Animation |

| | | |
|---|---|---|
| | | Tools |

**Specification Table**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 1 | Introduction | 04 | 02 | -- | 06 |
| 2 | Introduction and implementation to VB.Net | 02 | 02 | 02 | 06 |
| 3 | Introduction to ADO.Net and data manipulation | 02 | 02 | 04 | 08 |
| 4 | Introduction to ASP.Net, objects and components | 02 | 02 | 04 | 08 |
| 5 | ADO.Net | 02 | 02 | 02 | 06 |
| 6 | Graphics and Animation | 02 | 02 | 02 | 06 |
| | **Total** | 14 | 12 | 14 | 40 |

R-Remember U – Understand A – Analyze / Apply

**Scheme Of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Observations, | 10 |
| 2 | Calculations and Result | 25 |
| 3 | Viva voce | 15 |
| | **TOTAL** | **50** |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1. | .net Framework | Anthony Jones, Tata- McGraw Hill pub. | |
| 2 | Designing Application with Microsoft VB.net | Robert LandLizer, Tata- McGraw Hill pub. | |
| 3 | Prog. In VB.net | Grungrundgier | |
| 4 | Prog. In VB.Net | Anita C.Millspaugh& Julia Case Bradely, Tata- McGraw Hill pub. | |
| 5 | ASP.net | Dave Mercer, Tata- McGraw Hill pub. | |

**( Prepared by)** **(Member Secretary PBOS)** **(Chairman PBOS)**

**Name of Programme** : **Diploma in Information Technology**
**Programme Code** : **07**
**Name of Course** : **Software Engineering**
**Course Code** : **IT484**
**Class Declaration** : **YES**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| **Theory** | **03** | **48** |
| **Term work / Practical** | **02** | **32** |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 3Hrs | | | |
| Marks | 20 | 80 | - | 25 | 25 |

**Course Rationale:**

Software has become the key element in the evolution of Computer-based systems and products. Over the past 50 years, software has evolved from a specialized problem solving and information analysis tool to an industry in itself. Software is composed of programs, data and documents. Each of these items comprises a configuration that is created as part of the software engineering process. The intent of software engineering is to provide a framework for building software with higher quality.

**Course Outcomes:**

**After completing this course students will be able to**

1. Select and use specific SDLC model for assigned project/ case study.
2. Identify customer needs and formulate problem statement and present Software Requirement Specification (SRS).
3. Make effective use of UML tools.
4. Estimate size and cost of given software project.
5. Apply project management and quality assurance principles to software project development.
6. Test software by developing various test cases for software project.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs |
|---|---|---|
| **Section I** | | |
| **Units 1 : Software Engineering Concepts** | | |
| • Define Software and its Characteristics.<br>• Identify need Umbrella Activities<br>• Choose and apply domain specific life cycle model for software product development. | 1.1 The Evolving Role of Software | **06** |
| | 1.2 Software Characteristics and Application | |
| | 1.3 Framework of Umbrella Activities | |
| | 1.4 The Process**:** Software Engineering: A Layered Technology -Process, Methods, and Tools. | |
| | **1.5** A Generic View of Software Engineering, The Software Process | |
| | **1.6** Software process model: Prototyping model , RAD Model, Evolutionary Software Process Models, Incremental model , Spiral model, WINWIN spiral model, Concurrent development model, Component-based development model, Formal methods model, Fourth generation techniques .Component based Development(CBD),Aspect-Oriented Software Development, Agile Process Model: Extreme Programming, Adaptive Software Development(ASD). | |
| **Unit 2: Requirement Engineering** | | |
| • Identify Customer Requirement.<br>• Use various requirement<br>• gathering techniques.<br>• Use & Design use case for<br>• Requirement Elicitation<br>• Validate Requirement and Build Analysis model (SRS) | **2.1** Requirement Engineering Tasks: Inception,Elicitation, Elaboration, Negotiation,Specification, Validation. | **08** |
| | **2.2** Initiating the Requirement Engineering Process:Stakeholders, Recognizing Multipoint Viewpoint, Working Towards Collaboration. | |

| | | |
|---|---|---|
| | **2.3** Eliciting Requirements: Collaborative ,Requirements , Gathering, Quality Function , Deployment ,User Scenarios, Elicitation Work Products | |
| | **2.4** Developing Use-Case, Building the Analysis model, Negotiating Requirement, Validating Requirement | |
| | **2.5** Design Concepts The Design models: Data Design Elements, Architectural- Design elements, Interface Design Elements | |
| | **2.6** Component-Level design elements, Deployment-Level Design Elements | |
| **Unit 3: Software Project Management** | | |
| • Recognize need of Software project Management.<br>• Apply various tools and techniques for Estimation.<br>• To Determine Size using Function-Point metric and Cost Estimation using COCOMO model.<br>• To design RMMM Plan. | **3.1** The Management Spectrum:4 P's and Significance. | **10** |
| | **3.2** The People: The Stakeholders ,Team Leader, Software Team, Agile Team, Communication issues. | |
| | **3.3**The Process: Software Scope, Problem Decomposition, Decomposition Techniques: LOC and FP estimation, Effort estimation | |
| | **3.4** Empirical Estimation Models: COCOMO,Putnam estimation model, Function-point models, Automated Estimation Tools. | |
| | **3.5** Risk Analysis and Management**:** Risk identification, Risk projection, Risk assessment, Risk management and monitoring, Risk Refinement and Mitigation, RMMM Plan | |
| **Unit 4: Project Scheduling** | | |
| • Employ group working skills.<br>• Do the Project Scheduling and tracking using different<br>• techniques.<br>• To track the schedule of project using Earned value analysis. | **4.1** Basic concepts,-Basic principles :The relationship between people and effort. | **06** |
| | **4.2**An empirical relationship:-Effort distribution ,Defining a task set Examples | |
| | **4.3**Selecting the task set :Selecting software engineering tasks. | |

| | | |
|---|---|---|
| | **4.4** Defining a task network ,Tracking the schedule -Earned value analysis- Error tracking, Tracking Progress for an OO Project. | |
| **Unit 5: Software Quality Assurance** | | |
| • Measure process effectiveness and efficiency to track performance quality.<br>• Make effective use of UML, along with design strategies.<br>• Evaluate the quality of the requirements, analysis and design work done during the<br>• module.<br>• To design Data Flow Diagram for different projects.<br>• To design SQA Plan | **5.1** Quality concepts ,The quality movement, Software quality assurance ,SQA activities, Software reviews | **08** |
| | **5.2** Defect amplification and removal: Formal technical reviews, The review meeting, Review reporting and record keeping | |
| | **5.3** Software reliability: Measures of reliability and availability | |
| | **5.4**The ISO approach to quality assurance system: The ISO 9001 standard ,Six Sigma for Software Engineering, The SQA plan | |
| | **5.5**Functional modeling and information flow: Data Flow diagrams, UML Modeling :Use-Case ,Class Diagrams, Sequence Diagrams | |
| **Unit 6: Software Testing Techniques and Maintenance** | | |
| • Test software by developing various test cases for software project.<br>• To Describe software maintenance process.<br>• To apply unit, integration, system testing for software project.<br>• To Compare Reverse and Re-engineering | **6.1** Software testing Fundamentals ,Testing objectives ,Testing principles, Testability | **10** |
| | **6.2** White box testing :Basis path testing , Flow graph notation, Cyclomatic complexity , Graph matrices , Control structure testing, Condition testing , Data flow testing, Loop testing | |
| | **6.3** Black box testing: Graph based testing methods. | |
| | **6.4** Testing documentation, Testing for real time systems. | |
| | **6.5** Software Maintenance: A definition of software maintenance, Maintenance Characteristics, Maintainability, Maintenance tasks, Maintenance side effects, Software Configuration Management. | |
| | **6.6** Reverse engineering and Re-engineering. | |
| | **Total** | **48** |

**List of Practical's /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Course Outcome | Hrs. |
|---|---|---|---|---|
| 1. | Application and use of studied process models such as Agile, CBD,AOSD | Software Engineering Concepts | CO1 | 2 |
| 2. | Define the project title with bounded Scope of Your Project. | Software Engineering Concepts | CO2 | 2 |
| 3. | Design Project Plan and SQA Plan | Software Project Management | CO5 | 2 |
| 4. | To Develop Software Requirement Specification using Use-Case Scenario | Requirement Engineering&Design | CO2 | 4 |
| 5 | To perform data design using design concepts eg. DFD | Software Quality Assurance | CO3 | 2 |
| 6. | To Draw the Activity Diagram to represent a flow from one activity to another activity and draw ER diagram. | Project Scheduling | CO3 | 4 |
| 7. | To Draw class diagram, Sequence diagram, Collaboration diagram, State Transition Diagram for assigned project (eg. Library Management) | Software Quality Assurance | CO3 | 6 |
| 8. | To determine Size using Function-Point metric and Cost Estimation using COCOMO model | Software Project Management | CO4 | 6 |
| 9. | To Test software by developing various test cases for software project and practice it on the project | Software Testing Techniques and Maintenance | CO6 | 4 |
| | | **Total** | | 32 |

**Specification Table for Theory Paper:**

R-Remember U – Understand A – Analyze / Apply

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Software and Software Engineering | 03 | 04 | 06 | 13 |

| | | | | | |
|---|---|---|---|---|---|
| 02 | Project management concepts | 03 | 05 | 05 | 13 |
| 03 | Project Management estimation and planning | 05 | 03 | 03 | 11 |
| 04 | Project Scheduling and tracking | 04 | 04 | 05 | 13 |
| 05 | Software Quality assurancelevel4f | 06 | 06 | 04 | 16 |
| 06 | Software Testing Techniques and Maintenance | 06 | 03 | 05 | 14 |
| | **Total** | 27 | 25 | 28 | 80 |

**Scheme of Practical/Oral Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Evaluation | 05 |
| 2 | Practical Execution | 10 |
| 3 | Viva voce | 05 |
| | **TOTAL** | **25** |

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Software Engineering 6th Edition | Roger S. Pressman, Mc. Graw Hill | |
| 2 | Software Engineering | Jawadekar, Wiley India | |
| 3 | Software Engineering Concepts | Richard Fairly, Mc. Graw Hill | |

**Prepared By** **(Member Secretary PBOS)** **Chairman,PBOS**

(Smt.N.R.Wagh, Prof.S.V.Chaudhari Prof.U.V.Kokate

Smt.Sneha Raut)

**Programme : Diploma in CE/EE/ET/ME//MT/CM/IT/DDGM**
**Programme Code : 01/02/03/04/05/06/07/08/21//22/23/24/26**
**Name of Course : Development of Soft Skills - I**
**Course Code : NC481**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| Theory | -- | -- |
| Practical | 02 | 32 |

* NON EXAM.NON CREDIT COURSES (COMPULSORY) # Credits over & above 180 credits

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | -- | -- | -- | -- | -- |
| Marks | -- | -- | -- | -- | **25** |

**Course Rationale:**

This course aims to make students aware of good interpersonal relations, Professionalism in etiquettes, importance of time management and importance of good health. The techniques such as role play, group discussions can be used effectively to demonstrate understanding emotions of persons in daily contact.

**Course Objectives:**

After studying this course, the student will be able to

1. Develop better interpersonal relations among their peer group, subordinates and superiors and work effectively.
2. Display corporate etiquettes and professionalism while attending /answering phone calls. Plan time optimally/effectively in office –work as well for their personal growth.
3. Understand strengths and weaknesses of self.
4. Understand /feel emotions of persons (from office and family) in daily contact and take appropriate actions.
5. Demonstrate habits for keeping good health by following good food habits and daily exercise.

**Course Content:**

| Chapter No. | Name of Topic/Sub topic | | Hrs |
|---|---|---|---|
| **Unit 1- Interpersonal Skills through Personal Development** | | | |
| | 1.1 | Reducing conflict by preventing problems in the classroom. | -- |
| | 1.2 | Interpersonal Skills through Self Development and change. | |
| | 2.1 | Understanding Self | -- |
| | 2.2 | Polished personal habits | |
| | 2.3 | Ethics & Etiquettes: a way of life | |
| | 2.4 | Personal Attire & Grooming | |
| | 2.5 | Cell phone manners | |
| **Unit 2- Interpersonal Skills through Personal Development** | | | |
| | 3.1 | Time management skills in groups for completion of project | -- |
| | 3.2 | Factors that lead to time loss and how they can be avoided | |
| | 3.3 | Time matrix & urgent versus , Important jobs | |
| **Unit 3- Managing Emotions** | | | |
| | 4.1 | To understand and identify emotions, | -- |
| | 4.2 | To know our preferences | |
| | 4.3 | Strength, weaknesses ,opportunities and threats , Techniques of self control | |
| | 4.4 | To get desirable response from others | |
| **Unit 4- Health Management** | | | |
| | 5.1 | Importance of health management, | -- |
| | 5.2 | Relevance of it , | |
| | 5.3 | Tips to maintain good health | |
| | | **Total** | -- |

**List of Practicals/Experiments/Assignments:**

| Sr. No. | Name of Practical/Experiment/Assignment | Hrs |
|---|---|---|
| **1.** | Case studies to be discussed in a group and presentation of the same by group /group leader. | 04 |
| **2.** | Field exercises for the group of students. | 02 |
| **3.** | Role play by individual/group leader. | 04 |
| **4.** | Arranging Quizzes, puzzle- solving and educational games. | 02 |
| **5.** | Group discussions. | 04 |
| **6.** | Sharing of self -experiences in a group. | 04 |
| **7.** | Brain storming sessions | 02 |
| **8.** | Questionnaire -filling & discussing results of the same in a group. | 04 |
| **9.** | Live demonstrations on Yoga and other stress relieving techniques by professional persons. | 06 |
| | **Total** | **32** |

**~~Programme : Diploma in CE/EE/ET/ME/ MT/CM/IT/DDGM~~**
**Programme Code : 01/02/03/04/05/06/07/8/21/22/23/24/26**
**Name of Course : Development of Soft Skills – II**

**Reference Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1. | Mr. Shiv Khera | You can win | |
| 2. | Mr Abdul Kalam | Wings of Fire | |
| 3. | Mr Nirfarake | Prabhavi Vyaktimatwa.(Marathi) | |
| 4. | Mr Iyyengar | YogaDipika | |
| 5. | Mr. Anand Nadkarni | Tan tanavache niyojan (Marathi) | |
| 6. | Mr. Rajiv Sharangpani | Khusit raha ,Mast Jaga.(Marathi) | |

**Learning Resources :**Video cassettes on 1. Effective Communication 2. Group discussions, 3.Corporate Etiquettes and professionalism.

(Prof. D.K.Bhandare) (Prof. S. V.Chaudhari) (Prof. M.S.Satarkar)

Prepared By Member Secretary, PBOS Chairman, PBOS

**Course Code : NC482**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | **--** | **--** |
| **Practical** | **02** | **32** |

* NON EXAM.NON CREDIT COURSES (COMPULSORY) - B # Credits over & above 180 credits

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | -- | -- | -- | -- | -- |
| Marks | -- | -- | -- | -- | **25** |

**Course Rationale:**

This course aims to make students aware of importance of goal setting , develop self study techniques , importance of ethics and value system , This also aims one to inculcate creative mind along with interest in using problem solving techniques while dealing with any work. It also emphasizes about importance of stress relieving techniques to be practiced for good health.

**Course Objectives:**

After studying this course, the student will be able to

1. Describe SMART goals.
2. Develop and practice self- study techniques.
3. Use and practice stress management techniques for good health
4. Use and practice problem solving skills.
5. Understand importance of ethics and value system for positive interpersonal relations.

**Course Content:**

| Sr. No. | Name of Topic/Sub topic | | Hrs |
|---|---|---|---|
| **Unit 1- Motivation & Goal Setting** | | | |
| | **1.1** | Importance of goal setting, | **--** |

| | | | |
|---|---|---|---|
| | **1.2** | How to set SMART goals. | |
| **Unit 2- Study Habits** | | | |
| | **2.1** | Note taking, Methods of Learning, | -- |
| | **2.2** | Memory Enhancement, self - Study Techniques, | |
| | **2.3** | Techniques for effective Reading and Writing. | |
| **Unit 3- Stress Management** | | | |
| | **3.1** | Stresses in groups, how to control emotions, | -- |
| | **3.2** | Strategies to overcome stress, understanding importance of good health to avoid stress. | |
| **Unit-4 Ethics & Motivation** | | | |
| | **4.1** | What are ethics, how ethics help to ensure positive interpersonal relations, | -- |
| | **4.2** | Personal value system, and personal quality primer | |
| **Unit-5 Creativity** | | | |
| | **5.1** | Definition of Creativity, Tips and ways to increase creativity, importance of creativity. | -- |
| **Unit 6- Problem Solving Techniques** | | | |
| | **6.1** | Puzzles and technical quizzes to be organized to develop these skills. | -- |
| | | **Total** | -- |

**List of Practicals/Experiments/Assignments:**

| **Sr. No.** | **Name of Practical/Experiment/Assignment** | **Hrs** |
|---|---|---|
| **1.** | Case studies to be discussed in a group and presentation of the same by group /group leader. | 04 |
| **2.** | Field exercises for the group of students. | 02 |
| **3.** | Role play by individual/group leader. | 04 |
| **4.** | Arranging Quizzes, puzzle- solving and educational games. | 02 |
| **5.** | Group discussions. | 04 |
| **6.** | Sharing of self -experiences in a group. | 04 |
| **7.** | Brain storming sessions | 02 |
| **8.** | Questionnaire -filling & discussing results of the same in a group. | 04 |
| **9.** | Live demonstrations on Yoga and other stress relieving techniques. | 06 |
| | **Total** | **32** |

**Reference Books:**

| **Sr. No** | **Author** | **Title** | **Publication** |
|---|---|---|---|
| 1. | Mr. Shiv Khera | You can win | |

| | | | |
|---|---|---|---|
| 2. | Mr Abdul Kalam | Wings of Fire | |
| 3. | Mr Nirfarake | Prabhavi Vyaktimatwa.(Marathi) | |
| 4. | Mr Iyyengar | YogaDipika | |
| 5. | Mr. Anand Nadkarni | Tan tanavache niyojan (Marathi) | |
| 6. | Mr. Rajiv Sharangpani | Khusit raha ,Mast Jaga.(Marathi) | |

**Learning Resources:** V

Video cassettes on

1. Motivation & Goal Setting
2. Stress Management,
3. 3. Ethics & Motivation

| (Prof. D.K.Bhandare) | (Prof.S. V.Chaudhari) | (Prof. M.S.Satarkar) |
|---|---|---|
| Prepared By | Member Secretary, PBOS | Chairman, PBOS |

**Programme : Diploma in CM/IT**
**Programme Code : 06 / 07/26**
**Name of Course : Windows Programming**
**Course Code : CM582**
**Class Declaration : YES**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | **02** | **32** |
| **Practical** | **04** | **64** |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Three class tests, each of 60 minutes | 3Hrs. | -- | -- | -- |
| Marks | **10** | **40** | **50** | -- | **50** |

**Course Rationale:**

Today's workplace is constantly changing and adopting new technologies. In this era of Visual Programming it has become necessary to be able to develop GUI programs. As the industries rely on Visual C++ for its power and efficiency, VC++ has been used as the Windows Programming Tool. In this course the students will get the most out of Windows Programming.

**Course Outcomes:**

After studying this course, the student will be able to

1. Handle Keyboard Input.
2. Handle Mouse Input.
3. Create Check Boxes, Radio Buttons, List Boxes, Combo Boxes, Scroll Bars.
4. Create Menus, Toolbar buttons etc.
5. Create Dialog Boxes, add controls etc.

**Course Content:**

| Chapter No. | | Name of Topic/Sub topic | Hrs |
|---|---|---|---|
| **SECTION - I** | | | |
| **Unit-1Overview of MS-Windows** | | | |
| | 1.1 | The Windows Environment, Windows Programming Options, Your First Windows Program, | **04** |
| | 1.2 | A brief History of Character Sets, Wide Characters And C, Wide Characters And Windows, | |
| | 1.3 | Windows and Messages | |
| **Unit-2An Exercise in Text Output:** | | | |
| | 2.1 | Introduction to GDI | **12** |
| | 2.2 | Scroll bars, Building a better Scroll | |
| | 2.3 | The Structure of GDI, The Device Context | |
| | 2.4 | Drawing Dots and Lines, Drawing Filled Areas | |
| | 2.5 | The GDI Mapping Mode | |
| | 2.6 | Rectangles, Regions and Clipping. | |
| | **SECTION - II** | | |
| **Unit-3The Keyboard and Mouse** | | | |
| | 3.1 | Keyboard Basics | **08** |
| | 3.2 | Key-stroke Messages, Character Messages, Keyboard Messages and Character Sets | |
| | 3.3 | Mouse Basics, | |
| | 3.4 | Client- Area Mouse Messages, Non-Client- Area Mouse Messages, Hit-Testing in your Programs, Capturing the Mouse | |
| **Unit-4The Timer** | | | |
| | 4.1 | Timer Basics | **08** |
| | 4.2 | Using the Timer: Three Methods, Using the Timer for a Clock, Using the Timer for a Status Report | |
| | 4.3 | Child Window Controls | |
| | 4.4 | The Button Class, Controls and Colors, The Static Class, The Scroll Bar Class, The Edit Class, The List Box Class | |

| | |
|---|---|
| Total | **32** |

**List of Practicals/ Experiments/Assignments:**

| Sr. No. | Name of Experiment/Assignment | Hrs |
|---|---|---|
| 1 | Getting Familiar with VC++, parts of a VC++ Program | 02 |
| 2 | Writing Simple Programs using VC++. | 06 |
| 3 | Programs on drawing dots, lines | 06 |
| 4 | Programs on drawing filled areas, rectangles. | 06 |
| | Programs using Timer methods | 06 |
| | Programs for implementing Child Window Controls | 06 |
| | Programs for implementing Button class and controls | |
| 5 | Programs on Reading Keystrokes from the Keyboard, Displaying Our Text, Finding the size of the window | 06 |
| 6 | Programs for handling the Mouse. | 06 |
| 7 | Creating Check Boxes, Radio buttons, List Boxes, Combo Box, Scroll Bar | 06 |
| 8 | Programs for creating Menus, Toolbar buttons etc | 08 |
| 9 | Programs for creating Dialog boxes, adding controls, connecting methods to dialog box controls | 06 |
| | **Total** | **64** |

**Instructional Strategy:**

| Sr. No. | Topic | Instructional Strategy |
|---|---|---|
| 1 | Overview of MS-Windows | Lecture method, Demonstration |
| 2 | An Exercise in Text Output | Lecture method, Demonstration |
| 3 | The Keyboard and Mouse | Lecture method, Implementation |
| 4 | The Timer | Lecture method, Implementation |
| 5 | Child Window Controls | Practical Demonstration & Implementation |
| 6 | Menus and Other Resources | Practical Demonstration & Implementation |
| 7 | The Clipboard | Practical Demonstration & Implementation |
| 8 | Dialog Boxes | Practical Demonstration & Implementation |

**Text Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1 | **Charles Petzold** | Programming Windows | Microsoft Press |

**Reference Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1 | Steven Holzner | Microsoft Visual C++ 5 | BPB |
| 2 | Brent E. Rector<br>Joseph M. Newcomer | Win32 Programming | Addison Wesley |

**Learning Resources:** Books, Models

**Specification Table:**

| Sr. No. | Topic | Cognitive Levels | | | Total |
|---|---|---|---|---|---|
| | | R | U | A | |
| 1 | Overview of MS-Windows | 02 | 02 | 02 | 06 |
| 2 | An Exercise in Text Output | 02 | 02 | 06 | 10 |
| 3 | The Keyboard and Mouse | 02 | 04 | 06 | 12 |
| 4 | The Timer | 02 | 04 | 06 | 12 |
| | **Total** | 08 | **12** | **20** | **40** |

**Prepared By** **Chairman,PBOS** **Member Secretaory,PBOS**

**Programme : Diploma in Information Technology**
**Programme Code : 07**
**Name of Course : Database Administration**
**Course Code : IT581**
**Class Declaration : YES**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | **02** | **32** |
| **Practical** | **02** | **32** |
| **Tutorial** | **02** | **32** |

**Evaluation Scheme:**

| | Progressive assessment | Semester End Exam | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Tem Work |
| **Duration** | Two class test, each of 60 minutes | 2 Hrs. | --- | --- | --- |
| **Marks** | 10 | 40 | 50 | --- | 50 |

**Rationale:**

The subject is intended to teach the student Database Architecture, Database Creation and administration, Database backup and recovery techniques and Database security methods which will enable him to Creating, managing, designing, monitoring, executing and maintaining the work related to any database system. This subject serves the knowledge to maintain up to date any database system.

**Course Outcomes:**

**After completing this course students will be able to**

1. Describe database Architecture and management
2. Create and manage the database.
3. Create and manage control files& Redo log Files.
4. Backup and Recover Database using RMAN tool.
5. Manage tables, indexes and constraints.
6. Create and manage the database users.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **SECTION-I** | | |
| **Units 1 : Basic of the DBA** | | |
| • Define Responsibilities of DBA<br>• Define the purpose of table spaces and data files<br>• Create and Manage Table spaces.<br>• Describe Physical, Logical and memory structure of Oracle database.<br>• Plan an Oracle installation | 1.1 Responsibility of DBA, Oracle Architectural Components-Overview of Primary Components, Oracle server, Oracle instance, Establishing Connection and creating a session, Oracle Database.<br>1.2 **Physical Structure**- Data File, Control File, Redo log File, **Memory structure**: SGA,PGA, Shared Pool , Database Buffer cache, Redo log buffer, Large Pool , **Process Structure** –User Process, Background Process, Server Process, Database Writer, Log Writer, SMON , PMON,CKPT, ARCn ,**Logical Structure**- Blocks ,Extents and Segments, Different Types of Segments, Tablespaces<br>1.3 Getting Started with the Oracle Server-: Database Administrative Tools - Oracle Universal Installer, DBCA, SQL * plus, OEM<br>1.4 Managing Tablespaces : Types of Tablespaces , Creating , Altering and Dropping Tablespaces | **07** |
| **Unit 2: Managing an Oracle Instance AND Database** | | |
| • Create a database with the Database Configuration Assistant (DBCA) tool.<br>• Create and manage the database by writing command.<br>• Start and stop the Oracle database and components<br>• Modify database initialization parameters | 2.1 Managing an Oracle Instance- Initialization Parameter Files, PFILE, SPFILE, Starting Up a Database.<br>2.2 Creating Database- Planning & Organizing database, OFA, Prerequisites necessary for Database creation, Creating Database using DBCA, Creating Database Manually<br>2.3 Alter Database, Opening a Database Restricted Mode and Read Only mode, Shutting down Database using Various Modes | **04** |

| | | |
|---|---|---|
| **Unit 3: Maintaining Control and Redo Log files AND Storage Management** | | |
| • Create and Manage Redo Log Files and Control Files.<br>• Describe the main concepts and functionality of Automatic Storage Management (ASM)<br>• Describe the mechanism of OMF data file | 3.1 Control File- Control File Contents, Creating Control File, Multiplexing Control File, Obtaining Control File Information<br>3.2 Redo Log Files- Structure of Online Redo Log File, Working of Online Redo Log Files , Creating Initial online Redo Log files, Altering Redo Log Files-Adding Online Redo Log File Groups & Members, Dropping Online Redo Log File Groups & Members, Renaming & Clearing Online Redo Log Files<br>3.3 Why use Oracle Managed Files (OMFs), The mechanism of OMF, OMF Data File<br>3.4 Automatic Storage Management ASM Architecture, Data Dictionary, Data Dictionary Contents, How Data Dictionary is Used? | **05** |
| **SECTION-II** | | |
| **Unit 4: Overview of Backup & Recovery** | | |
| • Identify need of Database backup.<br>• Identify the types of failure that may occur in Database<br>• Backup database without shutting it down<br>• Backup database using RMAN tool<br>• Recover Database using RMAN tool. | 4.1 Database Backup: Factors impacting Backup and Recovery, Understand why System Fails, Why Need to be Backup?, Different Types of Backup- Logical and physical Backups, Operating System Backup, Cold and Hot backup, Whole & Partial Database Backup ,Flash Recovery Area-Benefits, Ways to create Flash Recovery Area, backing Up Flash recovery Area.<br>4.2 Database Recovery: Types of Database Failure , Different Recovery environment, The Oracle Recovery Process-Crash & Instance Recovery , Media Recovery<br>4.3 Performing Recovery with RMAN-Recovery Manager, Benefits of RMAN, RMAN Architecture, RMAN's Advantages for Recovery | **06** |
| **Unit 5: Managing Tables, Indexes and Data Integrity** | | |

| | | |
|---|---|---|
| • Create and Manage tables<br>• Create and manage Indexes on given data.<br>• Apply different constraints on table to maintain integrity. | 5.1Managing Tables: Creating Table, Creating Table Guidelines, Create Table using OEM , Create Temporary table ,Altering Table- Changing Storage and Block utilization parameters, Manually Allocating Extents, Truncating & Dropping Table , Obtaining Table Information<br>5.2 Managing Index: Classification of Indexes, B-Tree Index, Bitmap index, Creating B-Tree Index & Bitmap Index ,Altering Index- Changing Storage Parameters , Allocating and Deallocating Index Space, Rebuilding Indexes Checking Index validity, Dropping Index, Obtaining Index Information<br>5.3 Managing Constraints: Data Integrity, Different Types of Constraints, Primary key constraint, Foreign key constraint, unique constraint, Not Null constraint, Check constraint ,Defining Constraints while creating table, Altering Table Constraints- Enabling, Disabling & Renaming Constraints, Dropping Constraints, Obtaining constraint Information | **05** |
| **Unit 6: Database Security & Auditing** | | |
| • Create and Manage Users in Oracle database<br>• Grant and revoke privileges<br>• Create and Manage the User Roles<br>• Create and manage profiles<br>• Implement standard password security features on database.<br>. | 6.1 Managing User : Creating Users, Altering Users, Dropping Users<br>6.2 System Privileges and Role: System privileges ,Granting System Privileges, Revoking System Privileges, Object Privileges, Granting Object Privileges, Revoking Object Privileges, Obtaining Privileges information, Roles: Benefits of Roles, Creating Roles, Predefined Roles, Modifying Roles, Assigning Roles , Revoking Roles From Users, Removing Roles, Obtaining Role information<br>6.3 Password Management: Enabling Password Management, Password Account Locking, Creating Profile, Altering Profile, Dropping Profile with password setting<br>6.4 Auditing: Auditing Guidelines ,Statement Auditing, Schema Object Auditing, Fine Grained Auditing, Obtaining Auditing | **05** |

| | | |
|---|---|---|
| | Information | |
| | **Total** | **32** |

**LIST OF PRACTICALS/LABORATORY EXPERIENCES/ASSIGNMENTS:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Course Outcomes | Practical Hrs. | Tut Hrs |
|---|---|---|---|---|---|
| 1. | Demonstration of Installation of Oracle Database Software. | | CO1 | 02 | - |
| 2. | Study of the Oracle Architecture and its Main components | Basic of the DBA | CO1 | - | 02 |
| 3. | Create Oracle Database using DBCA | Managing an Oracle Instance AND Database | CO2 | 02 | 02 |
| 4. | Manage oracle instance and Create SPFILE and PFILE | Maintaining Control and Redo Log files AND Storage Management | CO2 | 02 | 02 |
| 5 | Create and Maintain Control file in Oracle Database | | CO3 | 02 | 02 |
| 6. | Create Initial Online Redo Log File and Alter Online Redo log file with adding Groups and Members in it. | | CO3 | 02 | 02 |
| 7. | **Create and Manage Tablespace**<br>• Create Different types of Tablespaces<br>• To Extend the Size of a tablespace<br>• To Decrease the size of a tablespace<br>• Making a Tablespace Read only.<br>• Renaming Tablespaces<br>• Dropping Tablespaces<br>• Change the storage settings of tablespaces<br>• Adding Data files to a Tablespace<br>• Manually resizing data files<br>• Obtaining Tablespace Information | Managing Tables, Indexes and Data Integrity | CO2 | 02 | 04 |

| | | | | | |
|---|---|---|---|---|---|
| 8. | **Managing Tables with Data Integrity-**<br>• Create Table<br>• Create Table using Oracle Enterprise Manager<br>• Create Table with Integrity Constraints<br>• Alter Table<br>• Create Temporary Tables<br>• Changing storage and Block Utilization parameters<br>• Reorganize, truncate, drop a table, Drop a column within a table | | CO5 | 04 | 04 |
| 9 | **Managing Indexes-**<br>• Create various types of indexes<br>• Altering Indexes<br>• Drop indexes<br>• Get index information from the data dictionary | | CO5 | 02 | 02 |
| 10 | **Managing Users-**<br>• Create new database Users<br>• Alter and Drop existing database Users<br>• Monitor Information about existing Users.<br>• Display existing Users Information | Database Security & Auditing | CO6 | 02 | 02 |
| 11 | **Managing Privileges:**<br>• Grant System and Object Privileges to Users<br>• Revoke System and Object Privileges from users | | CO6 | 02 | 02 |
| 12 | **Managing Profiles:**<br>• Creating Profiles: Password Setting<br>• Altering Profiles: Password Setting<br>• Dropping Profiles: Password Setting | | CO6 | 02 | 02 |
| | **Managing Roles-** | | CO6 | 02 | 02 |

| | | | | | |
|---|---|---|---|---|---|
| 13 | • Create and modify Roles<br>• Enabling and Disabling Roles<br>• Control availability of Roles<br>• Removing Roles<br>• Display Role Information | | | | |
| 14 | Configure RMAN , Create Backup sets using RMAN and Manage Backup. Perform Incomplete Recovery with RMAN | Overview of Backup & Recovery | CO4 | 02 | 02 |
| 15 | Create Oracle Database using SQL commands | Managing an Oracle Instance AND Database | CO2 | 02 | 2 |
| | | **Total** | | **32** | **32** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Basic of the DBA | Class room teaching |
| 2 | Managing an Oracle Instance AND Database | Class room teaching, laboratory demonstration |
| 3 | Maintaining Control and Redo Log files AND Storage Management | Class room teaching |
| 4 | Overview of Backup & Recovery | Class room teaching, laboratory work |
| | | |
| 5 | Managing Tables, Indexes and Data Integrity | Class room teaching, laboratory work |
| 6 | Database Security & Auditing | Class room teaching, laboratory work |

**Specification Table for Theory Paper:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | Knowledge | Comprehension | Application | |
| 01 | Basic of the DBA | 04 | 01 | 01 | 07 |
| 02 | Managing an Oracle Instance AND Database | 02 | 01 | 02 | 06 |
| 03 | Maintaining Control and Redo Log files AND Storage Management | 02 | 02 | 02 | 07 |
| 04 | Overview of Backup & Recovery | 02 | 02 | 03 | 07 |
| 05 | Managing Tables, Indexes and Data Integrity | 02 | 02 | 04 | 07 |
| 06 | Database Security & Auditing | 02 | 02 | 04 | 06 |
| | **Total** | **14** | **10** | **16** | **40** |

**Reference & Text Books:**

| Sr.No. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Oracle 9i : Expert publication | | |
| 2 | Oracle 9i:DBA Fundamentals | Oracle Education-Tutorialpoints | |
| 3 | Oracle 9i:complete reference | Kelvin Loney, BPB Publication | |
| 4 | Oracle 9i: SQL(Volume 1and Volume 2)Oracle9i: Program with PL/SQL (Volume1andVolume2 | Priya Nathan , BPB Publication | |

**E-References:**

- www.oracle.com
- www.databasejournal.com

| Prepared By | Chairman ,PBOS | Member Secretary PBOS |
|---|---|---|
| Prof. Anita D.Kshirsagar | Prof.S.V.Chaudhari | Prof. M.U.Kokate |
| Prof. Sneha D.Raut | | |

**Name of Programme** : **Diploma in Information Technology**
**Programme Code** : **07**
**Name of Course** : **Server Side Scripting using PHP**
**Course Code** : **IT582**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 02 | 32 |
| Term work / Practical | 02 | 64 |
| Tutorial | 02 | 32 |

**EvaluationScheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 03 Hrs | | | |
| Marks | **10** | **40** | **50** | -- | **50** |

**Rationale:**

In the growing field of Web technology it is essential for every Diploma Engineers to learn PHP Language to help them build large and complex web applications.PHP can be used in three Primary ways: for server side scripting, for command line scripting and to develop client side GUI applications.

**Course Outcomes:**

After completing this course students will be able to

1 Write program in PHP for interactive web development.
2 Implement different functions and use type conversion methods.
3 Write programs using arrays and graphics concepts.
4 Apply object oriented concepts in programming.
5 Develop web pages with validations.
6 Create and manipulate database in PHP programming.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **SECTION I** | | |
| **Units 1 : Introduction to PHP& Basics** | | |
| • Write programs in PHP using basic syntactical constructs.<br>• Write PHP program using flow control statements. | 1.1 History of PHP, Advantages of PHP, Syntax of PHP<br>1.2Variables, Data types, Expressions and operators.<br>1.3Flow control statements. | **04** |
| **Unit 2: Functions and Strings** | | |
| • Write program using parameter passing to call a function.<br>• Use type conversion methods in programs. | 2.1 Calling a function, Defining a function, function parameters, Return values and errors from function, Including code.<br>2.2 Variable Functions, Anonymous Functions<br>2.3 String functions, Type Conversion | **04** |
| **Unit 3: Arrays and Graphics** | | |
| • Write programs using arrays.<br>• Create and scale images using graphics concepts. | 3.1 Creating & Manipulating Array, and Types of Arrays.<br>3.2Extracting data from arrays, implode, explode, array flip<br>3.3 Storing data& comparing arrays<br>3.4 Extracting Multiple Values, arithmetic array function<br>3.5 Basics Graphics Concepts, Creating Images, Images with text , Scaling Images, Using PDF extensions. | **08** |
| **SECTION II** | | |
| **Unit 4: Object Oriented Concepts:** | | |
| • Apply object oriented concepts in programming:Inheritance,Cloning<br>• Write programs using | 4.1 Declaring a class & object, Accessing Properties and Methods, Static Class, Abstract Class, Interfaces<br>4.2 Inheritance, Overloading and Overriding , Cloning Object.<br>4.3 Introspection, Serialization | **06** |

| | | |
|---|---|---|
| Introspection,Serialization. | | |
| **Unit 5: Browser: Handling** | | |
| • Develop web pages using GUI components<br>• Implement validation of web page on client and server side<br>• Describe use and storage of cookies. | 5.1 Creating a webpage using GUI Components, Reading data from web page<br>5.2 Web page validation(Client-Server side)<br>5.3 Session, Cookies & Sending Email | **04** |
| **Unit 6: Databases** | | |
| • Use database techniques for creating and manipulating databases through PHP..<br>• Write programs for MySQL connectivity. | 6.1 Relational Database and SQL using MySQL<br>6.2 PEAR DB basics, Advanced Database Techniques<br>6.3 Sample Application for PHP-MySQL Connectivity | **06** |
| | **Total** | **32** |

**List of Practicals /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. | Tut. Hrs |
|---|---|---|---|---|
| 1 | Installation & Sample PHP program. | Introduction to PHP& Basics | **1** | **1** |
| 2 | WAP for using expressions and operators. | | **2** | **2** |
| 3 | WAP for using Flow Control -if else, while loop and switch case, etc. | | **2** | **2** |
| 4 | WAP for on anonymous and variable functions. | Functions and Strings | **2** | **2** |
| 5 | WAP on string functions. | | **1** | **1** |

| | | | | |
|---|---|---|---|---|
| 6 | WAP for Creating & manipulating Indexed array, Associative and Multidimensional array. | Arrays and Graphics | **2** | **2** |
| 7 | WAP different function with array. | | **1** | **1** |
| 8 | Program on stacks using arrays. | | **1** | **1** |
| 9 | Program using basic drawing functions | | **2** | **2** |
| 10 | Program on scaling images. | | **1** | **1** |
| 11 | Program on converting an image to text | | **1** | **1** |
| 12 | Program to create sample PDF document | | **1** | **1** |
| 13 | Programs on Images and links in PDF documents | | **2** | **2** |
| 14 | Creating an Object, Accessing Properties and Methods, Declaring a class in PHP program. | Object Oriented Concepts | **3** | **3** |
| 15 | Create an Overloading and Overriding class using Inheritance. | | **1** | **1** |
| 16 | Program on introspection | | **1** | **1** |
| 17 | Program on serialization | | **1** | **1** |
| 18 | To build a sample PHP-database application using database connectivity and displaying database | Databases | **3** | **3** |
| 19 | Create a Mini Project by Concluding all above subtopics. | All Units | **4** | **4** |
| | | **Total** | **32** | **32** |

**Specification Table for Theory Paper:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Introduction to PHP & Basics | 02 | 01 | 01 | 04 |
| 02 | Functions and Strings | 02 | 02 | 04 | 08 |
| 03 | Arrays and Graphics | 02 | 02 | 04 | 08 |
| 04 | Oops Concepts | 02 | 02 | 04 | 08 |
| 05 | Browser: Handling | 01 | 02 | 03 | 06 |
| 06 | Databases | 01 | 02 | 03 | 06 |
| Total | | 10 | 11 | 19 | 40 |

R-Remember U – Understand A – Analyze / Apply

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1. | Rasmus Lerdorf , Kevin.T & Peter M. | Programming PHP, O'Reilly | |
| 2. | Steven Holzner | The Complete Reference PHP (Third Edition covers PHP 5.2),<br>Tata - Macgraw hill | |

**Prepared by**
**Prof.K.S.Gaikwad**

**Prof.G.B.Garud**

**Secretary,PBOS**
**Prof.S.V.Chaudhari**

**Chairman,PBOS**
**Prof.M.U.Kokate**

**Name of Programme : Information Technology Engineering**
**Programme Code : 07**
**Name of Course : Object Oriented Modeling and Design**
**Course Code : IT583**
**Class Declaration : YES**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 02 | 32 |
| Term work / Practical / Tutorial | 04 | 64 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | 3Hrs | -- | -- | -- |
| Marks | 10 | 40 | 50 | -- | 50 |

**Rationale:**

Object oriented modeling and design presents an Object Oriented approach to software development. It is based on modeling objects from the real world and then using the model to build a language-independent design. This subject shows how to use Object **Oriented** concepts throughout the entire software life cycle, from analysis through design implementation by using different models. The graphical notation i.e. described in subjects helps the software developer to visualize a problem before going for implementation. This subject will be useful for the student to understand the concepts of Object Oriented Programming System and to model these concepts using Unified Modeling Language (UML) for any application, before actually going for coding part.

**Course Outcomes:**

**After completing this course students will be able to**

1. Explain principles and importance of object oriented modeling and design.
2. Identify different notations to draw UML diagrams.
3. Design structural model for given problem.
4. Design interactive model for given problem.
5. Design behavioral model for given problem.
6. Design UML model for given application.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **Units 1: Introduction to Modeling** | | |
| • Describe Object Modeling Technology<br>• Explain importance and principles of Modeling | 1.1 Brief overview of Object Modeling Technology (OMT) by Ram Baugh, Booch Methodology, Use Case driven approach (OOSE) by Jacobson, Overview of CRC card method by Cunningham.<br>1.2 Importance of Modeling, principles of Modeling | **04** |
| **Unit 2: Object Modeling and Overview of UML** | | |
| • Interpret object and class diagrams.<br>• Draw diagrams using different relationships.<br>• Explain unified software development life cycle. | 2.1 Objects and Classes (Object Diagrams, Attributes,Operations and Methods), Links, Associations and Advanced Concepts (General Concepts, Multiplicity, Link Attributes, and Association as a Class, Roll names, Ordering, Qualification, and Aggregation).<br>• Generalizations and Inheritance, Grouping Constructs.<br>• Aggregation verses Association and Generalization, Recursive Aggregates and Propagation of Operations.<br>• Abstract Classes, Multiple Inheritance, Metadata, Candidate Keys, Constraints<br>• Introduction to Dynamic and Functional Modeling.<br>• Overview of UML, Scope of UML, Conceptual model of UML, Architectural – Metamodel, Unified Software Development Lifecycle.<br>• Introduction to UML Diagram | **06** |
| **Unit 3:Structural Modeling (Use Case, Class Diagrams, Object Diagrams)** | | |

| | | |
|---|---|---|
| • Draw object and class diagrams.<br>• Draw Use case diagram.<br>• Draw advance class diagram by using relationship and interfaces. | • Use case diagram: Terms and Concepts<br>• Detail Use case specification<br>• Use case modeling (actors, use cases, relationships)<br>• Class Diagram and Advanced Class Diagrams: - Advanced Classes and Relationships, Interfaces, Types and Roles, Packages, Instances. Object Diagram. | **04** |
| **Unit 4:Interaction Modeling (Interaction, Sequence and Communication diagrams)** | | |
| • Differentiate between various interaction diagrams.<br>• Draw interaction, sequence diagram and communication diagram.<br>• Solve examples using diagrams. | 4.1 Interaction diagrams. Introduction of interaction diagrams, what are different types of interaction diagrams.<br>4.2 Sequence diagrams: Introduction to sequence diagrams, Symbols and notations used like boundary, relationship, object types, time, system border, operation, callback, message carrier, block, task, message signal etc., Example of sequence diagram.<br>4.3 Communication diagrams: Introduction to communication diagrams. Symbols and notations used like object, multiobject, association rule, delegation, and link to self, constraint, and note etc., Example of communication diagram. | **06** |
| **Unit 5: Behavioral Modeling: Activity and State Transition diagrams** | | |

| | | |
|---|---|---|
| • Draw Activity diagrams.<br>• Draw state diagrams using various constraints.<br>. | 5.1 Activity Diagrams: Introduction to activity diagrams. Elements in activity diagrams like initial nodes, control flow, activities, decisions, guard conditions, a fork and join, end nodes etc., Example of activity diagram.<br>5.2 State Transition diagrams : Concepts of state transition diagram, terms used are like state, submachine state, composite state, start state, end state, transition, transition arc, transition branch, transition joint, decision, history, detail history, constraints, note etc. Example of State transition diagrams. | **06** |
| **Unit 6: Behavioral Modeling: Component , Package and Deployment diagrams** | | |
| • Draw component diagrams.<br>• Explain different components of component diagram.<br>• Draw package diagrams using different elements.<br>• Explain terms and concepts in deployment diagrams. | 6.1 Component Diagram –What is component diagram, Elements of component diagrams are component, dependency, generalization, transparent stereotype, opaque stereotype, symbol, constraint, note, package, package container etc. Why component diagram is used. Example of component diagram.<br>6.2 Package diagram: Introduction to package diagram. Terms used in it – packages, owned elements, imported elements, elements enclosing namespaces (outer), access specifiers. Example of package diagram.<br>6.3 Deployment Diagrams: Terms and Concepts used in deployment diagrams, example. | **06** |
| | **Total** | **32** |

**List of Practical's/Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Course Outcome | Hrs. |
|---|---|---|---|---|
| 1. | Study of Unified Modeling Language. | Object Modeling and Overview of UML | CO1 | 05 |
| 2. | Draw Object diagram. | | CO2 | 05 |
| 3. | Draw Use case diagram. | Structural Modeling (Use Case, Class Diagrams, Object Diagrams) | CO3 | 05 |
| 4. | Draw Class diagram. | | CO3 | 05 |
| 5. | Draw Sequence diagram. | Interaction Modeling (Interaction, Sequence and Communication diagrams) | CO4 | 06 |
| 6. | Draw Collaboration diagram. | | CO4 | 05 |
| 7. | Draw State Chart diagram. | Behavioral Modeling: Activity and State Transition diagrams | CO5 | 05 |
| 8. | Draw Activity diagram. | | CO5 | 05 |
| 9. | Draw Component diagram. | Behavioral Modeling: Component , Package and Deployment diagrams | CO5 | 05 |
| 10. | Draw Package diagram. | | CO5 | 05 |
| 11. | Draw Deployment diagram. | | CO5 | 05 |
| 12. | Implement mini project which includes all the above diagrams. | | ALL | 08 |
| | | **Total** | | **64** |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Object oriented systems analysis and design | NoushinAshrafti, Pearson International Edition | |
| 2 | Object Oriented Modeling and Design | James Rumbaugh, Addison Wedley publication | |
| 3 | Object Oriented Modelling and Designing | Rumbaugh, Blaha, PHI publication | |
| 4 | The UML User Guide | Booch, Jacobson,<br>Rumbaugh, Addison Wedley publication | |
| 5 | Practical OOD with UML | Mark Paiestly, Tata McGRAW Hill publication | |

**Prepared by** **Member Secretary PBOS** **Chairman PBOS**

**Programme : Diploma in Comp Engg/Info Tech.**
**Programme Code : 07**
**Name of Course : Network Management and Administration**
**Course Code : CM586**
**Class Declaration : YES**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | **04** | **64** |
| **Practical** | **02** | **32** |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | **Two class tests of 60 Minutes** | 3 hrs. | ---. | --- | --- |
| Marks | **20** | **80** | **--** | **25** | **25** |

**Course Rationale:**

This course is aimed at providing the students with hands on Experience over Network Operating System: Windows 2008 Server, Configuring Server for Network Environment. It would expose students to administration and security issues in Network Environment.

**Course Outcomes:**

1. Install and configure Windows server 2008.
2. Manage Group policies.
3. Apply NTFS permissions to files and folders.
4. Create subnets and configure TCP/IP properties.
5. Configure DNS and DHCP servers.
6. Manage storage and backups for various users.

**Course Content:**

| Specific Learning Outcomes (Cognitive Domain | | Name of Topic/Sub topic | Hrs |
|---|---|---|---|
| **SECTION I** | | | |
| **Unit-1 The Windows Server 2008 Environment** | | | |
| • Install Windows server 2008 operating system.<br>• Configure administrative tools.<br>• Manage Users and Groups. | 1.1 | The Windows Server 2008 family and key features, Hardware requirements, Installation of Windows Server 2008. Architecture of windows server 2008. | **12** |
| | 1.2 | Installing Device Driver, Signing Options, Installing, configuring Administrative Tools. | |
| | 1.3 | Implementing User, Group, and Computer Accounts :Creating User Accounts, Creating Computer Accounts, Modifying User and Computer Account Properties. | |
| | 1.4 | Creating User Account Template, Managing User and Computer account Accounts | |
| | 1.5 | Managing Groups : Creating groups, Managing group membership, Strategies for using groups, Using default groups, Creating Global and Domain Local Groups. | |
| **Unit-2 Managing Access to Resources & Managing User Environment** | | | |
| • Compare various file systems.<br>• Apply NTFS permissions to files and folders.<br>• Configure Active directory.<br>• Manage group policies. | 2.1 | File systems – FAT, Fat32, NTFS, Features of NTFS, Creating and Sharing Folders, Configuring NTFS Permissions, Publishing Shared Folders, Testing Permissions, Determine effective permissions. | **12** |
| | 2.2 | The active directory's logical structure, Benefits of active directory, Components and mechanisms in active directory –data store, Schema, Global catalog, replication. Overview of Active directory domains, transitive two way trust relationships, using multiple domains, active directory forest, active directory object names, active directory's physical structure, accessing active directory through LDAP. | |
| | 2.3 | Managing Group Policy : Configuring Group Policy Settings, Assigning Scripts with Group Policy, Restricting Group Membership and Access to Software Planning group policy strategy. | |

| | | | |
|---|---|---|---|
| **Unit-3 Administrative Templates and Audit Policy** | | | |
| • Manage Group Policies.<br>• Use Account policy.<br>• Provide and maintain security to Server. | 3.1 | Group Policy Objects GPOs Group policy inheritance, Managing GPOs, Delegating Administrative control to GPOs Redirecting folders using group policy. | **08** |
| | 3.2 | Using Account policy – password policy, logon policy, disk quota policy, account lockout policy, audit policy, Configuring Auditing. | |
| | 3.3 | Overview of Security in Windows Server 2008, Using Security templates to Secure Computers, Testing Computer Security Policy, Managing Security Logs, Creating a Custom Security Template, importing security Template. | |
| **SECTION II** | | | |
| **Unit-4 Windows Server 2008 networking & IP Routing** | | | |
| • Describe network infrastructure.<br>• Describe various protocols. | 4.1 | Defining a network infrastructure, basic terms – workgroup, domain, multiple domains, trust relationship .Active directory, remote access, name resolution, TCP/IP network infrastructure – network protocols. | **12** |
| | 4..2 | IP address – the hierarchical addressing scheme, classification of IP address, Subnetting network, subnetting concepts – information hiding, subnetting TCP/IP networks, calculating number of subnets | |
| | 4.3 | Timesharing Environment, Logging, Network Virtual Terminal. Embedding, File Transfer Protocol, Communication over Control Connection, Communication over data connection, Anonymous FTP. | |
| | 4.4 | Architecture, User agent, Message transfer agent(SMTP), Message Access agent(POP and IMAP), Email Privacy. | |
| **Unit-5 DHCP & Domain Naming Systems** | | | |
| • Install and Configure DNS and DHCP server.<br>• Manage Remote access services. | 5.1 | Overview of DHCP, the DHCP lease process, Understanding scope details, Advantages and disadvantages of DHCP. Installing DHCP, authorizing DHCP for active directory, creating and managing DHCP scopes, managing reservations and exclusions, super scope, multicast scopes. | **12** |

| | | | |
|---|---|---|---|
| | 5.2 | Understanding DNS, Domain naming, DNS and the internet, DNS and Windows Server 2008, Dynamic DNS, DNS Terminology , Working of DNS | |
| | 5.3 | Installation and configuration of DNS server, Creating DNS zones – forward lookup and reverse lookup zone | |
| | 5.4 | Overview of Dial-up networking (DUN) and Virtual private networks (VPN) , Installing the remote access services, configuring RAS server. Managing RAS, Remote access security – user authentication, connection security, access control, Using remote access policies, Using remote access profiles. | |
| **Unit-6 Backup and Recovery Strategy & Cloud Computing** | | | |
| Learning Outcomes:<br>• Implement different backup and recovery strategies.<br>• Explain cloud computing technology. | 6.1 | Backup and Recovery Strategy :Planning backup and recovery strategy, using windows backup, Scheduling backup jobs, Backing up system state data, Using volume shadow copy, automated system recovery . | **08** |
| | 6.2 | Introduction to Cloud computing, Types of cloud, Desired features of cloud, Cloud Infrastructure management, Infrastructure as service providers, Platform as service providers. | |
| | | **Total** | **64** |

**List of Practicals/Experiments/Assignments:**

| Sr. No. | Name of Experiment/Assignment | Unit No. | Course Outcome | Hrs |
|---|---|---|---|---|
| **1.** | Installation of Windows Server 2008/Windows 2000 Server/ Windows 2008 Server. | **1** | **CO1** | **06** |
| | Creation and Management of local users . | | **CO1** | |
| | Creation and Management of group and implementation of its properties. | | **CO1** | |
| | Installation of Device Drivers. | | **CO1** | |
| | System Performance Monitoring through Windows Performance Monitoring. | | **CO1** | |
| **2.** | Installation and implementation of Remote Desktop. | **2** | **CO1** | **04** |

| | | | | |
|---|---|---|---|---|
| | Sharing and managing Resources. | | **CO3** | |
| **3.** | Creating login screen, Configuration of logon policies, password policy. | **3** | **CO2** | **04** |
| | Testing, creating and importing security templates. | | **CO2** | |
| **4.** | Configuration of TCP/IP network<br>i) Assign IP Address ii) Verify IP Communication | **4** | **CO4** | **06** |
| | Implementation of local, roaming, hardware profile. | | **-** | |
| **5.** | Installation and verification of Active Directory<br>i) Domain Controller ii) NetBIOS Domain Name iii)Permissions iv) Verifying the Installation | **5** | **CO5** | **04** |
| | Event Viewer, Event Log | | **CO5** | |
| | Installation of Domain Name System<br>DNS Namespace ii)DNS Zones | | **CO5** | |
| **6.** | Installation and implementation of DHCP<br>i) Authorizing DHCP for Active Directory<br>ii) Creating and managing DHCP Scopes | **5** | **CO5** | **04** |
| | Writing batch scripts for administrative purpose. | | **CO2** | |
| **7.** | Case Study on any one Open source and commercial Cloud- Microsoft Azure , Eucalyptus , Amazon EC2 | **6** | **-** | **04** |
| | | | **Total** | **32** |

**Reference Books and Text Books:**

| Sr. No | Author | Title | Publication |
|---|---|---|---|
| 1. | Michael Palmer | MCITP Guide to Microsoft Windows Server 2008 Administration | CENGAGE learning |
| 2. | Darril Gibson | MCITP Windows server 2008 server Administrator Study Guide | Wiley Publishing, Inc |
| 3. | Ian Mclean and Orin Thomas | 70-646 Windows server Administration Training kit | Microsoft Press |
| 4. | Behrouz Forouzan | Data Communication and Networking | Osborne Publishing |
| 5. | Rajkumar Buyya, James Broberg 2011 | Cloud Computing : Principles and paradigms | Wiley Publication |

Prepared By

Smt. H.F.Khan,

Smt. B.K.Vyas

Secretary, PBOS

Chairman, PBOS

**Name of Programme** : **Diploma in Information Technology**
**Programme Code** : **07**
**Name of Course** : **Graphics and Gaming Technology**
**Course Code** : **IT584**

**Teaching Scheme:**

| | Hours / Week | Total Hours |
|---|---|---|
| Theory | 04 | 64 |
| Term work / Practical | 02 | 32 |
| Tutorial | 01 | 16 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| Duration | Two class tests of 60 min. duration | Hrs | | | |
| Marks | 20 | 80 | -- | 25 | 25 |

**Rationale:**

Today's graphics oriented PCs require that students explore and understand a dazzling array of graphics techniques and technologies. Graphics under 'C' details the fundamentals of graphics programming for the Personal Computers and compatibles, teaching 'C' programmers of all level how to create impressive graphics easily and efficiently. An important characteristic of technical education is an emphasis on their challenging nature, the structured character of the concepts, the critical role of quantitative problem solving, and the importance of qualitative reasoning.

**Course Outcomes:**

**After completing this course students will be able to**

1. Explain components in Computer Graphics.
2. Write 'C' programs to draw line,circle and fill the polygons.
3. Compute 2D and 3D transformations using two dimensional and three dimensional Matrices..
4. Explain back-face removal algorithms ,shading algorithms and color models
5. Use methods of controlling animation and achieve real-time animation using Maya/OpenGL.

**Course Contents:**

| Specific Learning Outcomes (Cognitive Domain) | Topics and subtopics | Hrs. |
|---|---|---|
| **SECTION I** | | |
| **Units 1 : Graphics Systems** | | |
| • Define the scope of Graphics<br>• State all Graphics input devices<br>• Explain the advantages and future scope of graphics in Computer<br>• Compare Raster scan and Random scan display devices | 1.1 Need of Computer Graphics, Applications, Advantages, Future Scope.<br>1.2 Graphics Software, Graphics Functions & Standards<br>1.3 Video display Devices<br>1.4 Graphics input devices and Coordinate representations | **12** |
| **Unit 2: Raster Scan Graphics** | | |
| • Apply Bresenham's and DDA algorithms to draw line, circle<br>• Use of polygon filling methods.<br>• Compare Boundary fill and Flood fill algorithms<br>• Discuss Character generation Methods<br>• Compare DDA line and circle drawing with Bresenham's line and circle drawing algorithms. | 2.1Line Drawing Algorithms: Digital Differential Analyzer, Bresenham's Algorithm<br>2.2Circle Generation- Bresenham's Algorithm<br>2.3Polygon Filling : Seed fill algorithms: Flood fill, Boundary fill, scan line algorithms<br>2.4Character Generation:-Stroke method, Starburst method, Bitmap method ,Introduction to Frame Buffers | **16** |
| **Unit 3:Two and Three Dimensional Transformations** | | |
| • Define Translation, scaling and rotation<br>• Apply 2D Transformations using Translation, scaling and rotation factors<br>• Apply Composite Transformations using Translation, scaling and rotation factors<br>• Compare 2D and 3D transformations. | 3.1 Basic 2D Transformations: Translation, Scaling, Rotation<br>3.2 Matrix representations & homogeneous coordinates<br>3.3 Composite Transformations-Scaling relative to a fixed pivot, rotation about a pivot point<br>3.4 Other 2D transformations<br>3.5 Three dimensional transformation | **12** |
| **SECTION II** | | |
| **Unit 4: Curves, Fractals, Hidden Surfaces, Light and Color Models** | | |
| • Discuss object space and image space methods<br>• Learn the various color models | 5.1 Hidden surfaces: introduction, back-face removal algorithm: Painter's algorithm<br>5.2 Light and Color: Introduction, Diffused | 18 |

| | | |
|---|---|---|
| • Explain various Shading algorithms<br>• Compare Point source and Diffused illumination methods<br>• Define properties of Bezier curve<br>• Describe advantages of RGB over HIS | Illumination, point source illumination.<br>5.3 Shading Algorithms, reflections, Shadows.<br>5.4 Color models and tables: RGB, HIS, CMY.<br>5.5 Introduction to curve generation: Bezier Curve. | |
| **Unit 5: Animation and Gaming Platforms** | | |
| • Enlist methods for controlling animation<br>• Explain animation languages used for Animation<br>• Evaluate Look-Up table to achieve Real time animation<br>• Discuss basic guidelines used for animation | 5.1 Introduction, Conventional and Computer based Animation.<br>5.2 Real Time animation by look up Table<br>5.3 Methods for controlling Animation: Full Explicit Control, Procedural Control.<br>5.4 Basic Guidelines of Animation.<br>5.5 Animation Languages: Linear list notations, General purpose languages, Graphical Languages. | **14** |
| **Unit 6: Gaming Technologies** | | |
| • Use of OpenGL using its syntax<br>• Discuss the connection between CPU and GPU<br>• Discuss OpenGL syntax, Header files.<br>• Demonstrate Complete OpenGL program<br>• Demonstrate Computer animation using various Graphics Tools. | 6.1 Introduction to OpenGL: Basic OpenGL Syntax, Related Libraries, Header files, Display window Management, Complete OpenGL Program, OpenGL ES<br>6.2 NVIDIA GPU: Connection between CPU and GPU, Architecture<br>6.3 Graphics Memory Pipeline<br>6.4 Introduction to Graphics Tools:-Maya,3D Studio Max. | **08** |
| | **Total** | **80** |

**List of Practicals /Laboratory Experiences/Assignments:**

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Hrs. |
|---|---|---|---|
| 1. | Study of Video Display Devices. | Graphics Systems | 02 |
| 2. | Programs for displaying the point on the screen, graphics demonstration program. | Raster Scan Graphics | 02 |

| | | | |
|---|---|---|---|
| 3 | Programs for drawing: Lines, circles and ellipse. | | 02 |
| 4 | Programs for drawing and filling polygon. | | 04 |
| 5. | Programs for two-dimensional translation, scaling, rotation & reflection. | Two and Three Dimensional Transformations | 04 |
| 6. | Programs for drawing 3-D figures. | | 02 |
| 7. | Programs for three-dimensional translation, scaling, rotation. | | 04 |
| 8. | Case study of some (Minimum 03) popular video games. | Gaming Technologies | 04 |
| 9. | Use at least One Advanced Technology Programming (Any one).<br>1. Use OpenGL ES to draw a line for Android Mobile.<br>2. Use Microsoft IDE to Draw a line Diagram.<br>3. Use VRML to draw a line Diagram.<br>4. Use Parallel programming using Cuda to draw a Polygon. | | 04 |
| **10.** | Use Direct3D/Maya or open source equivalent to draw a Bouncing ball animation. | | **04** |
| | | **Total Hrs.** | **32** |

**Specification Table:**

| Sr. No. | Topic | Cognitive Levels | | | Total |
|---|---|---|---|---|---|
| | | R | U | A | |
| 1. | Graphics Systems | 06 | 04 | 02 | 12 |
| 2. | Raster Scan Graphics | 08 | 04 | 04 | 16 |
| 3. | Two and Three Dimensional Transformations | 04 | 04 | 04 | 12 |
| 4. | Curves, Fractals, Hidden Surfaces, Light and Color Models | 04 | 04 | 10 | 18 |
| 5. | Animation and Gaming Platforms | 04 | 08 | 02 | 14 |
| 6. | Gaming Technologies | 03 | 02 | 03 | 08 |
| | Total | 29 | 26 | 25 | 80 |

**Reference & Text Books:**

| S.N. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Donald Hearn and M. Pauline Baker | Computer Graphics, Prentice-Hall | |
| 2 | Radha Shankamani,Sauabh Jain,Gaurang Sinha. | Game architecture and Programming, Wiley India | |
| 3 | David F.Rogers | Procedural Elements for Computer Graphics, McGraw-Hill | |

**Prepared by** **Secretary,PBOS** **Chairman,PBOS**

**Prof.P.L.Sonawane** **Prof.S.V.Chaudhari** **Prof.M.U.Kokate**

**Programme : Diploma in Information Technology**
**Programme Code : 07**
**Name of Course : Information Security**
**Course Code : IT585**
**Class Declaration : YES**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | 04 | 64 |
| **Practical** | 02 | 32 |

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term Work |
| Duration | **Two class tests each of 60 minutes.** | **03 Hrs.** | -- | -- | -- |
| Marks | **20** | **80** | -- | **25** | **25** |

**Course Rationale:-**

The goal of Information Security is to familiarize students with the security issues and technologies involved in modern information systems. Students will gain an understanding of the various ways in which information systems can be attacked and tradeoffs in protecting networks.

**Course Outcomes:**

1. Describe OSI security architecture
2. Explain security at application and transport layer
3. Identify various access controls.
4. Describe web security threats.
5. Formulate service level agreement
6. List and elaborate various auditing techniques

**Course Content:**

| Chapter No. | | Name of Topic/Sub topic | Hours |
|---|---|---|---|
| **SECTION-I** | | | |
| **Unit 1-Introduction to Information Security** | | | |
| 1.Describe OSI security architecture<br>2.Enlist attributes of security<br>3.Explain security life cycle | 1.1 | Need of information security-Legal, Ethical and Professional Issues. Attributes of security-authentication, access control, confidentiality, authorization, integrity, non-repudiation | **10** |
| | 1.2 | OSI security architecture-attacks, services and mechanisms | |
| | 1.3 | Information security management-security policy, standards, guidelines and procedures, security lifecycle. Introduction to cryptography-classical cryptography | |
| **Unit2- Security at each Layer** | | | |
| 1.Describe security at Application Layer<br>2.Explain SSL & TLS<br>3.Explain Internet Key Exchange(IKE) | 2.1 | Security at Application Layer: PGP and S/MIME ,Email Security. | **12** |
| | 2.2 | Security at Transport Layer: SSL & TLS | |
| | 2.3 | Security at Network Layer: IPSec, Two modes, Two Security Protocols, Security Association, security Policy, Internet Key Exchange(IKE),ISAKMP | |
| **Unit 3- Security Policies And Design Guidelines** | | | |
| 1.Describe policy creation | 3.1 | Policies: Creation, Regularity considerations, Privacy regulations. | **10** |

| | | | |
|---|---|---|---|
| 2.Enlist design guidelines for security<br><br>3.Differentiate between Physical and logical access control. | 3.2 | Security: Infrastructure and components. Design guidelines | |
| | 3.3 | Authentication: Authorization and accounting. Physical and logical access control. | |
| | 3.4 | User Authentication: Biometric devices | |
| **SECTION-II** | | | |
| **Unit 4- Application and Web security** | | | |
| 1.Identify web security threats<br><br>2.Explain code injection | 4.1 | Application Hardening, application patches, web servers, active directory | **10** |
| | 4.2 | Web security threats, web traffic security approaches, secure electronic transaction | |
| | 4.3 | Software Development: Secure Code techniques, Buffer overflows, code injection, least privilege, good practices, requirements, testing. | |
| **Unit 5- Disaster Recovery, Business Continuity and Organizational Policies** | | | |
| 1. Describe Disaster recovery process.<br><br>2.Formulate service level agreement | 5.1 | Disaster Recovery-Plans/Process, Backups, Utilities, Secure Recovery, High Availability and fault tolerance, Computer incidence response teams, Test, Exercise and Rehearse | **12** |
| | 5.2 | Policies and Procedures-Security Policies, Privacy, Service Level Agreements, Human Resource Policies, Code of ethics , Incident response policies | |
| **Unit 6- Change Management & Privilege Management** | | | |

| | | | |
|---|---|---|---|
| 1.Differentiate between Centralized and Decentralized Model<br><br>2.List and elaborate various auditing techniques | 6.1 | Why Change Management? The Key Concept: Segregation of duties, Elements Of Change management | **10** |
| | 6.2 | Privilege Management-User, Group and Role Management. Centralized Vs Decentralized Management, The Decentralized and Centralized Model. | |
| | 6.3 | Auditing-Privilege Auditing, Usage auditing, Escalation Auditing | |
| | | **Total** | **64** |

**List of Experiments/Assignments:**

Note: For the tools mentioned in above practical list free downloadable Software's may be used.

**List of Practicals:**

| **Sr. No.** | **Name of Experiment/Assignment** | **Hrs** |
|---|---|---|
| 1 | Knowing the security provided with windows Operating system | 02 |
| 2 | Recovery the password of windows machines using password recover utility (John the ripper) or any other utility | 04 |
| 3 | Send and receive secret message using steganography techniques | 04 |
| 4 | Demonstrate any Data recovery tool | 04 |
| 5 | Using a typical IT Organization from a medium-sized company(100 | 04 |

| | | |
|---|---|---|
| | developers/managers/support personnel),describe the purpose, organization and responsibilities of a change control board appropriate for this organization | |
| 6 | An Administrator from your company needs some help defining the company's new auditing policy. Define the basic types of auditing and describe how they could benefit your company. | 04 |
| 7 | Tracing of email origin using eMailTracePro utility | 04 |
| 8 | Use of Keylogger and anti-keylogger to secure your system | 02 |
| 9 | • Practice use of Digital Signatures | 02 |
| 10 | • Study setting of Security levels in emails | 02 |
| | **Total** | **32** |

**Instructional Strategy:**

| S.N. | Topic | Instructional Strategy |
|---|---|---|
| 1. | Introduction to Information Security | Introduction and Explanation, Demonstration |
| 2 | Security at each Layer | Introduction and Explanation, Demonstration |

| | | |
|---|---|---|
| 3. | Security Policies And Design Guidelines | Introduction and Explanation, Demonstration |
| 4. | Application and Web security | Introduction and Explanation, Demonstration |
| 5. | Disaster Recovery, Business Continuity and Organizational Policies | Introduction and Explanation, Demonstration |
| 6. | Change Management & Privilege Management | Introduction and Explanation, Demonstration |

**Text/Reference Books:**

| SR. NO. | AUTHOR | TITLE | PUBLISHER |
|---|---|---|---|
| 1 | Wm.Arthur Cokin Dwayne Williams Gregory B. White RogerL.Davis Chuck Cothren | Principles of computer security Security+and Beyond | Mc Graw Hill Technology Education Intenational Edition |
| 2 | Behrouz A Forouzan,De Anza College,Deepak Mukopadhay | Cryptography And Network Security | Mc Graw Hill Technology Education Intenational 2nd Edition |
| 3 | Whitman | Principles of Information Security | Cengage india |

**Learning Resources:** LCD Projector, Black Board and Online Demonstration.

**Specification Table:**

| Sr. No. | Topic | Cognitive Levels | | | Total |
|---|---|---|---|---|---|
| | | R | U | A | |

| | | | | | |
|---|---|---|---|---|---|
| 1. | Introduction to Information Security | 12 | -- | -- | 12 |
| 2. | Security at each Layer | 08 | 02 | 06 | 16 |
| 3. | Security Policies And Design Guidelines | 06 | 06 | -- | 12 |
| 4. | Application and Web security | 04 | 04 | 04 | 12 |
| 5. | Disaster Recovery, Business Continuity and Organizational Policies | 06 | -- | 06 | 12 |
| 6. | Change Management & Privilege Management | 06 | 06 | 04 | 16 |
| **Total** | | 42 | 18 | 20 | 80 |

**Prepared By**

**(Smt .P.L.Sonawane &Smt.T.D.Pawar)**

**Secretary, PBOS**

**(Smt.S.V.Chaudhari)**

**Chairman, PBOS**

**Programme : Diploma in Information Technology**
**Programme Code : 07**
**Name of Course : Data Mining and Warehousing**
**Course Code : IT586**
**Class Declaration : YES**

**Teaching Scheme:**

| | Hours /Week | Total Hours |
|---|---|---|
| **Theory** | 03 | 48 |
| **Practical** | 02 | 32 |
| **Tutorial** | 01 | 16 |

**Evaluation Scheme:**

| | Progressive Assessment | Semester End Examination | | | |
|---|---|---|---|---|---|
| | | Theory | Practical | Oral | Term work |
| **Duration** | Two class tests, each of 60 minutes | 3Hrs. | -- | -- | -- |
| **Marks** | 20 | 80 | -- | 25 | 25 |

**Rationale:**

The subject is intended to teach the student Database Architecture, Database Creation and administration, Database backup and recovery techniques and Database security methods which will enable him to Creating , managing , designing, monitoring, executing and maintaining the work related to any database system. This subject serves the knowledge to maintain up to date any database system .

**Course Outcomes:**

**After completing this course students will be able to**

After undergoing the course, Students will be able to understand

1. Identify the scope and necessity of Data Mining & Warehousing for the society
2. Design a data mart or data warehouse for any organization.
3. Compare OLAP and data mining as techniques for extracting knowledge from a data warehouse.
4. Identify various stages of knowledge discovery of Database
5. Mine the Frequent Item sets and Association Rules
6. Perform Clustering technique on dataset.

**Course Contents:**

| Specific Learning Outcomes | Topics and subtopics | Hrs. |
|---|---|---|
| **SECTION-I** | | |
| **Units 1 : Introduction to Data warehousing** | | |
| • Identify need of data warehousing<br>• Describe Architecture of Data Warehouse.<br>• State the benefits of Data Warehousing | 1.1 What is Data warehouse? Need for data warehousing, Characteristics of data warehousing | **08** |
| | 1.2Difference between Operational Database System and Data warehouse, Basic elements of data warehousing | |
| | 1.3 A Multitiered Architecture of data warehousing | |
| | 1.4 Data Warehouse Models: Enterprise Warehouse, Data Mart, and Virtual Warehouse | |
| | 1.5 Extraction, Transformation, and Loading | |
| | 1.6 Metadata Repository | |
| | 1.7 Benefits of Data warehouse Framework | |
| **Unit 2: Data Warehouse Modeling and Designing** | | |
| • Describe the Data Warehousing<br>• Modeling<br>• State the Data Warehouse Design Process<br>• Design the Data warehouse. | 2.1 Data Warehouse Modeling: Data Cube and OLAP,Data Cube: A Multidimensional Data Model | **07** |
| | 2.2 Stars, Snowflakes, and Fact Constellations | |
| | 2.3 Data warehousing Component | |
| | 2.3 Data Warehouse Design and Usage | |
| | 2.4 A Business Analysis Framework for Data Warehouse Design | |
| | 2.5 Data Warehouse Design Process | |
| | 2.6 Data Warehouse Usage for Information Processing. | |
| **Unit 3: Online Analytical Processing** | | |
| • Implement OLAP operations on given data.<br>• Compare OLAP and OLTP tool.<br>• State the benefits of OLAP tool. | 3.1 OLAP : Need of OLAP, Benefits of OLAP, Categories of OLAP tool, OLAP Guidelines | **09** |
| | 3.2 Typical OLAP Operations | |
| | 3.3 A Business Analysis Framework for Data Warehouse Design | |

| | | | |
|---|---|---|---|
| | 3.4 From Online Analytical Processing to Multidimensional Data Mining | | |
| | 3.5 Data Warehouse Implementation- Efficient Data Cube Computation: An Overview, Indexing OLAP Data: Bitmap Index and Join Index, Efficient Processing of OLAP Queries | | |
| | 3.6 OLAP Server Architectures: ROLAP Versus MOLAP versus HOLAP | | |
| | 3.7 Introduction to OLTP, OLTP verses OLAP | | |
| **SECTION-II** | | | |
| **Unit 4: Introduction to Data Mining** | | | |
| • Explain the concept of Data Mini<br>• Explain concept of Knowledge Discovery of Data<br>• Describe the Data Mining System<br>• Identify various stages of KDD<br>• State the Function of Data Mining. | • Data Mining: Why Data Mining ? What is Data Mining? Essential steps in the process of knowledge discovery of Database(KDD) , Architecture of Typical Data mining system | | **08** |
| | • What Kind of data can be mined? What Kinds of Patterns Can Be Mined? | | |
| | • Major issues in data mining | | |
| | • Data Objects and Attributes types | | |
| | • Data Preprocessing: Why Preprocess the data? Major Tasks in Data Preprocessing | | |
| | • Introduction to Data Cleaning , Data Integration, Data Reduction and Data Transformation and Discretization. | | |
| | • Data Mining Functionalities / Tasks | | |
| **Unit 5: Mining Frequent Patterns and Association Rules** | | | |
| • Define the Frequent Itemsets, Clos Item sets.<br>• Find the Frequent Item sets using Apriori Algorithm.<br>• Mine the Association Rules<br>• Compare Classification and Prediction | 6.1 Frequent Patterns, Market Basket Analysis: A Motivating Example | | **09** |
| | 5.2 Frequent Itemsets, Closed Itemsets, and Association Rules | | |
| | 5.3 Frequent Pattern Mining:A Road Map | | |

| | | |
|---|---|---|
| | 5.4 The Apriori Algorithm: Finding Frequent Itemsets Using Candidate Generation | |
| | 5.5 Generating Association Rules from Frequent Itemsets, Mining various Kinds of Association Rules | |
| | 5.6 Classification and Prediction –Basic Concepts, Issues regarding Classification and Prediction | |
| | 5.7 Comparing Classification and Prediction | |
| **Unit 6: Cluster Analysis And Trends In Data Mining** | | |
| • Explain various clustering method<br>• Measure the Quality of Clustering<br>• Describe Data Mining Trends | 6.1 What is Cluster Analysis? Requirement s for Cluster Analysis | **07** |
| | 6.2 Overview of Basic Clustering Methods | |
| | 6.3 General Applications of Clustering, Examples of Clustering Applications | |
| | 6.4 Measure the Quality of Clustering | |
| | 6.5 Types of Data in Cluster Analysis | |
| | 6.6 Major Clustering Approaches | |
| | 6.7 Data Mining Trends | |
| | **Total** | **48** |

## LIST OF PRACTICALS/LABORATORY EXPERIENCES/ASSIGNMENTS:

| Practical No. | Specific Learning Outcomes (Psychomotor Domain) | Units | Course Outcomes | Hrs. |
|---|---|---|---|---|
| 1. | Demonstration of Installation of Oracle Database Software. | - | - | 02 |
| 2. | Importing Source Data structures in Oracle | 1 | CO2 | 02 |
| 3 | Design Target Data structures in Oracle. | 1 | CO2 | 02 |
| | Implementation of data cleaning techniques. | 1 | CO3 | 04 |
| 4. | Design and implement an application to implement OLAP and its operations like roll-up, drill down, slice and dice. | 3 | CO3 | 04 |

| | | | | |
|---|---|---|---|---|
| 6. | Building a data warehouse for any small application (e.g. super market, student information system, Library management system). | 2 | CO3 | 04 |
| 7. | Introduction to comparison of various Data Mining Tools( Example-WEKA , R-Programming, Orange, KNIME …) | 4 | CO5 | 04 |
| 8. | To perform Preprocessing, Classification on Weather dataset, Customer Dataset | 4,5 | CO6 | 04 |
| 9. | To perform Association technique on Customer dataset. | 5 | CO5 | 02 |
| 10. | To perform Clustering technique on Customer dataset. | 6 | CO6 | 04 |
| **Total** | | | | **32** |

**Instructional Strategy:**

| Sr.No | Topic | Instructional Strategy |
|---|---|---|
| 1 | Introduction to Data warehousing | Class room teaching, laboratory demonstration |

| | | |
|---|---|---|
| 2 | Data Warehouse Modeling and Designing | Class room teaching, laboratory demonstration |
| 3 | Online<br><br>Analytical Processing | Class room teaching, laboratory demonstration |
| 4 | Introduction to Data Mining | Class room teaching, laboratory work |
| 5 | Mining Frequent Patterns and Association Rules | Class room teaching, laboratory work |
| 6 | Cluster Analysis And Trends In Data Mining | Class room teaching, laboratory work |

**Scheme of Practical Evaluation:**

| S.N. | Description | Max. Marks |
|---|---|---|
| 1 | Query Execution | 10 |
| 2 | Designing the Data warehouse and Mining the datasets | 10 |
| 3 | Viva voce | 05 |
| | **TOTAL** | **25** |

**Specification Table for Theory Paper:**

| Unit No. | Units | Levels from Cognition Process Dimension | | | Total Marks |
|---|---|---|---|---|---|
| | | R | U | A | |
| 01 | Introduction to Data warehousing | 06 | 03 | 03 | 12 |
| 02 | Data Warehouse Modeling and Designing | 04 | 03 | 06 | 13 |
| 03 | Online Analytical Processing | 05 | 05 | 05 | 15 |
| 04 | Introduction to Data Mining | 07 | 05 | 03 | 15 |
| 05 | Mining Frequent Patterns and Association Rules | 04 | 06 | 05 | 15 |
| 06 | Cluster Analysis And Trends In Data Mining | 03 | 04 | 03 | 10 |
| | **Total** | **29** | **26** | **25** | **80** |

**Reference & Text Books:**

| Sr.No. | Title | Author, Publisher, Edition and Year of publication | ISBN Number |
|---|---|---|---|
| 1 | Data mining concepts andtechniques | Jiawei Han and Micheline Kamber, Third Edition, Elsevier, 2012. | |
| 2 | Data warehousing | Paul Punnian, John Wiley | |
| 3 | Data warehousing , data mining and OLAP | Alex Berson, Hill Edition, Thirteenth Reprint 2008, Tata McGraw Hill | |
| 4 | The Data warehouse life cycle tool Kit | Ralph Kimball, John Wiley | |

**E-References:**

- https://www.tutorialspoint.com/dwh/dwh_overview.htm
- http://www.dei.unipd.it/~capri/SI/MATERIALE/DWDM0405.pdf
- https://www.vssut.ac.in/lecture_notes/lecture1428550844.pdf

**Prepared by** **Member Secretary PBOS** **Chairman,PBOS**

Smt.S.B.Gosavi

Smt..H.S.Pawar,

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