

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 Objectives:

After studying this course, the student will be able to

- Comprehend the passage.
- Answer correctly the questions on unseen passages.
- Increase the vocabulary.
- Apply rules of grammar for correct writing.
- Speak correct English

Course Content:

Chapter No.	Name of Topic/Subtopic	Hrs	Marks	
1	GRAMMAR		12	20
	1.1	Tenses : Past Perfect, Past Perfect Continuous		
	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		PARAGRAPH WRITING		
	2.1	Types of paragraphs (Narrative, Descriptive, Technical)	04	10
3		COMPREHENSION	10	40
	3.1	Unseen passages		
4		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	Hrs.
1	Building of Vocabulary – 2 assignments 25 new words for each assignment with sentence	04
2	Conversational Skills – Role play student will perform the role on any 6 situations. Dialogue writing for the given situations.	04
3	Grammar – 2 assignments	04
4	Write paragraphs on given topics. 2 assignments.	04
5	Errors in English 2 assignments. Find out the errors and rewrite the sentences given by the teacher.	04
6	Essay writing 2 assignments. Write 2 essays on topic given by the teacher.	04
7	Biography (Write a short biography on your role model approximately in 250-300 words)	04
8	Idioms and phrases Use of idioms and phrases in sentences(20 examples)	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

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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
Course : Communication Skills
Course Code : HU182

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	One Class Tests of 60 Minutes and an Oral	03 Hrs.	--	--	--
Marks	20	80	--	25	--

Course 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 Objective:

After studying this course, the student will be able to

- Understand and use the basic concept of communication and principles of effective communication in an organized set up and social context.
- Give a positive feedback in various situations to use appropriate body language & to avoid barrier for effective communication.
- Write the various types of letters and office drafting with the appropriate format.
- Communicate with the Industry Professionals.

Course content:

Chapter No.	Name of Topic/Subtopic	Hrs	Marks
1	Basic Concepts And Principles Of Communication		
	1.1 The Communication Event The Communication event : Definition The elements of communication: The sender, receiver, message, channel, feedback	12	24
	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.		
2	Organizational Communication			
	2.1	What is an organization? Goal. Patterns of communication : Upward, Downward, Horizontal and Grapevine	04	12
3	Non-verbal Communication			
	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	12
4	Business Correspondence and Office Drafting			
	4.1	Business Correspondence : Letter of Enquiry, Order letter, Complaint Letter.	10	32
	4.2	Office Drafting : Circular, Notice and Memo		
	4.3	Job Application with Resume.		
	Total		32	80

List of Practicals/Experiments/Assignments:

Sr.No.	Name of Practical/Experiment/Assignment	Hrs.
1	Self Introduction	02
2	Elocution	04
3	Extempore	04
4	Mock Interview	04
5	Debate	02
6	Variety Application/Reports	02
7	Writing Paragraphs on Technical Subjects	02
8	Business letter	02
9	Individual/Group Presentation on identified topics	02
10	Group discussion	02
11	Role play	06
	Total	32

Reference Books :

Sr.No.	Author	Title	Publication
1	Joyeeta Bhattacharya	Communication skills	Macmillan Co.
2	Sarah Freeman	Written communication in English	Orient Longman Ltd.
3	Krishna Mohan and Meera Banerji	Developing Communication skills	Macmillan India Ltd.

Learning Resources: Books, Audio - Visual aids

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Basic Concepts and Principles of communication	08	08	08	24
2	Organizational communication	04	04	04	12
3	Non Verbal communication	---	---	12	12
4	Business Correspondence and Office Drafting	---	---	32	32
	Total	12	12	56	80

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Name of Programme: CE/EE/ET/ME/MT/CM/IT
Programme Code : 01/02/03/04/05/06/07/21/22/23/24/26
Name of Course : Applied Mathematics - I
Course Code : SC 181

Teaching Scheme:

	Hours / Week	Total Hours
Theory	03	48
Term Work /Tutorial	01	16

Evaluation:

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

Course Aim:

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

Course Objectives:

The students will be able to think logically and systematically. They will learn the importance of accuracy and develop attitude of problem solving with diligence and perseverance.

Course Contents:

Chapter No.	Name of Topic/Subtopic	Hrs	Marks	
1	ALGEBRA	18	32	
	1.1	Logarithms: Definition, Laws of Logarithms, Simple examples based on laws.	02	04
	1.2	Determinants: 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.	03	06
	1.3	Partial fractions: Rational fractions, resolving given rational fraction into partial fraction (Type : Denominator containing non-repeated, repeated linear factors and non repeated quadratic factor)	03	06
	1.4	Matrix Algebra - 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.	06	10

	1.5	Binomial Theorem 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)	04	06
2	TRIGONOMETRY		20	32
	2.1	Trigonometric ratios and fundamental identities.	04	08
	2.2	Trigonometric ratios of allied angles, compound angles, multiple angles (2A, 3A), submultiples angle.	06	08
	2.3	Sum and product formulae.	06	08
	2.4	Inverse Circular functions. (definition and simple problems)	04	08
3	COORDINATE GEOMETRY		10	16
	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.	06	10
	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.	04	06

Learning Resources – Chalk, Board etc.

Reference Books

Author	Title	Publisher
Shri S.P. Deshpande	Mathematics for Polytechnic Students	Pune Vidyarthi Griha
Shri S.L. Loney	Plane Trigonometry	Macmillan and London
Shri H.K. Dass	Mathematics for Engineers (Vol.I)	S.Chand and Comp.
Shri Shantinakaran	Engg. Maths Vol.I and II	S. Chand and Comp.

Specification Table :

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Algebra	08	16	08	32
2.	Trigonometry	08	16	08	32
3.	Co-ordinate Geometry	04	08	04	16
	Total	20	40	20	80

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Name of Programme : CE/EE/ET/ME/MT/CM/IT
Programme Code : 01/02/03/04/05/06/07/21/22/23/24/26
Name of Course : Applied Mathematics -II
Course Code : SC 182

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Term Work /Tutorial	01	16

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Three class tests of 60 minutes duration	3 Hrs	--	--	--
Marks	20	80	--	--	--

Course Aim:

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 Objectives:

The students will be able to, Understand basic facts of Mathematics about the field of analysis of any Engineering problem .Know the standard ways in which the problem can be approached. Apply basic concepts to engineering problems.

Course Contents:

Chapter No.	Name of Topic/Subtopic	Hrs	Marks
1	FUNCTIONS AND LIMITS :	13	18
	1.1 Functions: Concept of functions, Types of functions; (only definitions)	03	06
	1.2 Limits: Concept of limits and limits of functions. (algebraic, trigonometric, logarithmic and exponential.)	10	12
2	DERIVATIVES:	16	24
	2.1 Definition of the derivative, derivatives of standard Functions.	03	04
	2.2 Differentiation of sum, difference, product and quotient of two or more functions	03	04
	2.3 Differentiation of composite, inverse, implicit functions.	04	06
	2.4 Differentiation of parametric, exponential and logarithmic Functions.	04	06
	2.5 Successive differentiation.	02	04
3	APPLICATIONS OF DERIVATIVES:	05	08
	3.1 Geometrical meaning of derivative (Equations of tangents and Normals)	05	04
	3.2 Maxima and minima of functions.	02	04

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4	VECTORS		06	14
	4.1	Definition of vector, position vector, Algebra of vectors (Equality, addition, subtraction and scalar multiplication)	01	02
	4.2	Dot (Scalar) product with properties.	02	04
	4.3	Vector (Cross) product with properties.	02	04
	4.4	Workdone and moment of force about a point & line	01	04
5	NUMERICAL METHODS		08	16
	5.1	Solution of algebraic equations : Bisection method, Regulafalsi method and Newton - Raphson method	04	08
	5.2	Solution of simultaneous equations containing 2 and 3 Unknowns : Gauss elimination method. Iterative methods- Gauss Seidal and Jacobi's method	04	08
Total			48	80

(For Tutorials a batch of 20 students)

Reference Books:

Author	Title	Publisher
Vishwanath	Engineering Mathematics Vol.I	Satya Prakashan, New Delhi
S.P. Deshpande	Mathematic for polytechnic students I & II	Pune Vidyarthi Griha Prakashan
H.K. Dass	Mathematics for Engineering Vol-I	S.Chand and Company
Shantinakaran	Engineering Mathematics vol-I and II	S.Chand and Company

Learning Resources: Chalk, Board etc.

Specification Table:

Sr.No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Function And Limits	04	08	06	18
2	Derivatives	08	16	00	24
3	Applications Of Derivatives	00	00	08	08
4	Vectors	04	04	06	14
5	Numerical Methods	04	04	08	16
Total		20	32	28	80

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Name of Programme : CE/EE/ET/ME/MT/CM/IT
 Programme code : 01/02/03/04/05/06/07/21/22/23/24/26/15/16/17/18/19
 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			Term Work
		Theory	Practical	Oral	
Duration	1hr	3 Hrs	2 Hrs	--	--
Marks	20	80	50	--	--

Course Aim:

1. To understand various phenomena, principles and concepts in physics.
2. To understand the applications in Engineering Physics.
3. To solve the applied numerical problems.

Course Objective:

1. The student should be able to appreciate the role of physics.
2. The student should be able to think in scientific manner and apply the basic knowledge in different situations

Course Contents:

Chapter No.	Name of Topic/Subtopic	Hrs	Marks	
1	Motion	06	08	
	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.		
2	Properties of Matter	08	12	
	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 flow, turbulent flow, Reynolds's number (significance), applications and simple problems. Elasticity: Elastic, plastic and rigid bodies, stress and strain, Hook's law, types of elastic moduli with its relation, problems. Behaviour of wire under continuously increasing load.		

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3	Sound		03	06
	3.1	Wave motion, Transverse and longitudinal waves, free and forced vibrations, Resonance -explanation and example. absorption, reflection and transmission of sound.		
4	Heat		04	06
	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 $^{\circ}\text{C}$, $^{\circ}\text{K}$ with their conversion, absolute scale of temperature, modes of heat transfer, conduction, convection and radiation.		
5	Optics		06	12
	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.		
6	Electrostatics		06	10
	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.		
7	Current Electricity		06	10
	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	3 Electric work, electric power, energy, units and calculations of electric bill.		
8	Electromagnetism		03	06
	8.1	Magnetic effect of electric current, Ampere's rule, intensity of magnetic field, magnetic induction, Biot- Savart's Law (Laplace's Law), Fleming's left hand rule, force experienced by current carrying straight conductor placed in magnetic field, problems.		
9	Modern Physics		06	10
	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, work function, Einstein's photoelectric equation, photocell, problems.		
Total			48	80

List of Practical's: (Any Eight)

Sr. No.	Name of Experiment
1	Use of vernier calliper to measure the dimensions of different objects.
2	To understand the concept of error in instrument and to measure the dimensions of different objects using micrometer screw gauge.
3	To determine the velocity of sound using resonance tube method.
4	To determine period of simple pendulum.
5	To determine surface tension by capillary rise method.
	Repeat turn for experiments No.1 to 4
6	To determine the specific resistance using Ohm's law
7	To understand the concept of Whetstone's network and to determine the specific resistance using the meter bridge.
8	Comparison of EMF using single cell method.
9	To understand the concept of viscosity and hence to determine the coefficient of viscosity using Stokes' method.
10	Study of concept of total internal reflection.
11	Study of characteristics of photoelectric cell.
12	To determine permittivity of free space.
	Repeat turn for experiments No.5 to 8

Reference Books:

Author/s	Title	Publisher
R.K. Gaur and S. L. Gupta	Engineering Physics	Dhanpat Rai and Sons Publications
Manikpure, Prakash Deshpande and Dagwar	Basic Applied Physics	S. Chand and Co. New Delhi.
Modern Physics	Text book in Physics for diploma Engg. Student.	Sony Publications Pvt. Ltd.
Applied Physics	Schum's Series.	
Kshirsagar, Avdhanalu-	Engineering Physics	
M.S.Pawar, M.A.Sutar	Basic Physics (E Scheme)	

Learning Recourses :

1. Chart
2. Black Board
3. Television
4. Internet
5. Educational CD's
6. Models
7. Experimentation
8. Diagram Demonstration

Specification Table :

Sr. No	Topic	Cognitive Level			Total
		Knowledge	Comprehension	Applications	
1	General Physics	02	04	02	8
2	Properties of matter	04	04	04	12
3	Sound	02	02	02	06
4	Heat	02	02	02	06
5	Optics	04	04	04	12
6	Electrostatics	04	02	04	10
7	Current Electricity	04	02	04	10
8	Electromagnetism	02	02	02	06
9	Modern Physics	04	02	04	10
	Total	26	24	30	80

Note: Figures in the bracket indicate the marks for which question will be set to account for internal options.

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Programme : Diploma in CM
Programme Code : 06/26
Name of Course : Computing Essentials
Course Code : CM281

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 minutes.	02 Hrs.	--	--	--
Marks	10	40	25	--	25

Course Rationale:

In this world of high speed computing, it is essential for diploma in computer engineering students to know about basics of computer. This course is designed for basic perspective for first year diploma students.

Course Objectives:

Students should be able to

- Use computer system effectively.
- Describe and use different application software's.
- Demonstrate the basic functions of an operating system.
- Use essential utility programs.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
1.	Unit One: Classification and Components of Computer		
	1.1	04	04
	1.2		
	1.3		
2	Unit Two: I/O Media and Algorithms		
	2.1	08	08
	2.2		
3.	Unit Three: Main Memory		
	3.1	10	08
	3.2		
	3.3		

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4.	Unit Four: Computer Architecture			
	4.1	Introduction , A 4GL (User level) program , A 3GL (High Level) Program	10	06
	4.2	A 2GL (Assembly level) Program , A 1GL (Machine level) Program , 0GL (Hardware level)Program		
5.	Unit Five: Operating System			
	5.1	Introduction , What is OS , Different Services of OS	08	08
	5.2	Information Management (IM) , Process Management (PM) , Memory management (MM)		
6.	Unit Six: Internet and Principles of Programming Language			
	6.1	Introduction, History of Internet, Use of Internet, and Internet related concepts. Define the term Network.	08	06
	6.2	Introduction to Principles of Programming Language: Classification of Languages, Thinking Models History of Languages,		
	6.3	Basic Concepts Data Types, Modules and Separate Compilation		
Total			48	40

List of Practical/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1.	Practice of basic commands in command window: Ex: dir, md, copy, cd, move, rmdir, rd etc.	02
2.	Various operations on Window based operating system. Windows Operations: Minimizing, Maximizing, Resizing	02
3.	Using Windows Help Creating, copying, moving files and folders. Creating shortcuts.	02
4.	Creating and Removing/Deleting User Accounts, Setting window views using Add /Remove Programs Utility.	06
5.	Using Add Hardware Utility Adding Fonts.Viewing Computer configuration..	04
6.	Desktop settings: Display properties, time and date setting, Screen Saver, Appearance	04
7.	MS WORD 2010: Various options and its use in creating/ updating/ printing. (Perform at least 2 assignments)	02
8.	MS EXCEL 2010: Assignments based on use of Spreadsheets & Various menu items and its use in worksheets to solve problems. (Perform at least 2 assignments)	04
9.	MS office PowerPoint: Preparation of Various slides (Perform at least 3 assignments covering Presentation Graphics like objects grouping, Customizing Slide transition, Embedding Links)	04
10.	Introduction to Internet and WWW: Internet and Web, like creating mail accounts, using web based applications (eg. Google drive), browsing internet sites to fetch relevant information, etc.	04
11.	Introduction to e-Commerce and related web sites. Example Railway Reservations, Air Ticket Reservations etc.	02
Total		40

Text Books:

Sr. No	Author	Title	Publication
1.	Achyut Godbole	Demystifying computer	---
2.	Timothy O'Leary & Linda O'Leary	Computing Essential 2015	Mc Graw Hill
3.	Kadar Seema	Principles of Programming language	Technical Publications

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Classification and Components of Computer	02	02	00	04
2	I/O Media and Algorithms	05	03	00	08
3	Main Memory	03	03	02	08
4	Computer Architecture	02	02	02	06
5	Operating System	04	02	02	08
6	Internet and Principles of Programming Language	02	02	02	06
Total		18	14	08	40

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Programme : Diploma in CM/IT
Programme Code : 06/07/26
Name of Course : Programming in C
Course Code : CM 282

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical/Tutorial	02 +01	48

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60 Minutes	03 hrs.	---	---	---
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. This course is designed to provide a comprehensive study of C programming language. Now days almost every setup in software engineering domain chooses 'C' as a basic tool to develop software. It stresses the strengths of C which provides students with means of writing efficient, maintainable and portable code.

Course Objectives:

After studying this course, the student will be able to

- Understand basic terminology used in computer programming
- Write, Compile and Debug programs in C Language
- Implement data types & structures related to problems.
- Design programs involving decision structures, Loops and Functions
- Solve the problems/tasks in structured way.
- Understand the dynamics of memory by the use of Pointers

Course Content:

Ch. No	Name of Topic/Sub topic	Hrs	Marks
1	Overview of 'C'		
	1.1 Introduction: development of 'C',	02	04
	1.2 Importance of 'C',		
	1.3 Basic structure of 'C' programs, programming style, sample 'C' programs, execution of 'C' program		
2	Data Types & Character Set		
	2.1 Character set, C tokens, keywords & identifiers, constants, variables. Data types, declaration of variables, assigning values to variables, defining symbolic constants.	04	06

3	Operators & Expressions			
	3.1	Operators: Arithmetic, relational, logical, increment & decrement, conditional, bit-wise special.	06	10
	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.		
4	Decision Making			
	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
5	Arrays			
	5.1	Introduction, one- dimensional arrays, two-dimensional arrays, multidimensional arrays, Initialization of arrays	04	12
6.	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
7.	User defined functions			
	7.1	Need of user defined function, the types of C functions, return values & their types, calling a function.	10	12
	7.2	Category of functions: No argument- No return value, Argument-No return value, No argument-return value & No argument- return value.		
	7.3	Handling non-integer functions, nesting of functions, recursion, and unction with arrays.		
8.	Structures & Unions			
	8.1	Structure definition, giving values to members, structure initialization and comparison structure variables	08	12
	8.2	Arrays of structures, arrays within the structure, structure and functions, Unions, size of structures, bit fields & bit operations.		
9.	Introduction to Pointers			
	9.1	Pointer Concept,& and * operators, Declaration of Pointers, Initialisation 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

List of Practical's/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1.	Demonstration of GCC Compiler, Creating a program Compiling & linking executing programs.	02
2.	Write 'C' programs based on declaring variables & assigning values to variables. (Minimum 3)	02
3.	Write programs based on expressions and operators. Programs using scanf(), printf(), getch(), putchar().(Minimum 4)	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)	06
5.	Write programs based on arrays. (Minimum 4)	04
6.	Write programs using strings operations such as comparison, concatenation, copying etc. (Minimum 3)	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)	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)	04
9.	Write programs based on Pointers and pointer applications. (Minimum 3)	04
Total		32

Note :

All Practical's should be performed preferably 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	Strings	Theoretical explanation & implementation of strings.
7	User defined functions	Explanation & implementation of examples on user defined functions,
8	Structures and Unions	Theoretical explanation & implementation of structures & Unions.
9	Pointers	Explanation & implementation of examples on Pointers

Text Books:

Sr. No	Author	Title	Publication
1	E. Balagurusamy	Programming in ANSI 'C'	Tata- McGraw Hill pub.(Second Edition)

Reference Books:

Sr. No	Author	Title	Publication
1	Yeshwant Kanetkar	Let us 'C'	BPB Publication
2	Madhusudhan Mothe	C for Beginners	SPD Publication

Learning Resources: Black Board, Transparencies, Overhead projector, LCD, White Board

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Overview of 'C'	01	01	02	04
2	Data types & character set	02	01	03	06
3.	Operators & Expressions	03	03	04	10
4.	Decision Making	02	04	02	08
5.	Arrays	03	04	05	12
6.	Strings	02	02	02	06
7.	User defined functions	04	04	04	12
8.	Structures and Unions	05	04	03	12
9.	Pointers	03	02	05	10
Total		25	25	30	80

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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	--	--
Practical	04	64

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

Course Rationale:

To make the students conversant with use of various PC components and devices

Course Objectives:

After studying this course, the student will be able to

- Demonstrate various Parts of Computer System and Laptop
- Mount and Un mount various cards on Motherboards.
- Open and connect various PC components.
- Connect external devices.

Evaluation Scheme:

List of Practicals/Experiments/Assignments:

Sr. No.	Name of practical/Experiment/Assignment	Hrs
1.	Demonstration of Parts of Computer System	02
2.	Handling I/O devices : Keyboard, Mouse, Monitors, Speakers	04
3.	Handling 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.	Demonstration of Rear Panel View, I/O Serial and Parallel Ports	02
7.	Demonstration of opening and closing of the Computer	02
8.	Installing Keyboards and Mouse Interface	02
9.	Setting up CRT Monitor, Installing LCD Monitors. Demonstration of settings on monitor.	04
10.	Connections inside CPU and its demonstration	02

11.	Setting up the Cabinet.	04
12.	Demonstration of different slots on motherboard. Mounting and Unmounting 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.	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

Text Books:

Sr. No	Author	Title	Publication
1.	K.L. James	The computer hardware installation, interfacing, troubleshooting and maintenance	PHI
2.	M. David Stone & Alfred Poor	Troubleshooting your PC	PHI

Reference Books:

Sr. No	Author	Title	Publication
1.	Govindrajalu	IBM PC clones	BPB Publication

Learning Resources: models and books.

Prof. B.K. Vyas & Prof. J. P. Dandale
Prepared by

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Programme : Diploma in CM/IT
Programme Code : 06/07/26
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	--	--	--	--	--
Marks	--	--	50	--	25

Course Rational:

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 Objectives:

After studying this course, the student will be able to

- Install and Configure Linux O.S.
- Operate Linux Operating System efficiently.
- Develop programs using shell programming.
- Use and implement various commands of Linux: Operating System
- Configure Users and Groups on Linux Operating System.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs
1	Introduction to Linux Operating system:		
	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:		
	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	

Chapter No.	Name of Topic/Sub topic		Hrs
	2.4	File Name Arguments: *, ?, [], Standard Input/ Output and Redirection	
	2.5	Pipes, invoking command history.	
3	File Management Operations:		
	3.1	File and Directory Permissions: chmod	02
	3.2	Archive :tar	
	3.3	File Compression: gzip, gunzip	
4	Editors and Utilities:		
		The vi Editor: vi Command, Input, and Line Editing Modes	03
		Creating, Saving and Quitting a File in vi, Managing Editing Modes in vi	
		vi Editing Commands: Common Operations	
5	Shells:		
	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	Hrs
1.	<ul style="list-style-type: none"> • Installing Linux:Hardware, Software , Requirements, Opening Disk space for Linux partitions • Virtual Consoles • Configuring GRUB / LILO Boot Loader. 	04
2.	<ul style="list-style-type: none"> • Executing commands related to Login into user accounts, start up and shutdown commands, command line editing commands, man, who, who am i ,info , pwd. • Practicing Absolute and Relative Pathnames 	04
3.	<ul style="list-style-type: none"> • Executing various file Related commands -cat, more,ls, cd, cp, mv , rm, touch, mkdir,rmdir, find • Executing Commands I/O redirection and pipes. 	04
4.	<ul style="list-style-type: none"> • Practicing File Name Arguments: *, ?, [] • Creating User Defined commands. 	04
5.	<ul style="list-style-type: none"> • Setting/Changing file and directory related permissions chmod . 	02
6.	<ul style="list-style-type: none"> • Executing commands related to archive and file compression 	02
7.	<ul style="list-style-type: none"> • Executing various commands related to vi Editor. • Practicing editing with vi editor • Practicing vi editing commands. 	04

8.	<ul style="list-style-type: none">Executing various Shell commands: cat, tee, head and tail.Creating shell variables.	02
9.	<ul style="list-style-type: none">Configuring Login Shell with Special Shell Variables.Practicing filter output : wc, spell and sort.	02
10.	<ul style="list-style-type: none">BASH Shell Programming (any 4 basic programs without looping)	04
Total		32

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Introduction to Linux Operating system:	Lecture method and Demonstration
2	The Linux File Structure:	Lecture method and Demonstration
3	File Management Operations:	Lecture method and Demonstration
4	Editors and Utilities:	Lecture method and Demonstration
5	Shells:	Lecture method and Demonstration

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

Learning Resources: Books, LCD, White board.

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Programme : Diploma in Computer Engineering
Programme Code : 06/07/26
Name of Course : Web Designing
Course Code : CM 285

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 Objectives:

After studying this course, the student will be able to

- Create HTML document and text editing
- Giving Links to text, inks to images.
- How to import images
- How to crate tables, text alignments using Fonts
- Creation of HTML forms using tag.
- Creation of Style sheets , HTML forms using various attribute
- Know the advantages and use of different types of CSS.
- Creation of various forms using tag.
- Creation of STATIC Website.
- Adding various controls to web pages.

Course Content:

Sr. No.	Name of Topic/Sub topic	Hrs
1	Introduction to Common HTML and Links and Addressing	
	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 links
		04
2	IMAGES, COLORS AND BACKGROUNDS	
	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: 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.
		04
3	TABLES, FRAMES AND FORMS	
	3.1	Tables: Creating basic tables: TABLE, TR, TH, TD tags. Formatting tables : border, cellpadding, cellspacing, width, align, bgcolor attributes. Adding captions : CAPTION tag. Formatting contents in the table cells: align, valign, bgcolor, height, width, nowrap attributes. Spanning rows and coloums : rowspan and colspan attributes.
		04

	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, marginheight, marginwidth, 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.	
4	STYLE SHEETS		
	4.1	Adding style to the document: Linking to style sheets, Embedding style sheets, Using inline style.	04
	4.2	Selectors: CLASS rules, ID rules.	
	4.3	Style sheet properties: font, text, box, color and background properties.	

List of experiments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Design Web page and apply some block level tags and some text level tags.	04
2	Include Horizontal Rules and special characters in a Web page.	04
3	Design web page and include different list	02
4	Include 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.	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	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).	02
12	Create a web page to get watermark effect using style rules.	02
		32

Instructional Strategy

Sr. No.	Topic	Instructional Strategy
1	Introduction to Common HTML and Links and Addressing:	Explanation practical execution
2	HTML Images And Layout: Text Alignment, Tables and Fonts	Explanation & practical execution
3	Advanced Layout: Frames and Layers	Explanation & practical execution
4	Style Sheets and HTML Forms	Explanation & practical execution

Refrence Book:

Sr. No	Author	Title	Publication
1	Thomas A.Powell	The Complete Reference: HTML	TMH

Text Book

Sr. No	Author	Title	Publication
1.	Deborah S. Ray , Eric J. Ray	Mastering HTML 4.0	BPB

Learning Resources:OHP, LCD Projector and Transparency, Whiteboard.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
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

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Programme : Diploma in ET/CM/IT
Programme Code : 03/06/07/17/23/26
Name of Course : Fundamentals of Electrical Engineering.
Course Code : EE 283

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation Scheme:

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

Course Rationale:

Every branch of engineering is related with electrical engineering. Every student should know Fundamentals of electrical engineering. From this point of view this course is introduced.

Course Objectives:

After studying this course, the student will be able to

- 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:

Ch. No.	Name of Topic/Sub topic	Hrs	Marks	
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.

	1.4	Resistances in parallel, current division formula.	04	08	
2.	Magnetic Circuit:		04	06	
	2.1	Introduction to magnetic circuit, M.M.F., absolute and relative permeability, reluctance, relation between M.M.F. and reluctance			
	2.2	Comparison of magnetic & electrical circuits.			
	2.3	Simple series magnetic circuits, concept of useful flux, leakage flux, total flux & fringing.			
	2.4	Magnetization curves. Concept of hysteresis, hysteresis loop & loss			
3.	Electromagnetic Induction:		04	06	
	3.1	Faradays laws of Electromagnetic Induction.			
	3.2	Types of induced e.m.f : Dynamically induced e.m.f and Statically induced e.m.f (self and mutually)			
	3.3	Lenz's law, Fleming's right hand rule.			
	3.4	Self and mutually induced inductance ,Coefficient of coupling.			
4.	Electrostatics:		04	08	
	4.1	Brief review of electric field, field density, permittivity, relative permittivity, charge & their relation			
	4.2	Capacitor & Capacitance, Dielectric constant, Capacitors in series & parallel			
	4.3	Capacitance of parallel plate capacitor with single dielectric and composite dielectric medium.			
	4.4	Charging and discharging of capacitor to give idea of RC time constant (no derivation)			
5.	A.C. Fundamentals:		10	16	
	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			
	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.			

	6.4	Voltage, current, power relations in star & delta connected system & numerical ,Vector diagram.	04	08
7.	Single phase Transformer		04	06
	7.1	Definition, principal of working, construction,		
	7.2	Types of transformer on the basis of voltage, power & construction.		
	7.3	E.M.F. equation (No derivation).		
	7.4	Voltage, current ratio of a transformer.		
7.5	Losses in transformer, efficiency & regulation of transformer.(No Numericals)			
8.	Electrical Motors		10	16
	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.		
	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		04	06
	9.1	I.E. rules for safety of person & equipment followed when working with electrical installation. Electrical Hazards : Causes and Remedies		
	9.2	Electrical shock, Operational precautions necessary to avoid electrical shock ,Procedure for rescuing a person who has received an electrical shock.		
	9.3	Necessity of Earthing		
	9.4	Introduction to circuit protective devices: Concept of overload, O.C.,S.C., leakage current, H.R.C. fuses, MCB, use 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

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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 of use & tripping of MCB against overload & short ckt.	02
10	Demonstration of use & tripping of ELCB against leakage current.	02

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

Ms.V.L.Munde
Prepared By

Prof. .S.V.Chaudhari
Secretary PBOS

Prof. U.V.Kokate
Chairman PBOS

Programme : Diploma in CM/IT
Programme Code : 04/05/06/07/18/26
Name of Course : Fundamentals of Electronics
Course Code : ET 284

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	3 hrs.	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 Objectives:

After studying this course, the student will be able to

- Explain construction, working, characteristics and applications of semiconductor devices and circuits.
- Build and test the circuits

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
1.	Semiconductor devices		
	Concept& principles of electronics devices	16	22
	1.1 Rectifying diode : Review of P - type and N - type semiconductor ,PN junction, Barrier voltage , 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 Specif ications : 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.		
	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			
	2.1	Block diagram, Barkhausen Criteria for sustained oscillations, classification: LC and RC. Oscillations in LC tank circuit; Hartley; Colpitts. RC Wein Bridge and Phase shift, Oscillator. Crystal Oscillator.	08	16
3.	Linear ICs,			
	3.1	OP AMP. IC 741, symbol, pin diagram, ideal and typical characteristics, Applications such as Inverting , Non Inverting amplifier, Difference amplifier, adder subtractor , Integrator, differentiator.	09	14
	3.2	Timer IC 555: Block diagram, operating modes viz. Astable, Monostable.		
4.	Instrumentation			
	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			
	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:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1.	Plot V-I characteristics of P-N junction diode.	02
2.	Study of Half wave and Full wave rectifier with and without filter.	02
3.	Plot the i/p and o/p characteristics in CE configurations.	02
4.	Plot the characteristics of FET.	02
5.	Plot the characteristics of UJT.	02
6.	Plot the characteristics of SCR.	02
7.	Study of Hartley and Colpitts oscillator.	02
8.	Study of RC phase shift and Wein Bridge.	02
9.	Study of logic gates and verifications of logic gates.	02
11.	Study of Inverting and Non Inverting Amplifier.	02
13.	Study of Integrator and Differentiator.	02
14.	Study of astable multivibrator using 555.	02
15.	Study of C.R.O.	01
16.	Study of Function generator.	01
17.	Study of Transducers.	02
Total		32

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Semiconductor devices.	Classroom teaching and laboratory work.
2.	Digital fundamentals.	Classroom teaching and laboratory work.
3.	Linear IC's.	Classroom teaching and laboratory work.
4.	Oscillator.	Classroom teaching and laboratory work.
5.	Instrumentation.	Classroom teaching and laboratory work.
6.	Transducer.	Classroom teaching and laboratory work.

Text Books:

Sr. No	Author	Title	Publication
1.	Albert Malvino.	Basic Electronics.	TMH.
2.	Katre.	Basic Electronics.	Tech-Max.
3.	B.L.Theraja.	Basic Electronics.	S.Chand.
4.	Ramakant Gaikwad	Linear Integrated Circuits	PHI
5.	R P Jain	Modern Digital Electronics	TMH
6.	A K Sawheny	Instrumentation	DHANPAT RAI & SONS

Reference Books:

Sr. No	Author	Title	Publication
1.	Mottershed	Electronics Devices and Circuits.	PHI
2.	Milmann Halkies	Electronics Devices and Circuits.	TMH

Learning Resources: Reference Books, Data Manual

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Prepared By

Prof..S.V.Chaudhari
Secretary PBOS

Prof.U.V.Kokate
Chairman PBOS

Programme : Diploma in Computer Engineering
Programme Code : 06/26
Name of Course : Computing Organization
Course Code : CM288

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	-	-

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Three class tests each of 60 minutes.	03 Hrs.	--	--	--
Marks	20	80	--	--	--

Course Rationale:

In this world of high speed computing and rapid innovations, it is essential for diploma in computer engineering students to know about device of organization and Different architecture of the computers. This course is designed for basic perspective for students so that they should go hand in hand with the technological advances.

Course Objectives:

- Understand and Demonstrate the Organization of Pentium 4.
- Understand and Demonstrate a top level view of computer interconnection.
- Understand Multicore organization.
- Understand working of DMA

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks	
1.	Unit One:Introduction		06	08
	1.1	Organization and Architecture		
	1.2	Structure and Function		
	1.3	A Brief History of Computers		
	1.4	Designing for Performance		
	1.5	The Evolution of the Intel x86 Architecture		
2.	Unit Two: The Computer System		08	16
	2.1	A Top-Level View of Computer Function and Interconnection		
	2.2	Computer Components		
	2.3	Computer Function		
	2.4	Interconnection Structures		
	2.5	Bus Interconnection , PCI		

3.	Unit Three: Cache Memory			10	16
	3.1	Computer Memory System Overview			
	3.2	Cache Memory Principles			
	3.3	Elements of Cache Design , Pentium 4 Cache Organization			
4.	Unit Four: Control Unit Operation			10	12
	4.1	Control Unit Operation			
	4.2	Micro-operations,			
	4.3	Control of the Processor			
5.	Unit Five: Parallel Organization			08	16
	5.1	Parallel Processing			
	5.2	The Use of Multiple Processors Hardware Performance Issues,			
	5.3	Software Performance Issues			
	5.4	Multicore Organization			
6.	Unit Six: Input / Output			06	12
	6.1	I/O Modules			
	6.2	Programmed I/O Interrupt-Driven I/O			
	6.3	Direct Memory Access			
Total				48	80

Text Books:

Sr. No	Author	Title	Publication
1.	William Stallings	Computer Organization and Architecture	Pearson (8 th Edition)
2.	M. Morris Mano	Computer System Architecture	Pearson
3.	John Carpinelli	Computer system organization and architecture	Pearson

Prof. B.K. Vyas & Prof. J. P. Dandale
Prepared by

Prof. S.V. Chaudhary
Member Secretary PBOS

Prof. U. V. Kokate
Chairman PBOS

Name of Programme : EE / ET / CM / IT
 Programme Code : 02 / 03 / 06 / 07/26
 Name of Course : Engineering Mathematics
 Course Code : SC 282

Time Allotted:

	Hours/Week	Total Hours
Theory	2	32
Term work /Tutorials	1	16

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60 Min. duration	3 Hours	--	--	--
Marks	20	80	--	--	00

Course Aim:

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

Course Objectives:

At the end of the course student will be able to

Apply the definition of integration as inverse of differentiation to solve problems.

- Students will be able to apply various methods of integration..
- To apply mathematical principle to solve engineering problems.
- To draw and come to a valid conclusion.
- To locate the exceptional and critical points in an engineering system.

Course Content:

Sr. No	Name	Hrs	Marks
1	INTEGRATION	10	24
	Definitions, standard formulae, integration of algebraic sum of two or more functions, integration by substitutions and by trigonometric , transformations, integration of $\sqrt{ax^2+ bx+c}$, $1/\sqrt{ax^2+ bx+c}$, integration by parts, integration by partial fractions.		
2	Definite integrals	04	08
	Definition and properties of definite integrals Example based on these properties		

3.	APPLICATION OF INTEGRATION Mean value and root mean square value.	04	08
4	Differential Equations - Definition, 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.	05	16
5	COMPLEX NUMBERS Definition and algebra of a complex numbers. Geometrical representation(Argand's diagram), modulus and amplitude of a complex number. De Moivre's theorem (without proof), roots of complex number.	05	12
6.	LAPLACE TRANSFORMS Definition, Laplace Transforms of elementary functions, important properties of Laplace Transforms, Inverse of Laplace Transforms, Convolution Theorem and application of Laplace Transform for solving differential equations.	04	12
Total		32	80

Reference Books:

Author	Title	Publisher
Grewal B.S.	Higher Engineering Mathematics	Khanna Publishers, New Delhi
Vishwanath	Engineering Mathematics Vol.II	Satya Prakashan, New Delhi
S.P. Deshpande	Mathematics for Polytechnic students	Pune Vidyarthi Griha Prakashan
H.K. Dass	Engineering Mathematics Part II	S. Chand & Co. Ltd. Delhi

Learning Resources: Chock Board etc.

Specification Table:

Sr. No.	Topic / subtopic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Integration	08	16	00	24
2	Definite Integration	04	04	00	08
3	Application of integration	00	00	08	08
4	Differential Equations	04	08	04	16
5	Complex Numbers	04	04	04	12
6	Laplace Transform	04	04	04	12
Total		24	36	20	80

Prof. V. B. Shinde
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Secretary PBOS

Prof. U. V. Kokate
Chairman PBOS

Programme : Diploma in Computer Engineering
Programme Code : 06/26
Name of Course : Operating System
Course Code : CM381

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, each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	--	25	25

Course Rationale:

Operating Systems are system programs, which are very essential components of Computer system. Two primary aims of an 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 Objectives:

After studying this course, the student will be able to

- Use operating system effectively
- Understand overall issues in Operating System design
- Understand a process, deadlock & the concept of context switching & multiprogramming
- Learn various memory management and file management techniques.
- Implement various algorithms of scheduling
- Understand different File Systems.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
SECTION-I			
1	Introduction		
	1.1 What Operating Systems Do, Computer-System Organization, Computer-System Architecture	06	08
	1.2 Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security		
	1.3 Special-Purpose Systems, Open-Source Operating Systems.		
2	Operating-System Structures		
	2.1 Operating-System Services, User Operating-System Interface, System Calls, Types of System Calls	10	12

	2.2	System Programs		
	2.3	Operating-System Structure, Virtual Machines		
	2.4	The kernel, System Boot.		
3	Processes ,Thread and CPU Scheduling			
	3.4	Process Concept, Process Scheduling, Operations on Processes	15	20
	3.5	Inter process Communication, Examples of IPC Systems		
	3.6	Communication in Client-Server Systems, Multithreading Models		
	3.7	Thread Libraries, Threading Issues, Operating-System Examples.		
	3.8	Basic Concepts, Scheduling Criteria. Scheduling Algorithms		
	3.9	Operating System Examples, The Critical-Section Problem		
	SECTION-II			
4	Process Synchronization and Deadlocks.			
	4.1	Peterson's Solution, Synchronization Hardware, Semaphores	15	16
	5.1	Classic Problems of Synchronization, Monitors, Synchronization Examples		
	5.2	System Model, Deadlock Characterization		
	5.3	Methods for Handling Deadlocks		
	5.4	Deadlock Prevention, Deadlock Avoidance		
	5.5	Deadlock Detection, Recovery from Deadlock		
5	Memory Management			
	6.1	Main Memory: Background	12	16
	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.		
6	Storage Management			
	7.1	File-System Interface: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection	06	08
	7.2	File-System Implementation: File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Recovery,		
	Total		64	80

List of Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1.	Advanced Linux Installation: Network and Dual Boot	02
2.	Linux Disk Management using fdisk utility to create, delete and change the partitions on the disk.	02
3.	Setting/ Changing file and directory related permissions chmod and umask command.	02
4.	Displaying File Information : inodes, inodes and directories, cp and inodes, mv and inodes, rm and inodes, ls -l	04
5.	Working with Linux-supported File Systems: Mounting and Unmounting to be tested with external drives	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)	04
7.	Linux: Memory Management Practicing top, vmstat and free command	02
8.	Scheduling jobs with crontab : cron daemon, crontab options, The format of crontab file, Environment variable settings, crontab command lines	02
9.	System states :init Shutting down and changing Runlevels, Managing Users and Groups: Adding and Removing users with adduser,usermod and userdel commands	04
10.	Adding and Removing groups with groupadd,groupmod and groupdel commands, Superuser-The root User Desktop,System Time and Date	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.	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.

Text Books:

Sr. No	Author	Title	Publication
1	Silberschatz Galvin, Gagne	Operating System Concepts	John Wisley & Sons

Reference Books:

Sr. No	Author	Title	Publication
1	Achyut S. Godbole	Operating Systems	Tata McGraw-Hill
2	D. M. Dhamdhare	System Programming & Operating System	TMH
3	Kamin Jonathan	DOS 6 & 6.2	Galgotia Publication
4	Peterson	Operating System	
5	Milan Milenkovic	Operating System Concept & Design	TMH
6	Andrew S. Tanenbaum	Modern Operating Systems	Prentice Hall of India

Learning Resources: LCD, White board

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction	06	02	--	08
2	Operating-System Structures	06	04	02	12
3	Processes ,Thread and CPU Scheduling	08	06	06	20
4	Process SynchronizationandDead locks	04	06	06	16
5	Memory Management	06	04	06	16
6	Storage Management	02	02	04	08
Total		32	24	24	80

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Prof. K.S.Gaikwad & V.S.Pawar
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Prof. U. V. Kokate
Chairman, PBOS

Programme : Diploma in Computer Engineering.
Programme Code : 06/26
Name of Course : Microprocessor Programming
Course Code : CM382

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	Three class tests of 60Min. duration	3 hrs.	---	---	---
Marks	20	80	25	--	25

Course Rational:

Microprocessor is challenging field, to meet challenges of growing advanced microprocessor technology. It is necessary for computer engineering to know the architecture and behavior of processors in order to become efficient programmer. The course aims in providing the knowledge of 8085/8086 processors to the students since they are the foundation of Intel processor family.

Course Objectives:

After studying this course, the student will be able to

- Draw the architecture of microprocessor 8085/86/88.
- Write program in proper format.
- Understand conditional, loop & jumping rotate, compare etc.
- Write Instructions .
- Understand instruction to setup time delay.
- Understand and use of stack, subroutine and interrupts.
- The student is expected to known assembler tool.
- To understand the assembly language programming student must be familiar with instruction set of 8086.
- Understand various instructions & instructions cycle , working of data and address buses.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
1	Basics of Microprocessor 8085		
	1.1 Draw the architecture of 8085 –Define the functions of different pins of 8085	10	11

Chapter No.	Name of Topic/Sub topic		Hrs	Marks
	1.2	8085 Microprocessor, Salient features Pin description, Architecture of 8085 - Functional Block diagram,		
2	Introduction to 8086 Microprocessor			
	2.1	•Salient features •Pin descriptions •Architecture of 8086 - Functional Block diagram	10	15
	2.2	•Register organization, •Concepts of pipelining, •Memory segmentation •Physical memory addresses generation.		
	2.3	Operating Modes of 8086 •8284 Clock Generator •8288 Bus Controller •74LS245 Bi-directional Buffer •74LS373 Octal Latch •Minimum Mode operation and its timing diagram •Maximum Mode operation and its timing diagram.		
3	Instruction Set of 8086 Microprocessor			
	3.1	Machine Language Instruction format, addressing modes	12	15
	3.2	Instruction set, Groups of Instructions •Arithmetic Instructions •Logical Instructions •Data transfer instructions		
	3.3	•Bit manipulation instructions •String Operation Instructions, •Program control transfer or branching Instructions •Process control Instructions		
4	Basic Structure of Assembly Language Programming			
	4.1	Program development steps •Defining problem, •Writing Algorithms •Flowchart •Initialization checklist •Choosing instructions •Converting algorithms to assembly language programs.	10	12
	4.2	Assembly Language Programming Tools •Editors •Assembler •Linker •Debugger.		
	4.3	Assembler directives and Operators		
5	8086 Assembly Language Programming			
	5.1	Model of 8086 assembly language programs	12	12
	5.2	Programming using assembler - •Arithmetic operations on Hex and BCD numbers - Addition, Subtraction, Multiplication and Division		
	5.3	Sum of Series •Smallest and Largest numbers from array •Sorting numbers in Ascending and Descending order •Finding ODD/EVEN numbers in the array •Finding Positive and Negative Numbers in array		
	5.4	Block transfer •String Operations - Length, Reverse, Compare, Concatenation, Copy •Count Numbers of '1' and '0' in 8/16 bit number •BCD to Hex and Hex to BCD number conversion		
6	Procedure and Macro in Assembly Language Program			
	6.1	Procedure •Defining Procedure - Directives used, FAR and NEAR •CALL and RET instructions. •Reentrant and Recursive procedures. •Assembly Language Programs using Procedure	10	15

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Chapter No.	Name of Topic/Sub topic		Hrs	Marks
	6.2	Defining Macros. • Assembly Language Programs using Macros.8086 interrupts.		
Total			64	80

List of Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Identify the Assembly Language programming tools like Assembler, linker, debugger, editor.	02
2	Write an Assembly Language Program to add / subtract two 16 bit numbers	02
3	Write an ALP to find sum of series of numbers.	02
4	Write an ALP to multiply two 16 bit unsigned/ signed numbers	02
5	Write an ALP to divide two unsigned/signed numbers (32/16 ,16/8, 16/16, 8/8)	04
6	Write an ALP to add / Sub / multiply / Divide two BCD numbers.	06
7	Write an ALP to find smallest/ largest number from array of n numbers.	02
8	Write an ALP to arrange numbers in array in ascending/ descending order.	04
9	Write an ALP to perform block transfer data using string instructions / without using string instructions.	02
10	Write an ALP to compare two strings using string instructions / without using string instructions.	02
11	Write an ALP to display string in reverse order, string length, Concatenation of two strings.	02
12	• Write an ALP to convert Hex to Decimal, Decimal to Hex.	02
Total		32

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Basics of Microprocessor 8085	Explanation of Introduction, architecture
2	Introduction to 8086 Microprocessor	Explanation of Instruction format & demonstration of execution of simple program.
3	Instruction Set of 8086 Microprocessor	Writing 8085 based programs & hands on experience with it.
4	Basic Structure of Assembly Language Programming	Exercising detail programming
5	8086 Assembly Language Programming	Explanation of 8086/8088 arch.
6	Procedure and Macro in Assembly Language Program	Explanation

Text Books:

Sr. No	Author	Title	Publication
1	Awate S.P.	8085 Microprocessor Assembly language Programming & Applications	McGraw Hill

2	Ramesh Gaonkar	Microprocessor Architecture, Programming & Applications with the 8085	Penram International Publishing (India) (Third Edition)
3	B.Ram	Microprocessor programming (8085)	
4	Liu -Gibson	Microprocessor systems 8086/88 family	Prentice Hall of India
5	Douglass Hall	Microprocessor & Interfacing	Tata -McGraw Hill

Guideline for conducting practical examination : For performing practical's following tools can be used depending on availability: available kits, assembler, debug utility or simulator.

Learning Resources: Books, LCD, White board.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Basics of Microprocessor 8085	06	03	03	12
2.	Introduction to 8086 Microprocessor	06	04	02	12
3.	Instruction Set of 8086 Microprocessor	03	03	08	14
4.	Basic Structure of Assembly Language Programming	02	05	07	14
5.	8086 Assembly Language Programming	08	03	03	14
6.	Procedure and Macro in Assembly Language Program	03	03	08	14
Total		28	21	31	80

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(Prof. S. V. Chaudhari) (Prof. U. V. Kokate)
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Programme : Diploma in Computer Engineering
Programme Code : 06/26
Name of Course : Computer Graphics Using 'C'
Course Code : CM383

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:

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 IBMPC and compatibles, teaching 'C' programmers of all levels how to create impressive graphics easily and efficiently.

Course Objectives:

After studying this course, the student will be able to

- Understand the basics of graphics programming.
- Write programs for creating various shapes.
- Write programs for processing various shaped objects.
- Create a 3D picture.
- Develop graphical interface using minimum available tools for specific needs.

Course Content:

Ch. No.	Name of Topic/Sub topic	Hrs	Marks
1	Computer Graphics Systems		
	1.1 Raster scan display:	06	10
	1.2 Primitive operations: - moveto, lineto		
	1.3 Graphics Software		
	1.4 Coordinate representations		

	1.5	Graphics file formats: Basics, advantages, disadvantages - BMP - GIF - JPEG - TIFF - PCX		
	1.6	Graphics Functions & Standards: Text mode, Graphic mode Shapes, colors, graphics standards		
2	Raster Scan Graphics			
	2.1	Line Drawing Algorithms	12	20
	2.2	Digital Differential Analyzer		
	2.3	Bresenham's Algorithm		
	2.4	Circle Generation- Symmetry of circle ,Bresenham's Algorithm		
	2.5	Scan conversion		
	2.6	Generation of the Display		
	2.7	Frame Buffers		
	2.8	Line Display, Character Display		
	2.9	Polygon Filling : Seed fill algorithms: Flood fill, Boundary fill, scanline algorithms		
	2.10	Fundamentals of Antialiasing		
3	2-Dimensional and 3-Dimensional Transformations			
	3.1	Basic Transformations: Translation Scaling, Rotation	10	20
	3.2	Matrix representations & homogeneous coordinates		
	3.3	Composite Transformations-Scaling relative to a fixed pivot, rotation about a pivot point		
	3.4	Three dimensional transformation		
	3.5	Other transformations		
4	Windowing & Clipping Techniques			
	4.1	Windowing concepts	08	16
	4.2	Clipping algorithms		
	4.3	Area clipping		
	4.4	Line clipping: Cohen Sutherland clipping algorithm, Cyrusbeck , Liang Barsky, Mid point subdivision		
	4.5	Polygon clipping: Sutherland Hodgeman		
	4.6	Text clipping		
	4.7	Window to-viewport transformation		
5	Three Dimensional Graphics			
	5.1	Hidden line elimination & hidden surface elimination (back face removal, z-buffer, painters algorithm and Warnock's algorithms)	08	10
	5.2	Bezier and B-Spline curves, Hilbert's Curve, Koch curve		
6	Perspective and Parallel Transformation			
	6.1	Types of Perspective and Parallel projection	04	04
	6.2	Vanishing points		
		TOTAL	48	80

List of Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Programs for displaying the point on the screen, graphics demonstration program.	02
2	Programs for drawing: Lines, circles and ellipse. Programs for drawing and filling polygon using functions.	02
3	Implement DDA algorithm and Bresennham's algorithm for line drawing.	02

4	Implement DDA algorithm and Bresennham's algorithm of circle drawing.	02
5	Implement Flood fill algorithm for Polygon filling.	02
6	Implement scan-line algorithm for polygon filling.	02
7	Programs for two-dimensional translation, scaling, rotation & reflection.	04
8	Write Program for 2 D transformations -> shearing and Translation Program	02
9	Write Program for 3-D transformations -> scaling, Rotation	04
10	Program for point clipping, line clipping and polygon clipping.	04
11	Programs for drawing Bezier and B-Spline curves.	04
12	Implement midpoint subdivision algorithm for line clipping.	02
Total		32

Instructional Strategy :

Sr. No.	Topic	Instructional Strategy
1.	Graphics Systems	Explanation of basic concepts
2.	Raster Scan Systems	Explanation and Practical Demonstration
3.	Two Dimensional transformation	Explanation and Demonstration
4.	Windowing & Clipping Techniques	Explanation and Problems based on topic
5.	Three Dimensional Graphics	Explanation and Demonstration using projector
6.	Perspective and Parallel Transformation	Explanation and Demonstration using projector

Text Books:

Sr. No	Author	Title	Publication
1	Donald Hearn and M Pauline Baker	Computer Graphics	Prentice-Hall
2	David F.Rogers	Procedural Elements for Computer Graphics	McGraw-Hill

Reference Books:

Sr. No	Author	Title	Publication
1	William M. Newman Robert F. Sproull	Principles of Interactive Computer Graphics	McGraw-Hill
2	Zhigang Xiang Roy Plastock	Computer Graphics	Schaum O Series

Learning Resources:OHP, LCD, Projector, and Transference, White board

Web Sites:

- <http://www.rspa.com>
- <http://www.doc.ic.ac.uk/~dfg/graphics>

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Graphics Systems	06	02	02	10
2	Raster Scan Systems	05	05	10	20
3	Two Dimensional transformation	04	04	10	18
4	Windowing & Clipping Techniques	05	05	06	16
5	Three Dimensional Graphics	04	02	04	10
6	Perspective and Parallel Transformation	02	02	02	06
Total		25	18	37	80

Prof. H.F.Khan & Prof. K.S.Gaikwad
Prepared By

Prof.S.V.Chaudhri
Secretary, PBOS

Prof.U.V.Kokate
Chairman, PBOS

Programme	:	Diploma in CM
Programme Code	:	06/26
Name of Course	:	Computer Peripherals & Hardware Maintenance
Course Code	:	CM384

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 60minutes	2Hrs.	--	--	--
Marks	10	40	25	--	25

Course Rationale:

The PC Compatible Microcomputer family is rapidly moving forward in power & capabilities. This Course introduces students regarding tools, and equipment's of system and also upgrades & repairs the system. This course introduces different peripheral devices and interfacing cards.

Course Objectives:

After studying this course, the student will be able to

- Demonstrate the basic hardware of computer
- Demonstrate different components of motherboard, processing unit
- Apply various techniques of interfacing and Use serial/ parallel port.
- Demonstrate working of various power supplies.
- Identify systems hardware, I/O devices & related faults.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs.	Marks
1	Introduction to Computer Hardware		
	1.1 Features of Computer Systems: Features of Desktop Systems, Features of Server Computers, Features of Laptops, Features of Tablets	04	04
2	Motherboards		
	2.1 Features of Motherboards, Components of Motherboard, Form Factor of motherboards, Motherboard Controller	10	08
	2.2 Memory Support, Graphics Support, BIOS, IDE and SATA Connectors		
	2.3 Power Supply Connectors, External Devices Interfaces, Buses and Expansion Slots		
	2.4 Speaker and Battery, System Board Jumpers and LED, I/O Addresses and Interrupts		

	2.5	Selection of Motherboards, Using Modem Cards, Using Graphics Cards.		
3	Processing Units			
	3.1	Processor Features, Developmental Stages of CPU	08	06
	3.2	Towards Multiple Core Processors, Processor Specifications, CPU Overheating Issues		
	3.3	Processor: Common Problems and Solutions, Graphics Processing Units		
4	Memory and storage			
	4.1	Features of Computer Memory, Types of Computer Memory ,	08	08
	4.2	Hard Disks Details , Working of Hard Disks, Features of Hard Disks, Hard Disk Specifications.		
	4.3	Blu-ray Discs, External Storage Devices		
	4.4	Introduction to file system FAT 16, FAT 32, NTFS, EXT2/EXT3		
5	Power supply and UPS			
	5.1	Features of SMPS, Types of SMPS, Specification for SMPS, Selecting SMPS and Computer Cabinets	08	06
	5.2	Uninterrupted Power Supply: Working of UPS, Types of UPS, UPS Features and Specifications, UPS Batteries		
6	I/O Devices			
	6.1	Keyboard Features, Types of Keyboard, Types of mouse, Working of mouse, LED Monitors and Touch Screen Monitors, Computer	10	08
	6.2	Printers : Types of Printers, features, Specifications, Inkjet Printer Specification, Working of Laser Printer, Managing Laser Printers		
	6.3	Scanners and Speakers: Features of Scanner, Components of Scanner, Specifications of Scanner , Working of scanners, Computer Speakers: Working of Speakers, Speaker Specifications		
	6.4	Modem: Internal and External modem, Block diagram and specifications.		
Total			50	40

List of Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1.	Demonstration of External Interfaces and Connectors.	02
2.	Installation of mother - board and Study of motherboard layout.	02
3.	Study of POST and various system beeps.	02
4.	Installing Hard Disk with the interfacing types (SATA , PATA)and Troubleshooting Tips	02
5.	Installing SMPS and UPS and its Troubleshooting Tips	02
6.	Installation of Optical Drive(CD / DVD Drives)Troubleshooting Tips	02
7.	Configuring BIOS	02

8.	Installing Windows Operating System, Partitioning and formatting a hard disk using Bootable CD, Disk Management and formatting from My Computer.	04
9.	Maintenance of Printers and Troubleshooting tips	02
10.	Maintenance of Scanner and Troubleshooting tips.	02
11.	Maintenance of Keyboard and Mouse and Troubleshooting tips.	02
12.	Maintenance of Speaker and Troubleshooting tips.	02
13.	Writing detail specifications for buying machines	02
14.	Preventive Maintenance of PC: Checking Environment, Dealing with Dust, Removing Heat with Fan and Troubleshooting tips.	02
15.	Demonstrate the use of preventive maintenance tools like logic probe, logic pulser, current tracer, logic analyzer and windows diagnostics software	02
Total		32

Reference Books:

Sr. No	Author	Title	Publication
1	Mark Minasi	The Complete PC Upgrade & maintenance Guide	BPB Publication
2	Bigelow	Troubleshooting, Maintaining & Repairing PCs	Tata McGraw Hill
3	K.L. James	The computer hardware installation, interfacing, troubleshooting and maintenance	PHI

Learning Resources: OHP, LCD, Projector, and Transference, White board.

(Prof. Smt. B.K. Vyas &
Smt. Prof. J. P. Dandale)

Prepared By

Prof. S. V. Chaudhary
PBOS Secretary

Prof. U. V. Kokate
Chairman PBOS

Programme : Diploma in Computer Engineering
Programme Code : 06/26
Name of Course : Digital Techniques
Course Code : CM385

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	Three class tests, each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	25	--	25

Course Rationale:

This subject forms the foundation of digital electronics system. It is essential to know these fundamentals to understand the concept of microprocessor & its application.

Course Objectives:

After studying this course, the student will be able to

- Know the concept of Digital circuits.
- Understand the operations of fundamental digital circuits.
- Simplify logic circuit using Boolean algebra.
- Construct simple logic circuits, counters using IC's.
- Explain the function of various digital IC's.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks	
1	Number System & Codes		08	10
	1.1	Introduction		
	1.2	Number Systems : Binary Number System, Signed Binary Numbers, Octal Number System, Hexadecimal Number System , Binary Arithmetic		
	1.3	One's Complement & Two's Complement arithmetic , 9's Complement & 10's complement Arithmetic		
	1.4	Codes: BCD, Gray codes, Excess 3 code, Error detecting & Correcting Codes		

2	Logic Gates and Boolean Algebra			10	10
	2.1	Introduction			
	2.2	Working principals and Truth of AND,OR,NOT, NOR, NAND, EX-OR, EX-NOR Gates			
	2.3	Characteristics of Digital IC's			
	2.4	Universal Gates			
2.5	Boolean Algebra : Basic Boolean Operations , Basic Law's of Boolean Algebra , Duality Theorem, De-Morgan's Theorems				
3	Combinational logic design			08	12
	3.1	Introduction :Standard Representation For Logic Functions			
	3.2	Karnaugh Map Representation & Simplification of Logic Functions			
	3.3	Minimization of Logic Functions Specified in Minterms / Maxterms or Truth Table			
	3.4	Minimization of Logic Functions not Specified in Minterms / Maxterms			
3.5	Don't care conditions , Design Examples : Arithmetic Circuits				
4	Multiplexer & De Multiplexer			10	12
	4.1	Multiplexer - Block diagram, Truth table, Logical expression and logic diagram of Multiplexers (2:1, 4:1, 8:1and 16:1), Multiplexer Tree			
	4.2	Demultiplexer - Block diagram, Truth table, Logical expression and logic diagram of Demultiplexer (1:2, 1:4, 1:8and 1:16), Demultiplexer Tree.			
4.3	Adders and their use as subtractors				
5	Combinational logic design using MSI circuit			10	12
	5.1	Priority Encoders - Decimal to BCD Encoder (IC 74147) and Octal to Binary (IC 74148) -Block diagram, Truth table.			
	5.2	Decoder - BCD to 7-segment Decoder (IC 7447) - Block diagram, Truth table.			
	5.3	Digital comparator IC (7485) - Block diagram, Truth table. ALU 74181.			
5.4	BCD Arithmetic, Digital Comparators ,Parity Generator/Checkers				
6	Flip Flops			08	12
	6.1	Introduction, 1-Bit Memory Cell, R S flip-flop			
	6.2	Clocked S-R Flip-Flop J-K Flip-Flop			
	6.3	Race Around Condition Master-Slave J-K Flip-Flop D- flip flop and T-flip flop - using NAND gates - Symbol			
6.4	Application Of flip Flop				

		Sequential Logic Design		
7	7.1	Introduction Registers,	10	12
	7.2	Shift register : -Serial in- Serial Out (SISO) -Serial in-Parallel Out (SIPO) -Parallel in-Serial Out (PISO) -Parallel in- Parallel Out (PIPO) Applications of Shift Registers		
	7.3	Counters : -Ripple or Asynchronous counter -Synchronous Counters -Ring counter -Asynchronous UP/DOWN Counters -Modulus of the Counter		
Total			64	80

List of Experiments/Assignments:

Sr.No	Name of Experiment/Assignment (Minimum 08 practicals to be conducted)	Hrs.
1	Know your Digital Lab : IC tester Multimeter Bread Board Trainer Kit	02
2	Study of Basic Gates ICs and verification of Truth tables by monitoring the Output on ICs.	04
3	To derive AND ,OR, NOT gates using universal Gates	02
4	Verify De-Morgan's Theorem Using ICs	02
5	Minimization and realization of functions using Key maps and its implementation	04
6	To connect and observe O/P across multiplexer on Trainer Kit.	04
7	To connect and observe O/P across Adder/Subtractor on Trainer Kit.	02
8	To implement seven -segment Decoder on Trainer Kit.	04
9	To verify the Truth Tables of S-R,J-K, DLT Flip-Flops	04
10	To implement/observe the working of Shift Registers on Trainer Kit.	02
11	To implement/observe the working of counters on Trainer Kit.	02
Total		32

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Number System & Codes	
2.	Logic Gates and Boolean Algebra	Explanation, Case study and Implementation
3.	Combinational logic design	
4.	Multiplexer and Demultiplexer	Explanation, Case study and Implementation
5.	Combinational logic design using MSI circuit	Explanation, Case study and Implementation

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6.	Flip Flops	Explanation, Case study and Implementation
7.	Sequential Logic Design	Explanation, Case study and Implementation

Text Books:

Sr. No	Author	Title	Publication
1.	R.P. JAIN	Modern Digital Electronics	McGraw-Hill
2.	R.P. JAIN	Principles Of Digital Techniques	McGraw-Hill

Reference Books:

Sr. No	Author	Title	Publication
1.	Albatr paul Malvind	Digital Principal & Application	TMH

Learning Resources: , LCD Projector, and Transferences, White board.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Number System & Codes	04	01	01	06
2	Logic Gates and Boolean Algebra	05	02	03	10
3	Combinational logic design	06	02	02	10
4	Multiplexer and Demultiplexer	05	03	02	10
5	Combinational logic design using MSI circuit	12	03	05	20
6	Flip Flops	06	03	04	13
7	Sequential Logic Design	06	02	03	11
Total		44	16	20	80

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Prof. A. M. Galshetwar
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Prof. U. V. Kokate
Chairman, PBOS

Programme : Diploma in Computer Engineering

Programme Code : 06/26
Name of Course : Computer Networks
Course Code : CM386

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, each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	--	25	25

Course Rationale:

Computer network subject is totally based on networking of computers & the communication between all the computers. There are various computers worldwide which are connected to each other to form a proper communication. The networking part of this subject will stress on how to organize the network structure i.e. topology of the n/w as well as it will give the details about the hardware devices those are required to form a network. Also it will stress on transmission media i.e. the physical wires which are required to connect all the hardware devices with one another.

This subject stress on the different protocols those are used to perform communication within network. Also it will stress on various switching techniques such as circuit switching and packet switching as well as way of routing in switched network.

Course Objectives:

Student will able to:

- Understand the Basic Concept of Network.,Classification of Network.
- Identify the topology of the N/W
- Understand transmission media
- Understand H/W devices used for networking
- Understand ISO reference model
- Differentiate protocols like UDP, TCP, SMTP, HTTP, FTP, TELNET, DHCP etc.
- Learn switching techniques
- Learn Routing in switched networks.

Course Content:

Ch. No.	Name of Topic/Sub topic	Hrs	Marks	
1	Networking Concepts			
	1.1	Fundamentals of Computer Network- Definition Need of Computer Network, Applications, Component of Computer Network,	10	12
	1.2	Network Benefits : Sharing Information(File Sharing, E-mail) - Sharing Resources (Printer Sharing, Application Services), Maintaining the Network, Backing up data.		
	1.3	Computer Network Classifications- Classification of Network by their Geography.-PAN, CAN, LAN, MAN, WAN.		
	1.4	Classification of Network by their Component Role--Peer-to-Peer Network, client-Server-Based Network		
2	Network Topologies and Networking Devices			
	2.1	Network Topologies - Introduction, Definition	12	16
	2.2	Types of Topology- i) Bus ii) Ring iii) Star iv) Mesh v) Tree vi) Hybrid.		
	2.3	Network Control / Connecting Devices - Need of Network Control devices, Role of Network Control devices in a Network,		
	2.4	Network Control devices:- Hub, Repeater, Bridges, Switches, Router, Gateway, Modem. Firewall		
	2.5	Introduction to Mobile and Wi-Fi devices.		
	2.6	Network connectors:- RJ45,BNC,NIC,Optical fiber connectors: SC,ST		
	2.7	Network software: NIC Device Driver, client-server software		
3	Transmission Media			
	3.1	Introduction - Need of Transmission Media, Selection Criteria.	10	12
	3.2	Types of Transmission Media- Guided Media: Cable Characteristics, Types of Cable-Twisted Pair Cable, Co-axial Cable, Fiber Optic Cable. Unguided media: Types of Communication Band-Microwave Communication, Radio wave Communication, Satellite Communication		
	3.3	Latest Technologies in Wireless Network-Bluetooth Architecture, Wi-Fi, Wireless communication protocols		
4	OSI Reference Model & TCP/IP Suite			
	4.1	Introduction- Layered Architecture ,Interfaces between Layer	14	16
	4.2	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.		
	4.3	Layered Structure of the TCP / IP Model - Host-to-Network, Internet, Transport, Application		
	4.4	Comparision between OSI and TCP / IP Network Model		

	4.5	IP Addressing - IP Address classes, classless IP addressing, Subnetting, Supernetting, Masking.		
	4.6	Introduction, IPv4, IPv6(Header Format), Difference between IPv4 & IPv6.		
5	Local Area Network			
	5.1	Medium access control Methods: CSMA/CD , CSMA/CA	06	10
	5.2	Control Token, Slotted Ring, Token Ring, Token Bus,Token Passing, Cambridge Ring		
6	Wide Area Network & Distributed application			
	6.1	Circuit Switching: Space division & Time division circuit switching	12	14
	6.2	Packet Switching: Principle, Switching technique		
	6.3	Comparison between circuit switching and packet switching techniques		
	6.4	Distributed application : Introduction to domain name service, Introductions to Protocols - SMTP,SNMP,HTTP,FTP,DHCP,TELNET		
Total			64	80

List of Practicals / Experiments/Assignments:

Sr.No.	Title of Experiment	Hrs.
1	Identify Components of Network in your Computer Network Lab.	02
2	To Identify & understand different types of Transmission Media.	02
3	To Identify & understand different types of Networking devices.	02
4	To connect and understand different network control devices used in LAN	04
5	To prepare a network cable and Network Cross over Cable using RJ-45 connectors (to connect two hub/switch) and test by Line Tester.	04
6	Basic Configuration of router.	04
7	To Connect Computers in Star Topology using Wired Media and any Network control Device.	04
8	To Install Network Interface Card to locate MAC address of Computer.	02
9	To install TCP/IP protocol and configure advanced TCP/IP properties.	02
10	To install a network printer and to Share Printer and Folder in Network	02
11	To Run Basic TCP/IP Utilities and Commands.(Ping, ipconfig, Tracert, Netstat, Wireshark, ARP, NBTSTAT.EXE, WINIPCFG.EXE),	02
12	Capture TCP,UDP,IP,ARP,ICMP,Telnet, FTP packet using Wireshark packet sniffer software	02
Total		32

Instructional Strategy :

Sr. No.	Topic	Instructional Strategy
1	Networking Concepts	Explanation, Slide Presentation of networking concept
2	Network Topologies and Networking Device	Explanation, Slide Presentation and demonstrating actual existing topologies and networking devices

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3	Transmission Media	Explanation, Slide Presentation and demonstration of Transmission media
4	OSI Reference Model & TCP/IP Suite	Explanation, Slide Presentation of OSI Reference Model & TCP/IP Suite
5	Local Area Network	Explanation, Slide Presentation and demonstration of LAN
6	Wide Area Network and Distributed application	Explanation, Slide Presentation of WAN and demonstration of protocols

Reference Books:

Sr. No.	Title	Author	Publisher
1	Data Communications and Networks	Achyut S. Godbole	Tata McGraw Hill
2	A.S.Tanenbanm	Computer Network	PHI
3	Data Communications and Networking (Forth Edition)	Behrouz A. Forouzan	Tata McGraw Hill
4	Computer Networking	Tularam M Bansod	Dreamtech,Wiley
5	Complete Reference Networking	Craig Zacker	Tata McGraw Hill

Learning Resources: Books, Models, LCD

Web Sites References:

1. www.4shared.net
2. www.ihrb.org
3. www.networkconceptsinc.com
4. www.n2networksolutions.com
5. www.networkcomputing.com

Specification Table:

SR. NO.	TOPIC	COGNITIVE LEVELS			TOTAL
		Knowledge	Comprehension	Application	
1	Networking Concepts	08	04	--	12
2	Network Topologies and Networking Devices	04	04	08	16
3	Transmission Media	04	04	04	12
4	OSI Reference Model & TCP/IP Suite	08	04	04	16
5	Local Area Network	02	04	04	10
6	Wide Area Network and Distributed application	02	06	06	14
TOTAL		28	26	26	80

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Programme	:	Diploma in Computer Engineering/Information Technology
Programme Code	:	06/07/26
Name of Course	:	Data Structures
Course Code	:	CM 387
Pre-requisite	:	CM 282 (Programming in C)

Teaching Scheme:

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32
Tutorial	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:

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 Objectives:

After studying this course, the student will be able to

- Write programs in 'C' using different types of data structures.
- Understand concepts of arrays, pointers, link list, stacks, queues, trees, and graphs.
- Use proper data structures for particular problem.
- Develop efficient software using various data structures.

Course Content:

Ch. No.	Name of Topic/Sub topic	Hrs	Marks
1	Introduction to data structures		
	1.1 Introduction, Basic Terminology:- Elementary data structure organization Classification of data structure	08	08
	1.2 Operations on data structures:- Traversing, Inserting, deleting Searching, sorting, merging		
	1.3 Complexity :-Time complexity ,Space complexity, Big 'O' Notation		
	1.4 Structures in 'C', Dynamic memory Allocation		

2	Arrays			
	2.1	Introduction, Linear Arrays Representation of linear arrays in memory	06	06
	2.2	Traversing linear Arrays, Inserting and Deleting		
	2.3	Multidimensional Arrays		
3	Searching & sorting			
	3.1	Searching: Basic search techniques, Linear search, Binary search, Hashing.	08	12
	3.2	Sorting: General background, bubble sort, Selection sort, insertion sort, merge sort and radix sort, Shell sort		
4	Linked Lists			
	4.1	Introduction, Singly link list, Representation of link list in memory.	10	14
	4.2	creating, traversing, searching in sorted as well as unsorted link list.		
	4.3	Memory allocation, garbage collaction		
	4.4	Inserting into linked list, Deleting from a linked list		
	4.5	Header links list, Two-way list, Implementation of link list		
5	Stacks, Queues & Recursion			
	5.1	Stacks: Concept, representing stacks in 'C', Applications of stacks	12	15
	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		
6	Trees			
	6.1	Introduction, Binary trees, Binary tree representation, Traversing binary tree	10	13
	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		
7	Graphs and their applications			
	7.1	Introduction, Graph theory terminology	10	12
	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		
Total			64	80

List of Experiments/Assignments/Tutorials:

Sr. No.	Name of Experiment/Assignment/ Tutorial	Practical Hrs	Tutorial Hrs
1	Write Programs based on: Structures & Dynamic Memory allocation	--	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)	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	--	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	01	01
12	Write Programs based on Infix to postfix operation	01	02
13	Write Programs based on Tower of Hanoi	01	01
14	Write Programs based on recursion	--	02
15	Write Programs based on Queue implementation using PUSH & POP operations	02	--
16	Write Programs based on Creating a binary tree	01	01
17	Write Programs based on inorder, preorder and post order traversal	01	01
18	Write Programs based on Inserting, searching BST	03	03
20	Write Program to Heapsort	02	02
21	Write Programs based on Shortest path	02	01
22	Write Programs based on BFS & DFS using Graph	02	02
Total		32	32

Instructional Strategy:

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

Text Books:

Sr. No	Author	Title	Publication
1	Tanenbaum, Langsman, Augenstein	Data Structures in 'C'	PHI Publications
2	Lipschultz	Data Structures	Schaum Outline Series

Reference Books:

Sr. No	Author	Title	Publication
1	Yashwant Kanetkar	Pointers in 'C'	BPB Publications
2	Tremblie and Sorrenson	Data Structures	TMH Publications

Learning Resources: OHP, LCD Projector, Animations, Videos, White board.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Introduction to Data Structures	04	02	02	08
2.	Arrays	02	02	02	06
3.	Sorting and Searching	03	03	06	12
4.	Link Lists	04	03	07	14
5.	Stacks, Queues & Recursion	05	04	06	15
6.	Trees	04	03	06	13
7.	Graphs and their applications	04	03	05	12
Total		26	20	34	80

Prof. S.P.Emekar
& Prof. A.S.Paika
Prepared By

Prof..S. V.Chaudhari
Secretary, PBOS

Prof. U.V.Kokate
Chairman, PBOS

Programme : Diploma in Computer Engineering/Information Technology
Programme Code : 06/07/26
Name of Course : Object Oriented Programming: C++
Course Code : CM 388
Class declared : YES

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	Three class tests, each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	25	--	25

Course 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 Objectives:

After studying this course, the student will be able to

- Know Object Oriented concepts.
- Develop object-oriented software using C++ language.
Compare procedure oriented and object oriented approach.
- Implement real life object in programming
- Implement inheritance and multiple inheritances.
- Prepare reusable code.

Course Content:

Ch. No.	Name of Topic/Sub topic	Hrs	Marks
SECTION - I			
1	Basics of Object-Oriented Programming		
	1.1 What is Object Oriented Programming?, Programming Paradigm, Benefits of OOP & Applications, Structure of C++ program, A simple C++ program, Creating source file, Compiling & Linking,	10	14
	1.2 Tokens, Keywords, Identifiers, Basic Data Types, User Defined data types, Derived Data Types, Symbolic Constants, type Compatibility, Declaration Of Variables, Reference Variables		
	1.3 Operators In C++, Scope Resolution Operators, Member Dereferencing Operators, Manipulators, Type Cast Operator, Expressions & their types, Implicit Conversions, Operator Precedence, Control Structure.		
	1.4 Introduction of arrays and its types.		
2	Function in C++		
	2.1 Introduction, The Main Function, Function Prototyping, Call By Reference, Return By, Reference, Inline Function	08	14
	2.2 Default Arguments, Const Arguments, Function Overloading, Friend & Virtual Functions		
	2.3 Classes & Objects: Introduction, Specifying a Class, Creating objects, Memory Allocation For objects, Arrays of Objects, Object As a Function Arguments Returning Objects.		
	2.4 Defining Member functions , Making An Outside Function Inline, Nesting Of Member Function, Private Member Functions		
	2.5 Static Data Member, Static Member Functions		
3	Constructors & Destructors		
	3.1 Introduction, Constructors, Parameterized Constructors Multiple Constructors in a Class	06	12
	3.2 Constructors With Default Arguments, Dynamic initialization Of Objects, Object Pointers.		
	3.3 Destructors.		
SECTION - II			
4	Operator over loading and Pointers		
	4.1 Introductions Defining Operator Overloading, Rules For Overloading Operators Introduction, Overloading Unary Operator, Overloading Binary Operator, Overloading Binary Operators Using Friends	06	12
	4.2 Manipulation of Strings Using Operators, Pointers, Pointers to Objects, this pointer, Pointer to Derived classes, Virtual functions, Pure virtual function		
5	Inheritance and Introduction to Templates		
	5.1 Introduction, Defining Derived Classes, Access specifiers and its types, Single Inheritance	08	14
	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.		
6	Working with files and Exception Handling			
	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	10	14
	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.		
	Total		48	80

List of Experiments/Assignments:

Unit No.	Sr. No	Name of Experiment/Assignment	Hrs.
I	1.	Write a program to implement looping different statements.	6
	2.	Write a program to demonstrate all control structures.	
	3.	Write a program to implement concept of an array.	
	4.	Write a program to perform matrix operations using multi-dimensional array.	
II	5.	Write a program to implement concept of a class.	8
	6.	Write a program to create one class which contains member functions and invoke the same using objects.	
	7.	Write a program to implement concept of overloading.	
	8.	Write a program which implements friend function and inline function.	
III	9.	Write a program which implements all the types of constructors with destructor.	2
IV	10.	Write a program to demonstrate operator overloading for: Unary operator. Binary operator.	4
	11.	Write a program to demonstrate : Pointer to object. Pointer to derived class.	

V	12.	Write a program for MULTILEVEL inheritance.	8
	13.	Write a program for MULTIPLE inheritance.	
	14.	Write a program for HYBRID inheritance .	
	15.	Write a program to implement : Class template. Function template.	
VI	16.	Write a program to perform various operations on file.	4
	17.	Write a program to perform Exception Handling.	
	TOTAL		32
		MINI PROJECT: Implement mini project using all the C++ concepts	

Practical exam guidelines:

- New program statements may be given based on above concepts.

Tutorial guidelines:

- Conduct case studies for all above mentioned list of practical's..

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Principal of Object Oriented Programming	Explanation of basic concept and implementation
2	Function in C++	Explanation of function and implementation of function
3	Constructors & Destructors	Explanation of constructor & Destructors and implementation of constructor & Destructors
4	Operator Over Loading and Type Conversions	Explanation of operator overloading and implementation.
5	Inheritance: Extending Classes	Explanation of Inheritance & it's type and implementation.
6	Pointer, Virtual Function and Polymorphism	Explanation & Implementation of polymorphism, pointer
7	Templates and Exception handling	Explanation and implementation of templates and implementation using exception handling.

Text Books:

Sr. No	Author	Title	Publication
1	E Balagurusamy	Object Oriented Programming with C++	Tata McGRAW Hill

Reference Books:

Sr. No	Author	Title	Publication
1	Ivor Horton	Beginning C++ - The complete Language	Shroff Publishers
2	Robert Lafore	Object Oriented Programming in C++	BPB
3	Herbert Schildt	Teach Yourself C++	Tata McGRAW Hill
4	Bjarne Stoustrup	The C++ Programming Language	Addison-Wesley 2000

Learning Resources: OHP, LCD, Projector, and Transference, White board.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Principal of Object Oriented Programming	06	03	04	13
2	Function in C++	04	03	08	15
3	Constructors & Destructors	04	03	05	12
4	Operator Over Loading and Type Conversions	02	02	06	10
5	Inheritance: Extending Classes	02	02	06	10
6	Pointer, Virtual Function and Polymorphism	02	02	08	12
7	Templates and Exception handling	03	02	03	08
Total		23	17	40	80

(Mrs. G.B.Garud & Mrs.S.B.Gosavi)
Prepared By

Prof. S.V. Chaudhary
Secretary, PBOS

(Prof.U.V.Kokate)
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:

In the Era of Web technology it is essential for every Diploma Engg. To have knowledge of Internet programming. This course covers JAVA as a programming language.

Course Objectives:

After studying this course, the student will be able to

- Design and implement classes and methods
- Understand and implement basic programming constructs
- Apply object oriented features to real time entities
- Differentiate between primitive data types and class data types and implement conversion between them.
- Understand and implement the concept of reusability and extensibility
- Create packages and interfaces and used it in programs
- Design and implement multithreaded programs
- Manage errors and exceptions
- Design and implement applet and graphics programming
- Make use of Data streams in programs
- Write programs by combining all features of Java

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks	
1	Java Evolution and Basics Of Java		06	10
	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		
2	Classes, Object and Methods		08	15
	2.1	Defining a class, Fields declaration, Methods declaration, Creating object, Accessing class members		
	2.2	Constructors, Methods Overloading, Nesting of methods		
	2.3	Inheritance: Extending a Class (Defining a subclass Constructor, Multilevel inheritance Hierarchical inheritance)		
	2.4	Overriding Methods, Final keyword(variable and Methods, Final variables and methods, Final classes, Finalizer Methods)		
	2.5	Abstract methods and Classes, Methods with Var args, Visibility Control (Public access, friend access, Protected access, Private access, Private Protected access)		
3	Introduction to Strings ,Interfaces and Packages		10	15
	3.1	Special String Operations, Character Extraction, String Comparison, Searching Strings, Modifying a String, Data conversion using ValueOf(), StingBuffer		
	3.2	Command Line Arguments,Static Members.		
	3.3	Interfaces :Defining interfaces, Extending interfaces, Implementing interfaces, Accessing Interface variables.		
4	Multithreaded Programming , Managing Errors and Exceptions		08	10
	4.1	Creating Thread, Extending a thread class, Stopping and Blocking a thread, Life cycle of thread		
	4.2	Using thread methods, Thread exceptions, Thread priority, Synchronization, Implementing the 'Runnable' Interface, Inter-thread communication		
	4.3	Exception : Types of errors, Exceptions, Syntax of Exception Handling code		
	4.4	Multiple catch statements, Using finally statement, Throwing our own Exceptions, Using Exception for Debugging		
5	Introduction To Applet with Graphics Programming			

	5.1	Local and remote applets, How applets differ from applications, Preparing to write applets, Building applet code, Applet life cycle	08	15
	5.2	Creating an Executable Applet, Designing a Web page, Applet tag, Adding Applet to HTML file, Running the Applet		
	5.3	More about Applet Tag, Passing parameters to applets, Aligning the Display, More about HTML Tags, Displaying Numerical values, Getting input from the User, Event Handling		
	5.4	Graphics Programming : The Graphics Class, Lines and rectangle, Circle and Ellipse, Drawing Arcs, Drawing Polygons, Line Graphs, Using control loops in Applets, Drawing Bar charts		
	5.5	Introduction to AWT Package, Introduction to Swings		
Managing Input/Output Files in Java				
6	6.1	Concept of Streams, Stream classes, Byte stream classes, character stream classes, using streams, Other useful I/O classes	08	15
	6.2	Using the file class, Input/Output Exceptions, Creation of files, Reading/writing characters, Reading/writing bytes		
	6.3	Handling primitive data types, Concatenating and Buffering files, Random Access Files, Interactive Input and Output, Other Stream classes		
Total			48	80

List of Experiments/Assignments:

Unit No.	Sr.No	Name of Experiment/Assignment	Hrs.
I	1.	Write a program to demonstrate various operators and expressions using switch case.	6
	2.	Write a program to implement looping different statements	
	3.	Write a program based on type casting and decision making statements.	
	4.	Write a program to implement concept of an array.	
	5.	Write a program to perform matrix operations using multi-dimensional array.	
II	6.	Write a program on multiple type constructor by using classes.	6
	7.	Write a program on operator overloading.	
	8.	Write a program to implement vector class and wrapper class with its respective methods.	
	9.	Write a program on Abstract method class.	
	10.	Write a program for method overriding.	
	11.	Write a program to implement multilevel inheritance by applying various access controls to its data members and methods.	

III	12.	Write a program to accept input for the program by using command line argument	6
	13.	Write a program to demonstrate use of all string classes and its method using switch case.	
	14.	Write a program to demonstrate use of all string buffer classes and its method using switch case.	
	15.	Programs to demonstrate - use of implementing interfaces. - use of extending interfaces.	
	16.	Programs on creating package, Accessing a package, Importing class from other package, Adding a class to a package	
IV	17.	Write a program using thread.	4
	18.	Write a program showing try and catch block for exception handling, catching invalid commandline argument ,multiple catch statement.	
V	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 4 th text field.	4
	20.	Write a program to draw different shapes using applet. (use Switch case)	
VI	21.	Write a program to copy contents from source file to destination file by using Input/ Output stream.	4
	22.	Write a program to concatenate 2 strings by using file streams.	
	23.	Perform a mini project by using all java concepts..	6
			TOTAL

Instructional Strategy:

Sr.No.	Topic	Instructional Strategy
1	Java Evolution and Overview of Java Language	Explanation of basic concepts
2	Classes, Object and Methods	Explanation & Practical implementation
3	Array, Strings ,Vectors, Interfaces and Packages	Explanation & Practical implementation
4	Multithreaded Programming, Managing Errors and Exceptions	Explanation & Practical implementation
5	Applet and Graphics Programming	Explanation & Practical implementation
6	Managing Input/Output Files in Java	Explanation & Practical implementation

Text Books:

Sr. No	Author	Title	Publication
1	E. Balagurusamy	Programming with Java	TMH
2	Herbert Schildt	The Complete Reference Java2	TMH

Reference Books:

Sr. No	Author	Title	Publication
1	Michael Morrison	The Complete IDIOT's Guide To JAVA 2	PHI
2	Joseph L. Weber	Special Edition Using Java 1.2	PHI
3	Cay S. Horstmann	Core Java Volume I	Pearson

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Java Evolution and Overview of Java Language	4	0	5	9
2	Classes, Object and Methods	4	0	9	13
3	Array, Strings, Vectors, Interfaces and Packages	9	0	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

Prof. G.B.Garud & P.S.Ghode
Prepared By

Prof.S.V.Chaudhari
Secretary, PBOS

Prof.U.V.Kokate
Chairman, PBOS

**(GOVERNMENT POLYTECHNIC, PUNE
An Autonomous Institute of Govt. of Maharashtra)**

Name of programme : CE/ EE/ET/ME/MT/CM/IT/DDGM
 Programme Code : 01/02/03/04/05/08/21/22/23/24/15/16/17/18/19/26
 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

Course Content:

Ch. No.	Name of Topic/Subtopic	Hrs	Marks
1	Introduction	04	
	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.	
2	Sustainable Development:	04	
	2.1	Concept of sustainable development.	
	2.2	Social, Economical & Environmental aspect of sustainable development.	
	2.3	Control measure: 3 R (Reuse, Recovery, and Recycle). Appropriate Technology, Environmental education.	
3	Environmental Pollution:	16	
	3.1	Introduction.	
	3.2	Water Pollution: Sources of water pollution-Sewage, Industrial waste, Agriculture chemicals, Thermal & radioactive waste, Heavy metals. Effects of water pollution. Control of water pollution.	
	3.3	Air pollution: Introduction, sources of air pollution, types of air pollution, effects of air pollution, control measures of air pollution.	
	3.4	Concept of Global Warming, Ozone Layer Depletion, Acid rain, Greenhouse effects.	
	3.5	Noise Pollution: Definition, Classification of noise pollution, effects of noise pollution, control of noise pollution.	
	3.6	Land Pollution: Causes, effects and remedies.	
	3.7	E-Pollution: Definition, Causes and effects and remedies measures.	
	3.8	Introduction to solid waste management.	
	3.9	Water Conversation: Rainwater harvesting, Watershed Management	

4	Renewable sources of Energy:		04	
	4.1	Biomass, Biogas, Solar Energy, Nuclear Power, Hydropower, Wind Energy, Ocean (Tidal Energy), Geothermal Energy		
5	Environmental Legislation:		04	
	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.			
Total			32	

Assignments:

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

Text Books:

Sr. No	Author	Title	Publication
1	S.P. Nisture, D. A. 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/>

R.M.Aghav,V.M.
Kolhe,D.K. Fad

Prepared by

S.V.Chaudhari

Member Secretary, PBOS

M.S.Satarkar

Chairman, PBOS

Programme	:	Diploma in CE/EE/ ET/ ME/MT/ CM/ IT
Programme Code	:	01/02/03/04/05/06/07/21/24/26/15/16/17/18/19
Name of Course	:	Community Development
Course Code	:	AU482

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 min Duration	3 Hrs	---	---	---
Marks	20	80	---	---	---

Course Rationale:

The course has been introduced to make young Engineers especially aware of the present status of Villages & to motivate them to make improvement in villages when they start their Engineering carrier.

Course Objectives:

After studying this course, the student will be able to

- Able to understand present situation in villages and realize the gravity of the village development.
- Able to make survey of villages, collect the data, analyze it and identify the area of development.
- Able to identify the available natural resources and how they can be utilized for betterment of villages.
- Able to collect the useful information for starting probable new industries in villages.
- Able to guide villagers in building low cost durable houses taking in to considerations weather conditions of that area.
- Able to guide villagers for development good habits regarding health and hygiene.
- Motivated to bring about all round development of villages.

Course Content:

Ch. No.	Name of Topic/Sub topic	Hrs	Mraks
1.	Introduction		
	1.1 Present status of rural and urban community.	02	04
	1.2 Necessity of community development.		
	1.3 Identifying needs of community, Ways to develop community.		
2.	Human Power Development		
	2.1 Present scenario of Human power in India,	04	08
	2.2 Socioeconomic survey to ascertain requirement of human requirements.		
	2.3 Methodology for training the human power		
	2.4 Wage employment and self employment,		

	2.5	Support from financial institutions for self employment.		
3.	Appropriate Technology and Technology Transfer			
	3.1	Technological development of India, Additional needs of community due to technology development,	04	12
	3.2	Classification of rural industries,		
	3.3	Areas of appropriate technology,		
	3.4	Use of locally available materials,		
	3.5	Methods of transfer of technology, Project reports preparation.		
4.	Industrialization			
	4.1	Present status of rural traditional industries,	04	12
	4.2	Renewal of old industries in villages- Manufacturing new commodities such as plastic utensils, nylon ropes, ceramics Repairing – agricultural implements, tractors, automobiles, electrical or diesel pump sets, domestic appliances Food processing – Papad, jam, jelly, pickles, preservation, spices, syrups, ketchups Utilization of waste product – Gobar gas, fuel cake, Construction – Brick clamp, stone quarry, sand supply, and crusher. Miscellaneous – Handlooms, power looms, Ginning mills, Jaggery making Service Industry –House keeping Public facility centre (suvidha Kendra-setu) Net café, Bachat Gat concept and working.Housing support to industrialization.		
5.	Non Conventional Energy Sources			
	5.1	Availability of energy sources in India,	06	20
	5.2	Needs of use of non conventional energy sources.		
	5.3	Availability of such sources in India.		
	5.4	Various types of non conventional energy sources. Solar energy – Solar water heater and solar cooker, wind energy, wind mill and wind turbines, bio-gas-generation.		
6.	Community Services			
	6.1	Health and Hygiene awareness,	04	08
	6.2	Health services,		
	6.3	Educating the community for good habits of health and hygiene, Potable drinking water, purifying well water, low cost latrines, drainage system and soak pits Tree plantation programmes, roads and communications.		
7.	Waste Management			
	7.1	Generation of waste, causes	04	08
	7.2	Types of waste – domestic, commercial, industrial, E-waste, hazardous waste.		
	7.3	Waste separation of domestic waste e.g. wet, dry, reusable, recyclable,		
	7.4	Waste disposal – methods, treatments, etc.		
	7.5	Reduce, Reuse, and Recycle, 3Rs in Waste Management.		
8.	Developments			
	8.1	Programmes for all round development of	04	08
	8.2	Community, Various government schemes, IRDP – Integrated Rural Development Programme.		
	8.3	Active participation of community in development programmes		
	8.4	Motivation for participation.		
	Total		32	80

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Introduction	Class rooms teaching
2.	Man power developments	Class rooms teaching, data collection
3.	Appropriate technology & technology transfer	Class rooms teaching
4.	Industrialization	Class rooms teaching
5.	Non-conventional energy sources	Class rooms teaching
6.	Community services	Class rooms teaching
7.	Waste Management	Class rooms teaching
8.	Developments	Class rooms teaching

Text Books:

Sr. No	Author	Title	Publication
1.	Katav Sing	Rural Development Principles, Policies and management.	---
2.	S.P. Sukhatme	Solar Energy	---
3.	G.P. Rai	Non-Conventional Sources of Energy	---
4.	Debendra K. Das	Dynamics of rural development, perspectives	Deep & Deep Publications Delhi

Reference Books:

Sr. No	Author	Title	Publication
1.	T.T.T.I. Madras	Environmental Engg.	Tata McGraw Hill Publishing Co. Ltd. New Delhi.

Learning Resources: Internet, Daily News papers

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Introduction	04	--	--	04
2.	Man-power development	04	04	--	08
3.	Appropriate technology & its transfer	04	04	04	12
4.	Industrialization	04	04	04	12
5.	Non-conventional Energy Sources	08	06	06	20
6.	Community Services	04	04	--	08
7.	Waste Management	--	04	04	08
8.	Developments	04	04	--	08
	Total	32	30	18	80

(J. N Thorat-Shingte)
Prepared By

(Prof. S. V. Chaudhari)
Member Secretary, PBOS

(Prof.M.S.Satarkar)
Chairman, PBOS

Programme	:	Diploma in CE/EE/ET/ME/MT/CM/IT
Programme Code	:	01/02/03/04/05/06/07/15/16/17/18/19/24/26
Name of Course	:	Renewable & Sustainable Energy Management
Course Code	:	AU483

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 each of 60 minutes	3 Hrs	---	---	---
Marks	20	80	---	---	---

Course Rationale:

Energy is an important aspect in all sectors of country's economy. The energy crisis is mainly caused due to increased population and enhanced standard of living and life style of people. The conventional sources of energy are insufficient to meet these demands. Hence alternative energy sources are utilized for power production. The use of alternative energy source is increasing day by day. Diploma Engineers are to develop, operate and maintain these systems therefore essential to know basics of energy conversion, conservation, energy audit and waste heat recovery techniques.

Course Objectives:

After studying this course, the student will be able to

- Know the National scene of energy production, utilization, consumption and reserves.
- Appreciate the need for non-conventional energy sources.
- Understand relative advantages and disadvantages of various non-conventional energy sources.
- Develop awareness for effective utilization of alternative energy sources.
- Identify different components of solar energy and wind energy sources.
- Identify and analyze biomass plant.
- Identify and apply energy conservation techniques for commonly used Power absorbing and generating devices.
- Apply principles of energy conservation and energy management techniques.

Course Content:

Ch. No.	Name of Topic/Sub topic		Hrs	Marks
1.	Review of conventional sources of energy			
	1.1	Types of conventional energy sources, availability and important power plants in India	04	06
	1.2	India's production and reserves for fossil fuels, waterpower, nuclear power.		
	1.3	Need for non-conventional energy sources.		
	1.4	Environmental impact of various energy sources. Green building, sustainable development. Carbon credits and its significance		

2.	Solar Energy				
	2.1	Principle of conversion of solar energy into heat and electricity Solar radiation. Solar radiations at earth's surface	06	16	
	2.2	Solar radiation geometry- declination, hour Angle, altitude angle, incident angle, zenith angle, solar azimuth angle.			
	2.3	Solar collectors and their types ,applications, advantages and limitations			
	2.4	Applications of Solar energy			
		Solar electric power generation: solar photovoltaic cell, solar cell principle and working, its applications, advantages and disadvantages.			
		Solar water heating, Solar distillation, Solar cooking and furnace,			
		Solar pumping and Green house, Agriculture and industrial process heat. Space heating, space cooling,			
3.	Wind Energy				
	3.1	Basic principles of wind energy conversion, power in wind, available wind power formulation, power coefficient, and maximum power	05	16	
	3.2	Main considerations in selecting a site for wind mills, advantages and limitations of wind energy conversion			
	3.3	Classification of windmills, construction and working of horizontal And vertical axis wind mills, their comparison.			
	3.4	Main applications of wind energy for power generation and pumping.			
4.	Energy From Biomass				
	4.1	Common species recommended for biomass, methods for obtaining energy from biomass.	06	16	
	4.2	Classification of biomass- gasified, fixed bed and fluidized			
	4.3	Application of gasifier			
	4.4	Biodiesel production and application			
	4.5	Agricultural waste as biomass, biomass digester, comparison of biomass with conventional fuels.			
5.	Geothermal Energy and Tidal Energy				
	5.1	Availability, forms of geothermal energy- Dry steam, wet steam, hot dry rock, magnetic chamber system	06	16	
	5.2	Different power plants available.			
	5.3	Tidal power, factors for selection of tidal power plant			
	5.4	Classification-Single basin, double basin type			
	5.5	Tidal power plants in world, ocean thermal plants.			
6	Energy Conservation and management				
	7.1	Energy conservation and management, need and importance of energy conservation and management	05	10	
	7.2	Concept of payback period, return on investment, life cycle cost, Sankey diagrams, specific energy consumption, Distribution of energy consumption			
	7.3	Energy audit, types of audit, methods of energy conservation			
	7.4	Cogeneration and its application.			
	7.6	Concept of energy management, study of different energy Management techniques like- analysis of input, reuse and recycling of waste, energy education, conservative technique and energy audit.			
		Total	32	80	

List of Assignments:

Sr. No.	Name of Assignment
1.	To collect information about global and Indian energy market
2.	One field visit to be conducted to demonstrate application of Solar Energy
3.	One field visit to be conducted to Wind Mill
4.	To visit a biomass/ biogas plant of municipal waste or elsewhere.
5.	Perform energy audit for workshop/Office/Home/SSI unit.

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Review of conventional sources of energy	Classroom teaching and Internet browsing
2.	Solar Energy	Classroom teaching and field visits, use of charts
3.	Wind Energy	Classroom teaching, field visit & use of charts
4.	Energy From Biomass	Classroom teaching, field visit & use of charts
5.	Geothermal Energy	Classroom teaching and Internet browsing
6.	Tidal Energy	Classroom teaching and Internet browsing
7.	Energy Conservation	Classroom teaching
8.	Energy Conservation Techniques	Classroom teaching and case study

Text Books:

Sr. No	Author	Title	Publication
1.	Non conventional energy resources	Dr B.H.Khan	Tata McGraw Hill
2.	Non conventional energy Resources	G. D. Rai	Khanna publication

Reference Books:

Sr. No	Author	Title	Publication
1	Solar energy	S. P. Sukhatme	Tata McGraw Hill
2	Solar energy	H. P. Garg	Tata McGraw Hill
3	Power plant engineering	Arrora Domkundwar	Dhanpat Rai & co.
4	India- The energy sector	P.H. Henderson	Oxford University Press
5	Industrial energy conservation	D. A. Ray	Pergaman Press
6	Non-conventional energy source	K. M. Mittal	---
7	Energy resource management	Krupal Singh Jogi	---
8	Website for Akshay Urja News Bulletin. (www.mnes.nic.in)	---	---

Learning Resources: Charts of solar water heater and cooker, Models of solar water heater and cooker, Photovoltaic cells etc., video cassette no.131, 365 of G.P.P. library

Specification Table:

Sr. No	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Review of conventional sources of energy	06	--	--	06
2.	Solar Energy	02	06	08	16
3.	Wind Energy	04	04	08	16
4.	Energy From Biomass	04	04	08	16
5.	Geothermal Energy	04	--	06	10
6.	Tidal Energy	08	--	--	08
7.	Energy Conservation	--	04	--	04
8.	Energy Conservation Techniques	--	04	--	04
	Total	28	22	30	80

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Prof. Mrs. M. S. Deshmukh
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Programme	: Diploma in CE/EE/ET/ME/MT/CM/IT
Programme Code	: 01/02/03/04/05/06/07/15/16/17/18/19/26
Name of Course	: Engineering Economics
Course Code	: AU484

Teaching Scheme:

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

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Three class tests of 60 min Duration	3 Hrs	--	--	--
Marks	20	80	--	--	--

Course Rationale:

Diploma Engineers working in middle level management are no longer confined to the role of professional technicians. They often have to take business decisions, for which they are required to apply economic concepts, logic, tools of analysis and economic theories as they advance in their carrier. It is for this reason that diploma students are required to posses some working knowledge of economic concepts, economic policy of our country, also the effects of globalization, GATT, WTO etc.

Course Objectives:

After studying this course, the student will be able to

- Various concepts, applications, contribution of Micro Economics and macro economics to engineering business decisions.
- Consumer demand, market demand, supply and production.
- Prices and cost - Break even analysis, price decisions.
- Concept of National income.
- Inflation, Deflation and unemployment.
- Money and Banking, New economic environment.

Course Content:

Ch. No.	Name of Topic/Sub topic	Hrs	Marks
1	Introduction to Economics		
	1.1 Definitions of economics, Objectives, Importance, concept of engineering economics.	04	10
	1.2 General concepts on micro & macro economics-Market economy, Command economy, Mixed economy.		
2	Demand Analysis		
	2.1 Utility related demand- total and marginal utility, law of diminishing marginal utility, cardinal and ordinal utility.	07	20
	2.2 Law of demand, Determinants of demand, Elasticity of demand, Factors governing the elasticity of demand.		
	2.3 Techniques and methods for forecasting of demand.		

3	Supply, Production and Cost analysis			
	3.1	Law of supply, Determinants of supply, Elasticity of supply and factors governing elasticity.	06	14
	3.2	Theory of production, Laws of production.		
	3.3	Cost concepts, Elements of costs, Preparation of cost sheet, Segregation of costs into fixed and variable costs. Break-even analysis-Linear approach. (Simple numerical problems to be solved)		
4	Time value of money			
	4.1	Simple and compound interest.	08	16
	4.2	Principle of economic equivalence. Evaluation of engineering projects, Cost-benefit analysis in public projects.		
	4.3	Depreciation- Causes of depreciation, Methods of calculating depreciation- Straight line method and declining balance method.		
5	National Income and Inflation			
	5.1	Concepts and measurement of national income, Gross domestic and national production (GNP, GDP).	03	08
	5.2	Inflation and deflation, measures, kinds and effects.		
	5.3	Unemployment causes, kinds, effects and remedies.		
6	Finance, Money and Banking and New Economic Environment			
	6.1	Financial statements i.e. Profit & Loss (Income) Statement, Balance sheet, Book - Keeping, Financial reporting.	04	12
	6.2	Money- Kinds and functions, significance.		
	6.3	Banking- Meaning and functions of commercial banks and Reserve Bank of India.		
	6.4	Liberalization- merits and demerits, GATT and W.T.O.		
Total			32	80

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Introduction to Economics	Lecture method, discussion
2	Demand Analysis	Lecture method, Assignment, surveys, case study, discussion
3	Supply Production and cost analysis	Lecture method, Assignment, surveys, case study, discussion
4	Time value of money	Lecture method, Assignment, surveys, case study, discussion
5	National income and inflation	Lecture method, Literature survey, discussion.
6	Finance, money and banking and New economic environment	Lecture method, visits journals review, discussion.

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Text Books:

Sr. No	Author	Title	Publication
1	D.N. Dwivedi and Abhishek Dwivedi	Engineering Economics	Vikas publishing House Pvt. Ltd., New Delhi,
2	Maheshwari	Managerial Economics (2nd ed)	Prentice Hall of India Pvt. Ltd. New Delhi

Reference Books:

Sr. No	Author	Title	Publication
1	Pannerselvam	Engineering Economics	Prentice Hall of India Pvt. Ltd. New Delhi
2	Sasmita Mishra	Engineering economics & Costing	Prentice Hall of India Pvt. Ltd. New Delhi
3	Newnan, Eschenbach, and Lavelle,	Engineering Economic Analysis, 9th Edition,	Oxford University Press, 2004.
4	Eschenbach, Ted G.	Engineering Economy - Applying Theory to Practice	Irwin, 1995
5	Newnan and Wheeler,	Study Guide for Engineering Economic Analysis, 9th Edition,	Oxford University Press, 2004.
6	Anthony J. Tarquin	Engineering Economy	McGraw-Hill, 1989

Learning Resources: Books, Journals, and Reports etc.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction to Economics	04	06	--	10
2	Demand Analysis	06	08	06	20
3	Supply Production and cost analysis	06	04	04	14
4	Time value of money	06	06	04	16
5	National Income and Inflation	04	04	--	08
6	Finance, Money and Banking and New economic environment	06	04	02	12
Total		32	32	16	80

P. N Malu & P. B. Dighule
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Chairman, PBOS

Name of Programme : Dress Designing and Garment Manufacturing
Programme Code : 01/02/03/04/05/06/07/08/26
Name of Course : Fabric Studies
Course Code : AU485

Teaching Scheme

	Hours /Week	Total Hours
Theory	-	-
Team Work / Practical	02	32

Evaluation

	Progressive Assessment	Theory	Practical	Oral	Term work
Duration	-	-	-	-	-
Marks	-	-	50	-	50

Course Aim:-

The course delivers all basic information in the selection of textile fabric suitable for designing garments as well as the fabric construction process through various ways as weaving, Knitting & felting.

Course Objectives – The students will be able to –

- Identify different types & weaves of garment.
- Have the concept of manufacturing and weaving on different types of looms.

Course Content –

Sr. No	Topic / Subtopic	Hours	Weight age	Practical
01				a) Visit to Textile Mill b) Prepare Samples of different Weaves by using Hand Loom (different material paper satin ribbon etc.)
02				Over all information with demonstration of following- A) Lace Machine, B) Rashel Lace, C) Lycra Fabric D) Different type of Braids
03				Soft copy and Description of Development in Textile Fabric related to there use in garment industry

04				Prepare report on market survey using and a textile swatch booklet
05				Formation/Collection of Natural Dyes, sample preparation of printing (Any one) A) Roller printing B) Direct printing C) Discharge printing D) Duplex printing E) Block Printing F) Digital and Screen Printing

Reference Books

Author	Title	Publisher
Bernard P. Carbman	Fiber to Fabric	N. Yoris MGH
Gupta Sushma	Text Book of Clothing & Textile	N. Delhi Kalyani
Theodora Failola Priest	Guide to Clothing	
Meller Susan	Fundamentals of Textile and Textile Design	Hydrabad orient longmar Focal press N.Y.

Learning Resources – Chalk, Board, Books, Charts, Photographs, and Swatches etc.

Instructional Strategy

Sr. No.	Topic	Instructional Strategy
1.	Loom	Practical treatment
2.	Laces	Practical treatment
3.	Development in Textile	Practical treatment
4.	Fabric Portfolio	Practical treatment
5.	Printing	Practical treatment

K.Y.Kale

S.V.Chaudhari

K. Y. Kale

Prepared By

Member Secretary PBOS

Chairman PBOS

Programme : Diploma in Computer Engg and Information Technology.
Programme Code : 06/07/26
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 60Min. duration	3 hrs.	---	---	---
Marks	20	80	---	---	---

Course Rational:

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 Objectives:

After studying this course, the student will be able to

- Outline the ongoing business challenges of managing e-business and e-commerce in an organization.
- Evaluate the effectiveness of business and revenue models for online businesses.
- Outline the hardware and software requirements necessary to enable employee access to the Internet and hosting of e-commerce services.
- Assess the role of macro-economic factors such as economics, governmental e-business policies, taxation and legal constraints.
- Distinguish between marketing communication characteristics of traditional and new media.
- Assess different options for integration of organizations' Information systems with e-procurement suppliers.
- Describe techniques for retaining customers and cross- and upselling using new media.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Marks
1	Introduction to E-Business and E-Commerce			
	1.1	Introduction ,The impact of the electronic communications on traditional businesses , Real-world E-Business: HP.com	04	12
	1.2	difference between e-commerce and e-business, E-Commerce defined, E-business defined.		
	1.3	Business or consumer models of e-commerce transactions ,E-business opportunities ,Business adoption of digital technologies for e-commerce and e-business , Drivers of business Internet adoption .		
	1.4	E-business risks and barriers to business adoption , Evaluating an organization's e-business capabilities , Drivers of consumer Internet adoption ,Barriers to consumer Internet adoption .		
	1.5	Case Study : A history of Flipcart/Paytm.		
2	E-Commerce Fundamentals			
	2.1	Web presentation and data exchange standards, Audio and video standards, Focus on Internet governance .	06	14
	2.2	Managing e-business infrastructure ,Managing hardware and systems software, infrastructure, Managing Internet service and hosting providers, Managing employee access to the Internet and e-mail, Managing e-business applications infrastructure .		
	2.3	Focus on web services, SaaS and service-oriented architecture (SOA),Benefits of web services or SaaS, Challenges of deploying SaaS.		
	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			
	3.1	Introduction , Real-world E-Business: GD Worldwide 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				
	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				
	5.1	Introduction to e-marketing, Marketing defined, E-marketing defined, Distinguishing between e-marketing, e-business and e-commerce.	04	12	
	5.2	E-marketing planning, Situation analysis, Demand analysis, Competitor analysis, Intermediary analysis, Internal marketing audit, Objective setting. Strategy, Market and product positioning. Target market strategies, Focus on characteristics of new-media marketing communications, Tactics, Product, Price, Place, Promotion, People, Process and Physical evidence.			
	5.3	Focus on online branding, The importance of brand online Actions, Control .			
6	Customer Relationship Management				
	6.1	Introduction, Marketing applications of CRM , What is e-CRM? Benefits of e-CRM, Permission marketing, Customer profiling , Conversion marketing.	08	16	
	6.2	The online buying process, Differences in buyer behaviour in target markets, Differences between B2C and B2B buyer, Behaviour. The net promoter score, Customer acquisition management, Focus on marketing communications for customer Acquisition.			
	6.3	The characteristics of interactive marketing, communications, Assessing marketing communications effectiveness, Online marketing communications, Customer retention management, Personalization and mass customization, Online communities Techniques for managing customer activity and value, Lifetime value modelling.			
	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	

Instructional Strategy :

Sr. No	Topic	Instructional Strategy
1.	Introduction To E-Business and E-Commerce	Explanation of basic concepts
2.	E-Commerce Fundamentals	Explanation and Practical Demo on Internet using LCD
3.	E-Environment	Explanation and Demonstration of issues related to Internet
4.	E-Procurement	Explanation and Group discussion
5.	E-Marketing	Explanation and Marketing Demo by Students and Experts
6.	Customer Relationship Management	Explanation and Group Discussion in Class room

Text/Reference Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
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:

Sr. No	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction To E-Business and E-Commerce	06	04	02	12
2	E-Commerce Fundamentals	04	04	06	14
3	E-Environment	04	04	06	14
4	E-Procurement	04	04	04	12
5	E-Marketing	02	04	06	12
6	Customer Relationship Management	04	06	06	16
Total		24	26	30	80

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Programme : Diploma in CE/ EE/ET/ME/MT/CM/ IT
Programme Code : 01/02/03/04/05/06/07/08/21/22/23/24/26/15/16/17/18/19
Name of Course : Construction Management
Course Code : MA 481

Teaching and Scheme:

	Hours/Week	Total Hours
Theory	03	48
Practical	--	--

Evaluation Scheme:

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

Course Rationale:

The Civil Engineer has to plan, Manage and execute Civil Engineering works. He has to manage different resources. He should have knowledge of basic management of basic management processes related to Civil engineering field.

Objectives:

The student will able to

- Understand management techniques.
- Plan, Monitor and execute various types of construction work
- Manage different resources (Men, Material, Money, Machines)
- Read, draw & update bar charts, CPM and PERT.
- Inspect & control quality of construction.

Contents: Theory

Topic No.	Topic & Subtopic	Hours	Marks
1	Construction Industry 1.1 Importance of construction industry in National Development. 1.2 Special characteristics of Civil engineering works. 1.3 Classification and types of construction works. 1.4 Agencies associated with construction works. 1.5 Resources of construction industry, Material, Manpower, Money, Machinery. 1.6 Stages in construction - Planning stage execution stage. 1.7 Objectives of Construction Management.	05	06
2	Scientific Management 2.1 Definition of Management. 2.2 Necessity Of Scientific management. 2.3 Principles of Management. 2.4 Functions of Management.	06	08

	2.5 Application of Principal and function of management to Civil Engineering works.		
3	Leadership and human relationship 3.1 Leadership – styles of leadership 3.2 Desirable qualities of leadership of effective Execution of construction work. 3.3 Functions of leadership 3.4 Human relation. 3.5 Human needs. 3.6 Motivation and its importance and need, functions of Motivation. 3.7 Hygiene and motivation factors.	05	08
4	Planning and scheduling of construction works 4.1 Levels and stages of planning –(pre & post tenders) 4.2 Necessity and Importance of planning. 4.3 Planning for owner/client and planning for contractor. 4.4 Site selection and orientation of building. 4.5 Study of drawing, Design, Raw materials Equipment sand human resources required. 4.6 Methods of scheduling, Advantages of scheduling. 4.7 Bar chart. Preparing construction schedule. Advantages and limitations of bar charts. 4.8 Planning and scheduling by Network Construction, Logic, Determine of various timings EST, EFT, LST, and LFT. Total float preparation of activity table, Example on developing Critical path, Introduction to PERT. Terms used. 4.9 Comparison between CPM and PERT. 4.10 Preparing Construction schedule comprising of items of work and duration. 4.11 Resource Aggregation for labour.	10	24
5	Communication at site 5.1 Importance of communication at construction site. .2 Types of communication. .3 Barriers to effective communication. 5.4 Techniques to overcome barriers of effective communication.	04	06
6	Safety in Civil Engineering 6.1 Importance of safely in construction works. 6.2 Common Causes of accidents, types of accidents, Remedial measures. 6.3 Terms used- Injury frequency rate(IFR), Injury Severity rate (ISR), Injury Index (II), Accident cost. 6.4 Effective safety Programme.	04	08
7	Site layout 7.1 Storing and stacking of material site. 7.2 Location of Machinery and equipment.	05	08

	7.3 Factors on which site layout depend. 7.4 Preparation of site layout.		
8	Inspection and quality 8.1 Concept of quality. 8.2 Supervision techniques to establish dimensional control such as line, Level Gradient, Slope, Plumb Camber. 8.3 Functions of Inspection Department. 8.4 Quality assurance and quality control. 8.5 Sampling Techniques.	05	08
9	Application of Computer in Construction Management. 9.1 Types of software 9.2 Application of software & Areas. 9.3 Merits of software. 9.4 Demerits of software.	02	04
10	Entrepreneurship in Construction Management 10.1 Concept of Entrepreneur and Entrepreneurship 10.2 Merits of Entrepreneurship and employment. 10.3 Types of Construction Management.	02	06
Total		48	80

Suggested Instructional Strategies:

Lecture Method, Use of teaching aids, Demonstration, Case Study.

Learning Resources:

Books, Transparencies, Internet.

Reference Book:

S.N.	Author	Title	Publisher
1	M.L.Dhir, Gehlot	Construction Planning & Management	Wiley New Delhi
2	Harpal Singh	Construction Management & Accounts	Tata McGraw Hill
3	B.Sengupta and Guha	Construction management and planning	Tata McGraw Hill
4	R.L.Peurifoy	Construction Planning equipment and methods	McGraw-Hill Co. Ltd.
5	Banga & Sharma	Origination of Management	McGraw-Hill Co. Ltd.

N.G.Waykole
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M.S.Satarkar
Chairman P.B.O.S.

Programme : Diploma in CE/ EE/ET/ME/MT/CM/ IT
Programme Code : 01/02/03/04/05/06/07/15/16/17/18/19/26
Name of Course : Entrepreneurship Development
Course Code : MA483

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	---	---

Evaluation Scheme:

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

Course Rationale:

To make the students aware of entrepreneurship as one of the career options and hence to teach them the various aspects of starting a enterprise.

Course Objectives:

After studying this course, the student will be able to

- SWOT analysis.
- Business Environment scanning and opportunity scanning. (Search)
- Market assessment.
- Project formulation.
- Identification of product / Technology / Equipment

- Financial Sources.
- Sales and Marketing
- Reasons of failure of entrepreneurs.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
1.	Entrepreneurship Awareness		
	Entrepreneurship - need,scope& philosophy. Definition of an entrepreneur, attributes, Entrepreneurship. Need Analysis: Human Need, SWOT Analysis, goal setting, business environment, emerging trends, Information & collection techniques, opportunities. Role of Entrepreneur in Indian economy	08	10
2.	Starting & Identification of Project		
	Product and services, demand availability & resource requirement. Market survey technique - Identification of market, marketing trends, market survey techniques, agencies & organizations to be contacted. Product, suppliers of plant, equipment & raw material technology. Venture Capital Funding	08	14

3.	Preparation of Project report		
	Structure of project report, purpose of project report. Working & fixed capital, financial institutions, procedures & Norms for financing feasibility criteria, project planning, time management, legal formalities, municipal by laws. Safety considerations, plant layout, commissioning of plant & equipment, trial production.	10	16
4.	Information & support systems		
	Information needed & their sources. Information related to Project Information related to procedures & formalities. Support systems a) Small scale business planning Requirements b) Govt. & financial Agencies, Formalities. Role of Central Government and State Government in promoting Entrepreneurship- introduction to various incentives, subsidies and grants - Export Oriented Units - fiscal and tax concession available. Role of following agencies in the Entrepreneurship Development - District Industries Centers (DIC), Small Industries Service Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship & Small Business Development (NIESBUD), National Entrepreneurship Development Board (NEDB)	10	16
5.	Management of Enterprises		
	Forms of business Organization. Human behavior, personnel management, sales Management. Marketing practice, distribution channels, Advertisings, Packaging.	06	12
6.	Why do entrepreneurs fail?		
	The four entrepreneurial pitfalls (Peter Ducker) Case studies of successful entrepreneur. Women entrepreneurs - Reasons for low women entrepreneurs, problems & prospectus.	06	12
	Total	48	80

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Entrepreneurship Awareness	Lecture, market survey, workshops, interviews.
2.	Starting & Identification of Project	
3.	Preparation of Project report	
4.	Information & support systems.	
5.	Management of Enterprises	
6.	Why do entrepreneurs fail?	

Text Books:

Sr. No	Author	Title	Publication
1.	S. Saini, B.S. Rathore	Entrepreneurship - Theory & Practice	

Reference Books:

Sr. No	Author	Title	Publication
1.	Vasant Dsai, Pragati Desai	Entrepreneurial development Vol. I	
2.	Vasant Dsai, Pragati Desai	Entrepreneurial development Vol. II	
3.	Vasant Dsai, Pragati Desai	Entrepreneurial development Vol. III	
4.	Colombo Staff College, Manila	Entrepreneurship Development Plan	TMH, New Delhi
5.	Jerald Greenberg, Robert A. Baron/ Carol A. Sales/ Frances A. Owen / Verlag (1999)	Behaviour in organizations, Pearson Education.	Tata Mcgraw Hill.
6.	The winning Edge, corporate creativity.	Pradip N. Kandwalla	Tata Mcgraw Hill.(2006)
7.	John L. Colley, Jacqueline L. Doyle,	Corporate Governance	Tata Mcgraw Hill. (2003)
8.	Timpe, Dale A	Creativity	M/s. Jaico Publishing House, New Delhi. Tata Mcgraw Hill. (2005),

Learning Resources:Books, Articles, Case studies

Specification Table:

Sr. No	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Entrepreneurship Awareness	02	06	02	10
2	Starting & Identification of Project	04	06	04	14
3.	Preparation of Project report business plan.	03	10	03	16
4	Information & support systems.	04	08	04	16
5	Management of Enterprises :	04	06	02	12
6	Why do entrepreneurs fail?	04	04	04	12
	Total	21	40	19	80

Prof. S. P. Paranjape
Prepared By

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Prof. A. S. ZANPURE
Chairman, PBOS

Programme	:	Diploma in CE/EE/ET/ME/MT/CM/IT
Programme Code	:	01/02/03/04/05/06/07/15/16/17/18/19/26
Name of Course	:	Material Management
Course Code	:	MA484

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	--	--

Evaluation Scheme:

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

Course Rationale:

This course deals with management of materials. Smooth running of any industry depends upon the interdepartmental relations and planning for execution of work jointly. Efficiency of production department also depends upon the availability of raw material of required quality and quantity. Therefore there should be proper co-ordination between production department, production planning, stores department and purchase department. Incorrect materials planning can also lead to higher inventories & high cost.

Course Objectives:

After studying this course, the student will be able to

- To know the importance of materials and inventory management
- To know the different aspects of buying procedure and price forecasting.
- To acquaint with latest techniques in materials management
- To know procedure for giving requisition of materials along with specifications
- To know different features of negotiation technique and management of obsolete and scrap materials.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
1	Importance of Materials Management		
	1.1 Growing importance of Materials Management	10	16
	1.2 Scope of Materials Management		
	1.3 Objectives and functions of Materials Management		
	1.4 Organizing for Materials Management		
	1.5 Introduction to Materials planning		
	1.6 Importance of specifications in Materials Management		

2	Inventory Management			
	2.1	Selective control - ABC Analysis - Purpose and objectives of ABC Analysis Mechanics	10	16
	2.2	Advantages of ABC Analysis limitations of		
	2.3	ABC Analysis		
	2.4	Order point - Lead Time, safety stock, Re-order point, standard order. Economic order		
	2.5	Quantity (EOQ), Graphical & Analytical Method		
3	Buying procedure			
	3.1	Sourcing, Buy or lease	10	16
	3.2	Purchase systems		
	3.3	Problems in relations with supplier		
	3.4	Value Analysis → Definition & scope		
	3.5	Selection of products for value analysis		
	3.6	Value analysis framework		
	3.7	Implementation & methodology		
	3.8	Ethics in purchasing		
4	Price forecasting			
	4.1	Importance & Approaches	01	02
5	Inventory control & Cost reduction techniques			
	5.1	Inventory turns ratios	05	08
	5.2	Standardization- need & importance		
	5.3	Codification- concept, benefits.		
	5.4	Value engineering & Value analysis- concept & process		
6	Latest Techniques in Materials Management			
	6.1	Just in Time (JIT) zero inventory concept	05	10
	6.2	Integrated computerized management systems in Materials Management		
	6.3	Introduction to SAP.		
7	Management of obsolete Surplus and Scrap material			
	7.1	Definitions, Reasons for generation and accumulation of obsolete Surplus and scrap, Survey committee, presale preparations, sale, auction, sale by tender.	07	12
Total			48	80

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Importance of Materials Management	Class room teaching
2	Inventory Management	Class room teaching
3	Buying procedure	Class room teaching
4	Price forecasting	Class room teaching
5	Inventory control & Cost reduction techniques	Class room teaching
6	Latest Techniques in Materials Management	Class room teaching
7	Management of obsolete & scrap material	Class room teaching

Text Books:

Sr. No	Author	Title	Publication
1	Ammer Deans S.	Materials Management	R.D. Irwin Hillions
2	P. Gopalkrishan and M. Sundaresan	Materials Management An Integrated approach	Prentice - Hall of India Pvt. Ltd. New Delhi.
3	M.M. Shah	An integrated concept of Materials Management	Tata McGraw Hill Publisher Co. Ltd. New Delhi

Reference Books:

Sr. No	Author	Title	Publication
1	P.G. Menon	Materials Management	
2	A Deb	Materials Management	Academic Publishers
3	Dobler D.W. and Lee C	Purchasing and Materials Management	---
4	Brandy C.S.	Materials Handbook	---

Learning Resources: OHP, LCD, Projector, and Transference, White board

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Importance of Materials Management	6	6	4	16
2	Inventory Management	6	6	4	16
3	Buying procedure	6	6	4	16
4	Price forecasting	--	1	1	02
5	Inventory control & Cost reduction techniques	2	4	2	08
6	Latest techniques in Materials Management	2	4	4	10
7	Management of obsolete and scrap materials	6	6	--	12
Total		28	33	19	80

Prof.N.S.Kadam

Prof.S.V.Chaudhari

Prof.N.S.Kadam

Prepared By

Secretary, PBOS

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Programme : Diploma in CE/EE / ET/ ME/MT/ CM / IT
Programme Code : 01/02/03/04/05/06/07/21/24/26/15/16/17/18/19/26
Name of Course : Supervisory Management
Course Code : MA485

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	---	---

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	---	---	---

Course Rationale:

The diploma holders are intended to work as a supervisor in the industry. He has to perform a versatile role in the activities of an industry; he has to coordinate his subordinates and the higher personals. The students are required to understand to function as a supervisor. He should be able to plan, organize, and direct the subordinates to achieve better results within time for a task assigned to him.

Course Objectives:

After studying this course, the student will be able to

- Know the basic duties of a supervisor.
- Plan a particular job by splitting the whole job into pieces and monitoring each step.
- Understand human behaviors, identify skills, utilize skills, and observe safety of workers.
- Achieve better overall efficiency and utilize maximum capacity of machineries.

Course Content:

Sr. No	Name of Topic/Sub topic	Hrs	Marks
1.	Introduction		
	1.1 Management of a job. Necessity for Scientific Management for supervisor. Handling complexity and achieving optimization.	02	04
2.	Planning by Supervisor		
	2.1 Objectives of planning. Planning activities. Planning by supervisor. Detailing and following of each step. Prescribing standard forms for various activities. Budgeting at supervisory level for materials and man power. Planning a programme and actions for a job.	04	08
3	Organizing by supervisor		

	3.1	Organizing physical resources. Matching human needs with job needs. Allotment of tasks to individual and establishing relationship among persons working in a group.	04	08
4.	Directions by supervisor			
	4.1	Need for such directions and instructions to subordinates. Need for clarity, completeness and feasibility of instructions. Reviving of effectiveness of communication. Personal counseling. Advance predictions of possible mistakes. Elaborating decisions. On the spot adjustments during execution of job. Laying disciplinary standards in over all working.	06	10
5.	Motivation to subordinates			
	5.1	Workers participation in management of a job. Achievement motivation. Recognition for devotion. Delegating responsibilities to subordinates. Activities and intensions towards the growth of an individual. Identification of human needs and providing safety to the workers.	06	10
6.	Coordination & implementation			
	6.1	Understanding link between various departments in respect of process and quality standards. Synchronization of duties of subordinates. Control over the performance in respect of quality; quality of production; time and cost. Measuring performance, comparing with standard, correcting unfavorable deviations.	10	14
7.	Check list by supervisor			
	7.1	Introduction to subordinates regarding the job undertaken. Planning the days work suitable for the job. Responsibility survey. Checking possibility for acceptance of assignment from new department.	08	10
8.	Moving up in the organization			
	8.1	Demonstration of job competence. Exhibition of leadership and initiative. Looking for to accept challenging responsibilities and acceptance of the same. Attitude and actions to be followed and avoided. Stressing the value of own contribution. Achievement of trust of subordinates and the higher management.	08	16
		Total	48	80

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Introduction	Lecture method
2.	Planning by supervisor	Lecture method
3.	Organizing by supervisor	Lecture method
4.	Directions by supervisor	Lecture method
5.	Motivation to subordinates	Lecture method
6.	Coordination & implementation	Lecture method
7.	Check list by supervisor	Lecture method
8.	Moving up in the organization	Lecture method

Text Books:

Sr. No	Author	Title	Publication
1	Industrial Management	Shrinivasan	Khanna publisher, New Delhi

Reference Books:

Sr. No	Author	Title	Publication
1.	Industrial organization and Engineering Economies	Banga and sharma.	Khanna publisher, New Delhi
2.	Industrial Engineering and Management	O.P. Khanna	Dhanpat Rai and Sons, New Delhi
3.	What every Supervisor Should Know	Lestec R. Bittel John W. Newstrom	McGraw Hill Publishing Company, (GREGG Division)

Learning Resources: Books, Articles, C.D.'s, Visits, Video Cassettes No. 115 and 120

Specification Table:

Sr. No	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Introduction	02	02	-	04
2.	Planning by supervisor:	06	01	01	08
3.	Organizing by supervisor	04	02	02	08
4.	Directions by supervisor	05	03	02	10
5.	Motivation to subordinates	05	03	02	10
6.	Coordination & implementation	10	02	02	14
7.	Check list by supervisor	06	02	02	10
8.	Moving up in the organization	08	04	04	16
	Total	46	19	15	80

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Programme : Diploma in CE/EE/ET/ME/MT/CM/IT
Programme Code : 01/02/03/04/05/06/07/15/16/17/18/19/26
Name of Course : Total Quality Management
Course Code : MA486

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical / Tutorial	---	---

Evaluation Scheme:

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

Course Rationale:

In today's international market the quality is another name for universal acceptance for product and services. Hence the mechanical engineers must have consciousness about various quality aspects required for manufacturing / service sector.

To fulfill this need this subject about various factors and philosophies in quality development is introduced. So that student will have most of basic inputs before they enter their profession.

Course Objectives:

After studying this course, the student will be able to

- To understand the importance of Quality Standards and consumer need for quality items for price paid by him..
- To understand Quality Management Foundation and introduction to total quality management
- To know about Quality circle, Kaizen and various Quality improvement tools.
- To know about Quality Assurance Systems and Quality Management through ISO 9000 series.
- To know about Toyota way and Six Sigma concepts.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
1	Introduction		
	1.1 Basic concepts related with quality, Various definition of quality. Quality of design and quality of conformance, Service quality Vs product quality.	06	08
	1.2 Quality policy: definition and objectives. Quality audit.		

	1.3	Quality assurance: - definition, meaning it's various forms and advantages .Quality audit, quality mindedness, inspection and quality control.		
2.	Quality Management Foundation and introduction to total quality management.			
	2.1	Strategic quality management (HoshinKanri) Strategic quality planning, quality goals. The vision - future state of organization, good understanding by everyone, inspiration, achievable QCDF (Quality Cost Delivery Flexibility), Customer focus, sharing by all values of the leadership, organization and employees.	08	12
	2.2	Total Quality:- definition ,objectives, eight dimensional model of total quality.		
	2.3	Total Quality management:- definition , need ,mission, initiative and concept. Barriers, implementation and advantages..		
	2.4	TQM Models :-Juran trilogy , Deming programme , Mckinsey model, Crosby program..		
3.	Quality Management Processes			
	3.1	Quality planning Quality culture (Kaizen and Quality circle) Quality Circle: - concept, objective, structure, steps in formation of quality Circle. Roles of people involved in quality Circle. advantages of quality Circle.	12	20
	3.2	What is Kaizen. <ul style="list-style-type: none"> - The concept, meaning and definition ,areas for Kaizen - 10 ground rules for change. - Traditional methods Vs Kaizen , Kaizen Vs innovation - Types of waste and Waste elimination, value added work, hidden waste and obvious waste, Identification of wastes. - 5S in housekeeping and their meaning - Improvement in work methods. Achievement after Kaizen		
	3.3	Quality improvement Old statistical and analytical tools for quality. i) Tally-sheet ii) Graphs iii) Histograms iv) Stratification v) Scatter diagram vi) Control chart vii) Pareto diagram		
	3.4	New tools of quality (At least one example to be introduced for each tool) i) Ishikawa diagram ii) Arrow diagram iii) Relations diagram iv) Tree diagram v) Affinity diagram vi) Matrix diagram		

	3.5	Additional tools of quality improvement i) Brains storming ii) Flow charts iii) 5W & 1H iv) 5 WHYS		
4.	Quality Management Infrastructure			
	4.1	History of evolution of ISO 9000 standards. European economic community (EEC), need for quality system standards, International organization for standardization (ISO) adopted by Bureau of Indian Standards (BIS)	12	16
	4.2	ISO 9000: 2000 Quality system ISO 9000 series standards, ISO 9000 elements understanding requirement, assessment with respect to quality system. Documentation and implementation, quality manual, structure, internal quality audit, external audit and certification.		
	4.3	Various Quality Systems Vocabulary and features ISO 9001:2008 Requirements for a quality management system ISO 9004 : 2009 Guidelines for the effectiveness and efficiency of the quality management system IS 14000: 2004 series, its importance ISO 19011: guidance on auditing and environmental management systems.		
5.	Principles of the Toyota way			
	5.1	Introduction to Toyota way, Toyota production system (TPS), lean production, '4' P model of Toyota way.	04	12
	5.2	Toyota way principles and their meaning.		
6.	Six Sigma			
	6.1	Introduction to six sigma, Psychology of six sigma,	06	12
	6.2	Six sigma DMAIC process		
	6.3	The six sigma players, their roles and Responsibilities. Champions , Master black Belts, Black belts, Green belts.		
	6.4	Factors to be considered while selecting a project for six sigma, Do's and Don'ts for making six sigma effective. Advantages of six sigma. The zero defects concept.		
Total			48	80

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Introduction	Lecture method
2.	Quality Management Foundation and introduction to total quality management.	Lecture method
3.	Quality Management Processes	Lecture method, Transparencies, Internet surfing.
4.	Quality Management Infrastructure	Lecture method, Transparencies, Internet surfing.

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5.	Principles of the Toyota way	Lecture, Ppt& Discussion
6.	Six Sigma	Lecture method, Ppt& Discussion

Text Books:

Sr. No	Author	Title	Publication
1	Dr. K.C.Arora	Total Quality Management	S.K.Kataria and sons
2	B.Janakiraman and R.K. Gopal	Total Quality Management Text and cases	Prentice Hall of India pvt. Ltd. New Delhi.
3	Subburaj	Total Quality Management	Tata Mc - Graw Hill Co., New Delhi.
4	Gupta, Srinivas N & B Valarmathi	Total Quality Management	Tata Mc - Graw Hill Co., New Delhi.

Reference Books:

Sr. No			
1	Peter S.Pande Robert P. Neuman Roland R.Cavanagh	Six Sigma way	Tata Mc - Graw Hill Co., New Delhi.
2	Jeffrey K. Liker	The Toyota Way	Tata Mc - Graw Hill Co., New Delhi.
3	Suganthi and Samuel	Total Quality Management	Prentice Hall of India pvt. Ltd. New Delhi

Learning Resources: Books, journals, Internet searches.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Introduction	08	--	--	08
2.	Quality Management Foundation and introduction to total quality management.	08	04	--	12
3.	Quality Management Processes	08	08	04	20
4.	Quality Management Infrastructure	08	08	--	16
5.	Principles of the Toyota way	08	04	--	12
6.	Six Sigma	08	04	--	12
Total		52	28	--	80

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Programme : Diploma in CE/ EE/ET/ ME/MT/ CM/IT
Programme Code : 01/02/03/04/05/06 /07/15/16/17/18/26
Name of Course : Management Information System
Course Code : MA487

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	---	---

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	---	---	---

Course 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 Objectives:

After studying this course, the student will be able to

- Understand the role of MIS in various functional areas of management.
- Understand the determination of requirement and analysis it to design information system necessary.
- Understand the supporting role of MIS in decision-making, problem solving
- Understand the management in finance department.
- Understand the role of coding techniques for authentication
- Develop and use different management skills
- Visualize the impact of information Technology in organizational communication & leadership
- Understand the concept of quality management
- Understand the use of database management system in MIS
- Understand the role of taxation in India by studying the types of taxes such as service tax, income tax, excise duty, VAT
- Determine the alternative solutions
- Understand various steps required to process any organization using system development cycle
- Understand the concept of Profit and loss, details about budgeting system

Course Contents:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks	
1.	Information Systems and Organizations			
	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 Systems	04	10
	1.2	Decision Support Systems: Definition, Evolution of DSS, Characteristics of DSS, Model Management, Group Decisions		
2.	System Analysis and Design			
	2.1	Organizational context of System Analysis, Role of System Analyst, System Development Life Cycle, Requirements Analysis	04	10
	2.2	System Requirements Specification: System requirements specification: Example, Data dictionary, Steps in Systems Analysis, Modularizing requirements specifications, Conclusions.		
3.	Feasibility Analysis			
	3.1	Deciding on project goals, Examining alternative solutions, Evaluating proposed solution, Cost-benefit analysis, Payback period, Feasibility report, and System proposal.	08	15
	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.		
4.	Management			
	4.1	Quality Management: Specific Objectives: Meaning of Quality State 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.	10	15

	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.			
5.	Executive Information System and Executive Support System				
	5.1	Why EIS and ESS? Internal factor and External factor	10	15	
	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			
	5.5	Expert System-Definition,Components,Application and Limitations			
6.	Management Issues in MIS				
	6.1	Information Security and Control :Why break IT System Security?	12	15	
	6.2	Information System Security Threats: External Security Threats: Internet Connections, Remote Dial - in Capabilities Internal Security Threats: Passwords, User Terminations,Authorisation Levels, Special Privileges, Virus Checking, Audit Trails			
	6.3	Ethical And Social Dimensions			
Total				48	80

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Information and Management	Class room teaching for all
2.	Information Gathering	
3.	Feasibility Analysis	
4.	Decision Table	
5.	Database Management Systems (DBMS)	
6.	Control Audit and security of information systems	

Text Books:

Sr. No	Author	Title	Publication
1.	V Rajaraman	Analysis & design of Information system	PHI
2.	S.Sadagopan	Management Information Systems	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	2 nd 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	4 th edition

Learning Resources: OHP, LCD Projector and Transparency.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Information and Management	04	04	02	10
2.	Information Gathering	04	02	04	10
3.	Feasibility Analysis	02	08	05	15
4.	Decision Table	02	08	05	15
5.	Database Management Systems (DBMS)	06	04	05	15
6.	Control Audit and security of information systems	04	05	06	15
Total		22	31	27	80

Prof.Smt.A.B.Bhusagare &
Prof.Smt N.R.Wagh
Prepared By

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Prof. M.U.Kokate
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Programme : Diploma in Computer Engineering/Information Technology
Programme Code : 06/07/26
Name of Course : Project And Seminar
Course Code : CM481

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 mold 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 Objectives:

After studying this course, the student will be able to

- Define the problem from Project Development point of View.
- Apply various Design methodologies to the Projects.
- Practice Use of Designing tools on Real problem
- Integrate various components
- Test Various components
- Create working Model

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	<p>These titles are to be covered in Project Report:</p> <ol style="list-style-type: none">a. Problem Definitionb. Platform and/Hardware Specificationsc. Feasibility Study.d. Various Design UML charts/ diagrams as applicable like Use Case Diagram, Activity Charts, Class Hierarchy, DFD, CFD, ER-Diagrams or any othere. Cost Estimationf. Time Estimationg. Limitationsh. Usei. Future Scope/Extendibilityj. Books/References/Websites <p>(Other titles may be added and used as applicable, based on the nature of project)</p>
7	<p>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 show and keep proper nothing's. Impart proper guidance. This will assist in proper evaluation of students.</p>

Prof. M.U.Kokate

Prof. S. V. Chaudhari

Prof. U.V.Kokate

Prepared By

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

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 minutes	3Hrs.	--	--	--
Marks	20	80	25	--	25

Course Rationale:

In the Era of Web technology it is essential for every diploma Engg. to have knowledge of Internet programming. This course covers advanced features of JAVA.

Course Objectives:

After studying this course, the student will be able to

- Create network based applications.
- Create business application.
- Develop dynamic software components.
- Develop database application.
- Design and develop powerful GUI based components.
- Create Animation using Applet, Thread and AWT controls

Course Content:

Ch. No.	Name of Topic/Sub topic	Hrs	Marks
	Section I		
1	Event Handling and Introducing the AWT:		
	1.1 Two event handling mechanisms, The delegation Event Model	14	20
	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		
2	Swing Component :			
	2.1	The Tour of Swing : Japplet, Icons and Labels ,Text Fields, Buttons,	04	08
	2.2	Combo Boxes, Tabbed Panes, Scroll Panes, Trees, Tables, Exploring the Swings.		
3	Networking Basics:			
	3.1	Socket overview, client/server, reserved sockets, proxy servers, internet addressing.	06	12
	3.2	Inet address, Factory methods, instance method TCP/IP Client Sockets.		
	3.3	What is URL Format? URL connection, TCI/IP Server Sockets		
	3.4	Datagram :Datagram packets Datagram server & client Net worth		
Section II				
4	Java DataBase Connectivity Client/Server			
	4.1	Java as a Database front end .Database client/server methodology .Two-Tier and Three-Tier Database Design.	10	18
	4.2	The 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 Resultset Object.		
5	JAVA Beans			
	5.1	What is Java Beans? Advantages of Java Beans	06	08
	5.2	Application Builder Tools, The Bean Developer kit(BDK), JAR Files, Introspection, Developing a simple Bean Using Bound properties Using the BDK		
	5.3	Using Bound properties, Using the Bean Info Interface, Constrained properties		
	5.4	Persistence Customizers, The Java Beans API, Using Bean Builder		
6	Remote Method Invocation			
	6.1	Introduction to Distributed Computing with RMI : Goals, Comparison of Distributed and Non distributed Java Programs	08	14
	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		
Total			48	80

List of Practical/ Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Program to design a form using various controls.	02
2	Program to design a form and handle various events related to each control.	02
3	Programs to demonstrate use of different Layout Managers - Grid Layout. - Flow Layout. - Card Layout. - Border Layout.	02
4	Program to display any string using available Font and Font metrics class and their methods.	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.	02
6	Program to design a form using basic swing components.	02
7	Program to demonstrate the use of tabbed panes and scroll panes in Swing .	02
8	Program to map Directory tree and Table.	02
9	An Application program to make connectivity with database using JDBC API.	01
10	Application programs to send queries through JDBC bridge & handle result.	02
11	Program to retrieve hostname using methods in Inet Address class.	01
12	Program to demonstrate use of URL and URL Connection class for communication.	02
13	Program that demonstrates TCP/IP and UDP based communication between client and server.	04
14	Program to develop simple bean using BDK (Bean Developing Kit)	02
15	Create a Client/Server application using RMI.	04
Total		32

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Event Handling and Introducing the AWT	Explanations of basic concept
2	JDBC and Swing component	Explanation & Practical implementation
3	Networking basics	Explanation & Practical implementation
4	JDBC and Swing component	Explanation & Practical implementation
5	Java Beans	Explanation & Practical implementation
6	RMI	Explanation & Practical implementation

Text Books:

Sr. No	Author	Title	Publication
1	Patrick Naughton- Herbert Schildt	The Complete Reference Java 2 (Fifth Edition)	Tata - Mcgraw hill

Reference Books:

Sr. No	Author	Title	Publication
1	Jaworski	Java 1.2 Unleashed	Techmedia
2	Michael Morrison	The Complete IDIOT's Guide To JAVA 2	Prentice Hall of India
3	Keyur Shah	Java2 Programming	Tata McGraw hill
4	Cay S. Horstmann	Core Java Volume II	Pearson
5	Joseph L.Weber	Special edition using java1.2	PHI

Learning Resources: Books, Models

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Event Handling and Introducing the AWT	06	05	09	20
2	Swing component	02	02	04	08
3	Networking basics	04	04	04	12
4	Java DataBase Connectivity and	06	06	06	18
5	JAVA Beans	02	02	04	08
6	RMI	06	04	04	14
Total		26	23	31	80

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Programme	:	Diploma in Computer Engineering /Information Technology
Programme Code	:	06 / 07/26
Name of Course	:	Software Engineering
Course Code	:	CM483

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:

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 Objectives:

After studying this course, the student will be able to

- Become familiar with the standard Software Engineering Practices.
- Know Project management concepts Planning ,estimation ,Scheduling and tracking
- Apply design concepts and to build design
- Software Quality assurance
- Apply project management and analysis principles to S/W project development.
- Apply design & testing principles to S/W project development.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
1	Software Engineering Concepts		
	1.1 The Evolving Role of Software	06	12
	1.2 Software Characteristics and Application		
	1.3 Framework of Umbrella Activities		
	1.4 TheProcess: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),		
2	Requirement Engineering&Design			
	2.1	Requirement Engineering Tasks: Inception, Elicitation, Elaboration, Negotiation, Specification,Validation	10	12
	2.2	Initiating the Requirement Engineering Process: Stakeholders, Recognizing Multipoint Viewpoint, Working towards Collaboration		
	2.3	Eliciting Requirements: Collaborative Requirements Gathering, Quality Function Deployment ,User Scenarios ,Elicitation Work Products		
	2.4	Developing Use-Cases, 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		
3	Software Project Management			
	3.1	The Management Spectrum:4 P's and Significance	08	16
	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		
4	Project Scheduling			
	4.1	Basic concepts,-Basic principles :The relationship between people and effort ,	06	08
	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		
5	Software Quality Assurance			

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	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		
6	Software Testing Techniques and Maintenance			
	6.1	Software testing Fundamentals ,Testing objectives ,Testing principles ,Testability	10	16
	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		
		Reverse engineering and Re-engineering.		
Total			48	80

List of Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Application and use of studied process models such as Agile, CBD,AOSD.	2
2	Define the project title with bounded Scope of Your Project.	2
3	Design Project Plan and SQA Plan	2
4	To Develop Software Requirement Specification using Use-Case Scenario	4
5	To perform data design using design concepts eg. DFD	2
6	To Draw the Activity Diagram to represent a flow from one activity to another activity and draw ER diagram.	4
7	To Draw class diagram, Sequence diagram, Collaboration diagram, State Transition Diagram for assigned project (eg. Library Management)	6
8	To determine Size using Function-Point metric and Cost Estimation using COCOMO model	6
9	To Test software by developing various test cases for software project and practice it on the project	4
Total		32

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Software and Software Engineering	Explanation & case study
2	Project management concepts	Explanation & case study
3	Project Management estimation and planning	Explanation & case study
4	Project Scheduling and tracking	Explanation & case study
5	Software Quality assurance	Explanation & case study
6	Software Testing Techniques and Maintenance	Explanation & case study

Text Books:

Sr. No	Author	Title	Publication
1	Roger S. Pressman	Software Engineering 6 th Edition	Mc. Graw Hill

Reference Books:

Sr. No	Author	Title	Publication
1	Jawadekar	Software Engineering	Wiley India
2	Richard Fairly	Software Engineering Concepts	Mc. Graw Hill

Learning Resources: Black Board, LCD Projector, Transparencies

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Software Engineering Concepts	03	03	04	10
2	Project management concepts	05	05	00	10
3	Software Project Planning	05	06	00	11
4	Project Scheduling and tracking	04	04	05	13
5	Software Quality assurance	11	06	06	23
6	Software Testing Techniques and Maintenance	06	03	04	13
Total		34	27	19	80

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Programme	: Diploma in Computer Engineering.
Programme Code	: 06/26
Name of Course	: Advanced Computer Network
Course Code	: CM484
Pre-Requisite	: CM386 (Computer Network)

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	Three class tests, each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	--	25	25

Course Rational:

This course is aimed at providing the students with conceptual understanding of issues of Computer Networks with respect to Network and above layers of TCP/IP model. It aims at providing in depth knowledge of Network Organization, addressing, Security and role of various protocols in Internetworking Environment.

Course Objectives:

After studying this course, the student will be able to

- Understand Setting up of a network.
- Understand the use of Internet Protocol.
- Configure Static as well as Dynamic IP Addresses .
- Understand how World Wide Web is organized.
- Explain and compare the different interconnecting systems throughout the world.
- Understand various security and protection issues in the Networking Environment.

Course Content:

Ch. No.	Name of Topic/Sub topic	Hrs	Marks
SECTION - I			
1	Network Layer I		
	1.1 Logical Addressing :IPv4 Addresses- Address space, Notations, classful addressing, classless addressing, , Network address translation(NAT),IPv6 Addresses- Structure, Address space		
	1.2 Internetworking- Need for Network Layer, Internet as a Datagram network, Internet as a Connectionless Network, IPv4- Datagram, Fragmentation, Checksum, Options IPv6- Advantages, Packet format, Extension headers, Transition from IPv4 to IPv6- Dual Stack, Dual Stack, Tunneling, Header translation	10	12
	1.3 Address Mapping- Mapping Logical to Physical Addresses- ARP, Mapping Physical to Logical Addresses - RARP,BOOTP		

	and DHCP			
	Network Layer II			
3	2.1	ICMP- Types of messages, Message format, Error reporting, Query	10	12
	2.2	Delivery- Direct vs Indirect Delivery, Forwarding- forwarding Techniques, Forwarding Process, Routing Table, Unicast Routing Protocols- Optimization, Intra and Interdomain Routing, Distance Vector Routing, Link State Routing, Path Vector Routing, Introduction to multicasting and broadcasting.		
3	Transport Layer		12	16
	3.1	Process to Process Delivery- Client/Server Paradigm, Multiplexing and Demultiplexing, Connectionless vs. Connection-Oriented Service, Reliable vs. Unreliable		
	3.2	Three Protocols, User Datagram Protocol(UDP)- Well Known Ports for UDP, User Datagram, Checksum, UDP Operation, Use of UDP, TCP- TCP Services, TCP Features, Segment, A TCP Connection, Flow Control, Error Control, Congestion Control		
	3.3	Data Traffic- Traffic Descriptor, Traffic profiles		
	3.4	Congestion- Network Performance, Congestion Control- Open Loop Congestion Control, Closed Loop Congestion Control, Examples- Congestion Control in TCP and Frame Relay		
	3.5	Quality of Service- Flow Characteristics, Flow Classes, Techniques to Improve QoS- Scheduling, Traffic shaping, Resource Reservation, Admission Control		
SECTION - II				
4	Application Layer I: DOMAIN NAME SYSTEM		10	14
	4.1	Name Space- Flat Name Space, Hierarchical Name Space, Domain Name Space- Label, Domain Name, Domain, Distribution Of Name Space- Hierarchy of Name Servers, Zone, Root Server, Primary and Secondary Servers		
	4.2	DNS in the Internet- Generic Domains, Country Domains, Inverse Domain, Resolution- Resolver, Mapping names to Addresses, Mapping Addresses to Names, Recursive resolution, Iterative Resolution, Caching,		
	4.3	DNS Messages- Header, Types of Records- Question Record, Resource Record, Registrars, Dynamic, Domain Name Systems(DDNS), Encapsulation		
	4.4	REMOTE LOGGING :Remote logging, Telnet		
	4.5	ELECTRONIC MAIL AND FILE TRANSFER: , Electronic Mail- Architecture, User Agent, Message Transfer Agent: SMTP, Message Access Agent: POP and IMAP, Web-based Mail		
	4.6	File Transfer-File Transfer Protocol(FTP), Anonymous FTP		
5	Application Layer II:WWW AND HTTP		08	10
	5.1	Architecture- Client(Browser), Server, Uniform Resource Locator, Cookies		
	5.2	Web Documents- Static Documents, Active Documents, HTTP- HTTP Transaction, Persistent vs. No persistent Connection, Proxy Server		

	5.3	Network Management System- Configuration Management, Fault Management, Performance Management, Security and Accounting Management,		
6	Cryptography and Security in the Internet			
	6.1	Introduction to Cryptography- Definitions, Categories, Symmetric Key Cryptography- Traditional Ciphers, Simple Modern Ciphers, Asymmetric -Key Cryptography- RSA, Diffie-Hellman.		
	6.2	Security Services- Message confidentiality, Message Integrity, Message Authentication, Message Nonrepudiation, Entity Authentication.	12	16
	6.3	IPSecurity(IPSec)- Two modes, Two Security protocols, Security Association		
	6.4	PGP- Security Parameters, Services, A Scenario, PGP Algorithms, Key Rings, PGP Certificates		
	6.5	Firewalls- Packet filter firewall, Proxy firewall		
		Total	64	80

List of Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1.	To Execute Network commands like ping, nmap, ipconfig, traceroute, netstat, finger, route.	04
2.	Designing Networks and Subnetworks.	04
3.	Configuring Static IP address. Configuring Dynamic IP address.(DHCP)	04
4.	Study of Router, Gateway, Switches Specifications.	02
5.	Simulation of RIP Protocol	02
6.	Monitoring Network through Network Monitoring Tools.	04
7.	Write programs for execution of asymmetric and symmetric cryptography algorithms.	04
8.	Study of available ISPs in India	02
9.	Configuring FTP Server.	02
10.	Configuring Telnet Server	02
	Total	32

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Network Layer I :Host-to-Host Delivery, Internetworking, Addressing and Routing	Introduction and Explanation, Slide Presentation
2	Network Layer II :Host-to-Host Delivery, Internetworking, Addressing and Routing	Introduction and Explanation, Slide Presentation
3	Transport Layer : Process-to-process delivery: UDP, TCP	Explanation, Slide Presentation
4	Application Layer I: Client-Server Model	Explanation, Slide Presentation
5	Application Layer II: WWW AND HTTP	Explanation, Slide Presentation, Simulation of Algorithms
6	Cryptography and Security Protocols in Internet	Explanation, Presentation

Text Books:

Sr. No	Author	Title	Publication
1	Behrouz Forouzan A.	Data Communications and Networking	Tata McGraw Hill (Fourth Edition)

Reference Books:

Sr. No	Author	Title	Publication
1	Andrew S. Tanenbaum	Computer Networks	PHI Publications.

Learning Resources: Books, LCD, White board.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Network Layer: Host-to-Host Delivery, Internetworking, Addressing and Routing	08	02	02	12
2.	Transport Layer: Process-to-process delivery: UDP, TCP	10	02	04	16
3.	Application Layer: Client-Server Model	10	02	00	12
4.	Electronic Mail (SMTP) and File Transfer(FTP)	10	02	02	14
5.	Security	10	02	02	14
6.	Security Protocols in Internet: IP level Security: IPSEC	10	02	--	12
Total		58	12	10	80

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Programme : Diploma in Computer Engineering/Information Technology
Programme Code : 06/07/26
Name of Course : Computer Security
Course Code : CM485

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 60Min. duration	3 hrs.	---	---	---
Marks	20	80	---	25	25

Course Rational:

Computer security is one of the most important and relevant area of computing tod requirement to address security in computer system design is an important design consider many of today's system. It is essential to understand various threats to secure computing and t security design principles and techniques developed to address these threats to confide integrity and availability.This course will introduce basic cryptography, fundamer computer/network security, risks faced by computers and networks, security mechanisms, o system security, secure systems design principles, and information and information systems organizations .It focuses on concepts and methods associated with planning managing and a security at all levels including networks.

Course Objectives:

After studying this course, the student will be able to

- Understand the risks faced by Computer Systems and the nature of common Information hazard.
- Identify the potential threats to confidentiality, integrity and availability of Computer system
- Understand the working of standard security mechanisms.
- Use cryptography algorithms and protocols to achieve Computer Security.
- Understand the threats and security mechanisms for Computer Networks.
- Build systems that are more secure Operating Systems and applications.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Marks
1	Introduction and Security trends			
	1.1	Threats to security: Viruses and worms, Intruders, Insiders, Criminal organizations, Terrorists, Information Warfare, Avenues of attack, steps in attack	08	14
	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		
2	Organizational/Operational security			
	2.1	Role of people in security: Password selection, Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software/hardware, Access by non employees Security awareness, Individual user responsibilities.	06	09
	2.2	Security policies, standards, procedures and guideline		
	2.3	Physical Security: Access controls biometrics: finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns keystrokes.		
	2.4	Social Engineering.		
3	Cryptography and Public Key Infrastructure			
	3.1	Encryption algorithm /Cipher, Caesar's Cipher, Shift cipher, substitution software Vigenere cipher.	14	24
	3.2	Transposition Techniques, Steganography		
	3.3	Hashing, SHA		
	3.4	Symmetric encryption, DES (Data encryption standard), Asymmetric encryption, Digital Signatures, Keyescrow.		
	3.5	Public 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.		
4	Network Security			
	4.1	Firewalls: working design principles trusted systems Kerberos.	14	24
	4.2	Security topologies - security zones, DMS, Internet, VLAN, security implication tunneling.		

Chapter No.	Name of Topic/Sub topic		Hrs	Marks
	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.		
5	System security			
	5.1	Intruders, Intrusion detection systems (IDS).host based IDS, network based IDS	06	09
	5.2	Operating system security: Operating system updates : hot fix, patch, service pack		
Total			48	80

List of Experiments/Assignments:

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

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

Instructional Strategy:

S.N	Topic	Instructional Strategy
1.	Introduction and Security trends	Introduction and Explanation, Demonstration
2	Organizational/Operational security	Introduction and Explanation, Demonstration

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3.	Cryptography and Public Key Infrastructure	Introduction and Explanation, Demonstration
4.	Network Security	Introduction and Explanation, Demonstration
5.	System security	Introduction and Explanation, Demonstration

Text/Reference Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Wm.Arthur Conklin Dwayne Williams Gregory B. White RogerL.Davis Chuck Cothren	Principles of computer security Security+and Beyond	Mc Graw Hill Technology Education International Edition2005
2	Behrouz A Forouzan,De Anza College,Deepak Mukopadhyay	Cryptography And Network Security	Mc Graw Hill Technology Education International 2 nd Edition

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

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Introduction and Security trends	06	04	04	14
2.	Organizational/Operational security	03	03	03	09
3.	Cryptography and Public KeyInfrastructure:	10	08	06	24
4.	Network Security	10	06	08	24
5.	System security	03	03	03	09
Total		32	24	24	80

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Chairman, PBOS

Programme : Diploma in Computer Engineering/Information Technology
Programme Code : 06/07/26
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 Objectives:

After studying this course, the student will be able to

- Understand the impact of software bugs and importance of software testing.
- Develop the skills necessary to find bugs an any types of software testing
- Use your new testing skills to test not just the software but also the product specification the raw code, and even the user’s manual.
- Learn how to test software for compatibility, usability and cultural issues.
- Discover how to improve testing efficiency by automating your test.

Course Contents:

Chapter No.	Name of Topic/Sub topic		Hrs	Marks
1	Basics of Software Testing			
	1.1	Error and bug terminology, Testing terms, Test efforts, General principles of testing	06	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	Software Testing lifecycle (STLC): Requirement, Planning, Analysis, Design, Implementation, Execution, Conclusion, closure.		
	1.4	Quality Assurance and Quality Control, Testing, Verification and Validation.		
2	Types of Testing			
	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.		
	2.3	Integration testing: Top-Down and Bottom-Up integration, System integration, Scenario testing,		
	2.4	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			
	3.1	GUI testing: Compatibility testing, Security testing	04	06
	3.2	Performance and Stress testing, Recovery and Installation testing		
	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			
	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: Baselineing a test plan, Test case specification, Update of Traceability matrix, Executing test cases, Collecting and analyzing metrics, Preparing test summary report		
5	Defect Management			
	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	04	07
	6.2	Manual and Automation testing tools, Advantages and Disadvantages of using tools		
	6.3	What are metrics and measurement.: Types of Metrics, Project metrics, Progress and Productivity Metrics		
Total			32	80

List of Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Practical Hrs	Tutorial Hrs
1.	Introduction to Software Testing Concepts through writing test cases on any device.(Ex. Monitor, Keyboard, Mouse, Booting Failure)	06	02
2.	Perform STLC (Documentation, Planning, testing, delivery) and Create a test plan for any software project.	06	02
3.	Write Test Cases For any Application(e.g. Railway res. Form)	-	02
4.	Web Pages Testing- Functional testing and Integration testing on any Web Sites.	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 any above program.	02	06
6.	Write test cases for Regression testing on any web page.	02	02
7.	Write test cases for an Entry screen with at least 10 parameters.	01	02
8.	Write test cases for function calls.	01	02
9.	Case study on Defect Management.	06	02
10.	Study any two different Automation Testing tools, which one is cost effective and open source. Study Quality standard ISO 9000:9001.	04	08
Total		32	32

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Basics of Software Testing	Explanation & case study
2	Types of Testing	Explanation, Case study & Implementation
3	Special Tests	Explanation, Case study & Implementation

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4	Test Management and planning	Explanation, Case study & Implementation
5	Defect Management	Explanation, Case study & Implementation
6	Testing Tools and Measurements	Explanation, Case study & Implementation

Text Books:

Sr. No	Author	Title	Publication
1	Srinivasan Desikan Gopaldaswamy Ramesh	Software Testing: Principles and Practices	PEARSON
2	M G Limaye	Software Testing: Principles, Techniques and Tools	McGraw-Hill

Reference Books:

Sr. No	Author	Title	Publication
1	Andreas Spillner, Tilo Linz, Hans Schaefer	Software Testing Foundations	Rocky nook
2	John A. Estrella Maria C. Estrella	Sample Exam Questions ISTQB	SPD

Learning Resources:

Black Board, Transparencies, Overhead projector, LCD, White Board.

Form a team of students as per industry roles- Developers, testers, Business Analysts, Project managers, Customers. Assign this team a project

Specification Table:

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

Prof. A.M. Galshetwar &
Prof. J. P. Dandale

Prepared By

Prof. S.V.Chaudhari

Secretary, PBOS

Prof. U. V. Kokate

Chairman, PBOS

Programme : Diploma in Computer Engineering
Programme Code : 06/26
Name of Course : Relational Database Management System
Course Code : CM487

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, each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	25	--	25

Course Rationale:

The major objectives of this course are 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 Objectives:

After studying this course, the student will be able to

- Create Normalized Database structure files.
- Perform all relational database data related operations like, insert, update, delete.
- Write Logical and Conditional statement for Database Query.
- Write PL/SQL block of code.
- Create and use views.
- Create and use Indexes.
- Create and use sequences.
- Write procedures and functions.
- Create and use cursor & Trigger.
- Create and delete users and managing Tablespace.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks	
Section I				
1	Introduction to Database system			
	1.1	Basic Database concepts: Data, database, Database system, DBMS, and Drawbacks of file system, Advantages of DBMS, Applications of DBMS, Database users and administrator, data abstraction, Data independence, schema, , The Codd's laws for fully functional RDBMS.	08	12
	1.2	Architecture: Overall architecture of DBMS.		
	1.3	Data Models: Three classical Data Models-Hierarchical, Networking, Relational Data Models.		
	1.4	Advanced database concepts: Data mining ,Data Warehousing, Introduction to Big data.		
2	Relational Data Model			
	2.1	Relational Structure- Tables (Relations), Rows (Tuples), Domains, attributes.	10	14
	2.2	Keys: Super Keys, Candidate Keys, Primary Keys, Foreign 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.		
	2.5	Conceptual Design: Entity Relationship Model, Strong Entity set, Weak Entity set, Types of Attributes, E-R Diagrams.		
3	Interactive SQL			
	3.1	SQL: Invoking SQL*PLUS, The Oracle Data-types,Data Definition Language (DDL), Data Manipulation language (DML), data control language (DCL), Transaction control language (TCL)	12	14
	3.2	Clauses & Join: Different types of clauses in SQL . Joins, Types of Joins, Nested queries.		
	3.3	Operators: Relational, Arithmetic, Logical, set operators.		
	3.4	Functions: Date and time, String functions, Aggregate Functions.		
Section II				
4	SQL Performance Tuning			
	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			
	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.	12	14
	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 Database administration Overview			
	6.1	Procedures: Advantages, Creating, Executing and Deleting a Stored Procedure.	14	16
	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	Introduction to database administration: Creating and deleting users, Assigning privileges to users, Managing Tablespace and Datafiles , Backup database.		
Total			64	80

List of Practicals / Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	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.	02
2	Applying Constraints such as Referential Integrity and Entity Integrity constraints.	02
3	Writing Queries using various types of operators and Functions.	02
4	Writing Queries using different types of clauses.	02
5	Writing Queries using different types of Joins.	02
6	Working with Views .	02
7	Working with Sequence and Indexes	02
8	Write the basic PL/SQL Program .	02
9	Write the PL/SQL Program using different Control structures.	02
10	Write a program to implement cursors.	02
11	Programs based on Exceptions handling.(Predefined and userdefinedexceptions)	02
12	Write different Stored Procedures .	02
13	Write program to implement Functions.	02
14	Write program for creating Various types Triggers.	02
15	Creating and deleting users and assign privileges to users.	02
16	Study of MongoDB, CouchDB, and Related Free Certifications	02

Mini project :Design mini project using all database commands and Normalization technique.	
Total	32

Note: Any RDBMS tool can be used for implementing practical preferable MySQL, Oracle, SQL server.

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Introduction to Database system	Explanations of basic concepts of database
2	Relational Data Model	Explanation & Practical implementation of RDBMS
3	Interactive SQL	Explanation & Practical implementation of SQL
4	SQL Performance Tuning	Explanation & Practical implementation of SQL objects
5	PL/SQL	Explanation & Practical implementation of PL/SQL
6	PL/SQL Database Objects and Database administration Overview	Explanation of database objects and DBA concepts.

Text Books

Author	Title	Publisher
Abraham Silberschtz, Henry Korth and S.Sudharshan	Database system concepts(3rd edition)	Tata McGraw Hill
Ivan Bayross	SQL, PL/SQL The Programming Language of ORACLE(3rd Edition)	BPB Publication

Reference Books

Author	Title	Publisher
Kevin Lonely	Oracle DBA Handbook	Tata McGraw Hill

Learning Resources: Projector, White board, Books

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction to Database system	06	06	00	12
2	Relational Data Model	04	04	06	14
3	Interactive SQL	04	04	06	14
4	SQL Performance Tuning	02	04	04	10
5	PL/SQL	04	04	06	14
6	PL/SQL Database Objects and Database administration Overview	04	06	06	16
Total		24	28	28	80

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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	Marks
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.

D.K.Bhandare
Prepared By

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Member Secretary, PBOS

M.S. Satarkar
Chairman, PBOS

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	Marks
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

D.K.Bhandare
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Member Secretary, PBOS

M.S.Satarkar
Chairman, PBOS

Programme : Diploma in Computer Engg.
Programme Code : 06/26
Name of Course : Terminal Equipment APP Development Using Android Framework
Course Code : CM581

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	Two class tests, each of 60 minutes	02 Hrs.	--	--	--
Marks	10	40	50	--	50

Course Rationale:

Mobiles, tablets and electronic gadgets are very popular and widely used as a requisite to run our life smoothly. And this is the reason Terminal Equipment App Development Environments like Android OS, Symbian OS etc are popular and fastest growing environments which are widely used by Smartphone, Tablets, and equipments. This course is designed to introduce and familiarize students of computer engineering with such a popular environment so that respective skills on these environments help them as skill development and enhancement, placement assistance, and for their career growth.

Course Objective:

After studying this course, the student will be able to

- Understanding the Android Application Development Framework
- Setting up Android Application Development Environment
- Creating Android applications
- Publishing Android applications

Course Content

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
SECTION-I			
1	Overview Of Android Operating System and it's Development Environment setup		
	1.1 What is Android Operating System? Identify key features for various versions of Android. Identify the various tools and software required for developing an Android Application. Android Architecture.	04	06
	1.2 Architecture , Application Component		

	1.3	Install and Java and Android SDK , Install Eclipse IDE ,Configure Android Development Tool , Create Android Virtual Devices , Identifying the components of an Android Project, Create simple program hello world		
2	Configuration Of Andriod Environment			
	2.1	Operating System, Java JDK, Andriod SDK	08	08
	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		
3	Android Components and Layouts			
	3.1	Activities, Services, Broadcast Receivers, Content Provider, Fragments, Intents And Filter.	04	06
	3.2	Control Flow, Directory Structure,Understanding components of a screen, Fundamental UI Design		
	3.3	Linear Layout,Absolute Layout,,Frame Layout,Table Layout,Relative Layout		
SECTION-II				
4	Creating Android User Interface Elements			
	4.1	Text View, Button, Image Button, EditTextCheckbox, ToggleButton, RadioButton And RadioGroup, ProgressBar, ListView, GridView, Image View, Scroll View, Custom Toast Alert, Time And Date Picker.	06	06
	4.2	Creating Android Application for Sending Email ,Sending SMS, Phone Calls.		
	4.3	Android Alert Dialog, , Audio Capture, , Bluetooth		
5	Android Databases			
	5.1	1SQLite, , Creating Database, Creating Tables, Database handling Different transaction with database	06	08
6	Security & Permissions, Application Deployment			
	6.1	Understanding the Android Security Model, Declaring and Using Permissions, Understanding and Using Custom Permission.	06	06
	6.2	Application Deployment: Creating Small Application, Signing of application, Deploying app on Google Play Store, Become a Publisher, Developer Console.		
Total			32	40

List of Practicals / Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1.	Introduction To Android OS and Setup Android Development Environment	02
2.	Develop a program to Display Hello World On Screen.	02
3.	Write a Program to create an activity	02
4.	Write a Program to create Service	02
5.	Write a Program to create BroadCast Receiver	02
6.	Write A Program for Explicit Intent and Implicit Intent	04
7.	Write A Program to create fragments.	02
8.	Write program(s) using Linear Layout,Absolute Layout,,Frame Layout,Table Layout andRelative Layout.	06
9.	Write a Program Using UI Control(Text View ,Edit Text , Auto Complete Text View)	02
10.	Write a Program Using UI Control(Button , Image Button, Toggle Button)	02
11.	Write a Program Using UI Control(Check Box , Radio Button)	02
12.	Write a Program Using ProgressBar.	02
13.	Write program to create List View andGrid View	04
14.	Write a Program Using Time And Date Picker.	02
15.	. . Write programs to send email and SMS	04
16.	Write program(s) for Alert dialog box, Android, Audio capture, Bluetooth, Camera	04
17.	Write program(s) for Bluetooth, Camera	04
18.	Write program(s) for database transactions with Android OS.	06
19.	Develop a mini project to create Android App, Deploy and publish the App using Google Play Store.	10
Total		64

Text Books

Author	Title	Publisher
Pradeep Kothari, Kogent Learning Solutions Inc. Black Book,	Android Application Development(With Kitkat Support)	Dreamtech Press
Rick Rogers, John Lombardo, Zigurd Mednieks, and Blake Meike	Android Application Development	O'Reilly

Learning Resources: Black Board, Transparencies, Overhead projector, LCD, White Board

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Overview Of Android Operating System and it's Development Environment setup	04	02	--	06
2	Resource Organizing and Accessing	04	02	02	08
3	Creating Android User Interface Elements	02	02	02	06
4	Android DataBase	02	02	02	06
5	Android User Interface Design and UI Testing	02	02	04	08
6	Security & Permissions, Application Deployment	02	02	02	06
	Total	16	12	12	40

Mrs. Megha G .Yawalkar ,

Mrs. Archana S.Paike

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Prof.S.V.Chaushari

Secretary, PBOS

Prof.U.V.Kokate

Chairman, PBOS

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

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	Three class tests, each of 60 minutes	2Hrs.	--	--	--
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	Marks
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	12	12
	2.2	Scroll bars, Building a better Scroll		
	2.3	The Structure of GDI, The Device Context		
	2.4	Drawing Dots and Lines, Drawing Filled Areas		
	2.5	The GDI Mapping Mode		
	2.6	Rectangles, Regions and Clipping.		
SECTION - II				
3	The Keyboard and Mouse			
	3.1	Keyboard Basics	08	10

	3.2	Key-stroke Messages, Character Messages, Keyboard Messages and Character Sets		
	3.3	Mouse Basics,		
	3.4	Client- Area Mouse Messages, Non-Client- Area Mouse Messages, Hit-Testing in your Programs, Capturing the Mouse		
4	The Timer			
	4.1	Timer Basics	08	10
	4.2	Using the Timer: Three Methods, Using the Timer for a Clock, Using the Timer for a Status Report		
	4.3	Child Window Controls		
	4.4	The Button Class, Controls and Colors, The Static Class, The Scroll Bar Class, The Edit Class, The List Box Class		
Total			32	40

List of Practicals/ Experiments/Assignments:

Sr.No.	Name of Experiment/Assignment	Practical Hrs	Tutorial Hrs
1	Getting Familiar with VC++, parts of a VC++ Program	02	--
2	Writing Simple Programs using VC++.	04	04
3	Programs on drawing dots, lines	02	02
4	Programs on drawing filled areas, rectangles.	02	02
5	Programs using Timer methods	04	04
6	Programs for implementing Child Window Controls	04	04
7	Programs for implementing Button class and controls	02	04
8	Programs on Reading Keystrokes from the Keyboard, Displaying Our Text, Finding the size of the window	04	04
9	Programs for handling the Mouse.	04	04
10	Creating Check Boxes, Radio buttons, List Boxes, Combo Box, Scroll Bar	04	04
Total		32	32

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

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Programme : Diploma in Computer Engineering
Programme Code : 06/26
Name of Course : Web Technology Using JavaScript
Course Code : CM583

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 component 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 Objectives:

After studying this course, the student will be able to

- Build dynamic web pages
- Display alert boxes
- Write messages to the Browser status bar
- Control browser features
- Validate information in forms
- Create interactive forms

Course Content :

Chapter No.	Name of Topic/Sub topic		Hrs	Marks
	SECTION-I			
1	An Inside Look At JavaScript Programming			
	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			
	2.1	Array : Declaring, Defining Looping The Array, Adding Array Element	08	08
	2.2	Sorting Array Elements		

	2.3	Making a New Array from an Existing Array, Combining Array Elements into a String, Changing Elements of the Array		
	2.4	Function :Defining, The Scope of Variables and Arguments, Calling a Function, Function Calling Another Function, Returning Values from a Function.		
	2.5	String : Joining Strings, Dividing Text, Converting Numbers and Strings, Changing the Case of the Strings, Strings and Unicode		
3	Forms and Event Handling			
	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		
	SECTION-II			
4	Cookies and Browser Windows			
	4.1	Cookie Basics, Creating, Reading, Setting the Expiration Date, Deleting	04	07
	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			
	5.1	Regular Expression: The Language of a Regular Expression, Replace Text , Return the Matched Characters	04	07
	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			
	6.1	Setting the Stage	04	06
	6.2	Creating a Rollover		
	6.3	Text Rollovers		

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	6.4	Multiple Actions for a Rollover		
	6.5	More Efficient Rollovers		
	6.6	Making Magic Using the Status Bar		
	6.7	Banner Advertisements		
	6.8	Creating a Slideshow		
	6.9	Hiding Your Code		
	6.10	Concealing Your E-mail Address		
Total			32	40

List of Practicals

Experiments/Assignments:

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

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:

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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	--	06	08
3	Forms and Event Handling	02	--	06	08
4	Cookies and Browser Windows	02	--	05	07
5	Regular Expressions, JavaScript and Frames	02	--	05	07
6	Rollovers, Status Bar, Banners, Slideshow, Protecting Your Webpage	02	--	04	06
Total		12	02	26	40

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Prof. S.P.Emekar
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Programme : **Diploma in Computer Engineering**
Programme Code : **06/26**
Name of Course : **Multimedia Techniques**
Course Code : **CM584**

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	Two class tests, each of 60 minutes	2Hrs.	--	--	--
Marks	10	40	50	--	50

Course 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 Objectives:

After studying this course, the student will be able to

- Handle Multimedia hardware.
- Knowledge of different software like Photoshop for Image Editing.
- Create Animation & Integrate Audio & Video.
- Build Flash Movie.
- Build Text-Based Animation and Coral Draw for Text Editing.
- Play Movie.
- Integrate Multimedia In Web Page.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks	
SECTION-I				
1	Introduction To Multimedia			
	1.1	Definitions -Where to use Multimedia, Multimedia in Business, Multimedia in Schools, Multimedia in Home, Multimedia in Public Places, Virtual Reality.	06	07
	1.2	Basic Tools- I/P, O/P devices, Painting & Drawing Tools, OCR Software, Digital v/s Analog, CRT display System, Display Terminology, Flat Panel Display.		
	1.3	Storage media Magnetic Media Technology, Hard disk Technology, RAID, Criteria for Selection of RAID, Use of Magnetic Storage in Multimedia, Optical Media, Magneto Optical		
2	Multimedia Building Blocks & Compression/Decompression with File Formats			
	2.1	Images- Introduction to RIFF, AVI, JPEG, Bitmap file Format, Index Chunk and Boundary, condition handling for AVI files.	08	07

	2.2	Compression and Decompression -Types of compression ,Need of Data Compression ,Color Gray Scale and Still Video Image , Color Characteristics ,Color Model		
	2.3	Sound -Digital audio, Audio file format, MIDI Versus Digital Audio, Synchronization, Orchestration & QOS Architecture		
3	Architecture & Issues For Distributed Multimedia System.			
	3.1	Multimedia System Architecture.	06	06
	3.2	Distributed Multimedia.		
	3.3	Synchronization, Orchestration & QOS Architecture		
	3.4	Framework for Multimedia System		
SECTION-II				
4	Distributed Multimedia Systems			
	4.1	Components of Distributed Multimedia Systems	04	07
	4.2	Distributed Client Server Operation		
	4.3	Multimedia Object Server		
	4.4	Multi Server Network topologies		
	4.5	Distributed Multimedia Databases		
5	Animation & Video			
	5.1	The Power of motion, Principles of Animation,	04	07
	5.2	How Video Works, and Broadcast Video Standards.		
	5.3	Digital video, Study of story board.		
6	Multimedia Authoring Tools			
	6.1	Types of Authoring Tools-Different features	04	06
	6.2	Card- and Page-Based Authoring tools		
	6.3	Icon-and Object Based Authoring tools Time Based Authoring tools		
Total			32	40

List of Practicals / Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Installation of Adobe Flash, Photoshop and Corel draw software.	04
2.	Creating any simple video in Movie maker using Timeline & Sound.	02
3	<u>Corel Draw Assignments</u>	15
	<ul style="list-style-type: none"> • 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. 	
4	<u>Photoshop Assignments</u>	15
	<ul style="list-style-type: none"> • Implementing and Study of all tools in Photoshop software 	

	<ul style="list-style-type: none"> • 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. 	
5	<u>Adobe Flash Assignments</u>	20
	<ul style="list-style-type: none"> • Implementing and Study of all tools in Adobe Flash software. • 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 • Loading Sound into Animation Clip 	
6	Mini project -Create a movie of minimum 15 minutes.	08
Total		64

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Introduction To Multimedia	Explanation of basic concept and Slide Presentation
2.	Multimedia Building Blocks & Compression/Decompression with File Formats	Explanation and Demonstration
3	Architecture & Issues For Distributed Multimedia System.	Explanation and Demonstration
4	Distributed Multimedia Systems	Explanation and Practical Implementations
5	Animation & Video	Explanation and Practical Implementations
6	Multimedia Authoring Tools	Explanation and Slide Presentation

Text Books:

Sr. No	Author	Title	Publication
1	Tay Vaughan	Multimedia Making it Work 3 th edition	TMH
2	Prabhat k. Andheigh, Kiran Thakrar, JohnF	Multimedia Systems Design	Prentice Hall of India

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3	Koegel Buford	Multimedia Systems	Pearson Education
4	Katherine Ulrich	Micromedia Flash for Windows and Macintosh	Pearson Education
5	Free Halshall	Multimedia Communication	Pearson Education
6	R. Steimnetz, K. Nahrstedt	Multimedia Computing, Communication & Application	Pearson Education
7	J.D. Gibson	Multimedia Communication Directions and Innovations	Academic Press, Hardcourt India
8	J.F. Kurose, K. W.Rose	Computer Networking	Pearson Education

Learning Resources: Books, Models, OPH, LCD Projector and Transparency

<http://www.coreldrawtips.com/site/basic-tutorials>

<http://design.tutsplus.com/categories/text-effects>

<http://www.freeadobeflashtutorials.com/>

<http://www.techiwarehouse.com/engine/65eeb3b5/Flash-Tutorial-For-Beginners>

Specification Table:

Sr. No	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction To Multimedia	04	02	02	08
2	Multimedia Building Blocks & Compression/Decompression with File Formats	02	03	03	08
3	Architecture & Issues For Distributed MultimediaSystem.	02	02	02	06
4	Distributed Multimedia Systems	02	02	02	06
5	Animation & Video	01	02	03	06
6	Multimedia Authoring Tools	01	03	02	06
Total		12	14	14	40

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Programme : Diploma in Computer Engineering.
 Programme Code : 06/26
 Name of Course : Scripting Technology Using JSP
 Course Code : CM585

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	Three class tests, each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	--	25	25

Course Aim:

JSP is widely used server side scripting language. This course aims at providing in-depth knowledge of sever side scripting through JSP.

Course Objectives:

After studying this course, the student will be able to

- Understand Server side programming Using JSP.
- Building Server side applications using Java
- Write programs using threads and thread management.
- Write programs for managing sessions.
- Write programs for Event handling and using filters.
- Understand Request Dispatching and establishing database connectivity.
- Debug and deploy web applications

Course Content:

Sr. No	Name of Topic/Sub topic	Hrs	Marks	
SECTION - I				
1	Introduction to Web Programming Environment:		10	12
	1.1	Evolution of the Web Application		
	1.2	Overview of the Hypertext Transfer Protocol(HTTP): The HTTP Specification, HTTP Request Model.		
	1.3	Introduction to Servlets: Servlet LifeCycle, servlet Classes, Threading Models,HTTP sessions		
	1.4	A Simple Servlet, The Servlet API, The Javax.Servlet Package, Reading Servlet Parameters, Reading Initialization Parameters		
2	Elements of JSP:		12	12
	2.1	JSP Overview: How JSP works, A basic example.		
	2.2	JSP Syntax and Semantics: The JSP Development Model ,Components of JSP page, Complete example.		
	2.3	Expressions, Scriptlets and Declarations: Expressions, Scriptlets, Declarations.		
3	Request Dispatching and Session and JDBC		12	16
	3.1	Request Dispatching: Anatomy of Request processing, Including Other Recourses.		
	3.2	Session and Thread Management: Session Tracking , The Session API, Thread Management, Servlet Threading Models.		

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Sr. No	Name of Topic/Sub topic	Hrs	Marks
3.3	Database Access With JDBC: Overview of JDBC,JDBC Drivers, Connecting to a Database With Driver manager,		
SECTION - II			
4	Application Event Listeners and Filters:		
4.1	Application Event Listeners: Beyond Session Binding Listeners, Event Scope, Event Listener Interfaces, Examples.	10	14
4.2	Filters: Filter overview, Developing and deploying a Filter,		
5	JSP Tag Extensions:		
5.1	Introduction to Custom Tags: Why Custom Tags, Developing your first Custom Tag, How Tag handlers Works, tag Libraries, The Tag Handler Apathy Tag Handler Life Cycle,Defing Tag Attributes, the iteration of Tag interface, The Body tag Handler API.	12	16
5.2	Expression Language: What is EL? EL syntax, Functions.		
5.3	The JSP Standard Tag Library(JSTL):Getting started with JSTL,Core Tags,XML Tags,SQL Tags, Formatting Tags.		
5.4	Simple Tag Extensstions,tag Files, and JSP Fragments: JSP Fragments, The Simple Tag Interface, Tag Files.		
6	Testing and Deploying web application		
6.1	JSP Testing and Debugging: Building a Mental Model,Tesing in Isolation, Debugging Tools	08	10
6.2	Deploying Web application: The web application environment, The web archive (war) file, The deployment Descriptor.		
Total		64	80

List of Experiments/Assignments:

Note : For Practical's actual program statements should be framed by respective faculty .

Sr. No.	Name of Experiment/Assignment	Hrs
1.	<ul style="list-style-type: none"> • Installation of Web Server. • Write a program for demonstration of Generic servlets. • Write a program for demonstration of HTTP Servlets. • Write a simple JSP program and monitor the corresponding servlet class. 	06
2.	<ul style="list-style-type: none"> • Write a simple JSP program program for Demonstrating use of all basic elements . • Write a simple JSP program program for Demonstrating use of expressions, declarations . 	06
3.	<ul style="list-style-type: none"> • Write a JSP program program for Demonstrating use of request dispatching. • Write a simple JSP program program for Demonstration of Session Management . • Write a simple JSP program program for Demonstration of Thread Management . 	06
4.	<ul style="list-style-type: none"> • Write a JSP program for Demonstration of connecting to database using JDBC 	04
5.	<ul style="list-style-type: none"> • Write a JSP program program for Demonstration of Event Listeners. • Write a JSP program program for Demonstration of Filters. 	04
6.	<ul style="list-style-type: none"> • Write a JSP programs for Demonstration of all tags covered in chapter. 	04
7.	<ul style="list-style-type: none"> • Creating Web archive and writing Deployment descriptor 	02

Course Code : CM586

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 60Min. duration	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 Objectives:

After studying this course, the student will be able to

- Install Windows Server 2008
- Configure networking resources
- Monitor network performance
- Troubleshoot network faults
- Manage disk quota
- Implement backup and recovery strategy

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks	
SECTION - I				
1	The Windows Server 2008 Environment			
	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.		

Chapter No.	Name of Topic/Sub topic	Hrs	Marks	
2	Managing Access to Resources & Managing User Environment			
	2.1	File systems – FAT, Fat32, NTFS, Features of NTFS, Creating and Sharing Folders, Configuring NTFS Permissions, Publishing Shared Folders, Testing Permissions, Determine effective permissions.	12	16
	2.2	The active directory's logical structure, Benefits of active directory, Components and mechanisms in active directory – data store, Schema, Global catalog, replication Overview of Active directory domains, transitive two way trust relationships, using multiple domains, active directory forest, active directory object names, active directory's physical structure, accessing active directory through LDAP		
	2.3	Managing Group Policy :Configuring Group Policy Settings, Assigning Scripts with Group Policy, Restricting Group Membership and Access to Software Planning group policy strategy		
3	Administrative Templates and Audit Policy			
	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:			
	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 :			

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Chapter No.	Name of Topic/Sub topic		Hrs	Marks
	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:			
	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	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 Practical's / Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	<ul style="list-style-type: none"> • Installation of Windows Server 2008/Windows 2000 Server/ Windows 2008 Server • Creation and Management of local users . • Creation and Management of group and implementation of its properties. • Installation of Device Drivers. • System Performance Monitoring through Windows Performance Monitoring. 	06
2	<ul style="list-style-type: none"> • Installation and implementation of Remote Desktop. • Sharing and managing Resources. 	04
3	<ul style="list-style-type: none"> • Creating login screen, Configuration of logon policies, password policy. • Testing, creating and importing security templates. 	04
4	<ul style="list-style-type: none"> • Configuration of TCP/IP network <ul style="list-style-type: none"> i) Assign IP Address ii) Verify IP Communication • Implementation of local, roaming, hardware profile. 	06

5	<ul style="list-style-type: none"> • Installation and verification of Active Directory <ul style="list-style-type: none"> i. Domain Controller ii. NetBIOS Domain Name iii. Permissions iv. Verifying the Installation <ul style="list-style-type: none"> • Event Viewer • Event Log • Installation of Domain Name System <ul style="list-style-type: none"> i. DNS Namespace ii. DNS Zones 	04
6	<ul style="list-style-type: none"> • Installation and implementation of DHCP <ul style="list-style-type: none"> i) Authorizing DHCP for Active Directory ii) Creating and managing DHCP Scopes • Writing batch scripts for administrative purpose. 	04
7	<ul style="list-style-type: none"> • Case Study on any one Open source and commercial Cloud-Microsoft Azure , Eucalyptus , Amazon EC2 	04
Total		32

Text/Reference Books:

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	MCITP Guide to Microsoft Windows Server 2008 Administration	Michael Palmer, CENGAGE learning.	ISBN 10: 1423902823 ISBN 13: 9781423902829
2	MCITP Windows server 2008 server Administrator Study Guide	Darril Gibson, Wiley Publishing, Inc	ISBN 10: 0470293152 ISBN 13: 9780470293157
3	70-646 Windows server Administration Training kit	Ian Mclean and Orin Thomas, Microsoft Press	ISBN 10: 0735625107 ISBN 13: 9780735625105
4	Data Communication and Networking	Behrouz Forouzan, Osborne Publishing	ISBN 10: 0072322047 ISBN 13: 9780072322040
5	Cloud Computing : Principles and paradigms	Rajkumar Buyya, James Broberg 2011,Wiley Publication	ISBN 10: 0470887990 ISBN 13: 9780470887998

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	The Windows Server 2003 Environment	08	02	02	12
2.	Managing Access to Resources & Managing User Environment	10	02	04	16
3.	Administrative Templates and Audit Policy	08	02	02	12
4.	Windows Server 2008 networking & IP Routing	08	02	02	12
5.	DHCP & Domain Naming Systems	10	02	04	16
6.	Backup and Recovery Strategy & Cloud Computing	06	02	04	12
Total		50	12	18	80

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Programme Code : 06/07/26
Name of Course : System Programming
Course Code : CM587

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 60Min. duration	3 hrs.	---	---	---
Marks	20	80	--	25	25

Course Rational:

System Programs are the set of software which aids in effective communication with the system and makes the user interface more friendly.

This course is aimed in developing the knowledge about design aspects of such system software.

Course Objectives:

After studying this course, the student will be able to	
	After studying this course, the student will be able to
	<ul style="list-style-type: none"> • Understand various design aspects of the system Software. • Understand various software tools like editors and debuggers • Develop various system software

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
SECTION - I			
1	Introduction		
	1.1 Background , machine structure, Components of programming.	10	12
	1.2 System : -Assemblers, loaders, Macros, Compilers, formal system.		
	1.3 Evolution of Operating System		
	1.4 General Machine Structure: Machine Structure IBM 360 and 370 , Machine Language		
2	Assemblers		
	2.1 General design procedure, Design of the assembler, Statement of the problem	10	14
	2.2 Data Structure, Format of databases, Algorithm (Detailed PASS 1& PASS 2 Flowchart),Look for modularity, Table Processing Searching : Linear Search, Binary search		

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Chapter No.	Name of Topic/Sub topic		Hrs	Marks
	2.3	Sorting: Interchange sort, Shell sort, Bucket sort, Radix exchange sort, Address calculation sort, Comparisons of sort, Hash or Random entry searching.		
3	Macro Language & Macro Processors			
	3.1	Macro Instructions, Features of a Macro facility Macro Instruction Arguments	12	14
	3.2	Conditional macro expansion, Macro calls within Macros, Macro Instructions defining macros, Implementation, Implementation of restricted facility.		
	3.3	A two Pass algorithm, A single pass algorithm, Implementation of macro calls within Macros, Implementation within an assembler.		
SECTION - II				
4	Loaders			
	4.1	Introduction ,Loader Schemes, “Compile and go” loaders, General Loader Scheme, Absolute Loaders, Subroutine linkages.	12	12
	4.2	Relocating loaders, Direct-linking loaders, Other loader schemes: Binders, Linking loaders, Overlays		
	4.3	Dynamic Binders, Design of an Absolute loader, Design of Direct Linking Loader.		
	4.4	Specification Problem, Specification of data structures , Format of databases. Algorithm		
5	Compilers			
	5.1	Statement of a problem, Recognizing basic elements, Recognizing Syntactic units and Interpreting meaning	14	16
	5.2	Intermediate form :- Arithmetic statements , non arithmetic statement, non-executable statements		
	5.3	Storage Allocation, Code Generation: Optimization (M/c independent), Optimization (M/c dependent)		
	5.4	Assembly Phase, General Model of Compiler, Phases of a Compiler: Lexical Phase Tasks, databases, algorithm, Syntax Phase: Databases, Algorithm. Interpretation Phase: Databases, Algorithm. Optimization : Databases, Algorithm. Storage Assignment: Databases, Algorithm. Code Generation : Databases, Algorithm. Assembly Phase : Databases, Algorithm. Passes of a Compiler		
6	Parsing			
	6.1	Parse tree & abstract syntax tree Parsing Techniques: Top down parsing Implementing Top down parsing.	10	12
	6.2	Comment on Top down parsing, Top down parsing Without backtracking, Practical Top down parsing Bottom up parsing, LALR parsing		
	6.3	Software Tools : Software tools for program Development , Editors, Debug monitors Programming environments, User interfaces		
Total			64	80

List of Practicals / Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Implement a symbol table with functions to create, insert, modify, search, and display using 'C'.	04
2	Implement programs on sorting techniques within Symbol Table using 'C'.	02
3	Implement programs on searching techniques within Symbol Table using 'C'.	02
4	Simulation and Study of the Assembler using Simulation Tool(eg Reads51)	02
5	Implement a single pass macro processor	04
6	Simulation of loaders using Simulation Tool	04
7	Design of various phases of Compiler.	06
8	Demonstrating use of parsing techniques on given string	04
9	Study of different Software Tools	04
Total		32

Text Book/References

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	John J. Donovan	Systems Programming	Tata_McGraw Hills
2	Dhamdhare	Systems Programming and Operating systems	Tata McGraw Hills

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Introduction	08	02	02	12
2.	Assemblers	08	02	04	14
3.	Macro Language & Macro Processors	08	02	04	14
4.	Loaders	08	02	02	12
5.	Compilers	10	02	04	16
6.	Parsing	06	02	04	12
Total		48	12	20	80

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Programme	:	Diploma in Computer Eng.
Programme Code	:	06/26
Name of Course	:	Advanced Database Management System
Course Code	:	CM588

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	Three class tests, each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	--	25	25

Course Rationale:

In the present era, it is very essential to develop and arrange data in such a way that it solves a complex problem efficiently. Advanced database management is a subject which gives emphasis on managing the data which is available on internet. The students will be able to handle, manage and transform online data in a secure environment and gain the knowledge of emerging database technology such as multimedia database, digital library database and mobile database.

Course Objectives:

After studying this course, the student will be able to

- To understand fundamental transaction processing, concurrency and recovery control issues associated with database management system.
- To understand emerging databases.
- To develop understanding of database systems theory in order to apply that knowledge to any particular database implementation using SQL and XML.
- To learn and understand various database architectures.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
SECTION- I			
1	Introduction to Database Management system		
	1.1	12	12
	1.2		
	Introduction: Definition of DBMS, Benefits of DBMS, Database-System Architectures : Centralized and client-server architectures, Server system architectures, Parallel systems, Distributed systems, Network types.		

	1.3	Extended ER : E-R model revisited , Specialization & Generalization , Extended E-R , Subclass super class , Constraints and characteristics of specialization & Generalization, Relationship types of degree Higher than two , Aggregation, Union and categories , EER - To Relation Models Mapping		
2	Advanced SQL and Query processing.			
	2.1	Advanced SQL: SQL Data types & Schemas , Queries based on SQL 3 standards (outer join, multi join , left, right, a full outer join, equal join, natural join , Aggregate, functions, Null values etc. EXIST and NOT EXIST, any / all, pattern matching Dynamic SQL	14	18
	2.2	Query Processing: Overview Measures of Query cost, Selection operation , Sorting , Join Operations , Other Operations Evaluation of Expression.		
	2.3	Query Optimization: Translations of SQL Queries into relational algebra, Heuristic approach & cost base optimization.		
3	Transaction and Concurrency control			
	3.1	Transaction: Transaction concept, Transaction state, Implementation of atomicity and durability, Concurrent executions, Serializability, Recoverability, Implementation of isolation, Testing for serializability.	10	14
	3.2	Concurrency control: Lock-based protocols, Timestamp-based protocols, Validation-based protocols, Multiple granularity, Multiversion schemes, Deadlock handling, Insert and delete operations, Weak levels of consistency, Concurrency in index structures.		
SECTION-II				
4	Parallel Databases AND Distributed Databases			
	4.1	Parallel Databases Parallel databases, I/O parallelism, Interquery parallelism, Intraquery parallelism, Intraoperation parallelism, Interoperation parallelism, Design of parallel systems.	12	14
	4.2	Distributed Databases : Homogeneous and heterogeneous databases, Distributed data storage, Distributed transactions, Commit protocols, Concurrency control in distributed databases, Availability, Distributed query processing, Heterogeneous distributed databases, Directory systems.		
5	Emerging Database Technologies			
	5.1	Object-Based Databases Overview of object-based databases, Complex data types, Structured types and inheritance in SQL, Table inheritance, Array and multiset types in SQL, Introduction of object-identity and reference types in SQL, Object-oriented versus object-relational.	10	12
	5.2	Multimedia Database: Multimedia Sources, Multimedia database Queries, multimedia Database application		
	5.3	Mobile Database: Architecture of mobile databases , Characteristics of mobile, computing Mobile DBMS, commercial mobile database.		

6	XML and Internet Databases:		
6.1	Structure of XML data, XML document schema, Querying and transformation, Application program interfaces to XML, Storage of XML data, XML applications, UML.	06	10
Total		64	80

List of Practicals / Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Demonstration of Installation of Oracle Database Software's.	02
2	Write Queries using outer join, multi join , left, right, a full outer join, equal join, natural join, Aggregate function.	04
3	Translations of SQL Queries into relational algebra.	04
4	Write Query using pattern matching Dynamic SQL.	04
5	Write a program to simulate lock-based concurrency control protocol.	02
6	Write a program to simulate timestamp-based concurrency control protocol.	02
7	Write a program to simulate validation-based concurrency control protocol.	02
8	Write an SQL to store and retrieve multimedia objects (Image, Audio or Video). in Oracle Databases.	04
9	Study of XML	02
10	Creating XML Schema	02
11	Implementation of accessing database from a java/any programming language.	04
Total		32

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Introduction to DBMS	Explanations of basic concepts
2	Advanced SQL and Query processing.	Explanation & Practical implementation
3	Transaction and Concurrency control	Explanation of transaction and concurrency control & Practical implementation
4	Parallel Databases AND Distributed Databases	Explanation & Practical implementation
5	Emerging Database Technologies	Explanation & Practical implementation
6	XML and Internet Databases:	Explanation & Practical implementation

Text Books

Author	Title	Publisher
Abraham Silberschtz, Henry Korth and S.Sudharshan	Database system concepts(3rd edition)	McGraw Hill
Elmasri R., Navathe S	"Fundamentals of Database Systems"4'th Edition	Pearson Education

Reference Books

Author	Title	Publisher
Raghu Ramkrishnan & Johannes Gehrke	Database system concepts(3 rd edition)	Tata McGraw Hill.
Stefano Ceri, Hillseppe , pelagatti	Distributed Databases, Principles and Systems	Tata McGraw Hill.
Dr. P.S. Deshpande	SQL and PL/SQL for Oracle log	Black Books Dreamtech Press
Mark L. Gillenson, Paulraj Ponniah	Fundamentals of Database Systems	WILEY

Learning Resources: LCD, Projector, and Transference, White Board

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction to Database Management system	06	06	00	12
2	Advanced SQL and Query processing.	04	04	06	14
3	Transaction and Concurrency control	04	04	06	14
4	Parallel Databases AND Distributed Databases	04	04	06	14
5	Emerging Database Technologies	04	04	06	14
6	XML and Internet Databases:	06	04	02	12
Total		28	26	26	80

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