GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

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. Apply grammatical rules to form correct sentences.

2. Answer the questions based on the articles

4. Write a paragraph on a given topic.

5. Comprehend & provide the answers on given passages.

6. Use correct words as per situations

Course Content:

Chapter No.		Name of Topic/Subtopic		Hrs	Marks
1		**GRAMMAR**			
	1] To apply Grammar for day today and routine Reading, writing, Speaking and Listing Practices	1.1	Tenses : Past Perfect, Past Perfect Continuous	12	20
		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		
2	2]To practice Writing Paragraphs		**PARAGRAPH WRITING**		
		2.1	Types of paragraphs (Narrative, Descriptive, Technical)	04	10
3	3]To practice Comprehensions		**COMPREHENSION**		
		3.1	Unseen passages	10	40
4	4]To Improve Vocabulary And learn Various Jargon related Vocabulary		**VOCABULARY**		
		4.1	Homophones: To understand the difference between meaning and spelling of words	04	06
		4.2	Vocabulary : Understanding meaning of new words	02	04
		Total		**32**	**80**

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.	CO1	04

	Find out the errors and rewrite the sentences given by the teacher.		
6	Essay writing 2 assignments. Write 2 assays on topic given by the teacher.	CO4	04
7	Biography (Write a short biography on your role model approximately in 250-300 words)	CO4	04
8	Idioms and phrases 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**

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	1	2	1	1	3
CO2	3	1	3	3	3	1	2	1	1	3

CO3	3	2	2	2	1	1	2	1	1	3
CO4	3	1	2	2	1	1	2	1	1	3
CO5	3	2	2	2	1	1	1	1	1	3
CO6	3	2	2	2	1	1	2	1	1	3
Total	18	11	14	14	10	6	11	6	6	18
Average	3	1.833	2.3333	0	1.667	1	1.833	1	1	3
Atta Average	3	2	2	0	2	2	2	3	3	3
%	100	61.11	77.778	77.78	55.56	33.33	61.11	33.33	33.33	100
Attainment	3	0	0	0	0	1	1	3	3	3

CO-PSO Matrix:

CO/PSO →	Hardware and Networking	Database Technologies	Software Development
Apply grammatical rules to form correct sentences	-	-	-
Write a paragraph on a given topic	-	-	-
Comprehend & provide the answers on given passages.	-	1	1
Use correct words as per situations	-	-	
Summary	-	1	1

Prepared by   Member Secretary PBOS   Chairman PBOS

Prof. M.A.Surdikar   Prof. S.V.Chaudhari   Prof. 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 : **HU 182**

Teaching Scheme:

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

Evaluation:

	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. Analyze communication event.

2. Use the patterns required to communicate in an organization.

3. Communicate using appropriate non-verbal codes

4. Draft various types of letters and office drafts.

Course Contents:

A. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1 : Basic concepts and principles of communication		
1.Define all elements of communication 2 Analyze communication event . 3. Define the stages of communication process 4. Apply the principles of communication and minimize the barriers	1.1 The communication Event The communication event: Definition The elements of communication: The sender, receiver, message, channel, feedback. 1.2 The communication Process The communication process: Definition Stages in the process: defining the context, knowing the audience, designing the message, encoding, selecting the proper channels, transmitting, receiving, decoding and giving feedback. 1.3 Principles of Effective communication Effective Communication: definition Communication Barriers and how to overcome them at each stage of communication process. Developing effective message: Thinking about purpose, knowing the audience, structuring the message, selecting proper channels, minimizing barriers and facilitating feedback	
Unit 2: Organizational Communication		
1.Understand non-verbal codes and use them effectively	2.1 What is an organization? Goal. Patterns of communication: Upward, Downward, Horizontal and Grapevine	04
Unit 3: Non-verbal Communication		
1.Understad 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		
1.Understand office drafts and letters and practice those in various contexts	4.1 Business Correspondence: Letter of Enquiry, Order letter, Complaint Letter 4.2 Office Drafting: Circular, Notice and Memo 4.3 Job Application with Resume	10

Total Hrs.   32

B.   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 Hrs.	**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

Question Paper Profile For Theory Paper:

Q. No	Bit 1			Bit 2			Bit 3			Bit 4			Bit 5			Bit 6			option
	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	
01	1	U	10	1	A	14													**5/7**
02	2	U	04	0	A	08													**3/5**
03	3	U	02	3	A	10													**3/5**
04	4	R	08																**3/5**
05	4	U	08																**2/3**
06	4	A	16																**2/3**

T= Unit/Topic Number   L= Level of Question   M = Marks

Assessment and Evaluation Scheme:

		What	To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	(Continuous Assesment)	PT	STUDENTS	One PT and One oral (avg. of Two tests will be computed)	20	--	Test Answer sheets	1,2,3,4
		--		--	--	--	--	--
				Total	**20**	=		

	TEE	End exam	STUDENTS	End of the course	**80**	**28**	Theory Answer sheets	1,2,3,4
Direct Assessment **Practical**		--	STUDENTS	--	--	--	--	--
		End of course		End of the course	25	10	Oral	1 to 11
				TOTAL	**25**	**10**		

Scheme Of Practical Evaluation:

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

Mapping Course Outcomes With Program Outcomes:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Analyze communication event.	--	2	3	--	3	--	3	3	3	3

Use the patterns required to communicate in an organization.	--	3	3	--	3	--	3	3	3	3
Communicate using appropriate non-verbal codes	--	3	2	--	3	--	3	3	3	3
Draft various types of letters and office drafts.	--	3	2	--	3	--	3	3	3	3
Summary	--	3	2	--	3	--	3	3	3	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix :

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development
Analyze communication event.	-	-	1
Use the patterns required to communicate in an organization.	-	-	2
Communicate using appropriate non-verbal codes	-	1	1
Draft various types of letters and office drafts.	-	-	1
Summary	-	1	1

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	

List of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.		Chairman PBOS	
2.		Faculty from Institute	
3.		Faculty from Institute	
4.		Consultant from Industry	
5.		Faculty from nearby Institute	
6.		R.B.T.E.Representative	

Prepared by

(M.A.Surdikar)   **(Member Secretary PBOS)**   **(Chairman PBO)**

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:

	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. Think logically and systematically.

2. Learn the importance of accuracy and develop attitude of problem solving with diligence and perseverance**.**

3. Use the basic principles of algebra to solve the engineering problems.

4. Use the basic principles of trigonometric in various engineering practices.

5. Apply coordinate geometry principles in the design and practices in engineering tools.

Course Contents: (Course Name: Applied mathematics I – SC181)

C.   Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1 : Algebra 18		
1. Solve the examples using laws of logarithm 2. Solve simultaneous equations in three variables using Cramer's rule 3.Perform all algebraic operations on matrices. 4. Solve simultaneous equations in three variables using adjoint matrix method. 5. Find partial fraction of proper and improper fraction. 6. Define binomial expansion& general term 7. Solve examples using binomial theorem.	1.1 Logarithm: Definition, Laws of Logarithms, Simple examples based on laws. 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. 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) 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. 1.5 Binomial expansion : Definition of factorial notation, definition of permutation and combinations with formula,Binomial theorem for positive index,General term, Binomial theorem for negative index, Approximate value (only formula)	

Unit 2:Trigonometry		20
1.Define basic trigonometric terms 2. Determine values of trigonometric ratios of standard angles. 3. Solve examples of allied angle, compound angle, multiple and sub-multiple angles. 4.Solve examples using factorization and de-factorization formulae 5. Solve examples of inverse trigonometric ratios	2.1 Trigonometric ratios and fundamental identities. 2.2 Trigonometric ratios of allied angles, compound angles, multiple angles (2A, 3A), submultiples angle. 2.3 Sum and product formulae. 2.4 Inverse Circular functions. (definition and simple problems)	
Unit 3: Co ordinate geometry		**10**
1.Define slope , various forms of equation of straight line. 2.Find slope and intercepts of straight line 3.Find Angle between two straight lines 4.Define condition of Parallel and Perpendicular lines 5.Define various forms of equation of circle 6. Solve problems with given condition	3.1 Straight Line: Slope and intercept of straight line. Equation of straight line in 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 Perpendicular lines. Intersection of two lines. Length of perpendicular from a point on the line and perpendicular distance between parallel lines. 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.	

D.   List of Practicals/Laboratory Experiences/Assignments:

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

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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)**

Question Paper Profile For Theory Paper:

Specification Table for Theory Paper:

R-Remember　　　　U – Understand　　　　A – Analyze / Apply

Q. No	Bit 1			Bit 2			Bit 3			Bit 4			Bit 5			Bit 6			option
	T	**L**	**M**	**T**	**L**	**M**	**T**	**L**	**M**	**T**	**L**	**M**	**T**	**L**	**M**	**T**	**L**	**M**	
01	1	U	4	1	A	4	1	U	4	1	U	4	1	U	4	1	U	4	**4/6**
02	1	U	4	1	A	4	1	A	4	2	R	4	2	U	4	2	U	4	**4/6**
03	2	U	4	2	U	4	2	U	4	2	U	4	2	A	4	2	A	4	**4/6**
04	3	R	4	3	U	4	3	U	4	3	U	4	3	A	4	3	R	4	**4/6**
05	1	R	2	1	R	2	1	R	2	1	R	2	1	R	2	1	R	2	**8/12**
	2	R	2	2	R	2	2	R	2	2	R	2	3	A	2	3	R	2	

T= Unit/Topic Number　　　L= Level of Question　　　M = Marks

R-Remember　　U-Understand　　　　A-Analyze/ Apply

(Course Name: Applied mathematics I – SC181)

Assessment and Evaluation Scheme:

		What	To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	**CA** (Continuous Assessment)	PT	Students	Two PT (average of two tests will be computed)	20	--	Test Answer sheets	1,2,3,4,5
		Class Room Assignments		Assignments	--	--	Assignment Book	1,2,3,4,5
				TOTAL	**20**	=		
	(Term End Examination)	End Exam	Students	End Of the Course	**80**	**28**	Theory Answer sheets	1,2,3,4,5
Direct Assessment Practical	**CA** (Continuous Assessment)	--	Students	--	--	--	--	--
		--		--	--	--	--	--
	(Term End Examination)	--	Students	--	**--**	**--**	--	--

Indirect Assessment	Student Feedback on course	Students	After First PT	Student feedback form	
	End Of Course		End Of The Course	Questionnaires	

(Course Name: Applied mathematics I – SC181)

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	

Mapping Course Outcomes With Program Outcomes:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Think logically and systematically.	3	3	2	1	2	1	2	3	2	2
Learn the importance of accuracy and develop attitude of problem solving with diligence and perseverance.	3	3	2	1	2	1	2	3	2	2

Use the basic principles of algebra to solve the engineering problems.	3	2	2	1	1	1	2	2	1	2
Use the basic principles of trigonometric in various engineering practices.	3	3	3	2	1	1	2	2	1	1
Apply coordinate geometry principles in the design and practices in engineering tools	3	2	3	2	1	1	2	2	1	1
Summary	3	3	2	1		1	2	2	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix :

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development
Think logically and systematically.	-	-	3
Learn the importance of accuracy and develop attitude of problem solving with diligence and perseverance**.**	-	-	2
Use the basic principles of algebra to solve the engineering problems.	-	-	3

Use the basic principles of trigonometric in various engineering practices	-	-	2
Apply coordinate geometry principles in the design and practices in engineering tools.	-	-	2
Summary	**-**	**-**	**2**

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	

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.		Chairman PBOS	
2.	Shri V.B.Shinde	Faculty from Institute	Govt.Polytechnic Pune
3.		Faculty from Institute	
4.		Consultant from Industry	
5.		Faculty from nearby Institute	
6.		R.B.T.E.Representative	

Prepared by   (   )   (Member

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:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60 min. duration	Hrs	--	--	--
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. Understand basic facts of Mathematics about the field of analysis of any Engineering problem.
2. Know the standard ways in which the problem can be approached.
3. Apply basic concepts to engineering problems.

Course Contents:(Course Name: Applied mathematics II – SC182)

E. **Theory :**

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

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

(Course Name: Applied mathematics II – SC182)

F.   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 on differentiation of parametric function and Successive differentiation.		1
8.	Examples on equation of tangent & normal & determination of maxima & minima of fuction.	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 Hrs.	**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

(Course Name: Applied mathematics II – SC182)

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)

Specification Table for Theory Paper:

      R-Remember   U – Understand   A – Analyze / Apply

Question Paper Profile For Theory Paper:

Q. No	Bit 1			Bit 2			Bit 3			Bit 4			Bit 5			Bit 6			option
	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	
01	1	R	4	1	U	4	1	U	4	1	A	4	1	U	4	1	R	4	**4/6**
02	2	R	4	2	U	4	2	U	4	2	U	4	2	R	4	2	U	4	**4/6**
03	3	A	4	3	A	4	3	A	4	4	R	4	4	U	4	4	A	4	**4/6**
04	4	A	4	5	R	4	5	U	4	5	A	4	2	U	4	5	A	4	**4/6**
05	1	A	2	1	A	2	2	R	2	2	R	2	2	U	2	2	U	2	**8/12**
	4	A	2	4	R	2	5	A	2	5	A	2	5	U	2	5	R	2	

      T= Unit/Topic Number   L= Level of Question   M = Marks

             R-Remember   U-Understand   A-Analyze/ Apply

(Course Name: Applied mathematics II – SC182)

Assessment and Evaluation Scheme:

		What	To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	**CA** (Continuous Assessment)	PT	Students	Two PT (average of two tests will be computed)	20	--	Test Answer sheets	1,2,3
		Class Room Assignments		Assignments	--	--	Assignment Book	1,2,3
				TOTAL	20	--	--	--
	(Term End Examination)	End Exam	Students	End Of the Course	80	28	Theory Answer sheets	
Direct Assessment Practical	**CA** (Continuous Assessment)	--	Students	--	--	--	--	--
		--		--	--	--	--	--

(Term End Examination)	--	Students	--	--	--	--	--	--
Indirect Assessment	Student Feedback on course	Students	After First PT	Student feed back form				
	End Of Course		End Of The Course	Questionnaires				

(Course Name: Applied mathematics II – SC182)

Mapping Course Outcomes With Program Outcomes:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Understand basic facts of Mathematics about the field of analysis of any Engineering problem.	3	3	2	1	2	1	2	3	2	2

Know the standard ways in which the problem can be approached.	3	3	2	2	1	1	2	3	2	1
Apply basic concepts to engineering problems	3	3	3	2	1	1	2	2	1	2
Summary	3	3	2	1	1	1	2	2	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix:

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development
Understand basic facts of Mathematics about the field of analysis of any Engineering problem.	-	-	2
Know the standard ways in which the problem can be approached.	--	-	2
Apply basic concepts to engineering problems	-	-	2
Summary			

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	--

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.		Chairman PBOS	
2.	Shri . V.B.Shinde	Faculty from Institute	Govt. Polytechnic Pune
3.		Faculty from Institute	
4.		Consultant from Industry	
5.		Faculty from nearby Institute	
6.		R.B.T.E.Representative	

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

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

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

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:

	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. Develop logical and analytical abilities.
2. Illustrate basic concepts in physics
3. Interpret   various laws in physics using different basic instruments.
4. Apply principles and laws of physics .
5. To identify and solve numerical.
6. Recognize role of principles of physics in Engineering and technology

Course Contents:

G. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1 : Motion		**06**
1 Define circular motion and UCM 2 Define Simple harmonic motion with example . 3.State characteristics of SHM 4.Explain centripetal and centrifugal force with its example and application 5. Explain SHM as a projection of UCM on any one diameter of circle. 6. Distingush between centripetal and centrifugal force. 7 Derive equation of SHM when particle starts motion from mean position.	1.1 **Introduction** 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 1.3 **SHM**: Definition, SHM as a projection of UCM on the diameter,Equation of SHM, displacement and graphical representation	
Unit 2:Properties of matter		**08**
1: Define Surface tension of liquid with its unit. 2 State significance of angle of contact. . 3. State the effect of temperature and impurity on surface tension of liquid. 4.Explain phenomenon of ST with the help of Laplace's molecular theory 5 State Newton's law of viscosity.	2.1 **Surface Tension :** 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. 2.2 **Viscosity:** Definition, velocity gradient, Newton's & Stokes' law of viscosity, terminal velocity, coefficient of viscosity by stokes method(No derivation), type of flow of liquid - stream line	

6 Distinguish between stream line and turbulent flow. 7 State Significance of Reynolds number 8 Explain behavior of wire under continuous increase in load. 9 State Hooks law and define elastic Limit 10 Define different Moduli with its unit.	flow, turbulent flow, Reynolds's number (significance), applications and simple problems 2.3 **Elasticity:** Elastic, plastic and rigid bodies, stress and strain, Hook's law, types of elastic modulii with its relation, problems. Behaviour of wire under continuously increasing load.	
Unit 3: Sound		**03**

1. Distinguish between Transverse wave and Longitudinal wave.
2. Define Resonance with its applications.
3. Define….1)Coefficient of absorption
         2)Coefficient of transmission
         3)Coefficient of reflection
4 State characteristics of Free vibrations and forced vibration.
	3.1 Wave motion, Transverse and longitudinal waves, free and forced vibrations, Resonance - explanation and example. absorption, reflection and transmission of sound.	

Unit 4: Heat		**04**
1.State Boyle's law and Charles's law And Gay lussac's law. 2. State the factors affecting conduction of heat and give relation between them. 3. Define coefficient of thermal conductivity of a material with its unit. 4.Explain absolute zero scale of temperature	4.1 Explanation of Gas laws, Boyle's law, Charles's law, Gay Lussac's law, General Gas Equation, problems on gas laws, units of temperature ^0C, ^0K with their conversion, absolute scale of temperature, modes of heat transfer, conduction, convection and radiation.	

Unit 5:Optics		
1.State Snell's law of reflection. 2.Define reflection and refraction. 3.Define refractive index and state its physical significance. 4.Define Numerical aperture and Acceptance cone. 5 Explain different types of optical fiber. 6. Distinghish between electrical cable and optical fiber communication. 7. Explain the phenomenon of Total internal reflection with diagram. 8. State properties of LASER. 9. Explain construction and working of He-Ne LASER. 10.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. 5.2 **Fiber optics** : Propagation of light through optical fiber, numerical aperture, types of optical fibers, applications and comparison with electrical cable. 5.3 **LASER:** Definition, spontaneous and stimulated emission, population inversion, He-Ne laser- construction and working, applications and properties of LASER.	
Unit 6: Electostatics		06
1.State Coulomb's law of charges. 2.Define Electric field and Intensity of electric field. 3.State any four properties of electric lines of forces. 4.Define charge of one coulomb. 5.Explain why potential of earth is Zero. 6.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 (Properties), electric flux, flux density. 6.2 **Electric potential:** Explanation, definition**,** potential due to a point charge, potential due to a charged sphere, absolute electric potential, simple problems.	

Unit:7 Current Electricity		06
1.State and explain Ohm's law. 2.Define Resistance and Specific resistance. 3.Explain Wheatstone's network with its principle. 4.With neat diagram explain construction and principle of potentiometer. 5.Define EMF and potential gradient with its unit. 6. 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 7. 2 **Principle of potentiometer,** potential gradient, E.M.F., comparison of E.M.F. using potentiometer. 7:3 **Electric work**, electric power, energy, units and calculations of electric bill	

Unit:8 Electromagnetism		03
1.State and explain Biot's savart law. 2.State Fleming's left hand rule. 3.Give Ampere's Right hand rule 4.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.	

Unit:9 Modern Physics		06
1.State properties of X-Ray. 2.Explain production of X-Ray with neat label diagram. 3.State application of X-Ray. 4.Explain photoelectric effect. 5.Define Threshold frequency and Stopping potential. 6.State application of photoelectric cell. 7.State Einstein's photoelectric equation. 8.With neat diagram explain working of photoelectric cell.	9:1 **X- ray's**, principle, production, properties and applications 9:2 **Photo electricity**: Plank's quantum theory, photoelectric effect (circuit diagram and working), threshold frequency, stopping potential, wor function, Einstein's photoelectric equation, photocell, problems	

H. **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's law.	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 cell method.	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 Hrs.	**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

R-Remember U – Understand A – Analyze / Apply

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)**

Question Paper Profile For Theory Paper:

Q. No	Bit 1 T	L	M	Bit 2 T	L	M	Bit 3 T	L	M	Bit 4 T	L	M	Bit 5 T	L	M	Bit 6 T	L	M	option
01	1	R	2	2	R	2	3	R	2	4	R	2	5	R	2	6	R	2	**10/12**
	1	A	2	2	R	2	7	R	2	8	R	2	5	R	2	9	R	2	
02	1	U	4	2	U	4	3	U	4	5	U	4	6	U	4				**3/5**
03	1	A	4	2	U	4	3	A	4	6	U	4	7	U	4				**3/5**
04	2	A	4	4	U	4	7	A	4	6	A	4	5	U	4				**3/5**
05	9	U	4	8	U	6	7	A	6	5	A	4	4	A	4				**3/5**
06	8	A	4	9	U	6	5	A	4	2	A	4	9	A	4				**3/5**

T= Unit/Topic Number   L= Level of Question   M = Marks

R-Remember   U-Understand   A-Analyze/ Apply

Assessment and Evaluation Scheme:

		What	To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	**CA** (Continuous Assessment)	PT		Two PT (average of two tests will be computed)	20	--	Test Answer sheets	1,2,3
		Class Room Assignments		Assignments	--	--	Assignment Book	1,2,3
				TOTAL	**20**	=		
	(Term End Examination)	End Exam	Students	End Of the Course	**80**	**28**	Theory Answer sheets	1,2,3
Direct Assessment Practical		ST Journal Writing	Students	One skill test at end of term	--	--	Practical Answer sheets	4,5,6
				Assignments	--	--	Journal	4,5,6,
				TOTAL	**--**	**--**		

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(Term End Examination)	End Exam	Students	End Of the Course	**50**	**20**	Practical Answer Sheets	4,5,6
Indirect Assessment	Student Feedback on course	Students	After First PT	Student Feedback Form			1,2,3,4,5,6
	Student Feedback on course		After First PT	Student Feedback Form			

Scheme Of Practical Evaluation:

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

Mapping Course Outcomes With Program Outcomes:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Develop logical and analytical abilities.	3	1	2	1	1	2	3	2	2	2

Illustrate basic concepts in physics	3	2	1	1	1	2	2	2	2	3
Interpret various laws in physics using different basic instruments.	1	2	3	2	2	1	--	1	1	1
Apply principles and laws of physics .	2	1	3	3	3	--	1	2	1	1
To identify and solve numerical.	3	2	2	2	1	1	1	2	1	2
Recognize role of principles of physics in Engineering and technology	3	1	2	1	1	1	3	1	1	3
Summary	3	2	2	2	2	1	2	2	1	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix :

CO/PSO	Hardware and Networking	Database Technologies	Software Development
Develop logical and analytical abilities.	-	-	1
Illustrate basic concepts in physics	-	-	1
Interpret various laws in physics using different basic instruments.	-	-	-
Apply principles and laws of physics .	-	-	2
To identify and solve numerical.	-	-	2
Recognize role of principles of physics in Engineering and technology	-	-	3
Summary	-	-	2

Reference & Text Books:

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.	

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

E-References: www.howstuffworks.com

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

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.		Chairman PBOS	
2.		Faculty from Institute	
3.		Faculty from Institute	
4.		Consultant from Industry	
5.		Faculty from nearby Institute	
6.		R.B.T.E.Representative .	

Prepared by

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

Name of Programme : **Diploma in Computer Engineering**
Programme Code : **06/26**

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:

	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

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

Course Contents:

I.   Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.	Marks
SECTION – I			
Units 1: Overview of 'C'			
• State importance of 'C'. • Describe Basic structure of 'C' programs. • Demonstrate sample C program. • Execute sample C program.	**1.1** Introduction: development of 'C', **1.2** Importance of 'C', **1.3** Basic structure of 'C' programs, programming style, sample 'C' programs, execution of 'C' program	02	04
Unit 2:Data Types & Character Set			
• Describe Character set. • Define keywords, identifiers, • constants, variables, symbolic constants • 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	06
Unit 3: Operators & Expressions			
• Describe different types of operators. • State different types of Expressions. • Demonstrate input and output operators.	**3.1** Operators: Arithmetic, relational, logical, increment & decrement, conditional, bit-wise special. **3.2** Expressions**:** Arithmetic expressions, evaluation of expressions, procedure of arithmetic operators, type conversions in expressions, operator precedence & associatively, mathematical functions **3.3** Managing input & output operators: Introduction, reading a character, writing a character, formatted input, formatted output.	06	10
Unit 4: Decision Making			

• Understand and demonstrate branching and looping statements. • 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	08
Unit 5: Arrays			
• List different types of Arrays. • Distinguish between one-dimensional , two-dimensional and multidimensional arrays, • Demonstrate initialization of arrays	5.1 Introduction, one- dimensional arrays, two-dimensional arrays, multidimensional arrays, Initialization of arrays	04	12
Unit 6: Strings			
• Understand declaring and initializing string variables. • Describe String functions. • 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	06
Unit 7: User defined functions.			
• Define Function. • Identify different categories of function. • Understand nesting of functions, recursion. • Demonstrate function with arrays.	7.1Need of user defined function, the types of C functions, return values & their types, calling a function. 7.2Category of functions: No argument- No return value, Argument-No return value, No argument-return value & No argument- return value. 7.3Handling non-integer functions, nesting of functions, recursion, and function with arrays	10	12
Unit 8:Structures and Unions			

• Define Structure. • Understand Structure initialization • Demonstrate arrays of structure, arrays within structure • Identify use of structure in functions • Compare structure and Union.	8.1 Structure definition, giving values to members, structure initialization and comparison of structure variables. 8.2 Arrays of structures, arrays within the structure, structure and functions, Unions, size of structures, bit fields & bit operations	08	12
Unit 9: Introduction to Pointers			
• Define Pointer • Understand declaration of pointers, initialization of pointers and pointer Expressions • Describe application of pointers • 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	10
Total		48	80

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	TUTORIAL	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. Programs using scanf(), printf(), getch(), putch().(**Minimum 4**)	Operatorsn& Expressions	02	02

4.	Programs using following control statements: If statement,Switch statements,?: operator, go to statements Programs using following loop controls,while loop 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. Write programs demonstrating four categories of functions. Programs based on recursion & nesting of functions.(**Minimum 5**)	User defined functions	02	04
8.	Write programs based on structure definition and initialization. Write programs based on structure within structure. Write programs based on bitwise operations.(**Minimum 3**)	Structures and Unions	02	04
9	Write programs based on Pointers and pointer applications. (**Minimum 3**)	Introduction to Pointers	02	04
	Total		**16**	**32**

J. List of Practicals /Laboratory Experiences/Assignments:

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**

Sr.No	Description	Max Marks
1	Observation & Writing	05
2	Demonstration & Installation	15
3	Viva Voce	05
	Total	25

Mapping Course Outcomes with Program Outcomes:

CO ↓	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Represent the solution to problem with logical/functional methodology.	2	2	3	3	1	-	1	2	2	3
Write and execute C programs using syntactical constructs for decision making & looping	2	2	3	3	-	-	1	2	2	3
Use Library functions effectively for execution of C program.	2	2	3	3	-	-	1	2	1	3
Apply code reusability concept to execute C Programs efficiently.	2	2	3	3	1	-	2	1	2	3

Implement C programs with pointers.	2	2	3	3	1	-	2	1	2	3
Summary	**2**	**2**	**3**	**3**	**1**	**-**	**2**	**2**	**2**	**3**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix :

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Represent the solution to problem with logical/functional methodology.	-	-	2
Write and execute C programs using syntactical constructs for decision making & looping	-	-	2
Use Library functions effectively for execution of C program.	-	-	2
Apply code reusability concept to execute C Programs efficiently.	-	-	2
Implement C programs with pointers.	-	-	2
Summary	**-**	**-**	**2**

Reference & Text Books:

S.N.	Title	Author, Publisher, Edition and Year of publication
1	Programming in ANSI 'C'	E. Balagurusamy 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 CM / IT**
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:

	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	Implementaionof 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:

Sr.No	Description	Max Marks
1	Observation & Writing	05

2	Demonstration & Installation	15
3	Viva Voce	05
	Total	25

CO-PO Mapping:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Identify various components of Computer System.	-	2	-	-	-	-	-	-	-	-
Assemble and dissemble Computer system	--	3	2	-	-	-	-	2	3	-
Mount and Un-mount different expansion cards/memory cards on Motherboard.	-	2	2	-	-	-	-	2	2	

Identify various types of i/o ports for any computer system.	-	3	1	-	-	-	-	2	2	-
Connect different types of external devices to computer.	-	2	3	2	-	-	-	2	2	-
Summary		**2**	**2**	**1**				**2**	**2**	

Reference & Text Books:

Sr.No.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1.	The computer hardware installation, interfacing, troubleshooting and maintenance	K.L. James, PHI,Kindle Edition	978-8120347984
2.	Troubleshooting your PC	M. David Stone & Alfred Poor, PHI,2nd Edition	978-0735614901
3.	IBM PC clones	Govindrajalu , Tata McGraw-Hill Education,2nd edition	0070483116, 9780070483118

E-References:www.howstuffworks.com:

https://sumdho2013.wordpress.com/computer-fundamental-tutorial/

https://www.cs.utah.edu/~swalton/Documents/Computer-Fundamentals.p

www.tutorialspoint.com/**computer_fundamentals**/

Mapping Course Outcomes with Program Outcomes:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO mapping

CO/PSO	Hardware and Networking	Database Technologies	Software Development
Identify various components of Computer System.	3	-	-
Assemble and dissemble Computer system	3	-	-
Mount and Un-mount different expansion cards/memory cards on Motherboard.	3	-	-
Identify various types of i/o ports for any computer system.	3	-	-
Connect different types of external devices to computer.	3	-	-
Summary	3	-	-

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1	Prof. B.K. Vyas &	Lecturer	Government Polytechnic,pune
2	Prof. J. P. Dandale	Lecturer	Government Polytechnic,pune

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

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

Programme	:	**Diploma in Compute Engg/Information Technology**
Programme Code	:	**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:

- Install and Configure Linux O.S.
- Use and Implement various commands of Linux operating system.
- Write and execute programs using shell scripting.
- Use vi editor to handle files.
- Compress and archive files in Linux OS.

Course Content:

Unit No.		Name of Topic/Sub topic	Hrs
1		Introduction to Linux Operating system:	
Learning Outcomes: • Describe History of linux • Identify different types of shells • Compare Linux file systems	1.1	Operating system and Linux	03
	1.2	History, Overview of Linux	
	1.3	Shell: Bourne, Korn, Cshell	
	1.4	Linux releases, Linux File Systems(ext) and versions.	
2		The Linux File Structure:	
Learning Outcomes: • Describe Linux file structure • Use file name arguments, absolute and relative pathnames. • Execute file related commands. • 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.	
3		File Management Operations:	
Learning Outcomes: • Change file and directory permissions • Compress and archive files.	3.1	File and Directory Permissions: chmod	02
	3.2	Archive :tar	
	3.3	File Compression: gzip, gunzip	

4		Editors and Utilities:	
Learning Outcomes: • Create and modify files using vi editor. • 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	
5.		The Internet and Multimedia	
Learning Outcomes: • Execute Linux Filters. • Execute commands using regular expressions. • 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

CO-PO Matrix :

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Install and Configure Linux O.S.	-	3	3	-	-	-	3	1	1	3
Use and Implement various commands of Linux operating	-	3	3	-	-	-	-	2	1	3

system.										
Write and execute programs using shell scripting.	1	3	3	-	2	-	2	2	2	3
Use vi editor to handle files.	-	3	3	-	-	-	-	2	1	3
Compress and archive files in Linux OS.	-	3	3	-	1	-	-	2	1	3
Summary	**1**	**3**	**3**	**-**	**2**	**-**	**3**	**2**	**1**	**3**

CO-PSO Matrix:

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Install and Configure Linux O.S.	1	-	-
Use and Implement various commands of Linux operating system.	-	-	2
Write and execute programs using shell scripting.	-	-	3
Use vi editor to handle files.	-	-	2
Compress and archive files in Linux OS.	-	1	-
Summary	**1**	**1**	**2**

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

  (Smt. M. H. Thakare

  Shri.S.P.Emekar)

Name of Programme : **Diploma in Computer Engineering**
Programme Code : **06/07/26**
Name of Course : **Web Designing**
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:

K. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1 :Introduction to Common HTML and Links and Addressing.		
1.Define HTML. 2.State the Terminologies used in Web Design. 3.Describe Block Level Elements. 4.Define Components of HTML Tags. 5.Enlist Text Level Elements. 6.Create the different List. 7.Write a program for Linking HTML Documents.	1.1 Introduction to HTML 1.2 Web Publishing 1.3 Terminologies used in Web Design: Web, Web site, Web page, Web server, Web Browser, Search Engine 1.4 Components of HTML: Tags – closed tags and open tags, Attributes, Elements 1.5 Structure Tags : !DOCTYPE, HTML, HEAD, TITLE, BODY tags. 1.6 Block Level Elements : Headings, Paragraphs, Breaks, Divisions, Centered Text, Block Quotes, Preformatted text, Address. 1.7 Text Level Elements: Bold, Italic, Teletype, Underline, Strikethrough, Superscript, subscript. 1.8 Horizontal Rules, Special characters, Adding comments , The Meta tag. 1.9 Creating Lists: OrderedLists ,Unordered Lists ,Definition Lists, Nested Lists. 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		
1. fine Image Formats, Inline Image. 2. Describe HSPACE & VSPACE. 3. Differentiate between Server side image maps & Client side image maps. 4. Describe Text Color. 5. Write a program for setting text	2.1 Image: Image formats : gif, jpeg, png 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 2.2 colors and Backgrounds:	04

color & background Color. 6. Write a program for setting background images. 7. Describe attribute of BODY tag	The text color: color attribute of FONT tag, text attribute of BODY tag. Background color: bgcolor attribute of BODY tag. Background images: background attribute of BODY tag. Changing link colors: link, alink, vlink attributes of BODY tag.	
Unit 3: TABLES, FRAMES AND FORMS		

1. State Basic Tables Tags.
2. Describe how to add Captions.
3. Define Frames.
4. Enlist Advantages & Disadvantages of Frames.
5. Write a program to Create Frame using Frame Tag.
6. Define Forms.
7. Write a program to Create basic form using different form fields.
8. Describe Buttons tag.
	3.1 Tables:
	   Creating basic tables: TABLE, TR, TH, TD tags.
	   Formatting tables : border, cellspacing, cellpadding, width, align, bgcolor attributes.
	   Adding captions : CAPTION tag.
	   Formatting contents in the table cells: align, valign, bgcolor, height, width, nowrap attributes. Spanning rows and columns :rowspan and colspan attributes.
	3.2 Frames:
	   Introduction to frames : What is frame?, Advantages and disadvantages of using frames.
	   Creating frames: FRAMESET tag – rows, cols attributes, FRAME tag – name, frame border, margin height, margin width, src, resize, scrolling attributes.
	   Use of NOFRAMES tag , Frame targeting.
	3.3 Forms:
	   Creating basic form: FORM tag, action and method attributes.
	   Form fields: Single line text field, password field, multiple line text area, radio buttons, check boxes. Pull down menus: SELECT and OPTION tags.
	   Buttons: submit, reset and generalized buttons. Formatting technique: Using table to layout form.
		04

Unit 4: STYLE SHEETS		
1. Define CSS. 2. Write a program for adding different Style to the Document. 3. Describe Selectors.	4.1 Adding style to the document: Linking to style sheets, Embedding style sheets, Using inline style. 4.2 Selectors: CLASS rules, ID rules.	**04**

4. Describe Style Sheet Properties. 5. Write a Program displaying Style Sheet Properties.	4.3 Style sheet properties: font, text, box, color and background properties.	
	Total Hrs.	**16**

L. 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		02

	style rules.		
		Total Hrs.	**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

Mapping Course Outcomes With Program Outcomes:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Use HTML tags for information representation on webpages..	-	3	2	1	-	-	-	2	-	2
Design HTML forms.	-	3	2	1	-	-	-	2	-	2
Format web pages using CSS.		3	2	1	-	-	-	2	-	2
Develop static		3	2	2	2	-	-	2	-	3

web sites.									
Summary	-	3	2	1	1	-	-	2	-	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix :

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development
Use HTML tags for information representation on webpages..	-	-	2
Design HTML forms.	-	-	3
Format web pages using CSS.	-	-	3
Develop static web sites.	-	-	3
Summary	**-**	**-**	**3**

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.	Mrs.Aafiya A Shaikh	Lecturer	Government Polytechnic Pune

Prof.U.V.Kokate   Prof.S.V.Chaudhari
Chairman, PBOS   **Secretary, PBOS**

Programme : Diploma in ET/CM/IT
Programme Code : 03/06/07/17/23/26
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.

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Course Objectives:

After studying this course, the student will be able to

- Understand the basic and fundamental principle of Electrical engineering .
- Measure electrical quantity.
- Know the various electrical circuits concepts.
- Know principle and construction of various electrical machines.
- To explore electrical safety.

-

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
1.	Electrical Circuits:			
	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.	04	08
	1.4	Resistances in parallel, current division formula.		
2.	**Magnetic Circuit:**			
	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.	04	06
	2.4	Magnetization curves. Concept of hysteresis, hysteresis loop & loss		
3.	**Electromagnetic Induction:**			
	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)	04	06
	3.3	Lenz's law, Fleming's right hand rule.		
	3.4	Self and mutually induced inductance ,Coefficient of coupling.		
4.	**Electrostatics:**			
	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	04	08
	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)		

5.		A.C. Fundamentals:		
	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		
	5.3	Concept of phase and phase difference. Concept of lagging and leading		
	5.4	Representation of an alternating quantity by phasor	10	16
	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		
6.		**Three Phase Circuits**		
	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.	04	08
	6.4	Voltage, current, power relations in star & delta connected system & numerical ,Vector diagram.		
7.		**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).	04	06
	7.4	Voltage, current ratio o f a transformer.		
	7.5	Losses in transformer, efficiency & regulation of transformer.(No Numericals)		
8.		**Electrical Motors**		
	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 phase Induction Motor		
	8.2	Synchronous speed, slip		
	8.3	Necessity of a starter ,D.O.L starter for three phase induction motor.	10	16
	8.4	Change the direction of rotation		
	8.5	Single Phase Induction Motors- Working principle and applications of following Motors I)Split Phase a)Resistance b)Capacitance II)Capacitor start capacitor run III) Shaded pole. Reversal of rotation of above motors.		
	C)	Special Motors		
	8.1	Working principle and applications-stepper motor servo motor-AC servo motor & DC servo motor		
9.		**Electrical Safety**		
	9.1	I.E. rules for safety of person & equipment followed when working with electrical installation. Electrical Hazards : Causes and Remedies	04	06
	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 of 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 I)D.C.Motor 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 PBOS	Secretory PBOS	Chairman
(Ms.V.L.Munde) Mr.C.Y.Totewar)	(Mr.S.V.Chaudhari)	(

Name of Programme : **Diploma in CM/IT**
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:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60 min. duration	3Hrs	3 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. Use of semiconductor in various electronic circuits.

2. Use oscillators and filters in different electronic circuits.

3. Use OP-AMPs indifferent arithmetic and logical operations.

4. Operate instruments in industries like CRO, DSO, Function generator etc.

5. Identify and use transducers / sensors in control applications.

Course Contents:

M. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1 : Semiconductor devices		
1. Plot V-I characteristics of PN Diode 2 Define and Measure parameters of diode 3. Implement Zener diode as voltage regulator 4. Differentiate between half wave , Full wave and Bridge rectifiers 5. Analyze and differentiate between CE, CB, CC configurations 6. Interpret construction and working of UJT, FET and SCR. 7. 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. Diode symbol , forward & reversed Characteristics of PN junction diode Specifications : 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) 1.2 Zener diode : Construction ,Symbol ,characteristics (forward & reversed) Avalanche &Zener breakdown **Specifications :** Zener voltage , power dissipation , break over current, dynamic resistance & maximum reverse current (to be shown during practical hours) 1.3**Rectifier :** Half wave and Full wave Rectifier, circuit diagram, working, comparison, merits and demerits. Filters, necessity, types, comparison, merits, demerits.	**16**

	1.4 **Transistor :** construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison between CB, CE, CC. 1.5 **UJT :** Construction, symbol, operating principle, characteristics, applications, rating and specifications. 1.6 **FET:** Construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison. 1.7 **SCR :** Symbol, their construction, working, characteristics, applications.	
Unit 2:Oscillator		
1. State Barkhausen criteria for oscillator. 2. Classify oscillators. 3.Draw circuit and explain working of RF, LF and tuned oscillator.	2.1Block diagram, Barkhausen Criteria for sustained oscillations 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		

1. Draw symbol and pin diagram of IC 741. 2. Define various parameters related to OP-AMP. 3. Derive expression for various mathematical operation of OP-AMP. 4. Draw and explain block diagram of Timer IC555. 5. Implementation of timer as Astable andMono stable multivibrator.	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. 3.2Timer IC 555: Block diagram, operating modes viz. Astable, Monostable.	**09**

Unit 4:Instrumentation

1. Draw and explain blocks of CRO and Function generator. 2. State applications & specifications of CRO and Function generator.	4.1 CRO: Cathode Ray Tube, Oscilloscope Block diagram, operation, oscilloscope specifications, Applications. 4.2Function generator, Block diagram, operation, specifications, applications	**07**

Unit 5:Transducer

1. Define and classify transducers. 2. State selection criteria of transducer. 3.Differentiate betweenActive-Passive, Primary- Secondary, and Analog- Digital transducers. 4. Interpret working principle and application ofResistive, Capacitive, Inductive, Transducers (LVDT), Photoelectric, Piezoelectric Transducers, proximity switchtransducers.	5.1 Definition, 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 Hrs.	**48**

N. 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 Hrs.	**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)**

Assessment and Evaluation Scheme:

		What	To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	**CA** (Continuous Assessment)	PT	Students	Two PT (average of two tests will be computed)	20	12	Test Answer sheets	All
		Class Room Assignments		Assignments	--	--	Assignment Book	All
				TOTAL	**20**	**12**		
	(Term End Examination)	End Exam	Students	End Of the Course	**80**	**28**	Theory Answer sheets	All
Direct Assessment Practical	**CA** (Continuous Assessment)	Oral	Students	Oral on study experiments and practical performance	10	--	Answer Sheets	All
		Journal Writing		Assignments	15	--	Journal	All
				TOTAL	**25**	**--**		
	(Term End Examination)	End Exam	Students	End Of the Course	**25**	**10**	Answer Sheets	All

Indirect Assessment	Student Feedback on course	**Students**	After First PT	Student Feedback Form	
	End of The Course		End of The Course	Questionnaires	

Scheme Of Practical/Oral Evaluation:

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

Mapping Course Outcomes with Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	3	--	2	--	--	2	--	2	--	--
2	3	--	2	--	--	2	--	2	--	3
3	2	--	--	--	--	2	--	1	--	1
4	3	--	3	2	--	--	--	2	2	2
5	2	--	3	3	--	2	--	--	--	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix :

Course Outcomes	Program Outcomes (PSOs)		
	1	**2**	**3**
1	3	--	1
2	3	--	1
3	3	--	1
4	2	--	1
5	3	--	1

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	ISBN : 8177001006

		publication	

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/linear-variable-differential-transformer/

List of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.	R.N.Shikari	Chairman PBOS	GovernmentPolytechnic.Pune
2.	P.N.Malu	Faculty from Institute	GovernmentPolytechnic.Pune
3.	P.B.Dighule	Faculty from Institute	GovernmentPolytechnic.Pune
4.		Consultant from Industry	
5.		Faculty from nearby Institute	
6.		R.B.T.E.Representative	

Prepared by

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

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

Programme	:	**Diploma in CM/IT**
Programme Code	:	**06/07**
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 Minutes	3Hrs	3 Hrs	—	—
Marks	20	80	--	25	25

Course Rationale:

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

Course Outcomes:

- Use of semiconductor in various electronic circuits.
- Use oscillators and filters in different electronic circuits.
- Use OP-AMPs indifferent arithmetic and logical operations.
- Operate instruments in industries like CRO, DSO, Function generator etc.
- Identify and use transducers / sensors in control applications.

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Course Content:

Unit No.	Name of Topic/Sub topic	Hrs	Weightage
1	**Semiconductor devices**		
Learning Outcomes: • Plot V-I characteristics of PN Diode • Define and Measure parameters of diode • Differentiate between half wave , Full wave and Bridge rectifiers • Analyze and differentiate between CE, CB, CC configurations • Interpret construction and working of UJT, FET and SCR. • 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. Diode symbol , forward & reversed Characteristics of PN junction diode **Specifications :** 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)	16	22
	1.2 **Zener diode :** Construction ,Symbol ,characteristics (forward & reversed) Avalanche &Zener breakdown **Specifications :**Zener voltage , power dissipation , break over current, dynamic resistance & maximum reverse current (to be shown during practical hours)		
	1.3 **Rectifier :**Half wave and Full wave Rectifier, circuit diagram, working, comparison, merits and demerits. Filters, necessity, types, comparison, merits, demerits.		
	1.4 **Transistor :**construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison between CB, CE, CC.		

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	1.5	**UJT :**Construction, symbol, operating principle, characteristics, applications, rating and specifications.		
	1.6	**FET:** Construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison.		
	1.7	**SCR :**Symbol, their construction, working, characteristics, applications.		
2	**Oscillator**			
Learning Outcomes: • State Barkhausen criteria for oscillator. • Classify oscillators. • Draw circuit and explain working of RF, LF and tuned oscillator.	2.1	Block diagram, Barkhausen Criteria for sustained oscillations.		
	2.2	Classifications: LC and RC. Oscillations in LC tank circuit; Hartley; Colpitts. RC Wein Bridge and Phase shift, Oscillator. Crystal Oscillator.	**08**	**16**
3	**Linear ICs**			
Learning Outcomes: • Draw symbol and pin diagram of IC 741. • Define various parameters related to OP-	3.1	OP AMP. IC 741, symbol, pin diagram, ideal and typical characteristics, Applications such as Inverting , Non Inverting amplifier, Difference amplifier, adder substractor , Integrator, differentiator.	**09**	**14**

AMP. • Derive expression for various mathematical operation of OP-AMP. • Draw and explain block diagram of Timer IC555. • Implementation of timer as Astable and Monostable multivibrator.	3.2	Timer IC 555: Block diagram, operating modes viz. Astable, Monostable.		
4		**Instrumentation**		
Learning Outcomes: • Draw and explain blocks of CRO and Function generator. • State applications & specifications of CRO and Function generator.	4.1	CRO: Cathode Ray Tube, Oscilloscope Block diagram, operation, oscilloscope specifications, Applications.	**07**	**12**
	4..2	Function generator, Block diagram, operation, specifications, applications		
5		**Transducer**		
Learning Outcomes: • Define and classify transducers. • State selection criteria of transducer. • Differentiate between Active- Passive, Primary-Secondary, and Analog-Digital transducers. • Interpret working principle and application of Resistive, Capacitive, Inductive, Transducers (LVDT), Photoelectric, Piezoelectric Transducers, proximity switch transducers.	5.1	Definition, 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**	**16**
		Total	**48**	**80**

List of Practicals/Experiments/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 Hrs.	**32**

Reference Books and Text Books:

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Basic Electronics.	Albert Malvino, 8th Edition,Tata McGraw	ISBN10:1259200116ISBN13:9781259 200113

		Hill,2015	
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

10. www.nptel.com
11. http://www.electronics-tutorials
12. https://en.wikipedia.org/wiki/P%E2%80%93n_junction
13. https://learn.sparkfun.com/tutorials/transistors
14. http://www.pitt.edu/~qiw4/Academic/ME2082/Transistor%20Basics.pdf
15. http://faculty.cord.edu/luther/physics225/Handouts/transistors_handout.pdf
16. http://www.technologystudent.com/elec1
17. www.slideshare.net/manash234/classification-of-transducers
18. http://www.electrical4u.com/linear-variable-differential-transformer/

CO-PO Matrix :

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Use of semiconductor in various electronic circuits.	2	2	2	2	2	2	2	1	2	2
Use oscillators and filters in different electronic circuits.	2	2	2	2	2	2	2	1	2	2
Use OP-AMPs indifferent arithmetic and logical operations.	2	2	2	2	2	2	2	1	2	2
Operate instruments in industries like CRO, DSO, Function generator etc.	2	2	2	3	2	2	2	1	2	2
Identify and use transducers / sensors in control applications.	2	3	2	3	3	3	2	2	2	3
Summary	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**2**	**2**

CO-PSO Matrix :

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Use of semiconductor in various electronic circuits.	3	--	1
Use oscillators and filters in different electronic circuits.	3	--	1
Use OP-AMPs indifferent arithmetic and logical operations.	3	--	1
Operate instruments in industries like CRO, DSO, Function generator etc.	2	--	1
Identify and use transducers / sensors in control applications.	3	--	1
Summary	3	--	1

Specification table:

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)**

(P.N.Malu, P.B.Dighule)   R.N.Shikari

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

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

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:

- Format and Setup Desktop System for personal Use.

- Differentiate between Binary coding Systems.

- Set the BIOS for effective use of hardware .

- Create, Edit documents, prepare presentation ,create spreadsheets

- Describe working of input output devices.

- Describe connectivity, internet multimedia and web.

Course Content:

Unit No.	Name of Topic/Sub topic		Hrs	Weightage
1	**Algorithms and Data Representation**			
• Learning Outcomes: • Differentiate between algorithm and a program. • Explain ASCII EBCDIC and Unicode • Define : • - Bits • - Bytes • - Parity Bit • State the need for Binary System. • Use MS-Office Word, Excel , Powerpoint and Access	1.1	Introduction	**08**	**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. • List and state characteristics of Primary and Secondary storage devices. • Describe working of	2.1	Introduction		
	2.2	Main memory		
	2.3	Load and Store Instructions		
	2.4	Transferring a Data Item and a Record		

Hard Disk, Optical Disk , Pen Drive. • Install, Configure, Setup Hard Disk. • Setup BIOS	2.5	Cache Memory	08	10
	2.6	Memory Capacity		
	2.7	Memory Categories		
	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. • Describe Types of Printers. • State characteristic and use of RFID and Barcode Reader	3.1	The Keyboard	06	04
	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 • Use & Configure Windows Desktop. • Write & Execute basic O.S Commands	4.1	Introduction	08	06
	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 • State types of Internet Connections. • Browse Internet • Create mail account.	5.1	Introduction	**08**	**06**
	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 Busnisses. • Describe types of Ecommerce. • State the need of IT Act. • Explain the clauses in IT Act. • Use E-Commerce sites.	6.1	Introduction	**10**	**06**
	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**	**40**

List of Practicals/Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Unit No.	Hrs
1.	**Demonstrate types of Computers.**		
	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	02
	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	
	Types of Secondary Storage devices.	2	
	Installation, configuration and setting of Hard Disks.	2	
	BIOS Settings for Primary and secondary Memory.	2	04
	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: Ex: dir, md, copy, cd, move, rmdir, rd etc.	4	04
4.	**Operating System**		
	Various operations on Window based operating system.	4	
	Windows Operations: Minimising, Maximising, Resizing.	4	
	Using Windows Help.	4	04
	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**		
	Word Processors	**1**	
	Hands on Word Processors.(Ex: MS WORD, OpenOffice.org)		**07**
	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) Presentation Graphics:	**1**	
	Preparation of Various slides (Perform at least 5 assignments covering Presentation Graphics like objects grouping, Customising Slide transition, Embedding Links)	**1**	
6	**Database Management System**		
	Creation of tables using DBMS tools like MS Access. (Teachers should frame their own assignments for above tools which covers maximum features provided by respective softwares).	**1**	**07**
7.	**Introduction to Internet and WWW**		**02**

	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	
	Introduction to e-Commerce and related web sites. Example Railway Reservations, Air Ticket Reservations etc..	6	02
	Total		32

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

CO-PO Matrix :

CO ↓	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Format and Setup Desktop System for personal Use.	-	1	3	2	1	1	1	1	-	2
Differentiate between Binary coding Systems.	2	2	-	-	-	-	-	-	1	2
Set the BIOS for effective use of hardware .	-	3	3	1	-	-	-	1	1	2
Create, Edit documents, prepare presentation ,create spreadsheets	2	2	3	3	2	-	2	2	3	3
Describe working of input output devices.	--	2	3	2	1	-	2	3	3	3
Describe connectivity, internet multimedia and	-	2	2	1	2	1	2	1	2	2

web.										
Summary	**2**	**2**	**3**	**2**	**2**	**1**	**2**	**2**	**2**	**2**

CO-PSO Matrix :

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development
Format and Setup Desktop System for personal Use.	3	-	-
Differentiate between Binary coding Systems.	-	-	1
Set the BIOS for effective use of hardware .	3	-	-
Create, Edit documents, prepare presentation ,create spreadsheets	-	2	3
Describe working of input output devices.	2	-	2
Describe connectivity, internet multimedia and web.	2	1	2
Summary	**3**	**1**	**2**

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

(Smt. M. H. Thakare

Smt. S.S.Sant)

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-

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

Course Content:

Unit No.	Name of Topic/Sub topic		Hrs	Weightage
1	**Overview of E – Commerce, E – Logistics and E-Governance**			
Learning Outcomes: • Understand models of E-Commerce. • Identify various E-transaction systems. • Explain various E-logistics and managements. • Identify E-Governance models.	1.1	Internet, Intranet, Extranet, Definition, Goals of E- Commerce	**12**	**16**
	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		
2	**Knowledge management and Gaming Technology**			
Learning Outcomes: • State Knowledge management. • Identify KM tools. • Identify components in gaming system.	2.1	What is KM? (Components and Type of Knowledge), Knowledge Building Models,KM Cycle	**08**	**14**
	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.		

3.	CRM			
Learning Outcomes: • Explain process of BPO/BCP. • 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**	**12**
	3.2	Call Center – brief perspective technology wise, Functioning, Ethics, Disaster Recovery Management, Case Study.		
4	**Content Management and Disseminations**			
Learning Outcomes: • Compare various E-learning techniques. • Relate various online communities	4.1	E-learning – Models WBT, CBT, Virtual Campus, LMS & LCMS, Video Conferencing.	**08**	**12**
	4..2	Chatting Bulleting, Building Online Community, Asynchronous/Synchronous Learning, Case Study.		
5	**GIS/GPS**			
Learning Outcomes: • Define geographic and spatial data. • Explain GIS development process. • State the use of GPS.	5.1	What is GIS?, Nature of Geographic data, Spatial Objects & Data Models, Getting Map on Computers	**06**	**12**
	5.2	GIS standards & Standardization Process of GIS development, Implementation and Deployment phases.		
	5.3	Introduction to GPS		
6.	**Introduction to cloud computing**			
Learning Outcomes: • Compare different computing environments. • Define cloud computing and its benefits.	6.1	Overview of Computing Paradigm		
	6.2	Recent trends in Computing :Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing		

• Compare different 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	14
		Total	**48**	**80**

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.

CO-PO Matrix :

CO ↓	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Identify models of E-commerce and E-Governance	--	2	-	-	1	1	--	1	1	1
Identify KM tools.	--	2	-	1	1	1	--	1	1	1
Describe functioning of BPO	--	3	-	-	3	--	-	1	3	2
Compare and identify various E-learning techniques.	--	3	-	-	2	2	--	1	1	1
Explain GIS and GPS systems	2	3	-	-	3	3	-	1	2	3
Compare different cloud platforms.	--	3	-	-	3	2	-	1	2	2
Summary	2	3	-	1	2	2	-	1	2	2

Specification Table :

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

CO-PSO Matrix :

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Identify models of E-commerce and E-Governance	--	--	1
Identify KM tools.	--	--	1
Describe functioning of BPO	1	1	2
Compare and identify various E-learning techniques.	--	--	1
Explain GIS and GPS systems	3	1	2
Compare different cloud platforms.	3	1	2
Summary	2	1	2

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

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

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:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60 min. duration	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 the definition of integration as inverse of differentiation to solve problems.

2.Apply various methods of integration..

3. Apply Mathematical principle to solve engineering problems.

4.Apply differential equation for solving problems in different engineering fields.

5.Apply the knowledge of Laplace transform to solve engineering problems.

6. Draw and come to a valid conclusion.

7. Locate the exceptional and critical points in an engineering system.

Course Contents:(Course Name: Engineering Mathematics III – SC282)

O. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1 : Integration10		
1.Define integration as anti derivative. 2. 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	
Unit 2: Definite integrals	**04**	
1 Solve problems on definite integrals using the properties	2.1Definition and properties of definite integrals Example based on these properties.	
Unit 3: Applications of integration04		
1. Find mean and R.M.S. value	3.1Mean value and root mean square value.	
Unit 4:Differential Equations	**05**	
1. Define order and degree of differential equation 2. Solve the differential equation of first order and first degree 2. Solve different engineering problems using differential equation	4.2Definition, order and degree of differential equations. Formation of differential equations. Solution of differential equations : (using following methods) i) Variable separable (ii) Reducible to variable separable. (iii) Homogeneous differential equations. (iv) Exact diff. equations. (v) Linear differential equations.	

Unit 5: Complex number05		
1.Define complex number 2. Define modulus ad amplitude 3.Solve examples on complex number using De Moivre's theorem 4.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.	
Unit 6:Laplace Transform04		
1.Define Laplace transform, inverse transform , and Convolution theorem. 2. Solve examples on L.T. and Inverse L.T. 3.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.	
Total Hrs.		**32**

(Course Name: Engineering Mathematics III – SC282)

P.   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 $1/ax^2+bx+c$, $1/\sqrt{ax^2+bx+c}$,$1/a\sin x+b\cos x+c$, $1/a\sin^2 x +b\cos^2 x +c$.		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	1

	differential equation.		
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.	Complex Number	1
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
	Skill Test		02
		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

(Course Name: Engineering Mathematics III – SC282)

Specification Table for Theory Paper:

Unit No.	Units	Levels from Cognition Process Dimension			Total Marks
		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)**

R-Remember   U – Understand   A – Analyze / Apply

Question Paper Profile For Theory Paper:

Q. No	Bit 1			Bit 2			Bit 3			Bit 4			Bit 5			Bit 6			option
	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	
01	1	R	4	1	R	4	1	U	4	1	U	4	1	U	4	1	U	4	**4/6**
02	1	U	4	2	R	4	2	R	4	2	U	4	3	A	4	3	A	4	**4/6**
03	4	R	4	4	U	4	4	U	4	4	U	4	4	A	4	4	A	4	**4/6**
04	5	R	4	5	R	4	5	R	4	6	A	4	6	A	4	6	A	4	**4/6**
05	1	R	2	1	R	2	1	U	2	1	U	2	3	A	2	3	A	2	**8/12**
	5	U	2	5	U	2	5	U	2	6	R	2	6	R	2	6	R	2	

T= Unit/Topic Number   L= Level of Question   M = Marks

R-Remember   U-Understand   A-Analyze/ Apply

(Course Name: Engineering Mathematics III – SC282)

Assessment and Evaluation Scheme:

		What	To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	**CA** (Continuous Assessment)	PT	Students	Two PT (average of two tests will be computed)	20	--	Test Answer sheets	1,2,3,4,5,6,7
		Class Room Assignments		Assignments	--	--	Assignment Book	1,2,3,4,5,6,7
				TOTAL	20			
	(Term End Examination)	End Exam	Students	End Of the Course	**80**	**28**	Theory Answer sheets	1,2,3,4,5,6,7
Direct Assessment Practical	**CA** (Continuous Assessment)	--	Students	--	--	--	--	--
		--		--	--	--	--	--
	(Term End Examination)	--	Students	--	**--**	**--**	--	--

Indirect Assessment	Student Feedback on course	Students	After First PT	Student feed back form	
	End Of Course		End Of The Course	Questionnaires	

(Course Name: Engineering Mathematics III – SC282)

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	

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	3	3	2	1	1	1	1	3	1	2
2	3	3	2	1	1	1	1	2	1	2
3	3	2	3	2	1	1	2	2	1	3
4	3	2	3	2	1	1	2	2	1	3
5	3	2	3	2	1	1	2	2	1	3
6	3	2	2	1	1	1	2	2	2	1
7	2	2	2	1	1	1	2	2	2	1
Summary	3	2	2	1	1	1	2	2	1	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix :

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Apply the definition of integration as inverse of differentiation to solve problems	-	-	1
Apply various methods of integration.	-	-	1
Apply Mathematical principle to solve engineering problems.	-	-	3
Apply differential equation for solving problems in different engineering fields.	-	-	2
Apply the knowledge of Laplace transform to solve engineering problems.	-	-	2
Draw and come to a valid conclusion.	-	-	-
Locate the exceptional and critical points in an engineering system.	-	-	2
Summary	**-**	**-**	**2**

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 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:

	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

- Install and Configure Linux OS.
- Describe working of OS and its issues.
- Execute process handling command in Linux.
- Execute file management commands in Linux.
- Write shell scripts.
- Perform group and users management in Linux.

Course Contents:

Q. Theory :

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

Unit 4:CPU Scheduling and Process Synchronization		
- Compare various processor scheduling algorithms - Define critical section problem - Write algorithm for critical section problem - Differentiate between critical section problem solutions - Job scheduling through execution of commands (Ref. to Practical 08)	4.1 BasicConcepts, SchedulingCriteria. Scheduling Algorithms 4.2 Operating System Examples, The Critical-Section Problem 4.3 Peterson's Solution, Synchronization Hardware, Semaphores 4.4 Classic Problems of Synchronization, Monitors, Synchronization Examples	10
Unit 5:Deadlocks		
- State and describe deadlock characteristics - Describe various methods for deadlock prevention, recovery etc - State conditions for deadlock avoidance	5.1 System Model, Deadlock Characterization 5.2 Methods for Handling Deadlocks 5.3 Deadlock Prevention, Deadlock Avoidance 5.4 Deadlock Detection, Recovery from Deadlock	10
Unit 6:Memory Management		
- Explaindifferent approaches to memory management - Calculate page faults based on given data (Ref. to Practical 07) - Describe paging	6.1 Main Memory: Background 6.2 Swapping, Contiguous Memory Allocation 6.3 Paging, Structure of the Page Table 6.4 Segmentation Example: The Intel Pentium 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 - Describe file allocation method - Managing file permission (Ref. to Practical 03) - 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 7.2 File-System Implementation: File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management,	06

	Efficiency and Performance, Recovery		
	Total Hrs.		**64**

R.   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, 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, 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)	**Processes and Thread**	CO3	04

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		CO6	04
10.	Adding and Removing groups with groupadd,groupmod and groupdel commands, Superuser-The root User Desktop,System Time and Date		CO6	02
11.	Executing various Shell commands 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. Configuring your own login shell.Using Functions in Shell scripts.		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	

Mapping Course Outcomes With Program Outcomes:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Install and Configure Linux OS.	-	2	3	3	1	1	1	2	1	3
Describe working of OS and its issues.	-	2	2	-	1	1	-	-	2	-
Execute process handling command in Linux.	-	3	3	3	1	1	-	-	2	-
Execute file management commands in Linux.	-	3	3	3	1	1	-	2	2	-
Write shell scripts.	-	3	3	3	1	1	-	2	2	-

Perform group and users management in Linux.	-	3	3	3	1	1	-	2	2	-
Summary	-	**3**	**3**	**3**	**1**	**1**	**1**	**2**	**2**	**3**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix :

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Install and Configure Linux OS.	3	-	-
Describe working of OS and its issues.	1	-	-
Execute process handling command in Linux.	2	-	1
Execute file management commands in Linux.	2	-	1
Write shell scripts.	3	-	2
Perform group and users management in Linux.	3	-	2
Summary	**3**	**-**	**2**

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**)

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

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

Teaching Scheme:

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

Evaluation:

	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. Analyze algorithms and determine its time and space complexity to identify cost effective algorithm for a given problem.
2. Implement various algorithms for searching and sorting.
3. Implement data structure operations on linear data structure like Stacks, Queues and Linked List.

4. Implement data structure operations on non linear data structure like Trees and Graphs
5. Select and use appropriate data structure which is best suitable for a given problem.

Course Contents:

S. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.	Marks
Units 1 : Introduction to data structures			
1. Differentiate between various complexities. 2. Enlist various data structure Operation. 3. Use dynamic memory allocation in programs	1.1 Introduction, Basic Terminology:- Elementary data structure organization Classification of data structure. 1.2 Operations on data structures:- Traversing, Inserting, deleting Searching, sorting, and merging. 1.3 Complexity :-Time complexity ,Space Complexity, Big 'O' Notation. 1.4 Structures in 'C', Dynamic memory Allocation.	**08**	**08**
Unit 2: Arrays			
1. Implement array data structure to carry out various data structure operation on array. 2. Enlist advantages and disadvantages of array compare to other data structures.	2.1 Introduction, Linear Arrays Representation of linear arrays in memory. 2.2 Traversing linear Arrays, Inserting and Deleting. 2.3 Multidimensional Arrays	**06**	**06**
Unit 3: Searching & sorting			
1. Analyze time and space complexity of various searching and sorting method. 2. Create programs for various sorting and searching operation	3.1 Searching: Basic search techniques, Linear search, Binary search, Hashing. 3.2 Sorting: General background, bubble sort, Selection sort, insertion sort, merge sort and radix sort, Shell sort.	**08**	**12**

Unit 4: Linked Lists			
1. Implement linked list data structure to carry out various data structure operation 2. Use Linked list to implement other data structures	4.1 Introduction, Singly link list, Representation of link list in memory. 4.2 Creating, traversing, searching in Sorted as well as unsorted link list. 4.3 Memory allocation, garbage Collection. 4.4 Inserting into linked list, Deleting from a linked list 4.5 Header links list, Two-way list, Implementation of link list	10	14
Unit 5: Stacks, Queues & Recursion			
1. Implement Stack and Queue data structure to carry out various data structure operation. 2. Use stack and queues to solve various problem(likes prefix to postfix conversion, evaluation of expression, Tower of Hanoi etc) **3.** Differentiate between stack and queue**.**	5.1 Stacks: Concept, representing stacks in 'C', Applications of stacks 5.2 Polish Notations (Prefix, postfix, Infix), Quick sort. 5.3 Recursion: Recursive definitions and processes, Recursion in 'C', writing recursive programs factorial, Fibonacci. 5.4 Tower of Hanoi, Implementation of recursive, procedures by means of stack. 5.5 Queues: The queue and its sequential representation, concept of queues, priority queues.	12	15
Unit 6: Trees			
1. Implement Tree data structure to carry out various data structure operation. 2. Use tree For Sorting and searching.	6.1 Introduction, Binary trees, Binary tree representation, Traversing binary tree. 6.2 Traversal algorithms using stacks. 6.3 Binary search tree (BST), searching and inserting in BST, deleting from BST. 6.4 Heap, Heap sort, Path lengths: Huffman algorithm.	10	13

Unit 7: Graphs and their applications			
1. Implement Graph data structure to carry out various data structure operation. 2. Find out Shortest Path between to vertices using various graph techniques	7.1 Introduction, Graph theory terminology. 7.2 Sequential representation of graphs, Adjacency matrix, Path matrix. 7.3 Warshall's Algorithm; Shortest Paths. 7.4 Linked representation of graph, Operations on graphs, traversing a graph(BFS,DFS). 7.5 Application Of Graph.	**10**	**12**
Total Hrs.		**64**	**80**

T. 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.		01	01
3.	Write Programs based on Multidimensional Arrays		01	01
4.	Write Programs based on Various searching operation (Linear & Binary Search)	**Arrays**	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 Hrs.	**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.

Unit No	Units	Levels from Cognition Process Dimension	Total Marks

Specification Table for Theory Paper:

		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**

R-Remember   U – Understand   A – Analyze / Apply

Assessment and Evaluation Scheme:

		What	**To Whom**	**Frequency**	**Max Marks**	**Min Marks**	**Evidence Collected**	**Course Outcomes**
Direct Assessment Theory	CA (Continuous Assessment)	PT	Students	Two PT (average of two tests will be computed)	10	--	Test answer sheets	1,2,3,4,5,6

Direct Assessment	**TEE** (Term End Examination)		End Exam	Students	End Of the Course	40	13	Theory Answer sheets	1,2,3,4,5,6
	Practical	**CA** (Continuous Assessment)	--	Students	--	--	--	--	
			Journal Writing		Assignments	25	--	Journal	1,2,3,4,5,6
					TOTAL	**25**	**10**		
		TEE (Term End Examination)	End Exam	Students	End Of the Course	**25**	**10**	Practical Answer Sheets	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course			Students	After First PT	Student Feedback Form			1,2,3,4,5,6
	End Of Course				End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

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

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	1	3	3	1	-	-	-	-	-	-
2	-	3	3	-	-	-	-	-	-	-
3	-	3	3	1	-	-	-	-	-	-
4	-	3	3	1	-	-	-	-	-	-
5	1	3	3	1	-	-	-	-	-	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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**

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.	Prof. U.V.Kokate	Chairman PBOS	Government Polytechnic Pune.
2.	Prof. S.P.Emekar	Faculty from Institute	Government Polytechnic Pune.
3.	Prof. A.S.Paike	Faculty from Institute	Government Polytechnic Pune.
4.		Consultant from Industry	
5.		Faculty from nearby Institute	
6.		R.B.T.E.Representative	

Prof. S.P.Emekar   Prof..S. V.Chaudhari   Prof. U.V.Kokate

& Prof. A.S.Paike

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

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

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:

U. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Section I
Units 1 : Basics of Object-Oriented Programming
1. State importance of Object Oriented Programming 2. Define object, class, program, tokens, keywords, identifiers, constants, and array. 3. List applications of Object Oriented Programming 4. Describe Structure of C++ program. 5. State benefits of OOP. 6. Implement C++ program using tokens, keywords, identifiers, constants and variable. 7. State types of arrays with example. 8. Execute program using various operators and arrays.	1.11 What is Object Oriented Programming?, Programming Paradigm, Benefits of OOP& Applications, Structure of C++ program, A simple C++ program, Creating source file, Compiling & Linking 1.12 Tokens, Keywords, Identifiers, Basic Data Types, User Defined data types, Derived Data Types, Symbolic Constants, type Compatibility, Declaration Of Variables, Reference Variables 1.13 Operators In C++, Scope Resolution Operators, Member Dereferencing Operators, Manipulators, Type Cast Operator, Expressions &their types, Implicit Conversions, Operator Precedence, Control Structure. 1.14 Introduction of arrays and its types.	**10**
Unit 2: Function in C++
8. Define Function, member function 9. Implement program using main Function, Function Prototyping, Call By Reference, Return By, Reference, Inline Function 10. Apply the concept of Default Arguments, Const Arguments, Function Overloading, Friend & Virtual Functions 11. Perform program using classes and objects.	2.3 Introduction, The Main Function, Function Prototyping, Call By Reference, Return By, Reference, Inline Function 2.4 Default Arguments, Const Arguments, Function Overloading, Friend & Virtual Functions 2.5 Classes &Objects**:** Introduction, Specifying a Class, Creating objects, Memory Allocation For objects, Arrays of Objects, Object As a Function Arguments Returning Objects. 2.6 Defining Member functions ,Making An Outside Function Inline, Nesting Of Member Function, Private Member	**08**

	Functions 2.7 Static Data Member, Static Member Functions	
Unit 3: Constructors & Destructors		
1. Define Constructors , Destructors 2. Execute program using constructors and Destructors	3.4 Introduction, Constructors, Parameterized Constructors Multiple Constructors in a Class 3.5 Constructors With Default Arguments, Dynamic initialization Of Objects, Object Pointers. 3.6 Destructors.	**06**
Section II		
Unit 4: Operator overloading and Pointers		
6. Define pointer 7. State rules of overloading operators 8. Perform program using different operators. 9. Execute program on pointers, string and virtual functions.	4.4 Introductions Defining Operator Overloading, Rules For Overloading Operators Introduction, Overloading Unary Operator, Overloading Binary Operator, Overloading Binary Operators Using Friends 4.5 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		
1. Define inheritance, template, abstract class, virtual base class 2. Describe access specifies with its types. 3. Classify inheritance with its types. 4. Implement programs using inheritance, virtual base class, abstract class and templates.	5.1 Introduction, Defining Derived Classes, Access specifiers and its types, Single Inheritance 5.2 Making a Private Member Inheritable Multilevel Inheritance, Inheritance, Hierarchical Inheritance, Hybrid Inheritance 5.3 Virtual Base Classes, Abstract Classes, Constructors In Derived Classes, Member Classes: Nesting of classes. 5.4 Class Templates, Class Templates with Multiple Parameters, Function Templates 5.5 Function Templates with multiple parameters, Overloading of Templates function.	**08**

Unit 6: Working with files and Exception Handling		
1. Define exception, stream 2. Describe working of files. 3. Explain mechanism of exception. 4. 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. 6.2 Working with files , Introduction, Classes for file stream operations, Opening & closing a file, Detecting End-of-file, more about open (): 6.3 File modes, File pointers and their manipulations, Sequential Input and Output operations 6.4 Updating a file: Random access, Error handling during file operations, Command line arguments. 6.5 Exception Handling: Introduction, Basics of Exception Handling, Exception handling mechanism 6.6 Throwing mechanism, catching mechanism.	**10**
Total Hrs.		**48**

V. 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.		CO1, CO2	02
6.	Write a program to create one class which contains member functions and invoke the same using objects.	Function in C++	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. Pointer to derived class.		CO3	02
12.	Write a program for MULTILEVEL inheritance.	Inheritance and Introduction to Templates	CO4	02
13.	Write a program for MULTIPLE inheritances.		CO4	02
14.	Write a program for HYBRID inheritance.		CO4	02
15.	Write a program to implement : Class template. 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	Class room teaching, laboratory demonstration

	Programming	
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

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

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.	Mrs. S.B.Gosavi	Lecturer	Government Polytechnic Pune
2.	Smt. P. N. Yewale	Lecturer	Government Polytechnic Pune

CO-PO Matrix:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Distinguish between procedure/functional/logical oriented paradigms and object oriented paradigm.	-	3	1	1	-	-	-	-	-	2
Develop programs in C++ for representing a class.	-	3	3	1	1	-	1	1	2	3
Develop programs in C++ using overloading and overriding.	-	3	3	1	1	-	1	1	2	3
Develop programs in C++ using various types of inheritance.	-	3	3	1	1	-	1	1	2	3
Develop programs in	-	3	3	1	1	-	1	1	2	3
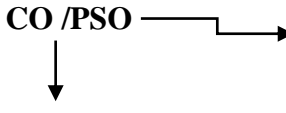
C++ for handling file operations.									
Execute programs in C++ for handling exceptions.	-	3	3	1	1	-	1	1	2	3
Summary	**-**	**3**	**3**	**1**	**1**	**-**	**1**	**1**	**2**	**3**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix:

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development
Distinguish between procedure/functional/logical oriented paradigms and object oriented paradigm.	-	-	1
Develop programs in C++ for representing a class.	-	-	3
Develop programs in C++ using overloading and overriding.	-	-	3
Develop programs in C++ using various types of inheritance.	-	-	3
Develop programs in C++ for handling file operations.	-	-	3
Execute programs in C++ for handling exceptions.	-	-	3
Summary	**-**	**-**	**3**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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

Prepared by

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

Programme : **Diploma in CM / IT**
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. Represent and apply the solution to problem using object - oriented concepts.
2. Differentiate between platform independent and other types of languages.
3. Write and execute programs in Java using object-oriented principles, basic control structures, vectors, packages, interfaces, applets.
4. Write and execute programs in java using concepts of Multithreading and exception handling.
5. Create and execute user defined packages and exceptions.
6. Implement I/O functionality using Streams in Java.

Course Contents:

W. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1 : Java Evolution and Basics Of Java		
9. State Features of Java. 10. Describe JVM. 11. Enlist different data types & Operators in Java. 12. Define decision making Branching& Looping. 13. Describe One Dimensional arrays & Two Dimensional arrays.	1.1.Creation Of Java, Java Features, The Java Buzzwords, Simple Java Program. 1.2.Java Virtual Machine, Constant, Variables, Data Types, Operators and Expressions 1.3.Decision making and Branching, Decision making and Looping. 1.4.Arrays, One Dimensional arrays, Creating an array, Two Dimensional arrays	**06**
Unit 2: Classes, Object and Methods		
12. Define Class,Methods,Objects. 13. Describe creation of ojects& Accessing class members. 14. Define Constructors,Method Overloading & Nesting of Methods. 15. Describe Inheritance . 16. Enlist different types of Inheritance. 17. Write a program for Overriding. 18. Describe the final variables,final class & methods. 19. State different visibility controls. 20. Define Vectors & Wrapper Classes. 10.Write a program for Vectors & Wrappers Classes.	2.8 Defining a class, Fields declaration, Methods declaration, Creating object, Accessing class members 2.9 Constructors, Methods Overloading, Nesting of methods 2.10 Inheritance: Extending a Class (Defining a subclass Constructor, Multilevel inheritance Hierarchical inheritance) 2.11 Overriding Methods, Final keyword(variable and Methods, Final variables and methods, Final classes, Finalizer Methods) 2.12 Abstract methods and Classes, Methods with Varargs, Visibility Control (Public access, friend access, Protected access, Private access, Private Protected access) 2.13 Vectors, Wrapper Classes, Enumerated Types, Annotations.	**08**

Unit 3:Introduction to Strings ,Interfaces and Packages		
9. Enlist Special String Operations. 10. Describe Character Extraction & String Comparison. 11. Define String &StringBuffer. 12. Describe Command Line Arguments & Static Members. 13. Define Interfaces 14. Describe different forms of implementing Interfaces. 15. Create user defined Packages & accessing a package 16. Write a program to add class to a package & hiding classes.	3.7 Special String Operations, Character Extraction, String Comparison, Searching Strings, Modifying a String, Data conversion using ValueOf(), StringBuffer 3.8 Command Line Arguments, Static Members. 3.9 Interfaces : Defining interfaces, Extending interfaces, Implementing interfaces, Accessing Interface variables. 3.10 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		
10. Define Thread. 11. Describe Thread Life Cycle. 12. Write a program to Create & Extending Thread class. 13. Enlist Thread Methods & Thread Exceptions. 14. Describe Thread Priority & Synchronization. 15. Implement the runnable Interface. 16. Define Exception ,Errors& its types. 17. Write a program of Exception Handling code. 18. Enlist Exception Handling parameters. 19. Describe multiple catch statements. 20. Write a program throwing our own Exceptions & Exceptions for Debugging.	4.6 Creating Thread, Extending a thread class, Stopping and Blocking a thread, Life cycle of thread 4.7 Using thread methods, Thread exceptions, Thread priority, Synchronization, Implementing the 'Runnable'' Interface, Inter-thread communication 4.8 Exception : Types of errors, Exceptions, Syntax of Exception Handling code 4.9 Multiple catch statements, Using finally statement, Throwing our own Exceptions, Using Exception for Debugging	**08**

Unit 5:Introduction To Applet with Graphics Programming		
5. Differentiate between Local & Remote Applets, Applets & Applications. 6. Create an Executable Applet & Design a Web page using Applet tag. 7. Write a Program for passing Parameters to Applets & Event Handling. 8. Describe Graphics Class Methods. 9. Displaying Numerical values, Getting input from the Use. 10. Write a program to Draw different Shapes of Graphics Class using Applet. 11. DefineAWT & Swing. 12. Describe AWT Package.	5.6 Local and remote applets, How applets differ from applications, Preparing to write applets, Building applet code, Applet life cycle. 5.7 Creating an Executable Applet, Designing a Web page, Applet tag, Adding Applet to HTML file, Running the Applet. 5.8 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. 5.9 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. 5.10 Introduction to AWT Package, Introduction to Swings.	**08**
Unit 6: Managing Input/Output Files in Java		
5. Define Streams. 6. Enlist Different Classes. 7. State Input/Output Exceptions. 8. Describe the different Files Operations. 9. State different Primitive Data Types. 10. Write a program for Concatenating & Buffering Files. 11. Write a Program for Random Access Files. 12. Describe Other Stream Classes.	6.7 Concept of Streams, Stream classes, Byte stream classes, character stream classes, using streams, Other useful I/O classes 6.8 Using the file class, Input/Output Exceptions, Creation of files, Reading/writing characters, Reading/writing bytes 6.9 Handling primitive data types, Concatenating and Buffering files, Random Access Files, Interactive Input and Output, Other Stream Classes,	**08**
Total		**48**

X. 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 - use of implmenting interfaces.		01

	- use of extending interfaces.		
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 have a button labeled "FIND AVG". When user clicks on button the average of test marks will be displayed in the 4th text field.	Introduction To Applet with Graphics Programming	02
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 Hrs.	**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

Question Paper Profile For Theory Paper:

Q. No	Bit 1			Bit 2			Bit 3			Bit 4			Bit 5			Bit 6			option
	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	
01	1	R	2	2	R	2	3	R	2	5	R	2	6	R	2	4	R	2	5/7
	1	R	2																
02	4	R	4	1	U	4	2	U	4	2	U	4	3	U	4				3/5
03	2	U	4	3	U	4	4	U	4	5	U	4	6	U	4				3/5
04	5	U	4	6	U	4	7	U	4	7	U	4	2	R	4				3/5
05	2	A	6	3	A	6	4	A	6										2/3
06	4	A	6	5	A	6	6	A	6										2/3

T= Unit/Topic Number   L= Level of Question   M = Marks

R-Remember   U-Understand   A-Analyze/ Apply

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	CA (Continuous Assessment)	PT	Students	Two PT (average of two tests will be computed)	10	--	Test answer sheets	1,2,3,4,5,6
		--		--	--	--	--	--

					10			
Direct Assessment	**TEE** (Term End Examination)	End Exam	Students	End Of the Course	40	13	Theory Answer sheets	1,2,3,4,5,6
Practical	**CA** (Continuous Assessment)	--	Students	--	--	--	--	--
		Journal Writing		Assignments	25	--	Journal	1,2,3,4,5,6
				TOTAL	**25**	**10**		
	TEE (Term End Examination)	End Exam	Students	End Of the Course	**25**	**10**	Practical Answer Sheets	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form			1,2,3,4,5,6
	End Of Course			End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

S.N.	Description	Max. Marks
1	Observations,	05
2	Practical Performance	15
3	Viva voce	05

TOTAL	25

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	PO1. Basic knowledge	PO2. Discipline knowledge	PO3. Experiments and practice	PO4. Engineering Tools	PO5. The Engineering and society	PO6. Environment and Sustainbility	PO7. Ethics	PO8. Individual and Teamwork	PO9. Communication	PO10. Life-long Learning
CO1.Represent and apply the solution to problem using object - oriented concepts.	-	-	3	2	-	1	-	1	2	1
CO2. Differentiate between platform independent and other types of languages.	2	2	-	-	-	-	-	-	1	1
CO3. Write and execute programs in Java using object-oriented	-	-	-	2	-	-	-	-	2	1

principles, basic control structures, vectors, packages, interfaces, applets.										
CO4. Write and execute programs in java using concepts of Multithreading and exception handling.	1	-	-	2	-	-	-	-	1	-
CO5. Create and execute user defined packages and exceptions	-	-	-	1	-	-	-	-	-	-
CO6. Implement I/O functionality using Streams in Java.	-	-	1	1	-	-	-	-	1	-
Summary	2	2	2	2	-	1	-	1	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Mapping Course Outcomes With Program Specific Outcomes:

Course Outcomes	Program Outcomes (PSOs)		
	Hardware and Networking	Database Technologies	Software Development

CO1.Represent and apply the solution to problem using object - oriented concepts.	--	1	3
CO2. Differentiate between platform independent and other types of languages.	--	--	3
CO3. Write and execute programs in Java using object-oriented principles, basic control structures, vectors, packages, interfaces, applets.	--	1	3
CO4. Write and execute programs in java using concepts of Multithreading and exception handling.	--	--	3
CO5. Create and execute user defined packages and exceptions	1	--	3
CO6. Implement I/O functionality using Streams in Java.	1	2	3
Summary	1	2	3

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**/

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.	Mrs. G.B.Garud & P.S.Ghode	Lecturer	Government Polytechnic, Pune.
2.	Mrs.P.S.Ghode	Lecturer	Government Polytechnic, Awasari.

Prepared by	**Member Secretary PBOS**	**Chairman PBOS**
Prof.T.d.Pawar	**Prof.S.V.Chaudhari**	**Prof.M.U.Kokate**
		Prof.H.S.Pawar

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

Name of Programme	**Diploma in Information Technology**

Programme Code	**07**
Name of Course	**Digital Techniques and Microprocessors**
Course Code	**IT381**
Class Declaration	**--**

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:

Y. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1: Number System, Codes & Logic Gates and Boolean Algebra		
1. Convert codes from one number system to another. 2. Perform arithmetic operations with number system. 3. Differentiate various logic gates and apply the logic on Boolean algebra. 4. Explain theorems for Boolean algebra. 5. Create simplified logic circuits.	1.1 Decimal, Binary, Octal, Hex 1.2 Binary addition, subtraction 1.3 One's complement, Two's Complement, Signed Numbers, Codes, Error code. 1.4 Working principals and Truth of AND,OR,NOT, NOR, NAND, EX-OR, EX-NOR Gates, Universal Gates 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		
1. Design Multiplexer and De-Multiplexer. 2. Implement combinational logic design with MUX. 3. Implement combinational logic design with DEMUX.	2.1 Multiplexer and their use in combinational, logic design 2.2 De-multiplexer/decoders and their use in combinational logic design 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		
1. Construct K-MAP using logic functions and vice versa. 2. Simplify equations in the minterms/maxterms.	3.1 KARNAUGH map representation, Simplification of logic function using K-MAP 3.2 Minimization of logical function specified in minterms/maxterms or truth table 3.3 Minimization of logic function not specified in minterms/maxterms. Don't care condition	10
Unit 4: Microprocessor, Microprocessor Architecture & Microcomputer Systems		

1. Describe Microprocessor architecture. 2. Understand 8085 registers and instruction format. 3. Draw timing diagram for read/write memory cycle.	4.1 Microprocessor architecture & its Operations 4.2 Memory & I/O Devices 4.3 8085 MPU, Example of 8085 based microcomputer. 4.4 Classification of instruction, Instruction format 4.5 How to write & execute 8085 program 4.6 8085 instruction set & Instruction timing	12
Unit 5: 8085 Programming		
1. Write and execute 8085 programs for addition, subtraction. 2. Write programs implementing branching.	5.1 Basic instruction of 8085 5.2 All instructions of 8085 like Data transfer, Arithmetic Operations, Branch, Debugging Programs, etc.	10
Unit 6: Additional Instructions, Stack, Subroutines, Interrupt		
1. Perform 16-bit arithmetic and logic operations. 2. Recognize 8085 interrupts. 3. Write programs using looping, subroutine.	6.1 Looping, indexing, counting 6.2 16-bit arithmetic logic operations, rotate, compare. 6.3 Stack, Subroutine & 8085 interrupts	10
Total Hrs.		**64**

Z. List of Practical's /Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Course Outcome	Hrs.
1.	Know your Digital Lab 1.IC Tester 2.Multimeter 3.Bread Board	**Number System, Codes & Logic Gates and Boolean Algebra**	--	02

	4.Trainer Kit			
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.		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.	**8085 Programming**	CO6	05
12.	Find the smallest and greatest number of series.		CO6	05
13.	Arrange the given numbers in ascending		CO6	05

	and descending order.			
14.	Transfer the block of data in reverse order from one place to another place.		CO6	08
		Total Hrs.		**64**

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	

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.	Mrs.M. U. Kokate	HOD	Government Polytechnic Pune
2.	Smt. P. N. Yewale	Lecturer	Government Polytechnic Pune

CO-PO Matrix:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Perform arithmetic operations with various number systems.	3	-	-	-	-	-	-	1	-	2
Differentiate various logic gates and apply the logic on Boolean algebra.	3	2	3	2	1	-	-	2	1	1
Test combinational logic circuits of Multiplexer and De-Multiplexer.	3	3	2	2	-	-	-	2	1	-
Construct K-MAP using logic functions and vice versa.	3	3	3	2	1	1	-	2	1	1
Describe Microprocessor architecture.	-	2	-	-	-	-	-	-	2	1
Write and execute 8085 programs.	2	3	3	3	1	-	1	2	2	-

Summary	3	3	3	2	1	1	1	2	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix:

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development
Perform arithmetic operations with various number systems.	-	-	-
Differentiate various logic gates and apply the logic on Boolean algebra.	2	-	-
Test combinational logic circuits of Multiplexer and De-Multiplexer.	2	-	-
Construct K-MAP using logic functions and vice versa.	1	-	-
Describe Microprocessor architecture.	-	-	-
Write and execute 8085 programs.	3	-	3
Summary	**2**	**-**	**3**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Prepared by

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

Name of Programme	**Information Technology Engineering**
Programme Code	**07**
Name of Course	**Multimedia and Animation**
Course Code	**IT382**
Class Declaration	**--**

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:

AA. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1: Introduction To Multimedia		
6. State the applications of multimedia. 7. Identify the basic tools of multimedia. 8. 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 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. 1.8 Virtual Reality.	**04**
Unit 2:Multimedia Building Blocks		
3. Describe components of multimedia. 4. Draw various types of image files for relative applications. 5. Create audio using different sound formats. 6. Explain QOS architecture.	2.1 Text. Using text in multimedia 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 2.3 Sound -Digital audio, Audio file format, MIDI Versus Digital Audio, Synchronization, Orchestration & QOS Architecture	**06**

Unit 3: Animation & Video		
1. Compose Flash Movie (Audio Video). 2. Create Text-Based Animation. 3. 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. 3.2 How Video Works and Broadcast Video Standards. 3.3 Digital video, Study of story board.	**06**
Unit 4: Introduction to action script in flash		
4. Execute various programs with the help of action script. 5. Build time based animation.	4.1 Programming Concepts – Variables, Data types, conditionals, loops, arrays, Functions 4.2 Custom objects - Properties, Methods and Events – Display List, Timeline Control	**10**
Unit 5: Multimedia Authoring Tools		
3. Choose various authoring tools. 4. Differentiate various authoring tools.	5.1 Types of Authoring Tools-Different features 5.2 Card- and Page-Based Authoring tools 5.3 Icon-and Object Based Authoring tools, Time Based Authoring tools	**06**
Total Hrs.		**32**

BB. List of Practical's/Laboratory Experiences/Assignments:

Prac tical 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,**	CO2	02

3	Corel Draw Assignments Implementing and Study of all tools in Corel Draw software Implementing different fonts of text on the screen Creating Wallpaper using multiple tools of Corel draw. Applying Drop Shadow effect or vignette effect or mirror, reflection effect etc. to text Merging photographs and rotate & change rotation center in CorelDraw Creating Banner effect etc. Interfacing of sound, editing, mixing sound, cropping, cross fading & effect.	**Animation & Video**	CO2	16
4	Photoshop Assignments Implementing and Study of all tools in Photoshop software Creating or Adding Rainy Season effect in image Creating funny image Creating water drop effect in image Designing poster by using different Text effect (Ketchup, rope, Fire, fruit). Create broken mirror effect, Flaming ball effects Interfacing of images, Resolution, Editing, color modes. Setting current & background colors.		CO2	16
5	Adobe Flash Assignments Implementing and Study of all tools in Adobe Flash software.	**Animation & Video, Introduction To Action Script In**	CO2,CO3, CO4	16

	Study & Implementing Shape & Motion Tweening in flash. Example for Implementation of types of symbols Creating Animation using Motion guide layer Creating Animation using Masking Creating Bouncing and Rolling ball down etc examples, Controlling windows to load URL, Creating advanced/animated buttons Creating Roll Over/Roll Out effect on buttons Rotating ball using scripting and other Scripting Animation etc. Create Animation for Start/Stop Button for Animation using Script. Create Animation Using Progress Bar preloaded Action Script Create a variable for different Data Types using Action Script Program for conditional loop and array Loading Sound into Animation Clip	**Flash**		
6	Mini project -Create a movie of minimum 15 minutes.	**ALL**	**ALL**	12
		Total Hrs.		**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

CO-PO Matrix:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
State the applications and components of multimedia.	-	2	-	-	-	-	1	1	-	-
Create multimedia applications using various image and sound formats.	1	3	3	3	1	2	-	1	1	2
Build Flash Movie and Text-Based Animation.	1	3	3	3	1	2	1	2	2	1
Execute various programs with the help of action script and time based animation.	-	3	3	3	1	2	2	2	2	3
Differentiate various authoring tools.	-	2	1	2	-	-	-	-	-	1
Summary	**1**	**3**	**3**	**3**	**1**	**2**	**1**	**2**	**2**	**2**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix:

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development
State the applications and components of multimedia.	-	-	-
Create multimedia applications using various image and sound formats.	1	2	3
Build Flash Movie and Text-Based Animation.	1	2	3
Execute various programs with the help of action script and time based animation.	1	2	3
Differentiate various authoring tools.	-	-	-
Summary	**1**	**2**	**2**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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

List Of Experts & Teachers Who Contributed For This Curriculum:

Sr. No.	Name	Designation	Institute / Industry
1	Smt. P. N. Yewale	Lecturer	Government Polytechnic Pune
2	Smt. H. F. Khan	Lecturer	Government Polytechnic Pune

Prepared by

(   )   (Member Secretary PBOS)   (Chairman PBOS)

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:

	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:

CC. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
SECTION-I **Unit 1: Introduction to Data Communication and Networking**	
1.Describe different modes of data transmission **2.** Differentiate various multiplexing techniques. **3**. 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 **1.2**Analog Signal, Analog Transmission, Digital Signal ,Digital Transmission, Digital Signal Analog Transmission, Baud Rate and Bits per second **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	
1.Define analog and digital signals. **2**.Describe various coding schemes **3.**State various network performance criteria **4.**Compare ASK,FSK,PSK.	**2.1** Signals :Analog and Digital Data, Analog and Digital Signals, Periodic and non periodic signals **2.2** Analog Signals: Sine Wave, Phase, Time and Frequency domain, Composite Signals, Bandwidth **2.3** Digital Signals: Bit Rate, Bit Length, Digital Signal as a composite analog signal, Transmission of Digital Signals: Baseband Transmission, Broadband Transmission. **2.4** Transmission Impairment: Attenuation, Distortion, Noise **2.5** Data Rate Limits: Noiseless channels: Nyquist Bit Rate, Noisy channel: Shannon capacity, Using both	**12**

	limits	
	2.6 Performance: Bandwidth, Throughput, Latency, Bandwidth-Delay product	
	2.7 Transmission: Line Coding: Characteristics, Schemes	
	2.8 Block coding: Some common block codes	
	2.9 Analog-To-Digital Conversion: Pulse Code Modulation	
	2.10 Transmission modes: Parallel transmission, Serial transmission	
	2.11 Analog Transmission : Digital-To-Analog Conversion : Aspects of Digital-to-Analog conversion, ASK, FSK, PSK	
	2.12 Analog-To-Analog Conversion: Amplitude modulation, Frequency modulation, Phase modulation	
Unit 3:Overview: OSI Model and MAC Sublayer		
1.Describe Layered architecture **2.**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 **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		
1.Identify and correct errors in transmission. **2.**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 **4.2** Block coding: Error detection, Error correction, Hamming Distance, Linear Block Codes, Cyclic codes: Cyclic Redundancy Check, Polynomials, Advantages of cyclic codes, Checksum **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. **4.4** Framing, Transition Phases, Multiplexing, LCP, PAP, CHAP, NCP, IPCP, Other Protocols, Multilink PPP, An Example	**12**
Unit 5: Internetworking Basics		
1.Identify problems in internetworking. **2.**Describe and differentiate between network devices. **3.**Differentiate between ISP services category.	**5.1** Introduction–Why Internetworking, Problems in Internetworking, Dealing with Incompatibility, Vistual Network, internetworking Devices, Repeaters, Bridges, Routers, Gateways **5.2** Brief History of Internet, Growth of Internet, Internet Topology, Internal Architecture of ISP **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		
1.Compare OSI and TCP/IP protocol suite **2.**Describe ports and sockets. **3.**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	**10**

	TCP/IP Protocol Suite. **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 . **6.3** Introduction DNS, TCP,FTP TFTP	
	Total Hrs.	**64**

DD.   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. 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 Deciding upon type of network, Floor designing/ building designing 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

Q. No	Bit 1			Bit 2			Bit 3			Bit 4			Bit 5			Bit 6			option
	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	
01	1	R	4	2	R	4	3	R	4	1	R	4	2	R	4	3	U	4	4/6
02	1	U	4	2	U	4	1	U	4	2	U	4	2	A	4				3/5
03	1	A	6	2	U	6	3	A	6										2/3
04	4	R	4	5	R	4	6	R	4	4	U	4	5	U	4	6	U	4	4/6
05	4	U	4	5	A	4	4	A	4	5	A	4	5	U	4				3/5
06	4	A	6	5	A	6	6	A	6										2/3

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	3	4	8	10
	Total	19	28	38	80

Question Paper Profile For Theory Paper:

T= Unit/Topic Number L= Level of Question   M = Marks

R-Remember   U-Understand   A-Analyze/ Apply

Mapping Course Outcomes With Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
Identify modes of transmission and multiplexing	1	2	1	2	2	2	1	1	1	2
Describe various network performance criteria	1	2	2	2	2	2	1	2	2	1
Design network using various network technologies	1	2	2	3	2	2	1	2	2	3
Identify and correct errors in transmission	2	2	2	1	1	1	2	2	2	3
Describe and differentiate between various networking devices.	--	3	3	--	1	1	1	1	1	2
Describe various packet	--	3	3	3	2	2	2	2	2	3

formats										
Summary	**1**	**2**	**3**	**2**	**2**	**2**	**1**	**1**	**1**	**2**

Mapping Course Outcomes With Program Specific Outcomes:

CO/PSO	PSO1	PSO2	PSO3
Identify modes of transmission and multiplexing	**3**	**--**	**1**
Describe various network performance criteria	**3**	**--**	**2**
Design network using various network technologies	**3**	**--**	**2**
Identify and correct errors in transmission	**3**	**--**	**2**
Describe and differentiate between various networking devices.	**3**	**--**	**1**
Describe various packet formats	**3**	**--**	**2**
Summary	**3**	**--**	**2**

Assessment and Evaluation Scheme:

			What	To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	CA	(Continuous Assessment)	PT	Students	Two PT (average of two tests will be computed)	20	--	Test answer sheets	1,2,3,4,5,6
			--		--	--	--	--	--

					20			
Direct Assessment Practical	TEE (Term End Examination)	End Exam	Students	End Of the Course	80	28	Theory Answer sheets	1,2,3,4,5,6
	CA (Continuous Assessment)	--	Students	--	--	--	--	--
		Journal Writing		Assignments	25	--	Journal	1,2,3,4,5,6
				TOTAL	**25**	**10**		
	TEE (Term End Examination)	End Exam	Students	End Of the Course	**25**	**10**	Oral	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form			1,2,3,4,5,6
	End Of Course			End Of The Course	Questionnaires			

Scheme of Practical Evaluation:

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

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

Reference & Text Books:

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Data Communications and Networking	Behrouz A. Forouzan Tata 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)**

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

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-

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

Course Content:

Unit No.	Name of Topic/Sub topic		Hrs	Weightage
	Section I			
1	**Introduction to Database system**			
• Define the database management system. • Identify the advantages of the database approach over the file-based data storage system • Describe the architecture of DBMS and Data Models.	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**	**12**
	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.		

2		Relational Data Model		
• Create Normalized Database structure on given data. • Draw the ER Diagrams on given database. • Analyze functional dependencies for designing a robust database	2.1	Relational Structure- Tables (Relations), Rows (Tuples), Domains, attributes.		**14**
	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.		
	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.		
3.		**Interactive SQL**		
• Perform various operations on given data using DDL, DML and DCL Commands. • Write and execute Database Queries on given data by using different operators ,functions and clauses • 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) .		**14**
	3.2	Clauses & Join: Different types of clauses in SQL ,Joins, Types of Joins, Nested queries.	**10**	
	3.3	Operators: Relational, Arithmetic, Logical, set operators.		

	3.4	Functions: Date and time, String functions, Aggregate Functions.		
Section II				
4.		**SQL Performance Tuning**		
• Create and Manage views, Sequences and Indexes on given data. • Examine given Database performance.	4.1	Views: Creating Views, Types of Views: Read Only View and Updatable Views, Dropping Views.	**08**	**10**
	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.		
5.		**PL/SQL**		
• Write PL/SQL code using control structure . • Manage data retrieval with cursors and cursor variables. • 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**	**12**
	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.		
6.		**PL/SQL Database Objects and File System**		

• Write and Execute stored procedures • Write and Execute Functions. • Create triggers to solve business challenges • Describe Database File System Organization.	6.1	Procedures: Advantages, Creating, Executing and Deleting a Stored Procedure.	**10**	**18**
	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**	**80**

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, Delete Operations, Modifying the Structure of the Table, Renaming the table, Dropping Tables.	3	CO1& CO2	02	01
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

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	24	28	30	80

Scheme of Practical Evaluation:

S.N.	Description	Max. Marks
1	Designing database model	05
2	Query Execution	15
3	Viva voce	05
	TOTAL	**25**

Reference & Text Books:

S.N.	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

CO-PO Matrix :

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Apply Normalization techniques to normalize a database	1	2	2	1	1	-	-	2	2	1

Create & Manage the database Tables with constraints.	-	2	2	2	1	1	-	2	2	1
Perform various operations on database.	2	3	3	3	2	-	-	2	2	1
Create and Manage views, Sequences and Indexes.	1	2	3	3	1	-	-	2	1	1
Develop PL/SQL programs using cursor and control structure	2	2	3	3	1	1	-	2	1	1
Create and debug stored procedures and functions	1	2	3	3	1	-	-	2	1	1
Summary	**1**	**2**	**3**	**3**	**1**	**1**	**-**	**2**	**2**	**1**

CO-PSO Matrix :

CO /PSO ⟶ ↓	Hardware and Networking	Database Technologies	Software Development
Apply Normalization techniques to normalize a database		3	-
Design a data model and schemas in RDBMS		3	1
Perform various operations on database.		3	2
Create and Manage views,		3	2

Sequences and Indexes.			
Develop PL/SQL programs using cursor and control structure		3	3
Create and debug stored procedures and functions		3	3
Summary	-	3	2

Prepared By	Secretary, PBOS	Chairman, PBOS

Smt. Mrs.S.B.Gosavi,   Prof.M.U.Kokate

Smt.A.A.Shaikh,

Smt. Sneha D. Raut,

Smt. Anita Kshirsagar

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

Sr. No	Topic/Subtopic	Hours	Weight age	Practical

1.	**Introduction** 1.1 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.	04		
2.	**Sustainable Development:** 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.	04		
3	**Environmental Pollution:** 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.	16		

	3.9 Water Conversation: Rainwater harvesting, Watershed Management			
4	**Renewable sources of Energy:** Biomass, Biogas, Solar Energy, Nuclear Power, Hydropower, Wind Energy, Ocean (Tidal Energy), Geothermal Energy.	04		
5	**Environmental Legislation:** 5.1 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.	04		

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. Joshi, G.S.Chhawsaria	Basic Civil and Environmental Engineering	Pearson
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

R.M.Aghav   (S.V.Chaudhari)   (M.S.Satarkar)
V.M. Kolhe
D.K. Fad
  LCE   Member Secretary, PBOS   Chairman, PBOS

Programme   :   Diploma in CM/IT

Programme Code   :   07

Name of Course   :   E-Commerce

Course Code   :   AU486

Teaching Scheme:

	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-

- Illustrate e-business models.

- Describe e-procurement process.

- Identify new-media for marketing communications.

- Assess e-commerce services quality.

Course Content:

Unit No.	Name of Topic/Sub topic	Hrs	Weightage
1	**Introduction to E-Business and E-Commerce**		

Learning Outcomes:	1.1	Introduction ,The impact of the electronic communications on traditional businesses , Real-world E-Business: HP.com		
• Identify E-technologies for e-commerce Explain ASCII EBCDIC and Unicode	1.2	Difference between e-commerce and e-business, E-Commerce defined, E-business defined.	04	12
• Tackle with business challenges of e-commerce. • Identify risk and barriers of E-business.	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.		
2		**E-Commerce Fundamentals**		
Learning Outcomes:	2.1	Web presentation and data exchange standards, Audio and video standards, Focus on Internet governance.		
• Manage e-business infrastructure effectively • Use various web services for e-commerce.	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.	06	14
	2.3	Focus on web services, SaaS and service-oriented architecture (SOA),Benefits of web services or SaaS, Challenges of deploying SaaS.		
	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?		

3.	E-Environment			
Learning Outcomes: • Identify environmental and green issues related to Internet. • 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	14
	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.		
4	**E-Procurement**			
Learning Outcomes: • Apply e-procurement process in e-Business. • Identify Risks and impacts of e-procurement.	4.1	Introduction to e-procurement, Understanding the procurement process, Types of procurement.	04	12
	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.		
5	**E-Marketing**			

Learning Outcomes: • Recognize new-media for marketing communications • 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.		
	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.	**04**	**12**
	5.3	Focus on online branding, The importance of brand online Actions, Control .		
6.		**Customer Relationship Management**		
Learning Outcomes: • Compare CRM and e-CRM. • Assess e-commerce services quality • Perform interactive marketing.	6.1	Introduction, Marketing applications of CRM , What is e-CRM? Benefits of e-CRM, Permission marketing, Customer profiling , Conversion marketing.		
	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.	**08**	**16**

	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**	**80**

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

CO-PO Matrix :

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Illustrate e-business models.	--	1	--	--	2	1	1	1	1	-
Describe e-procurement process.	--	2	--	--	1	1	1	1	2	-
Identify new-media for marketing communications.	--	2	--	--	2	2	1	1	2	-
Recognize customer relationship in e-Business.	--	2	--	--	3	--	1	1	2	-
Summary	**--**	**2**	**--**	**--**	**2**	**1**	**1**	**1**	**2**	**-**

CO-PSO Matrix :

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Illustrate e-business models.	--	--	1
Describe e-procurement process.	1	1	--
Identify new-media for marketing communications.	1	1	--
Recognize customer relationship in e-Business.	--	1	1
Summary	1	1	1

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

Name of Programme   **: Diploma in Computer Engineering**
Programme Code   **: 06**

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	Hrs			
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 Information System and various functional areas of management.
2. Perform Analysis of organizational scope of information system for various business processes.
3. Generate System requirement specification.
4. Represent system with data flow diagrams for assigned case study.
5. Illustrate Decision support system, Information system threats and security issues.

Course Contents:

Specific Learning Outcomes	Topics and subtopics	Hrs

(Cognitive Domain)		.
Units 1 : Information Systems and Organizations		
1. Define Organization, Data ,MIS 2. Classify IS and signify its use 3. 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 1.2 Decision Support Systems:, Definition, Evolution of DSS, Characteristics of DSS,Model Management, Group Decisions	12
Unit 2: System Analysis and Design		
1. Perform System Analysis 2. Describe SDLC 3. Generate Requirement Specification Document	2.1 Organizational context of System Analysis, Role of System Analyst, System Development Life Cycle, Requirements Analysis 2.2System Requirements Specification: System requirements specification: Example, Data dictionary, Steps in Systems Analysis, Modularizing requirement specifications, Conclusions.	
Unit 3: Feasibility Analysis		
1. Performs feasibility Analysis and develop feasibility report 2. Apply Structural Analysis and Design to design flow of System 3. Draw context DFD and level 1 and level 2 DFD for project 4. 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. 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. 3.3 Process Specifications: Process specification methods, structured English Some examples of process specification.	12
Unit 4:Management		
1. Define Quality and state its attribute	4.1Quality Management: Specific Objectives: Meaning of Quality State	18

2. space methods models 3. Describe Quality objects and Quality Management principle 4. Describe various Quality Control and Assurance such TQM,6-Sigma,ISO 5. Specify significance of Financial Management	Principles of Quality Management, Describe Modern Technique & Systems of Quality Management Quality Management System: Activities, Benefits Quality Control - Objectives, Functions, Advantages Quality Circle - Concept, Characteristics & Objectives Quality Assurance - Concept, Quality Assurance System Total Quality: Meaning of Total Quality 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. 4.2 Financial Management Specific Objectives: Explain functions of financial management; State the sources of finance & types of budgets, Describe concepts of direct & indirect taxes. Financial Management- Objectives & Functions Budgets and accounts :Types of Budgets Production Budget - Sample format: Labour Budget - Sample format, Profit & Loss Account & Balance Sheet: Meaning, sample format, Meaning of different terms involved. Meaning & Examples of - Excise Tax, Service Tax, Income Tax, Value Added Tax, Custom Duty 4.3 Data input Methods: Data input, Coding techniques, Detection of error in codes, Validating input data, interactive data input.	
Unit 5:Executive Information System and Executive Support System		
1.Define EIS,ESS 2.State the characteristics ESS,ESS 3.Compare EIS,ESS 4.Discuss need of Expert System in Organization	5.1 Why EIS and ESS? Internal factor and External factor 5.2 What is EIS and ESS? Characteristics of EIS and ESS 5.3 Informational characteristics, User Interface/Orientation Characteristics, Managerial/Executive Characteristics 5.4 EIS/ESS Capabilities and Benefits	**14**

	5.5 Expert System-Definition,Components,Application and Limitations	
Unit 6:Management Issues in MIS		
1. Demonstrate need of Information Security 2.Discuss and Determine different threats for IS System 3.Apply various Security Tools for Information System 4.Realize Ethical and Social Dimensions of Information System and publishing its significance	6.1 Information Security and Control: Why break IT System Security? 6.2 Information 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 6.3 Ethical And Social Dimensions	**08**
	Total Hrs.	**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 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

CO-PO Matrix:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Describe Information System and various functional areas	2	2	2	-	-	-	2	3	2	2

of management										
Perform Analysis of organizational scope of information system for various business processes.	1	1	2	-	1	2	2	2	3	3
Generate System requirement specification.	1	2	2	-	-	1	2	2	2	2
Represent system with data flow diagrams for assigned case study.	1	1	-	2	-	-	-	-	2	3
Illustrate Decision support system, Information system threats and security issues.	1	2	2	2	2	1	-	2	1	2
Summary	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**2**	**2**	**3**

CO-PSO Matrix :

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Describe Information System and various functional areas of management	-	-	1
Perform Analysis of organizational scope of information system for various business processes.	-	-	2
Generate System requirement specification.	-	-	2
Represent system with data flow diagrams for assigned case study.	-	-	3
Illustrate Decision support system, Information system threats and security issues.	-	-	1
Summary	**-**	**-**	**2**

(Prepared by)	**(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 :
- Analyze and define the real life problem from Project development point of view.
- Apply appropriate design methodology to the Projects.
- Make use of designing tools.
- Conduct feasibility study and cost estimation.
- Create , test and debug working model.
- Compile and Write a Software Project Report.
- Work in team and deliver presentations.

Subject Guideline regarding implementation:

Sr. No.	Name of Experiment/Assignment

1.	Subject would contain two components :
	  1. Seminar
	  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:
	  a. Problem Definition
	  b. Platform and/Hardware Specifications
	  c. Feasibility Study.
	  d. Various Design UML charts/diagrams as applicable like Use Case Diagram, Activity Charts, Class Hierarchy, DFD, CFD, ER-Diagrams or any other
	  e. Cost Estimation
	  f. Time Estimation
	  g. Limitations
	  h. Use
	  i. Future Scope/Extendability
	  j. Books/References/WebSites
	(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.

CO-PO Matrix :

CO /PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1	3	1	2	2	1	2	3	3	3
CO2	1	3	2	3	2	1	2	3	3	3
CO3	1	3	3	3	2	1	2	3	3	3
CO4	2	3	2	3	2	1	2	3	3	3
CO5	--	3	3	3	2	1	2	3	3	3
CO6	--	2	-	3	2	1	2	3	3	3
CO7	--	2	1	3	2	-	2	3	3	3
Summary	1	3	2	3	2	1	2	3	3	3

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 databaseswith 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		
1.Enlist various AWT components

2.Practice event handling

3.Describe various handling events by extending AWT

4.Design a form containing various AWT components and apply event handling. | 1.1 Two event handling mechanisms, The delegation Event Model
1.2 Event classes, Sources of Events, Event Listener Interfaces
1.3 Using the Delegation Event Model, Adapter classes, Inner classes
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
1.5 Working with graphics, Working with color, Setting the paint mode
1.6 Working with Fonts, Managing text output using Font Metrics, Exploring text & graphics
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
1.8 Understanding Layout Managers, Menu Bars and Menus, Dialog Boxes, File Dialog
1.9 Handling events by Extending AWT Components, Exploring the Controls, Menus, and Layout Managers | **14** |
| **Unit 2: Swing Component :** | | |
| 1.Demonstrate working of applet

2. Use swing components in applet | 2.1The Tour of Swing : Japplet, Icons and Labels ,Text Fields, Buttons
2.2Combo Boxes, Tabbed Panes, Scroll Panes, Trees, Tables, Exploring the Swings | **4** |

Unit 3:Networking Basics:		
1.Define socket 2. Compare various sockets 3.Write a java programs for client server communication using sockets	3.1Socket overview, client/server, reserved sockets, proxy servers, internet addressing 3.2Inetaddress ,Factory methods, instance method TCP/IP Client Sockets 3.3What is URL Format? URL connection, TCI/IP Server Sockets 3.4Datagrams :Datagram packets Datagram server & client Net worth	**6**
Unit 4:Java DataBase Connectivity Client/Server		
1. Develop a program for steps to connect a database 2. Describe the Basics of JDBC 3. 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 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		
1.State advantages of Java Beans 2..Develop your own Java Bean	5.1What is Java Beans? Advantages of Java Beans 5.2Application Builder Tools, The Bean Developer kit(BDK), JAR Files, Introspection, Developing a simple Bean Using Bound properties Using the BDK 5.3Using Bound properties, Using the Bean Info Interface, Constrained properties 5.4Persistence Customizers, The Java Beans API, Using Bean Builder	**6**

Unit 6:Remote Method Invocation		
1.Compare Distributed and Non distributed Java Programs 2.Draw RMI Architecture 3.Define stubs and skeletons 4.Demonstrate working RMI Client side call backs	6.1 Introduction to Distributed Computing with RMI : Goals, Comparison of Distributed and Non distributed Java Programs 6.2 Java RMI Architecture Interfaces: The Heart of RMI, RMI Architecture Layers, Stub and Skeleton Layer, Remote Reference Layer, Transport Layer 6.3 Naming Remote Objects, Using RMI, Interfaces, Implementation, Stubs and Skeletons, Host Server, Client. 6.4 Running RMI System, Parameters in RMI, Parameters in a Single Java Virtual Machine, Primitive Parameters, Object Parameters, Remote Object Parameters 6.5 RMI Client-Side Call backs, Distributing and Installing RMI Software, Distributing RMI Classes, Automatic Distribution of Classes, Firewall Issues	8
	Total Hrs.	48

EE. 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 Hrs.	**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

Question Paper Profile For Theory Paper:

Q. No	Bit 1			Bit 2			Bit 3			Bit 4			Bit 5			Bit 6			option
	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	
01	1	R	2	2	R	2	3	R	2	5	R	2	6	R	2	4	R	2	**5/7**
	1	R	2																
02	4	R	4	1	U	4	2	U	4	2	U	4	3	U	4				**3/5**
03	2	U	4	3	U	4	4	U	4	5	U	4	6	U	4				**3/5**
04	5	U	4	6	U	4	7	U	4	7	U	4	2	R	4				**3/5**
05	2	A	6	3	A	6	4	A	6										**2/3**
06	4	A	6	5	A	6	6	A	6										**2/3**

T= Unit/Topic Number   L= Level of Question   M = Marks

R-Remember   U-Understand   A-Analyze/ Apply

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	CA (Continuous Assessment)	PT	Students	Two PT (average of two tests will be computed)	20	--	Test answer sheets	1,2,3,4,5,6
		--		--	--	--	--	--
					40			
	(Term End Examination)	End Exam	Students	End Of the Course	80	28	Theory Answer sheets	1,2,3,4,5,6
Direct Assessment Practical	CA (Continuous Assessment)	--	Students	--	--	--	--	--
		Journal Writing		Assignments	25	--	Journal	1,2,3,4,5,6
				TOTAL	**25**	**10**		

TEE (Term End Examination)	End Exam	Students	End Of the Course	**25**	**10**		Practical Answer Sheets	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course	Students	After First PT	Student Feedback Form				1,2,3,4,5,6
	End Of Course		End Of The Course	Questionnaires				

Scheme Of Practical Evaluation:

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

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	--	2	3	3	2	2	3	3	2	1
2	--	2	3	3	2	2	3	3	2	1
3	--	2	3	3	2	2	3	3	2	1
4	--	2	3	3	2	2	3	3	2	1
5	--	2	3	3	2	2	2	3	2	1

6	--	2	3	3	2	2	3	2	2	1
Summary	**--**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**1**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Mapping Course Outcomes With Program Specific Outcomes:

Course Outcomes	Program Outcomes (PSOs)		
	1	**2**	**3**
1	--	1	3
2	2	--	3
3	1	3	3
4	--	--	3
5	1	--	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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:

5. www.**java**tpoint.com/**java**-**tutoria**
6. www.w3schools.in/**java**-**tutorial**

 Prepared by

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

Name of Programme   : **Diploma in CM/IT**
Programme Code   : **06/07**
Name of Course   : **Computer Security**
Course Code   : **CM485**

Teaching Scheme:

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

Evaluation:

	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 various software 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 for encryption/decryption.
4. Describe applications of firewall, IP Security and Intrusion Detection System in computer security.
5. Install Hot-fix,patch,service pack for security software up gradations.

Course Contents:

FF. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1 : Introduction and Security trends		
1.Identify threats to security 2.List different types of attack 3.Explain security basics 4.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 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 1.3 Security Basics - Confidentiality, Integrity, Availability, Operational model of Computer Security, Layers of security 1.4 Access control: Discretionary, Mandatory, Role based Authentication: Introduction	08
Unit 2:		
1.Describe role of people in password selection 2.Define Security Policies,standards and procedures 3.List different access controls 4.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 2.2Security policies, standards, procedures and guideline 2.3Physical Security: Access controls biometrics: finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns keystrokes 2.4Social Engineering.	6

Unit 3: Cryptography and Public Key Infrastructure		
1.Describe various encryption algorithms 2. Demonstrate use of Steganography 3.Analyze Public key Infrastructure 4. Compare different trust models	3.1 Encryption algorithm /Cipher, Caesar's Cipher, Shift cipher, substitution software Vigenere cipher. 3.2 Transposition Techniques, Steganography 3.3 Hashing, SHA 3.4 Symmetric encryption, DES (Data encryption standard), Asymmetric encryption, Digital Signatures, Keyescrow. 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 3.6 Centralized or decentralized infrastructure, private key protection. 3.7 Trust models: Hierarchical, peer to peer, hybrid	**14**
Unit 4: Network Security		
1.Demonstrate working of firewall 2.List different security topologies 3.Justify importance of email security	4.1 Firewalls: working design principles trusted systems Kerberos 4.2 Security topologies - security zones, DMS, Internet, VLAN, security implication tunneling 4.3 IP security: overview, architecture, IPSec, IPSec configuration, IPSec security 4.4 Introduction Virtual Private Network 4.5 Email Security: security of email transmission, malicious code, spam, mail encryption.	**14**

Unit 5: System security		
1.Classify Intrusion detection systems 2.Define Hot fix,patch,service pack	5.1 Intruders, Intrusion detection systems (IDS).host based IDS, network based IDS 5.2 Operating system security: Operating system updates : hot fix, patch, service pack	**6**
	Total Hrs.	**48**

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

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Hrs.
1	Study of any Antivirus Installation & Configurations		08
2	Study/Demo of Packet Sniffers	1	
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

Mapping Course Outcomes With Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0
CO ↓	Basic knowledge	Discipline knowledge	Experiments & Practice	Engineering Tools	The Engineer & society	Environment & sustainability	Ethics	Individual and team work	Communicatio n	Life-long learning
Identify various software threats and attacks on operating system and online/offline application software	--	2	3	3	2	2	2	1	1	1
Adopt security measures for security of vital data	--	2	3	3	2	2	2	1	1	1
Write and execute programs for encryption/decryptio n	---	3	3	3	3	3	3	1	1	1

Describe applications of firewall, IP Security and Intrusion Detection System in computer security.	--	2	2	2	2	1	1	1	1	1
Install Hot-fix, patch, service pack for security software up gradations	--	3	3	2	2	2	2	2	1	1
Summary	--	2	3	3	2	2	2	1	1	1

Mapping Course Outcomes With Program Specific Outcomes:

CO/PSO	Hardware and Networking	Database Technologies	Software Development
Identify various software threats and attacks on operating system and online/offline application software	1	--	3
Adopt security measures for security of vital data	1	--	3
Write and execute programs for encryption/decryption	2	1	3
Describe applications of firewall, IP Security and Intrusion Detection System in computer security.	3	--	3
Install Hot-fix, patch, service pack for security software up gradations	--	--	3
Summary	2	1	3

R-Remember   U – Understand   A – Analyze / Apply

Specification Table for Theory paper:

	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

Assessment and Evaluation Scheme:

		What	**To Whom**	**Frequency**	**Max Marks**	**Min Marks**	**Evidence Collected**	**Course Outcomes**
Direct Assessment Theory	CA (Continuous Assessment)	PT	Students	Two PT (average of two tests will be computed)	20	--	Test answer sheets	1,2,3,4,5,6
		--		--	--	--	--	--

					40			
Direct Assessment	**Practical**	TEE (Term End Examination)	End Exam	Students	End Of the Course	80	28	Theory Answer sheets	1,2,3,4,5,6
		CA (Continuous Assessment)	--	Students	--	--	--	--	--
			Journal Writing		Assignments	25	--	Journal	1,2,3,4,5,6
					TOTAL	**25**	**10**		
		TEE (Term End Examination)	End Exam	Students	End Of the Course	**25**	**10**	Practical Answer Sheets	1,2,3,4,5,6
Indirect Assessment		Student Feedback on course		Students	After First PT	Student Feedback Form			1,2,3,4,5,6
		End Of Course			End Of The Course	Questionnaires			

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 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)**

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

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

Programme	:	Diploma in Computer Engineering/Information Technology
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:

- Prepare test plan and test cases for given application software product.

- Test software for performance measures such as compatibility, usability.

- Identify bugs to create defect report of given application software.

- Select and Apply various software testing techniques.

- Know various automated testing tools.

Course Content:

Unit No.	Name of Topic/Sub topic		Hrs	Weigh tage
1	**Basics of Software Testing**			
• Identify need of testing in software development. • Analyze the quality of Software.	1.1	Error and bug terminology, Testing terms, Test effort.	**04**	**05**
	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.		
2	**Types of Testing**			
• Generate test cases from software requirements using various test Processes for continuous quality improvement. • Apply software testing techniques for information systems development	2.1	White box testing : Static testing , Structural testing.	**08**	**09**
	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		
3.	**Special Tests**			
• Test software for compatibility,	3.1	GUI testing: Compatibility testing, Security testing	**04**	**06**
	3.2	Performance and Stress testing, Recovery and Installation testing		

usability and security issues. • Write test cases for given object oriented application	3.3	Smoke and Sanity testing: Regression testing, Usability testing.		
	3.4	Object oriented application testing: Client-Server testing, Web based testing.		
4.	**Test Management**			
• List uses of Internet • State types of Internet Connections. • Browse Internet • 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**	**08**
	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.		
5.	**Defect Management**			
• Find Defect using different technique. • Describe Defect Life cycle.	5.1	Introduction, Defect classification, Defect management process.	**04**	**05**
	5.2	Defect life cycle, Defect template.		
	5.3	Estimate expected impact of a defect, Techniques for finding a defects, Reporting a defect.		
6.	**Testing Tools and Measurements**			
	6.1	Features of test tool: Guideline for selecting a tool .	**06**	**07**
	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**	**40**

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 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 1) For… Loop 2) Switch…case 3) Do…While 4) If...else 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 source. Study Quality standard ISO 9000:9001.	**6**	CO5	04	08
			Total	**32**	**32**

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

Instructional Strategy:

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 Gopalaswamy Ramesh	Software Testing: Principles and Practices, 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 Maria C. Estrella	Sample Exam Questions ISTQB

CO-PO Matrix :

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Prepare test plan and test cases for given application software product.	2	2	2	3	1	1	1	1	2	2
Test software for performance measures such as compatibility, usability	2	3	2	2	2	-	1	1	3	3
Identify bugs to create defect report of given application software.	2	3	2	2	1	-	2	1	2	3
Select and Apply various software testing techniques	2	3	2	3	2	2	2	1	3	3
Know various automated testing tools.	3	2	3	3	3	2	1	2	3	3
Summary	**2**	**3**	**3**	**3**	**2**	**1**	**2**	**2**	**3**	**3**

CO-PSO Matrix :

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Prepare test plan and test cases for given application software product.	-	1	3
Test software for performance measures such as compatibility, usability	-	1	3
Identify bugs to create defect report of given application software.	-	-	2
Select and Apply various software testing techniques	-	-	2
Know various automated testing tools.	-	-	3
Prepare test plan and test cases for given application software product.	-	1	3
Summary	-	1	3

(Prof.Smt .A.M.Galshetwar ,   (Prof. S.V.Chaudhari)   (Prof.M.U.Kokate)
Smt.J.P.Dandale &
Smt.Sneha Raut)

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:

HH.Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
Units 1: Introduction To Andriod Operating System		
1.Understand features of Andriod. 2.Describe Andriod Architechture.	1.1.What is Andriod ?, What is open handset alliance? Andriod Ecosystem. 1.2.Why Andriod? Features Of Andriod 1.3..Andriod Architechture.	04
Unit 2: Configuration Of Andriod Environment		
1. Install and configure Android application development tools 2. Differentiate between Java JDK and Andriod SDK	2.1 Operating System, Java JDK, Andriod SDK 2.2 Andriod Development Tools(ADT) 2.3 Andriod Virtual Devices(AVDs) 2.4 Emulators 2.5 Dalvik Virtual Machine, Difference between JVM and DVM 2.6 Steps to install and configure Eclipse and SDK	02
Unit 3: Create The First Andriod Application and study of Layouts		
1.Develop First Andriod Application 2.Use Different layouts.	3.1 Control Flow, Directory Structure 3.2 Understanding components of a screen, Fundamental UI Design 3.3 Linear Layout 3.4 Absolute Layout 3.5 Frame Layout 3.6 Table Layout	06
Unit 4: Designing your User Interface With View		
1. Design and develop rich user Interfaces for the Android platform. **2.** Use various views **3.** Display Alerts.	1.1 Text View 1.2 Button, Image Button 1.3 EditText 1.4 Checkbox 1.5 ToggleButton 1.6 RadioButton And RadioGroup 1.7 ProgressBar 1.8 ListView 1.9 GridView 1.10 Image View 1.11 Scroll View 1.12 Custom Toast Alert 1.13 Time And Date Picker	06

Unit 5: Activity And Multimedia		
1. Apply Intents. 2. Develop programs for playing audio and video.	5.1 Introduction 5.2 Intent, Intent_Filter 5.3 Activity LifeCycle 5.4 Broadcast Lifecycle 5.5 Service: Features Of service, Andriod platform service, Defining new service, Service Lifecycle, Permission ,example of service 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		
1.Create database and perform various operations on it. 2. . Use location based services	6.1 SQLite Database, Why SQLite ?Creation and connection of the database ,Extracting value from cursors, Transactions 6.2 SMS Telephony 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 Hrs.		**32**

II. 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 Hrs.	**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

Assessment and Evaluation Scheme:

		What	**To Whom**	**Frequency**	**Max Marks**	**Min Marks**	**Evidence Collected**	**Course Outcomes**
Direct Assessment Theory	CA (Continuous Assessment)	---	Students	---	--	--	----	---
	(Term End Examination)	----	Students	---	---	---	---	---
Direct Assessment Practical	CA (Continuous Assessment)	--	Students	--	--	--	--	
		Journal Writing	Students	Assignments	50	--	Journal	1,2,3,4,5,6
				TOTAL	**50**	**20**		

TEE (Term End Examination)	End Exam	Students	End Of the Course	**25**	**10**	Practical Answer Sheets	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course	Students	After First PT	Student Feedback Form			1,2,3,4,5,6
	End Of Course		End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

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

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Install and configure Android application development tools operations	--	2	3	3	3	2	2	2	2	2
Develop rich user Interfaces by using layouts and controls.	--	2	3	3	3	2	2	2	2	2
Develop application for providing	1	3	3	3	3	2	2	2	1	2

location based services.										
Develop application using intent and menus.	--	2	3	3	3	2	2	2	1	2
Create a complete Mobile application using content provider to handle database	1	3	3	3	2	2	2	2	1	2
Summary	1	2	3	3	3	2	2	2	1	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Mapping Course Outcomes With Program Specific Outcomes:

Course Outcomes	Program Specific Outcomes (PSOs)		
	1	2	3
Install and configure Android application development tools operations	--	--	3
Develop rich user Interfaces by using layouts and controls.	--	--	3
Develop application for providing location based services.	2	2	3
Develop application using intent and menus.	--	1	3
Create a complete Mobile application using content provider to handle database	--	3	3

Summary	2	2	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.	Prof.M.U.Kokate	Chairman PBOS	Government Poytechnic,Pune
2.	Mrs.Jayashree Gurumuthy	Faculty Seed Institute	Seed Infotech.Pvt. Ltd
4.	Mr.Sandeep Deshmukh	Consultant from Industry	Tata Technologies Pvt. Ltd.
5.	Mr.Akbar Shaikh	Consultant from Industry	Cognizant Technology Solutions Pvt. Ltd.
6.	Mr.B.S.Pawar	Faculty from nearby Institute	Government Polytechnic,Jalna

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)**

(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 WebPages.

Course Outcomes:

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

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

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Course Contents

Ch. No.	Name of Topic/Sub topic			Hrs	Weightage
1	**An Inside Look At JavaScript Programming**				
Learning Outcomes: • Write and Execute webpages with JavaScript programs using basic syntactical construct.	1.1	Getting Down To JavaScript		04	04
	1.2	Values and Variables			
	1.3	Operators and Expressions			
	1.4	if Statement			
	1.5	switch…case Statement			
	1.6	Loop Statement			
2	**Arrays ,Functions and String**				
Learning Outcomes: • Write and Execute webpages with JavaScript programs using Arrays. • Write and Execute webpages with JavaScript programs using Functions. • Write and Execute webpages Using String utilities in JavaScript .	2.1	Array : Declaring, DefiningLooping The Array, Adding Array Element		08	10
	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			
3	**Forms and Event Handling**				
Learning Outcomes: • Write and Execute webpages with forms and JavaScript programs responding to form events. • 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	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			
4	**Cookies and Browser Windows**				
Learning Outcomes: • Write and Execute JavaScript for handling cookies. • Write and Execute JavaScript for controlling window positions. • Write and Execute JavaScript for changing window contents dynamically.	4.1	Cookie Basics, Creating, Reading, Setting the Expiration Date, Deleting	04	06	
	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			
	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			
5	**Regular Expressions, JavaScript and Frames**				
Learning Outcomes: • Write and Execute JavaScript for handling child windows. • Write and Execute JavaScript using regular expressions for validating/ formatting user input on the webpage.	5.1	Regular Expression: The Language of a Regular Expression, Replace Text , Return the Matched Characters	04	06	
	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			
6.	**Rollovers, Status Bar, Banners, Slideshow, Protecting Your WebPage**				
Learning Outcomes: • Write and Execute JavaScript for for creating rollover images or giving rollover effects on the webpage. • Write and Execute JavaScript for	6.1	Setting the Stage			
	6.2	Creating a Rollover			
	6.3	Text Rollovers			
	6.4	Multiple Actions for a Rollover	04	06	
	6.5	More Efficient Rollovers			
	6.6	Making Magic Using the Status Bar			
	6.7	Banner Advertisements			
	6.8	Creating a Slideshow			

				Total	32	40
managing display on status bar of the window. • Write and Execute secured JavaScript code.	6.9 6.10	Hiding Your Code Concealing Your E-mail Address				

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

CO-PO Matrix :

CO /PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	3	3	2	1	2	3	3	3
CO2	-	3	3	3	2	-	2	3	3	3
CO3	-	3	3	3	2	-	2	3	3	3
CO4	2	3	3	3	2	-	2	3	3	3
CO5	--	3	3	3	2	-	2	3	3	3
Summary	2	3	3	3	2	1	2	3	3	3

CO-PSO Matrix :

CO /PSO	PSO1	PSO2	PSO3
CO1	-	-	3
CO2	-	-	3
CO3	-	-	3
CO4	-	-	3
CO5	-	-	3
Summary	-	-	3

Prepared By　　　　　　　**Secretary, PBOS**　　　　**Chairman, PBOS**
Prof. M.U.Kokate　　　　　**Prof. S. V.**　　　　　　**Prof. U.V.Kokate**
Prof. S.P.Emekar　　　　　**Chaudhari**

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

- Describe various components of .NET Framework.

- Write VB.NET program using Loops, Control structures, Form controls and OOP Concepts.

- Write VB.Net applications using Microsoft ADO.NET.

- Set up a programming environment for ASP.Net Programs.

- Create web applications using Asp.Net controls&ADO.Net.

- Build VB.Net applications using Graphics and Animations.

Course Contents:

JJ. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs
Units 1 : Introduction		
• Describe the procedure for using Visual Basic.Net Environment • Identify different Building Blocks • 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 1.2 VB.Net: VB.Net overview, Difference between VB and VB.Net 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. • Implement lists and loops with controls and iteration in VB.Net • Separate operations into appropriate procedures and functions • 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. 2.2 Implementation of OOP: Creation of class and objects, Inheritance, Constructors, Exception handling. 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 • Write program for database connection & querying database • Define Multi-threading • 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 3.2 Accessing and manipulating Data: Selecting data, Insertion, deletion, updating, Sorting, How to fill dataset with Multiple tables. 3.3 Multi-threading: Working with	**06**

	multithreading, Synchronization of Threads.	
Unit 4: Introduction to ASP.Net, objects and components		
• Debug and deploy ASP.NET web applications • Create a rich GUI for web based applications using a rich set of controls • 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. 4.2 Web forms Controls: Creation of web forms Controls, Using web form controls. Response, Server, Application, Session. ASP.Net scope, state, viewstate, post back and configuration 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. 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 • Perform configuration settings in web.config file • Generate and add crystal reports to web form	5.1 ADO.Net in ASP.Net, Connection, Dataset and datareader, Data table and Data row, Web.configintroduction, Binding data with data grid, Accessingand manipulating data. 5.2 ADO.Net : Server control templates and Data bindingtechniques, Understand data access in .Net using ADO.Net, Understand various Server ControlTemplates available for Data Binding like Repeater,Data List and Data Grid Controls. 5.3 Crystal Reports -Adding a report ,creating a report-step by step,ReportDesigner, adding a report to a web form,moving a Crystal Reports	**06**

Unit 6: Graphics and Animation		
• Create, debug, and test a program using appropriate components, image buffering, timers, and user input • Implement various event procedure, pen and brush objects • Create simple animation controlling pictures	6.1 The graphics Environment, Steps for drawing Graphics, The Paint Event Procedure, Pen and Brush Objects. CoordinateSystem, GraphicsMethods, Random Number Example 6.2 Simple Animation Displaying an Animated Graphic, Controlling Pictures at run time, Moving a picture ,The Timer Component 6.3 Scroll Bar Controls Scroll Bar Properties, Scroll Bar Event, Programming Example	**04**
	Total Hrs.	**48**

KK.List of Practicals/Laboratory Experiences/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Units	Course Outcomes	PR Tut. 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) (a) Using dataset, data reader. (b) Same application using data table and data	**Introduction to ASP.Net, objects and components ,Introduction to ASP.Net, objects**	CO2, CO4, CO5	06

		and components		
	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)	**and components**		
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 for Theory Paper:

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**

Mapping Course Outcomes With Program Outcomes:

CO ↓	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Describe various components of .NET Framework.	--	--	--	--	--	--	--	--	2	--
Write VB.NET program using Loops, Control structures, Form controls and OOP Concepts.	1	3	3	3	1	1	--	3	2	-
Write VB.Net applications using Microsoft ADO.NET..	1	3	3	3	1	1	--	3	2	--
Set up a programming environment for ASP.Net Programs	--	2	3	3	2	1	--	2	--	1
Create web applications using Asp.Net controls&	1	3	3	3	1	1	--	3	2	1

ADO.Net.										
Build VB.Net applications using Graphics and Animations	1	3	3	3	1	1	--	3	2	--
Summary	**1**	**3**	**3**	**3**	**2**	**1**	**--**	**3**	**2**	**1**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO/PSO ⟶	Hardware and Networking	Database Technologies	Software Development
Describe various components of .NET Framework.	-	-	-
Write VB.NET program using Loops, Control structures, Form controls and OOP Concepts.	-	-	3
Write VB.Net applications using Microsoft ADO.NET..		3	3
Set up a programming environment for ASP.Net Programs	-	-	3
Create web applications using Asp.Net controls& ADO.Net.	-	3	3
Build VB.Net applications using Graphics and Animations	-	-	3
Summary	**-**	**3**	**3**

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 IT**
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

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

Course Contents:

LL. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs	Weightage
Section I			
Units 1 : Software Engineering Concepts			
• Define Software and its Characteristics. • Identify need Umbrella Activities • Choose and apply domain specific life cycle model for software product development.	1.1 The Evolving Role of Software	06	13
	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. • Use various requirement gathering techniques. • Use & Design use case for Requirement Elicitation • 4.Validate Requirement and	2.1 Requirement Engineering Tasks: Inception,Elicitation, Elaboration, Negotiation,Specification, Validation.	08	13
	2.2 Initiating the Requirement Engineering Process:Stakeholders, Recognizing Multipoint Viewpoint, Working Towards		

Build Analysis model (SRS)	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. • Apply various tools and techniques for Estimation. • To Determine Size using Function-Point metric and Cost Estimation using COCOMO model. • To design RMMM Plan.	**3.1** The Management Spectrum:4 P's and Significance.	**10**	**11**
	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		
Section II			
Unit 4: Project Scheduling			
• Employ group working	**4.1** Basic concepts,-Basic principles :The relationship between people and effort.	**06**	**13**

skills. • Do the Project Scheduling and tracking using different techniques. • To track the schedule of project using Earned value analysis.	**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. • Make effective use of UML, along with design strategies. • Evaluate the quality of the requirements, analysis and design work done during the module. • To design Data Flow Diagram for different projects. • To design SQA Plan	**5.1** Quality concepts ,The quality movement, Software quality assurance ,SQA activities, Software reviews	**08**	**16**
	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. • To Describe software maintenance process. • To apply unit, integration, system testing for software project. • To Compare Reverse and Re-engineering	**6.1** Software testing Fundamentals ,Testing objectives ,Testing principles, Testability	**10**	**14**
	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 Hrs.	**48**	**80**

B .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 Hrs.		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 assurance	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**

CO-PO Matrix:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Select and use specific SDLC model for assigned project/ case study.	-	3	1	-	2	--	2	3	3	3
Identify customer needs and formulate problem statement and present Software	1	2	1	1	2	1	2	3	3	3

Make effective use of UML tools.	--	3	2	3	2	1	1	3	3	3
Estimate size and cost of given software project.	1	3	2	2	--	2	2	3	2	3
Apply project management and quality assurance principles to software project development.	1	3	3	1	1	1	2	3	3	3
Test software by developing various test cases for software project.	1	3	3	-	1	2	2	2	2	2
Summary	1	3	3	2	2	2	2	3	3	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix:

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development

Select and use specific SDLC model for assigned project/ case study.	-	--	3
Identify customer needs and formulate problem statement and present Software	--	--	3
Make effective use of UML tools.	--	1	3
Estimate size and cost of given software project.	--	--	3
Apply project management and quality assurance principles to software project development.	--	--	3
Test software by developing various test cases for software project.	--	--	3
Summary	**-**	**1**	**3**

Reference & Text Books:

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 : NC 481

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

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

Course Content:

Chapter No.		Name of Topic/Sub topic	Hrs	Weightage
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.		**Corporate Etiquettes & Professionalism**		
	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		
3.		**Time Management**		
	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		
4.		**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		
5.		**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**

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

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
Course Code	:	NC 482

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

- Understand importance of goal setting and strategies for setting one's goal.
- Develop and practice self- study techniques.
- Use and practice stress management techniques for good health
- Use and practice problem solving skills.
- Understand importance of ethics and value system   for positive interpersonal relations.
- Develop overall personality and be successful in his/her career.

 Course Content:

Sr. No.	Name of Topic/Sub topic		Hrs	Weightage
1.	**Motivation & Goal Setting**			
	1.1	Importance of goal setting,	**--**	**--**
	1.2	How to set SMART goals.		

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.			
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.			
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			
5.	**Creativity**				
	5.1	Definition of Creativity, Tips and ways to increase creativity, importance of creativity.		--	--
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: Video cassettes on 1. Motivation & Goal Setting
2. Stress Management,3. Ethics & Motivation

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

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

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 Objectives:

After studying this course, the student will be able to
- To handle Keyboard Input
- To handle Mouse Input
- To create Check Boxes, Radio Buttons, List Boxes, Combo Boxes, Scroll Bars
- To create Menus, Toolbar buttons etc.
- To create Dialog Boxes, add controls etc.

Course Content:

Chapter No.		Name of Topic/Sub topic	Hrs	Weightage
		SECTION - I		
1		**Overview of MS-Windows**		
	1.1	The Windows Environment, Windows Programming Options, Your First Windows Program,	**04**	**08**
	1.2	A brief History of Character Sets, Wide Characters And C, Wide Characters And Windows,		
	1.3	Windows and Messages		
2		**An Exercise in Text Output:**		
	2.1	Introduction to GDI		
	2.2	Scroll bars, Building a better Scroll		
	2.3	The Structure of GDI, The Device Context	**12**	**12**
	2.4	Drawing Dots and Lines, Drawing Filled Areas		
	2.5	The GDI Mapping Mode		
	2.6	Rectangles, Regions and Clipping.		
		SECTION - II		
3		**The Keyboard and Mouse**		
	3.1	Keyboard Basics		
	3.2	Key-stroke Messages, Character Messages, Keyboard Messages and Character Sets		
	3.3	Mouse Basics,	**08**	**10**
	3.4	Client- Area Mouse Messages, Non-Client- Area Mouse Messages, Hit-Testing in your Programs, Capturing the Mouse		
4		**The Timer**		
	4.1	Timer Basics		
	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	**08**	**10**
	4.4	The Button Class, Controls and Colors, The Static Class, The Scroll Bar Class, The Edit Class, The List Box Class		

		Total	**32**	**40**

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 Joseph M. Newcomer	Win32 Programming	Addison Wesley

Learning Resources: Books, Models

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
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**

CO-PO Matrix

CO ↓	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Create Dialog Boxes.	-	2	1	1	-	-	-	-	-	-
Draw different object using GDI.	-	2	1	1	-	-	-	-	-	-
Interface I/O devices like keyboard and mouse using controls.	-	2	1	1	-	-	-	-	-	-
Use timer and apply child window control for windows application		3	1	1	-	-	-	-	-	-
Summary	**-**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix :

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Create Dialog Boxes	-	-	1
Draw different object using GDI.	-	-	1
Interface I/O devices like keyboard and mouse using controls.	-	-	2
Use timer and apply child window control for windows application	-	-	2
Summary	-	-	**2**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

(Prof.Smt .A.M.Galshetwar , (Prof. S.V.Chaudhari) (Prof.M.U.Kokate)
Smt.J.P.Dandale &
Smt.Sneha Raut)

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

GOVERNMENT POLYTECHNIC, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

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

- Identify roles and responsibilities of DBA .
- Create and Manage the database
- Create and manage control files & Redo log Files
- Backup and Recover Database using RMAN tool.
- Manage tables, indexes and constraints.
- Create and Manage the database users .

Course Contents:

MM. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
SECTION-I		
Units 1 : Basic of the DBA		
17. Define Responsibilities of DBA 18. Define the purpose of tablespaces and data files 19. Create and Manage Tablespaces. 20. Describe Physical ,Logical and memory structure of Oracle database. 21. Plan an Oracle installation	1.15 Responsibility of DBA, Oracle Architectural Components-Overview of Primary Components, Oracle server, Oracle instance, Establishing Connection and Creating a session, Oracle Database . 1.16 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 1.17 Getting Started with the Oracle Server-: Database Administrative Tools - Oracle Universal Installer, DBCA, SQL * plus, OEM 1.18 Managing Tablespaces : Types of Tablespaces , Creating , Altering and Dropping Tablespaces	07
Unit 2: Managing an Oracle Instance AND Database		
1.Create a database with the Database Configuration Assistant (DBCA) tool. 2.Create and Manage the database by writing command. 3. Start and stop the Oracle database and components 4.Modify database initialization parameters	2.1 Managing an Oracle Instance- Initialization Parameter Files, PFILE, SPFILE, Starting Up a Database. 2.2 Creating Database- Planning & Organizing database, OFA, Prerequisites necessary for Database creation, Creating Database using DBCA, Creating Database Manually 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		
1. Create and Manage Redo Log Files and Control Files . 2. Describe the main concepts and functionality of Automatic Storage Management (ASM) 3. Describe the mechanism of OMF data file	3.1 Control File- Control File Contents, Creating Control File, Multiplexing Control File, Obtaining Control File Information 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 3.3 Why use Oracle Managed Files (OMFs), The mechanism of OMF, OMF Data File 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		
1. Identify the types of failure that may occur in Database 2. Backup database without shutting it down 3. Backup database using RMAN tool 4.Recover Database using RMAN tool.	4.1 Database Backup: Factors impacting Backup and Recovery, Understand why System Fails, Why Need to be BackupUp?, 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. 4.2 Database Recovery: Types of Database Failure , Different Recovery environment, The Oracle Recovery Process-Crash & Instance Recovery , Media Recovery 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		

1. Create and Manage tables
2. Create and manage Indexes on given
   data.
3. Apply different constraints on table
   to maintain integrity.
	5.1 Managing 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
	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
	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		
1. Create and Manage Users in Oracle database 2. Grant and revoke privileges 3. Create and Manage the User Roles 4.Create and manage profiles 5. Implement standard password security features on database. .	6.1 Managing User : Creating Users, Altering Users, Dropping Users 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 6.3 Password Management: Enabling Password Management, Password Account Locking, Creating Profile, Altering Profile, Dropping Profile with password setting	**05**

	6.4 Auditing: Auditing Guidelines ,Statement Auditing, Schema Object Auditing, Fine Grained Auditing, Obtaining Auditing Information	
	Total Hrs.	**32**

NN. 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** • Create Different types of Tablespaces • To Extend the Size of a tablespace • To Decrease the size of a tablespace • Making a Tablespace Read only. • Renaming Tablespaces • Dropping Tablespaces • Change the storage settings of	Managing Tables, Indexes and Data Integrity	CO2	02	04

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

13	**Managing Roles-** • Create and modify Roles • Enabling and Disabling Roles • Control availability of Roles • Removing Roles • Display Role Information		CO6	02	02
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	02
		Total Hrs.		**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	06
02	Managing an Oracle Instance AND Database	02	01	02	05
03	Maintaining Control and Redo Log files AND Storage Management	02	02	02	06
04	Overview of Backup & Recovery	02	02	03	07
05	Managing Tables, Indexes and Data Integrity	02	02	04	08
06	Database Security & Auditing	02	02	04	08
	Total	**14**	**10**	**16**	**40**

Mapping Course Outcomes with Program outcomes:

CO ↓	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Identify roles and responsibilities of DBA .	-	1	-	-	1	-	-	1	-	-
Create and Manage the database	-	3	-	-	-	-	-	2	2	-
Setup and Schedule for database backup	-	3	3	3	1	1	-	2	2	-
Backup and Recover Database using RMAN tool.	-	3	3	3	1	1	-	2	2	-
Manage tables, indexes and constraints.	-	3	3	3	1	1	-	2	2	-
Create and Manage the database users .	1	3	3	3	1	1	-	2	2	-
Summary	**1**	**2**	**3**	**3**	**1**	**1**	**-**	**2**	**2**	**-**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix:

CO/PSO	Hardware and Networking	Database Technologies	Software Development
Identify the scope and necessity of Data Mining & Warehousing for the Society.	-	1	1
Design a data mart or data warehouse for any organization.	1	3	1
Compare OLAP and data mining as techniques for extracting knowledge from data warehouse.	-	3	-
Identify various stages of knowledge discovery of Database	1	3	1
Mine the Frequent Item sets and Association Rules.	-	3	1
Perform Clustering technique on dataset.	-	3	1
Summary	-	3	1

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   **Member Secretary PBO**   **Chairman 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

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60 min. duration	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:

OO.Theory :

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

.		
Unit 5: Browser: Handling		
1. Develop web pages using GUI components 2. Implement validation of web page on client and server side 3. Describe use and storage of cookies.	5.1 Creating a webpage using GUI Components, Reading data from web page 5.2 Web page validation(Client-Server side) 5.3 Session, Cookies & Sending Email	**04**
Unit 6: Databases		
1. Use database techniques for creating and manipulating databases through PHP.. 2. Write programs for MySQL connectivity.	6.1 Relational Database and SQL using MySQL 6.2 PEAR DB basics, Advanced Database Techniques 6.3 Sample Application for PHP-MySQL Connectivity	**06**
	Total Hrs.	**32**

PP. 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	Arrays and	2	2

	array, Associative and Multidimensional array.	Graphics		
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), Tata - Macgraw hill	

CO-PO Matrix :

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Write program in PHP for interactive web development.	2	2	3	3	1	1	2	3	2	2
Implement different functions and use type conversion methods.	2	2	3	3	1	1	2	3	2	2
Write programs using arrays and graphics concepts.	-	-	-	-	-	-	-	1	1	2
Apply object oriented concepts in programming.	2	2	3	3	2	-	2	2	3	3
Develop web pages with validations.	--	2	3	2	1	-	2	3	3	3
Create and manipulate	1	-	-	-	-	-	-	-	-	-

database in PHP programming.										
Summary	**2**	**2**	**3**	**2**	**2**	**1**	**2**	**2**	**2**	**2**

CO-PSO Matrix :

CO /PSO →	Hardware and Networking	Database Technologies	Software Development
Write program in PHP for interactive web development.	-	-	1
Implement different functions and use type conversion methods.	-	-	3
Write programs using arrays and graphics concepts.	-	-	3
Apply object oriented concepts in programming.	-	-	1
Develop web pages with validations	-	-	3
Create and manipulate database in PHP programming.	-	-	1
Summary	**-**	**-**	**2**

Prepared by   **Secretary,PBOS**   **Chairman,PBOS**
Prof.K.S.Gaikwad   **Prof.S.V.Chaudhari**   **Prof.M.U.Kokate**

Prof.G.B.Garud

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		
1. Describe Object Modeling Technology 2. 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. 1.2 Importance of Modeling, principles of Modeling	**04**
Unit 2: Object Modeling and Overview of UML		
1. Interpret object and class diagrams. 2. Draw diagrams using different relationships. 3. Explain unified software development life cycle.	2.1 Objects and Classes (Object Diagrams, Attributes,Operations and Methods), Links, Associations andAdvanced Concepts (General Concepts, Multiplicity, Link Attributes, and Association as a Class, Roll names, Ordering, Qualification, and Aggregation). 2.2 Generalizations and Inheritance, Grouping Constructs. 2.3 Aggregation verses Association and Generalization,Recursive Aggregates and Propagation of Operations. 2.4 Abstract Classes, Multiple Inheritance, Metadata, Candidate Keys, Constraints 2.5 Introduction to Dynamic and Functional Modeling. 2.6 Overview of UML, Scope of UML, Conceptual model ofUML, Architectural – Metamodel, Unified SoftwareDevelopment Lifecycle. 2.7 Introduction to UML Diagram	**06**
Unit 3:Structural Modeling (Use Case, Class Diagrams, Object Diagrams)		

1. Draw object and class diagrams. 2. Draw Use case diagram. 3. Draw advance class diagram by using relationship and interfaces.	3.1 Use case diagram: Terms and Concepts 3.2 Detail Use case specification 3.3 Use case modeling (actors, use cases, relationships) 3.4 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)

1 Differentiate between various interaction diagrams. 2 Draw interaction, sequence diagram and communication diagram. 3 Solve examples using diagrams.	4.1 Interaction diagrams. Introduction of interaction diagrams, what are different types of interaction diagrams. 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. 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

1. Draw Activity diagrams. 2. Draw state diagrams using various constraints. .	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. 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		
1. Draw component diagrams. 2. Explain different components of component diagram. 3. Draw package diagrams using different elements. 4. 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. 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. 6.3 Deployment Diagrams: Terms and Concepts used in deployment diagrams, example.	**06**
	Total Hrs.	**32**

QQ. 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 Hrs.		**64**

CO-PO Matrix:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Explain principles and importance of object oriented modeling and design.	-	3	-	-	-	-	-	-	-	-
Identify different notations to draw UML diagrams.	-	2	3	3	2	1	-	2	2	3
Design structural model for given problem.	-	2	3	3	2	1	1	2	3	3
Design interactive model for given problem.	-	2	3	3	2	1	1	2	3	3
Design behavioral model	-	2	3	3	2	1	1	2	3	3

for given problem.										
Design UML model for given application.	-	2	3	3	2	2	2	2	3	3
Summary	-	2	3	3	2	1	1	2	3	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix:

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development
Explain principles and importance of object oriented modeling and design.	-	-	1
Identify different notations to draw UML diagrams.	-	2	2
Design structural model for given problem.	-	2	3
Design interactive model for given problem.	-	2	3
Design behavioral model for given problem.	-	2	3
Design UML model for given application.	1	2	3
Summary	**1**	**2**	**3**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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, Rumbaugh, Addison Wedley publication	
5	Practical OOD with UML	Mark Paiestly, Tata McGRAW Hill publication	

List Of Experts & Teachers Who Contributed For This Curriculum:

S.N.	Name	Designation	Institute / Industry
1.		Lecturer	Government Polytechnic Pune
2.		Lecturer	Government Polytechnic Pune

Prepared by

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

Programme	:	Diploma in CM/IT
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:

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

Course Content:

Unit No.	Name of Topic/Sub topic		Hrs	Weigh tage
	SECTION I			
1	**The Windows Server 2008 Environment**			
Learning Outcomes: • Install Windows server 2008 operating system. • Configure administrative tools. • 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**	**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.		
2	**Managing Access to Resources & Managing User Environment**			
Learning Outcomes: • Compare various file systems. • Apply NTFS permissions to files and folders. • Configure Active directory. • 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.		**16**
	2.2	The active directory's logical structure, Benefits of active directory, Components and mechanisms in active directory –datastore, 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.	**12**	
3.		**Administrative Templates and Audit Policy**		
Learning Outcomes: • Manage Group Policies. • Use Account policy. • 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**	**12**
	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				
4		**Windows Server 2008 networking & IP Routing**		
Learning Outcomes: • Describe network infrastructure. • 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**	**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.		

5		DHCP & Domain Naming Systems		
Learning Outcomes: • Install and Configure DNS and DHCP server. • 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	16
	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.		
6		Backup and Recovery Strategy & Cloud Computing		
Learning Outcomes: • Implement different backup and recovery strategies. • 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	12
	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	80

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 i) Assign IP Address ii) Verify IP Communication	4	CO4	06
	Implementation of local, roaming, hardware profile.		-	
5.	Installation and verification of Active Directory 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 DNS Namespace ii)DNS Zones		**CO5**	

6.	Installation and implementation of DHCP
	
	  i) Authorizing DHCP for Active Directory
	
	  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

CO-PO Matrix :

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Install and configure Windows server 2008 .	-	3	3	1	-	-	1	2	1	2
Manage Group policies.	-	3	3	-	2	-	-	2	1	2
Apply NTFS permissions to files and folders.	-	3	3	-	2	-	-	2	1	2
Create subnets and configure TCP/IP properties.	2	3	3	-	-	-	-	2	1	2
Configure DNS and DHCP servers.	-	3	3	-	-	-	1	2	1	2
Manage storage and backups for various users.	1	3	3	3	2	1	-	2	1	2
Summary	**2**	**3**	**3**	**2**	**2**	**1**	**1**	**2**	**1**	**2**

CO-PSO Matrix :

CO /PSO	Hardware and Networking	Database Technologies	Software Development
Install and configure Windows server 2008 .	3	-	-
Manage Group policies.	3	-	-
Apply NTFS permissions to files and folders.	2	-	-
Create subnets and configure TCP/IP properties.	3	-	-
Configure DNS and DHCP servers.	3	-	-
Manage storage and backups for various users.	2	1	-
Summary	**3**	**1**	**-**

Specification Table :

Unit No.	Units	Levels from Cognition Process Dimension			Total Marks
		R	U	A	
01	The Windows Server 2003 Environment	02	02	08	12
02	Managing Access to Resources & Managing User Environment	04	02	10	16
03	Administrative Templates and Audit Policy	02	02	08	12
04	Windows Server 2008 networking & IP Routing	02	02	08	12
05	DHCP & Domain Naming Systems	04	02	10	16
06	Backup and Recovery Strategy & Cloud Computing	04	02	06	12
	Total	18	12	50	80

Prepared By   Secretary, PBOS   Chairman, PBOS

(Smt. H.F.Khan,

Smt. B.K.Vyas)

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:

RR. Theory :

Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
SECTION I		
Units 1 : Graphics Systems		
1.Define the scope of Graphics 2.State all Graphics input devices . 3.Explain the advantages and future scope of graphics in Computer 4.Compare Raster scan and Random scan display devices	1.1 Need of Computer Graphics, Applications, Advantages, Future Scope. 1.2 Graphics Software, Graphics Functions & Standards 1.3 Video display Devices 1.4 Graphics input devices and Coordinate representations	**12**
Unit 2: Raster Scan Graphics		
1.Apply Bresenham's and DDA algorithms to draw line,circle 2 Use of polygon filling methods. 3.Compare Boundary fill and Flood fill algorithms 4.Discuss Character generation Methods 5.Compare DDA line and circle drawing with Bresenham's line and circle drawing algorithms .	2.1Line Drawing Algorithms: Digital Differential Analyzer, Bresenham's Algorithm 2.2Circle Generation- Bresenham's Algorithm 2.3Polygon Filling : Seed fill algorithms: Flood fill, Boundary fill, scan line algorithms 2.4Character Generation:-Stroke method, Starburst method, Bitmap method ,Introduction to Frame Buffers	**16**
Unit 3:Two and Three Dimensional Transformations		
5. Define Translation,scaling and rotation 6. Apply 2D Transformations using Translation,scaling and rotation factors 7. Apply Composite Transformations using Translation,scaling and rotation factors 8. Compare 2D and 3D transformations.	3.1 Basic 2D Transformations: Translation, Scaling, Rotation 3.2 Matrix representations & homogeneous coordinates 3.3 Composite Transformations-Scaling relative to a fixed pivot, rotation about a pivot point 3.4 Other 2D transformations 3.5 Three dimensional transformation	**12**
SECTION II		
Unit 4: Curves, Fractals, Hidden Surfaces, Light and Color Models		

1.Discuss object space and image space methods 2.Learn the various color models 3.Explain various Shading algorithms 4.Compare Point source and Diffused illumination methods 5.Define properties of Bezier curve 6.Describe advantages of RGB over HIS	4.1 Hidden surfaces: introduction, back-face removal algorithm: Painter's algorithm 4.2 Light and Color: Introduction, Diffused illumination, point source illumination. 4.3 Shading Algorithms, reflections, shadows. 4.4 Color models and tables: RGB, HIS, CMY. 4.5 Introduction to curve generation: Bezier Curve.	18
Unit 5: Animation and Gaming Platforms		
1.Enlist methods for controlling animation 2.Explain animation languages used for Animation 3.Evaluate Look-Up table to achieve Real time animation 4.Discuss basic guidelines used for animation	5.1 Introduction, Conventional and Computer based Animation. 5.2 Real Time animation by look up Table 5.3 Methods for controlling Animation: Full Explicit Control, Procedural Control. 5.4 Basic Guidelines of Animation. 5.5 Animation Languages: Linear list notations, General purpose languages, Graphical Languages.	14
Unit 6: Gaming Technologies		
1.Use of OpenGL using its syntax 2.Discuss the connection between CPU and GPU 3.Discuss OpenGL syntax,Header files. 4.Demonstrate Complete OpenGL program 5.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 6.2 NVIDIA GPU: Connection between CPU and GPU, Architecture 6.3 Graphics Memory Pipeline 6.4 Introduction to Graphics Tools:-Maya,3D Studio Max.	08
	Total Hrs.	**80**

SS. 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). 1. Use OpenGL ES to draw a line for Android Mobile. 2. Use Microsoft IDE to Draw a line Diagram. 3. Use VRML to draw a line Diagram. 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
		Knowledge	Comprehension	Application	
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	

CO-PO Matrix:

CO ↓	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Explain components in Computer Graphics	-	2	-	-	-	-	-	-	2	2
Write 'C' programs to draw line,circle and fill the polygons.	1	3	3	3	-	-	2	2	2	3
Compute 2D and 3D transformations using two dimensional and three dimensional matrices.	3	2	3	-	-	-	2	2	2	3
Explain back-face removal algorithms ,shading algorithms and color models	2	2	1	3	-	-	-	-	2	3
Use methods of controlling	-	2	3	3	2	1	-	2	1	3

animation and achieve real-time animation using Maya/OpenGL.										
Summary	1	3	2	2	1	1	1	2	2	3

CO-PSO Matrix :

CO /PSO ⟶	Hardware and Networking	Database Technologies	Software Development
Explain components in Computer Graphics	-	-	1
Write 'C' programs to draw line,circle and fill the polygons.	-	-	3
Compute 2D and 3D transformations using two dimensional and three dimensional matrices.	-	-	3
Explain back-face removal algorithms ,shading algorithms and color models	-	-	1
Use methods of controlling animation and achieve real-time animation using Maya/OpenGL.	-	-	3
Summary	-	-	2

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 tech involved in modern information systems. Students will gain an understanding of the variou which information systems can be attacked and tradeoffs in protecting networks. Students appreciation of the need to develop an understanding of underlying system applications and security issues early in the design process. New communication systems and digital techno made dramatic changes in the way we live and the means to transact our daily business. Bu are increasingly using computers to create, transmit and store information in electronic form of traditional paper documents. It is cheaper, easier to store and retrieve and speedier to con .This will enable them to develop a sound knowledge and analytical ability facilitating thei intellectual and professional development and future employment.

Course Outcomes:

1. Describe OSI security architechture
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		Hrs	Weightage
SECTION I				
1.	**Introduction to Information Security**			
• Describe OSI security architechture • Enlist attributes of security • 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		
	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		
2	**Security at each Layer**			

• Describe security at Application Layer	2.1	Security at Application Layer: PGP and S/MIME ,Email Security.		
• Explain SSL & TLS	2.2	Security at Transport Layer: SSL & TLS		
• Explain Internet Key Exchange(IKE)	2.3	Security at Network Layer: IPSec, Two modes, Two Security Protocols, Security Association, security Policy, Internet Key Exchange(IKE),ISAKMP	12	
3.		**Security Policies And Design Guidelines**		
• Describe policy creation	3.1	Policies: Creation, Regularity considerations, Privacy regulations.		
• Enlist design guidelines for security	3.2	Security: Infrastructure and components. Design guidelines	08	
• Differentiate between Physical and logical access control.	3.3	Authentication: Authorization and accounting. Physical and logical access control.		
	3.4	User Authentication: Biometric devices		
SECTION II				
4.		**Application and Web security**		
• Identify web security threats	4.1	Application Hardening, application patches, web servers, active directory	08	
• Explain code injection	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.	
5.		**Disaster Recovery, Business Continuity and Organizational Policies**	
• Describe Disaster recovery process. • 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	
	5.2	Policies and Procedures-Security Policies, Privacy, Service Level Agreements, Human Resource Policies, Code of ethics , Incident response policies.	
6.		**Change Management & Privilege Management**	
• Differentiate between Centralized and Decentralized Model • List and elaborate various auditing techniques.	6.1	Why Change Management? The Key Concept: Segregation of duties, Elements Of Change management	
	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**	**80**

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 developers/managers/support personnel),describe the purpose, organization and responsibilities of a change control board appropriate for this organization	04

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	Introduction and Explanation, Demonstration

		Policies	
Text/Reference Books:	6.	Change Management & Privilege Management	Introduction and Explanation, Demonstratio

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.

Mapping Course Outcomes With Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10

CO →	Basic knowledge	Discipline knowledge	Experiments & Practice	Engineering Tools	The Engineer & society	Environment & sustainability	Ethics	Individual and team work	Communication	Life-long learning
Describe OSI security architechture	--	2	2	2	2	2	1	1	1	2
Explain security at application and transport layer	--	3	2	3	2	1	1	1	1	1
Identify various access controls.	--	3	2	3	2	2	1	1	1	1
Describe web security threats	--	3	2	2	2	2	1	1	1	1
Formulate service level agreement	--	3	3	3	2	2	1	1	1	1
List and elaborate various	--	3	3	3	2	2	1	1	1	1

auditing techniques									
Summary	--	3	2	3	2	2	1	1	1	1

Mapping Course Outcomes With Program Specific Outcomes:

CO/PSO	Hardware and Networking	Database Technologies	Software Development
Describe OSI security architechture	1	--	2
Explain security at application and transport layer	1	--	2
Identify various access controls.	--	--	2
Describe web security threats	--	--	2
Formulate service level agreement	--	--	1
List and elaborate various auditing techniques	--	--	1
Summary	1	--	2

Specification Table:

Sr.	Topic	Cognitive Levels	Total

No.		Knowledge	Comprehension	Application	
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   **Secretary, PBOS**   **Chairman, PBOS**

(Prof.Smt .P.L.Sonawane &   **(Prof.S.V.Chaudhari)**   **(Prof.)**
Prof.Smt.T.D.Pawar)

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:

	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

- Identify the scope and necessity of Data Mining & Warehousing for the society
- Design a data mart or data warehouse for any organization.
- Compare OLAP and data mining as techniques for extracting knowledge from a data warehouse.
- Identify various stages of knowledge discovery of Database
- Mine the Frequent Item sets and Association Rules

- Perform Clustering technique on dataset.

Course Contents:

TT. Theory :

Specific Learning Outcomes	Topics and subtopics	Hrs.	Weightage
SECTION-I			
Units 1 : Introduction to Data warehousing			
- Identify need of data warehousing - Describe Architecture of Data Warehouse. - State the benefits of Data Warehousing	1.19 What is Data warehouse? Need for data warehousing, Characteristics of data warehousing	08	12
	1.20 Difference between Operational Database System and Data warehouse, Basic elements of data warehousing		
	1.21 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 Modeling - State the Data Warehouse Design Process - Design the Data warehouse.	2.1 Data Warehouse Modeling: Data Cube and OLAP, Data Cube: A Multidimensional Data Model	07	13
	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. • Compare OLAP and OLTP tool. • State the benefits of OLAP tool.	3.1 OLAP : Need of OLAP, Benefits of OLAP, Categories of OLAP tool, OLAP Guidelines	09	15
	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 Mining. • Explain concept of Knowledge Discovery of Data • Describe the Data Mining System • Identify various stages of KDD • State the Function of Data Mining.	4.4 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	15
	4.5 What Kind of data can be mined? What Kinds of Patterns Can Be Mined?		
	4.6 Major issues in data mining		
	4.7 Data Objects and Attributes types		
	4.8 Data Preprocessing: Why Preprocess the data? Major Tasks in Data Preprocessing		
	4.9 Introduction to Data Cleaning , Data Integration, Data Reduction and Data Transformation and Discretization.		
	4.10 Data Mining Functionalities / Tasks		
Unit 5: Mining Frequent Patterns and Association Rules			

• Define the Frequent Itemsets, Closed Item sets. • Find the Frequent Item sets using Apriori Algorithm. • Mine the Association Rules • Compare Classification and Prediction	5.1 Frequent Patterns, Market Basket Analysis: A Motivating Example	09	15
	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 methods • Measure the Quality of Clustering • Describe Data Mining Trends	6.1 What is Cluster Analysis? Requirement s for Cluster Analysis	07	10
	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 Hrs.	**48**	**80**

B. 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 Hrs.		**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 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

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**

R-Remember   U – Understand   A – Analyze / Apply

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**

CO-PO Matrix:

CO	PO1 Basic knowledge	PO2 Discipline knowledge	PO3 Experiments & Practice	PO4 Engineering Tools	PO5 The Engineer & society	PO6 Environment & sustainability	PO7 Ethics	PO8 Individual and team work	PO9 Communication	PO10 Life-long learning
Identify the scope and necessity of Data Mining & Warehousing for the Society.	-	1	-	-	1	-	-	1	-	-

Design a data mart or data warehouse for any organization.	1	1	2	2	2	1	-	2	2	-
Compare OLAP and data mining as techniques for extracting knowledge from data warehouse.	1	2	2	2	1	-	-	1	1	-
Identify various stages of knowledge discovery of Database	1	2	1	1	1	1	-	1	2	-
Mine the Frequent Item sets and Association Rules.	2	2	3	3	1	1	-	1	1	-
Perform Clustering technique on dataset.	1	2	3	3	1	-	-	1	1	-
Summary	**1**	**2**	**3**	**3**	**1**	**1**	**-**	**2**	**2**	**-**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrix:

CO/PSO	Hardware and Networking	Database Technologies	Software Development
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 data warehouse.	-	2	-
Identify various stages of knowledge discovery of Database	-	2	-
Mine the Frequent Item sets and Association Rules.	-	3	1
Perform Clustering technique on dataset.	-	3	1
Summary	**-**	**3**	**1**

Reference & Text Books:

Sr.No.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Data mining concepts and techniques	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

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